

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NOKIA OF AMERICA CORPORATION,
Petitioner,

v.

IPCOM, GMBH & CO. KG,
Patent Owner.

IPR2021-00533
Patent 6,983,147 B1

Before KRISTEN L. DROESCH, KARA L. SZPONDOWSKI, and
SCOTT RAEVSKY, *Administrative Patent Judges*.

RAEVSKY, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Nokia of America Corporation (“Petitioner”) filed a Petition (Paper 3, “Pet.”) requesting *inter partes* review of claims 1–4, 6, and 32–40 of U.S. Patent No. 6,983,147 B1 (Ex. 1001, “the ’147 patent”).¹ Pet. 1. IPCoM GmbH & Co. KG (“Patent Owner”) filed a Preliminary Response (Paper 7) and also filed a disclaimer (Ex. 2022) that disclaimed claims 37–40. Based on these and other preliminary submissions, we instituted an *inter partes* review of claims 1–4, 6, and 32–36. Subsequent filings include a Patent Owner Response (Paper 26, “PO Resp.”) and a Petitioner Reply (Paper 28, “Reply”). Patent Owner waived filing a Sur-reply. Paper 39. An oral hearing was held on May 18, 2022, and a copy of the transcript was entered into the record. Paper 47 (“Tr.”).

We have jurisdiction over this proceeding under 35 U.S.C. § 6(b). After considering the evidence and arguments of the parties, we determine that Petitioner has proven by a preponderance of the evidence that claims 1–4, 6, and 32–36 of the ’147 patent are unpatentable. *See* 35 U.S.C. § 316(e). We issue this Final Written Decision pursuant to 35 U.S.C. § 318(a).

II. BACKGROUND

A. Related Matters

The parties identify the following related district court litigations: *IPCoM, GmbH & Co. v. AT&T Corp.*, No. 2:20-CV-00322 (E.D. Tex. Oct. 1, 2020); *IPCoM, GmbH & Co. v. Verizon Commc’ns Inc.*, No. 2:20-CV-00323 (E.D. Tex. Oct. 1, 2020); and *IPCoM, GmbH & Co. v. Sprint Spectrum L.P.*, No. 2:20-cv-00321 (E.D. Tex. Oct. 1, 2020). Pet. 78;

¹ Ericsson Inc. was also a Petitioner, but we terminated the proceeding as to Ericsson Inc. due to settlement. Paper 46.

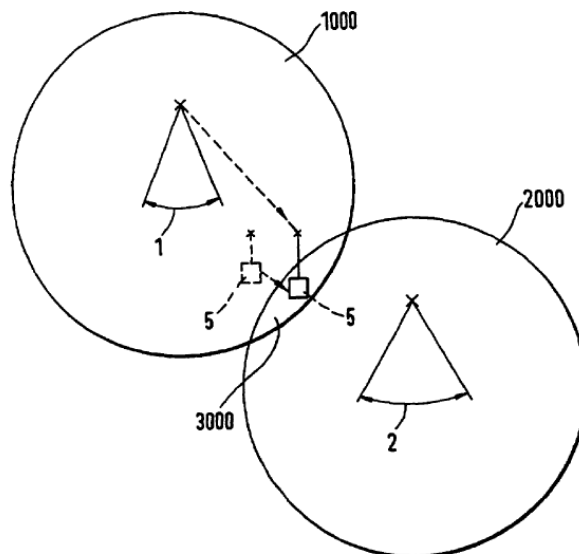
Paper 5, 2. Patent Owner also identifies the following related *inter partes* reviews: IPR2021-00506, -00507, and -00548. Paper 5, 2.

B. The '147 patent

The '147 patent relates to a method of transmitting signaling information between a master station (e.g., base station) and a slave station (e.g., mobile station) in a mobile wireless network. Ex. 1001, 1:8–10, 3:61–63. The master station transmits, to the slave station, signaling information containing information regarding whether processing of data to be sent is performed in the master station or in an additional master station. *Id.* at 1:41–50. If the slave station determines that the data has already been processed, then it may omit a complicated distortion elimination that would waste power (and thus battery) at the mobile station. *Id.* at 1:56–64.

Figure 6, reproduced below, illustrates two master (base) stations 1, 2, each in a radio cell area 1000 or 2000, and slave (mobile) station 5 that has moved into transitional area 3000 where the two radio cells overlap:

Fig.6



Id. at 19:22–29. Figure 6 above illustrates a scenario where first base station 1 ascertains that mobile station 5 is able to exchange data with second base station 2 (the “additional transmitting station” described above) because second base station 2 results in a higher reception quality than with first base station 1. *Id.* at 19:30–32; *see id.* at 1:41–50. In this scenario, first base station 1 prepares for a transfer, called a “handover,” of a link between first base station 1 and mobile station 5 to second base station 2. *Id.* at 19:34–36.

First base station 1 transmits a message to mobile station 5 with signaling information, which includes information regarding whether processing of the data is performed after the handover in second base station 2, and if so, which type or types of processing are used (discussed below). *Id.* at 19:38–44. As a result, in the case of handover before setting up a dedicated transmission channel between second base station 2 and mobile station 5, mobile station 5 may decide how it may perform distortion removal and detection of the data sent by second base station 2. *Id.* at 19:45–51. This process enables mobile station 5 to guarantee optimum data reception and minimization of power consumption. *Id.* at 19:51–52.

The types of processing to be used include transmission diversity and predistortion of the data. *Id.* at 5:63–6:1, 6:34–36. Transmission diversity uses multiple transmit antennas to allow mobile station 5 to compensate for signal dips or fading on one or more of the reception pathways. *Id.* at 6:3–8. Predistorted data can be compensated by properties of the transmission channel so that the data sent from base station 1 arrives undistorted, and thus distortion removal may no longer be necessary in mobile station 5. *Id.* at 6:36–41.

C. Challenged Claims

Petitioner challenges claims 1–4, 6, and 32–36 of the ’147 patent.

Claim 1 is illustrative:²

1. A method of transmitting signaling information between a transmitting station and a receiving station, comprising the step of:

[1a] transmitting a first message with the signaling information from the transmitting station to the receiving station, the first message including information regarding whether data to be sent is processed in an additional transmitting station,

[1b] the additional transmitting station being successively assigned to the receiving station to increase reception quality of the data to be sent at the receiving station, in accordance with measures relating to a transmission channel between the receiving station and at least one of the transmitting station and the additional transmitting station.

D. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability (Pet. 3):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–4, 6, 32–36 ³	103(a) ⁴	TS-25.331, ⁵ Motorola Proposal ⁶

² For convenience, we use Petitioner’s element labeling. *See* Pet. 35–42.

³ Petitioner also challenged claims 37–40, but Patent Owner disclaimed claims 37–40. Pet. 3; Ex. 2022.

⁴ 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. Because the challenged patent was filed before March 16, 2013, we refer to the pre-AIA version of § 103.

⁵ TS-25.331 v1.0.0 (1999-04), “RRC [Radio Resource Control] Protocol Specification” (Ex. 1007).

⁶ R2-99438, “RRC Parameters for the Support of Transmission Diversity,” Motorola, May 25–28, 1999 (Ex. 1008).

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–4, 6, 32–36	103(a)	Weaver ⁷ , Kotzin ⁸

Petitioner relies on the declarations of Mark Lanning (Exs. 1003, 1042), and Patent Owner relies on the declaration of Ray Nettleton, Ph.D. (Ex. 2039).

III. ANALYSIS

A. Principles of Law

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

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) any secondary considerations or objective evidence of nonobviousness.⁹ See *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

We apply these principles to the Petition’s challenges.

⁷ U.S. Patent No. 5,848,063 to Weaver et al., issued Dec. 8, 1998 (Ex. 1005).

⁸ U.S. Patent No. 6,173,005 to Kotzin et al., issued Jan. 9, 2001 (Ex. 1006).

⁹ Patent Owner has not submitted any objective evidence of nonobviousness.

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 Science, Computer Engineering or equivalent degree with at least 2 to 3 years of experience in the cellular telecommunications industry, including experience operating or implementing 3G networks. . . . Additional education might substitute for some of the experience, and substantial experience might substitute for some of the educational background.

Pet. 16–17 (citing Ex. 1003 ¶¶ 19–20).

Patent Owner accepts Petitioner’s definition of the level of skill. PO Resp. 9. We are persuaded, on the present record, that Petitioner’s proposal is consistent with the problems and solutions in the ’147 patent and prior art of record. We adopt Petitioner’s definition of the level of skill.

C. Claim Construction

In *inter partes* review, 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).

The parties agree that no terms require express construction. Pet. 23; PO Resp. 16. Based on our review of the record, we agree that no terms need to be construed. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe

terms that are in controversy, and only to the extent necessary to resolve the controversy.”) (internal quotation omitted).

D. Asserted Obviousness over Weaver and Kotzin

Petitioner contends that claims 1–4, 6, and 32–36 would have been obvious over Weaver and Kotzin. Pet. 49–71. For the reasons that follow, we agree with Petitioner.

Because this ground is dispositive of all the claims, we do not reach Petitioner’s ground over TS-25.331 and Motorola Proposal. *See Boston Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App’x 984, 990 (Fed. Cir. Apr. 30, 2020) (non-precedential) (recognizing that the “Board need not address issues that are not necessary to the resolution of the proceeding” and, thus, agreeing that the Board has “discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims”).

1. Overview of Weaver

Weaver describes different techniques for facilitating hard handoff from a first base station controlled by a first system controller to a second base station controlled by a second system controller. Ex. 1005, 4:13–16. These techniques attempt to address the difficulties presented by movement of a remote unit into a coverage area serviced by a base station from another cellular system. *Id.* at 3:37–40. Two separate cellular systems are shown below in Figure 2:

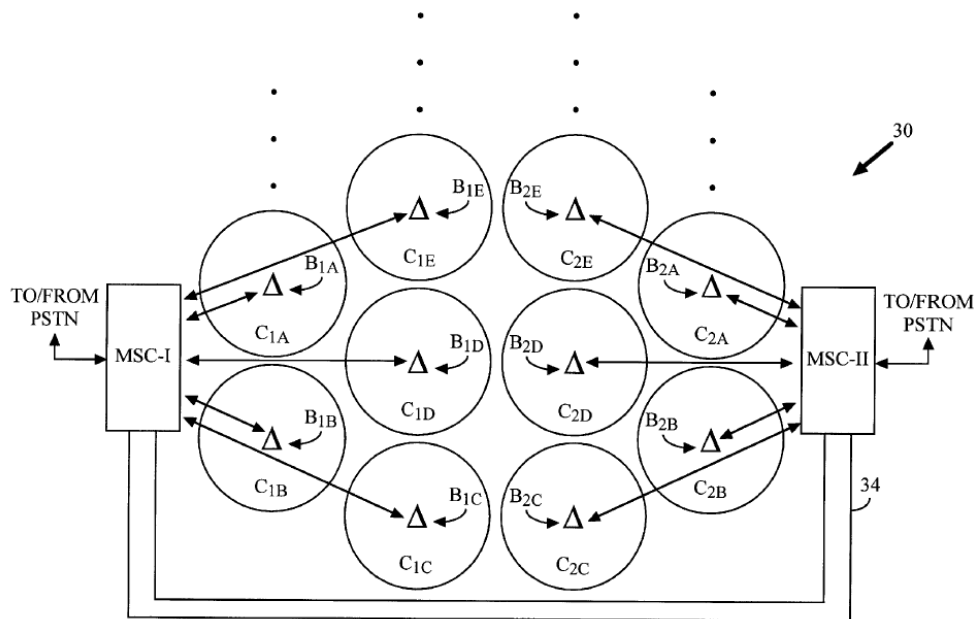


FIG. 2

Id. at 7:61–64. In Figure 2, cellular communications network 30 includes two cellular systems under the control of first and second mobile switching centers, MSC-I and MSC-II. *Id.* Each MSC communicates with five example base stations in five corresponding coverage areas. *Id.* at 7:64–8:6. MSC-I and MSC-II can also communicate with one another. *Id.* at 8:27–28.

To provide soft handoff between a base station associated with MSC-I and a base station associated with MSC-II, a large volume of call signal and power control information has to pass between MSC-I and MSC-II. *Id.* at 8:33–36. To avoid these complications, Weaver's system performs hard handoffs. *Id.* at 8:44–47.

2. Overview of Kotzin

Kotzin describes a process for implementing orthogonal transmit diversity. Ex. 1006, 2:32. A base station has multiple antennas for transmitting data to a mobile station. *Id.* at 2:48–54. Orthogonal transmit diversity is implemented by employing a data splitter to subdivide channel

information into first and second portions of bits. *Id.* at code (57). Each portion is spread with its own Walsh code for eventual transmission to a mobile station. *Id.* Control information related to the subdivision is transmitted to the mobile station so the channel information can be accurately reconstructed prior to decoding. *Id.*

3. Independent Claim 1

Petitioner contends that the combination of Weaver and Kotzin teaches or suggests all the limitations of claim 1. Pet. 49–66. Patent Owner disputes that the combination of Weaver and Kotzin teaches or suggests limitation 1[a]. PO Resp. 62–64. Patent Owner also disputes that one of ordinary skill in the art would have combined Weaver and Kotzin. *Id.* at 56–61.

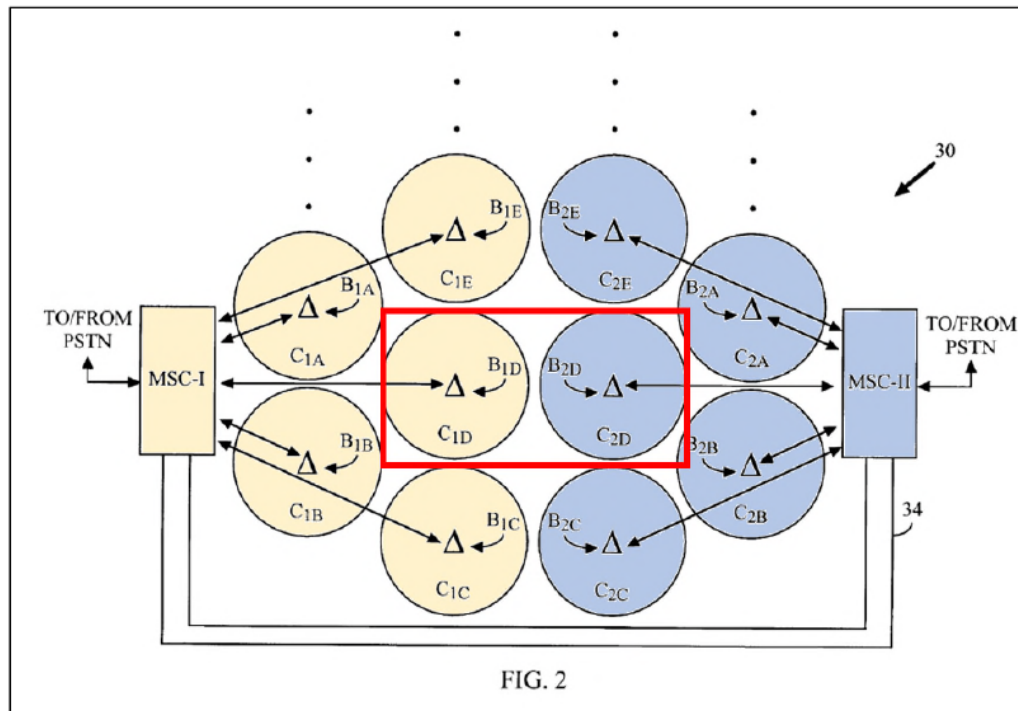
a. Undisputed Limitations

Petitioner contends that Weaver discloses the preamble of claim 1. Pet. 57–58. Petitioner supports its arguments with specific citations to Weaver and Dr. Lanning’s first declaration. Pet. 57–58 (citing, e.g., Ex. 1005, 10:6–8, 1:26–28, 10:37–40, 2:11–14; Ex. 1003 ¶¶ 192, 196, 197). On this record, we agree with Petitioner that Weaver discloses the preamble. We thus need not discuss Petitioner’s arguments on these limitations in detail. *LG Elecs., Inc. v. Conversant Wireless Licensing S.A.R.L.*, 759 F. App’x 917, 925 (Fed. Cir. 2019) (nonprecedential) (“The Board is ‘not required to address undisputed matters’ or arguments about limitations with which it was never presented.” (quoting *In re NuVasive, Inc.*, 841 F.3d 966, 974 (Fed. Cir. 2016))). We also need not determine whether the preamble is limiting because even if it were, we determine that Petitioner has shown that Weaver discloses it.

Petitioner also contends that the combination of Weaver and Kotzin discloses limitation 1[b]. Pet. 64–66. Petitioner supports its arguments with specific citations to Weaver, Kotzin, and Dr. Lanning’s first declaration. Pet. 64–66 (citing, e.g., Ex. 1005, 1:62–67, 1:53–2:18, 7:18–43, 6:8–10, 3:14–16; Ex. 1006, 9:27–37, 10:28–48, 11:27–60; Ex. 1003 ¶¶ 212, 214). On this record, we agree with Petitioner that Weaver discloses limitation 1[b]. *See LG Elecs.*, 759 F. App’x at 925.

b. [a] transmitting a first message with the signaling information from the transmitting station to the receiving station, the first message including information regarding whether data to be sent is processed in an additional transmitting station

Petitioner argues that the combination of Weaver and Kotzin teaches or renders obvious limitation 1[a]. Pet. 59–64. Petitioner contends that Weaver discloses handover between two base stations controlled by two different mobile switching centers (MSCs), which are shown in yellow and blue in Figure 2 below:



Id. at 57 (citing Ex. 1005, Fig. 2 (annotated by Petitioner)). Figure 2 above depicts two cellular systems (in different colors) under the control of first and second mobile switching centers, MSC-I and MSC-II. Ex. 1005, 7:61–64. Petitioner has drawn a red box around two base stations, B_{1D} and B_{2D}, each from separate cellular systems, between which handover may occur. Pet. 57–58. Petitioner asserts that each of these base stations represents a “transmitting station.” *Id.* at 58 (citing Ex. 1005, 10:6–8). Weaver’s “remote unit” or mobile telephone (not shown) discloses the claimed “receiving station,” according to Petitioner. *Id.* (citing Ex. 1005, 1:26–28).

Petitioner asserts that Weaver’s handover process discloses or renders obvious the transmission of a message with the claimed “signaling information.” *Id.*¹⁰ For instance, during Weaver’s handover process,

¹⁰ We reference some of Petitioner’s arguments with respect to the preamble here because Petitioner did not repeat all of its preamble arguments under limitation 1[a]. But as the preamble states in part, “transmitting signaling

Petitioner contends, mobile switching center “MSC I supplies the *new channel information* to the remote unit via base station B_{1D}, *and specifies a time at which the remote unit is to begin communication* with base station B_{2D}.” *Id.* (citing Ex. 1005, 10:37–40). In other words, Petitioner argues that base station B_{1D} (the claimed “transmitting station”) sends new channel information and a start time (“signaling information”) to the remote unit (“the receiving station”), so that it may begin communicating with base station B_{2D} (“an additional transmitting station”). *Id.* at 58, 64. Thus, Petitioner maps Weaver to the claimed “transmitting a first message with the signaling information from the transmitting station to the receiving station, the first message including information regarding . . . an additional transmitting station.” *See id.* at 60–61, 64; *see also* Reply 27–28 (discussed below).

Petitioner relies on Kotzin for the claimed “information regarding whether data to be sent is processed.” Pet. 60–61 (“Kotzin presents an example of the ‘data processing’ contemplated by the ’147 Patent.”) (citing Ex. 1003 ¶ 203). Petitioner cites to Kotzin’s disclosure of “an improved transmission diversity scheme” as an example of the claimed “data processing.” *Id.* at 60 (citing Ex. 1003 ¶ 203). Petitioner further contends that Kotzin’s base station informs the mobile station (UE) about the transmission diversity technique. *Id.* at 61 (citing Ex. 1006, 2:43–47 (“[C]ontrol information . . . is transmitted to the mobile station . . .”).

information between a transmitting station and a receiving station,” Petitioner’s arguments for this phrase are relevant to its arguments for limitation 1[a]’s “transmitting a first message with the signaling information from the transmitting station to the receiving station.”

Petitioner therefore contends that Kotzin discloses the claimed “information regarding whether data to be sent is processed.” *Id.*; *see also* Reply 27–28 (discussed below). Petitioner therefore contends, “Kotzin (in combination with Weaver) presents an example of ‘information regarding whether data to be sent is processed in an additional transmitting station.’” Pet. 61.

Patent Owner contends that the combination of Weaver and Kotzin fails to disclose this limitation for two main reasons. PO Resp. 62–64. First, Patent Owner contends that Weaver merely discloses that a base station will supply “new channel information” to a remote unit, “which does not necessarily mean that the mobile terminal will be connected to ‘an additional transmitting station.’” *Id.* at 62. Instead, Patent Owner contends, a POSITA would have recognized that a network may provide “new channel information” for a number of other reasons, such as due to “tearing down, setting up, and reconfiguring of traffic channels in response to, e.g., traffic overload, dropped calls,” and other factors. *Id.* at 63 (citing Ex. 2039 ¶¶ 87–89). This “new channel information,” Patent Owner argues, “does not identify an ‘additional transmission station,’ and certainly does not convey ‘whether data to be sent’ will be ‘processed in an additional transmitting station.’” *Id.* (citing Ex. 2039 ¶¶ 87–89).

Patent Owner’s second argument focuses on Kotzin’s teachings. *Id.* at 63–64. Kotzin “has nothing to do with handoff” or transmitting “signaling information” during handoff, Patent Owner asserts. *Id.* at 63 (citing, e.g., Ex. 1006, 2:43–47; Ex. 2039 ¶ 88). Further, Patent Owner argues that Kotzin’s “‘control information’ . . . would convey to a mobile station only that data will be processed in a certain way (i.e., using ‘orthogonal transmit diversity’)” and therefore “would not indicate *where*

that processing occurs; *e.g.*, it could be in the *same* base station.” *Id.* at 64 (citing Ex. 2039 ¶ 89). Thus, Patent Owner concludes, Kotzin does not teach or suggest that a mobile station will be connected to “an additional transmitting station” or “whether data to be sent *is processed in an additional transmitting station.*” *Id.*

In the Reply, Petitioner asserts that Patent Owner does not address the full disclosure of Weaver relied upon by Petitioner. Reply 27–28. Instead, Petitioner contends, Patent Owner focuses only on the “new channel information” of Weaver while ignoring Weaver’s teaching that

MSC I supplies the new channel information . . . and specifies a time at which the remote unit is to begin communication with base station B_{2D}.

Id. at 27 (citing Ex. 1005, 10:37–40; Ex. 1003 ¶¶ 195, 208, 227). Petitioner explains that Weaver’s control message for handover sent from a source base station would include the “specified ‘time’ to begin communication with base station B_{2D}.” *Id.* at 28. This teaching, Petitioner asserts, would have rendered obvious that the mobile station to which that control message is transmitted will be connected to “*an additional transmitting station.*” *Id.*

As for Kotzin, Petitioner asserts that “Kotzin teaches that control information is transmitted that allows a mobile station to receive a diversity transmission.” *Id.* at 27. In Petitioner’s view, Patent Owner argues the references individually by attacking Weaver “for essentially not disclosing sufficient ‘new channel information’ related to handover” and by attacking Kotzin “for not disclosing handoff.” *Id.* at 28 (citing PO Resp. 63; *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986)).

Turning to our analysis, Petitioner persuades us that the combination of Weaver and Kotzin discloses this limitation. Patent Owner's arguments do not undermine Petitioner's persuasive showing.

We first address Patent Owner's argument that Weaver's "mobile terminal will [not] be connected to 'an additional transmitting station.'" *See* PO Resp. 62–63. This argument is unavailing because Petitioner persuasively relies on Weaver's disclosure that "MSC I supplies the *new channel information* to the remote unit via base station B_{1D}, *and specifies a time at which the remote unit is to begin communication* with base station B_{2D}." Pet. 58 (citing Ex. 1005, 10:37–40); Reply 27. We preliminarily relied on this same disclosure in our Institution Decision ("Dec."), but, as with its Preliminary Response, Patent Owner again overlooks this quotation in its Response. Dec. 47–48; PO Resp. 62–64; Prelim. Resp 38–39.¹¹ We credit Mr. Lanning's testimony that Weaver's base station B_{2D} discloses the claimed "additional transmitting station." Ex. 1003 ¶ 211. We further credit Mr. Lanning's testimony that Weaver's "new channel information" and specified "time" to begin communication with base station B_{2D} disclose the claimed "signaling information" that conveys "information regarding . . . an additional transmitting station." *Id.*

¹¹ Although Patent Owner did not address this full passage in its Response, it did reproduce it in its oral hearing demonstratives. *See* Paper 42, 47–48. Tellingly, Patent Owner's demonstratives quote the passage but highlight only the text, "new channel information." *Id.* Petitioner's demonstratives reproduce the same passage but highlight the more pertinent text, "and specifies a time at which the remote unit is to begin communication with base station B_{2D}." Paper 43, 50.

Patent Owner’s Weaver argument has another problem: it is not commensurate with the scope of claim 1. Patent Owner asserts that Weaver supplies “new channel information” to a remote unit, “which does not necessarily mean that the mobile terminal *will be connected* to ‘an additional transmitting station.’” PO Resp. 62, 63 (emphasis added). But claim 1 does not require that a mobile terminal be “connected” to an additional transmitting station; rather, element 1[a] recites “the first message including information regarding whether data to be sent is processed in an additional transmitting station.” Ex. 1001, 19:64–66. Even element 1[b], which Patent Owner does not address, recites “the additional transmitting station being successively *assigned* to the receiving station,” not *connected* to the receiving station. *Id.* at 19:66–67 (emphasis added). There is no “connected” requirement in this claim. And limitations not appearing in the claim cannot be relied upon for patentability. *See In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998) (“[The] proffered facts . . . are not commensurate with the claim scope and are therefore unpersuasive.”).¹²

We next address Patent Owner’s Kotzin argument. *See* PO Resp. 63–64. We agree with Petitioner that Patent Owner’s contention that Kotzin “has nothing to do with handoff” improperly argues Kotzin individually. *See id.*; Reply 28. Petitioner relies primarily on Weaver for the “additional transmitting station” and relies on Kotzin primarily for the claimed “whether

¹² Our Institution Decision made the preliminary finding, “We view base station B2D as an additional transmitting station, and thus the ‘new channel information’ message conveys that the mobile terminal will connect with ‘an additional transmitting station.’” Dec. 48. This preliminary finding should not be read to imply that we viewed the claim as requiring a “connected” limitation.

data to be sent is processed.” Pet. 58–64; Reply 27. Thus, it is immaterial that Kotzin “would not indicate *where* that processing occurs,” as Patent Owner contends, because Petitioner relies primarily on Weaver for where the processing occurs, i.e., in Weaver’s base station B_{2D}. *See* Pet. 58–64; Reply 27.¹³

Moreover, Patent Owner’s Kotzin argument also is not commensurate with the scope of claim 1 because Patent Owner states,

Thus, Kotzin fails to account for the deficiencies in Weaver because the cited “control information” does not teach or even suggest to the mobile station that it *will be connected* to “an additional transmitting station” or “whether data to be sent is processed in an additional transmitting station.”

PO Resp. 64 (emphasis changed). Patent Owner’s argument based on nonexistent claim language related to “connect[ing] to ‘an additional transmitting station’” is unavailing.

c. Motivation to Combine

Petitioner contends that one of ordinary skill in the art would have combined Weaver and Kotzin because they are both analogous and both describe CDMA (code division multiple access) transmit diversity. Pet. 55–56 (citing Ex. 1003 ¶¶ 189–90). Kotzin, Petitioner contends, is “specifically

¹³ At the hearing, Petitioner asserted that Kotzin also discloses handover: “Kotzin supplies the motivation to look to Weaver for the handover aspects of Weaver. But then when you get to Weaver, Weaver is the reference that does show the new channel information and the specific time information that’s going to be conveyed to the UE which meets both parts of the [limitation].” Tr. 30:20–24. That Kotzin may also disclose handover does not alter our view that Patent Owner argues the references individually because Petitioner primarily relies on Weaver for “the additional transmitting station.” Pet. 58–64; Reply 27.

designed to improve on” the form of transmit diversity used in Weaver. *Id.* (citing Ex. 1006, 4:56–5:15, 8:57–61). Thus, Mr. Lanning testifies, “[a] person of ordinary skill in the art, motivated by a desire to improve the reliability of a mobile station receiving a transmission from the target base station during handover, would have incorporated Kotzin’s transmission diversity improvements into Weaver’s system.” Ex. 1003 ¶ 191, *cited in* Pet. 56.

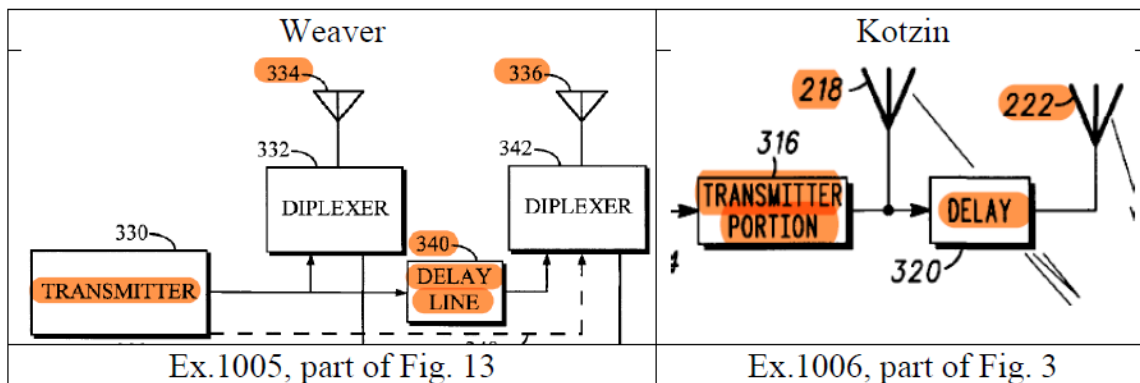
Patent Owner disputes Petitioner’s proposed combination, asserting that there are two main issues with Petitioner’s reasoning. PO Resp. 56–61. First, Patent Owner contends that Weaver and Kotzin are “addressed to entirely different problems,” so the combination would have required “expensive and time-consuming modifications to Weaver’s system.” *Id.* at 56. And second, Patent Owner views Kotzin’s “orthogonal transmit diversity” as incompatible with and teaching away from Weaver’s objectives. *Id.* We address these arguments and Petitioner’s responses in the following two sections.

(1) Addressed to Different Problems

In Patent Owner’s first argument, Patent Owner views the references as addressed to different problems because Weaver’s goal is allegedly to “facilitate intersystem hard handoff.” PO Resp. 60 (citing Ex. 1005, Fig. 2, 7:61–8:1). In contrast, Patent Owner argues, Kotzin has nothing to do with handoff but instead addresses “the limitations of RAKE receivers and the problem of self-interference caused by sending a delayed copy of the original signal.” *Id.* (citing Ex. 1006, 1:24–50). Further, Patent Owner asserts that Weaver and Kotzin are addressed to “different kinds of diversity.” *Id.* at 58 (emphasis omitted). Weaver’s system employs space

(or “path”) diversity, Patent Owner contends, while Kotzin’s system uses orthogonal transmit diversity. *Id.* at 57–58.

In the Reply, Petitioner reemphasizes its argument from the Petition that “Kotzin is specifically designed to improve on [Weaver’s] form of transmission diversity.” Reply 19 (citing Pet. 55–56). The parties agree that both Weaver and Kotzin disclose CDMA systems, Petitioner asserts. *Id.* at 19–20 (citing Ex. 1042 ¶¶ 60–61; Ex. 1036, 17:9–18 (Patent Owner’s expert, Dr. Nettleton, agreeing that “the base station in [Weaver’s] figure 13 employ[s] CDMA.”)). Petitioner compares, in a side-by-side depiction of Figure 13 of Weaver and Figure 3 of Kotzin below, Weaver’s CDMA system to a prior art CDMA system that Kotzin attempts to improve upon:



Id. at 23 (citing Ex. 1042 ¶ 68). According to Petitioner, Figure 13 of Weaver above depicts a transmitter supplying one signal to two antennas, separated by a delay line. *Id.* at 21 (citing Ex. 1005, 28:45–50, 29:33–37; Ex. 1042 ¶ 64). Petitioner states that Figure 3 of Kotzin, above, similarly depicts transmitting a signal to two antennas, also separated by a delay. *Id.* at 22 (citing Ex. 1006, 1:43–46).

Petitioner further points to Kotzin’s identification of a “self-interference” problem in Kotzin’s prior art Figure 3: “the delayed (but otherwise identical) copy of the original signal transmitted from an

additional antenna is not orthogonal to the original signal and acts as self-interference.” *Id.* at 22 (citing Ex. 1006, 1:43–46). Petitioner asserts, “Kotzin is describing an issue directly applicable to [the] form of transmission diversity illustrated in Weaver’s Figure 13 where the ‘delay line’ 340 is used.” *Id.* Accordingly, Petitioner asserts that Kotzin aims to improve on a system that is similar to Weaver’s. *Id.* at 22–23.

Moreover, Petitioner notes that Figure 13 of Weaver also depicts a second embodiment with dashed line 348, which shows that “two separate signal paths **carrying a different set of signals**” may be used. *Id.* at 21 (quoting Ex. 1005, 29:33–37; Ex. 1042 ¶ 64). This point is relevant because, as Petitioner later argues, Kotzin likewise discloses subdividing a signal and sending different information to each of two antennas. *Id.* at 25–26 (citing, e.g., Ex. 1042 ¶¶ 72, 93–101; Ex. 1006, Fig. 8).

For all the above reasons, Petitioner concludes, Weaver is not incompatible with Kotzin. *Id.* at 23 (citing Ex. 1042 ¶¶ 65–69). Rather, Petitioner believes that Kotzin addresses a similar problem and shows how its invention improves upon CDMA systems such as Weaver’s. *Id.*

Turning to our analysis, we agree with Petitioner that Kotzin is specifically designed to improve on Weaver’s form of transmission diversity. Pet. 55–56; Reply 19. Petitioner’s side-by-side comparison of Weaver’s Figure 13 and Kotzin’s prior art Figure 3 is persuasive because these systems are, in fact, very similar. *See* Reply 23 (citing Ex. 1042 ¶ 68). Kotzin explains that the problem with the prior art is that “the delayed (but otherwise identical) copy of the original signal transmitted from an additional antenna is not orthogonal to the original signal and acts as self-interference.” Ex. 1006, 1:43–46; *see also id.* at 4:55–5:18 (further

describing the self-interference problem with prior art systems and then introducing Figure 3 as depicting a system “of the prior art”); Ex. 1042 ¶¶ 65–66 (confirming that Figure 3 is a prior art system with the self-interference problem described by Kotzin). Thus, Mr. Lanning explains, and we agree, that “Kotzin is showing how its CDMA invention is created by improving upon CDMA systems like Weaver.” Ex. 1042 ¶ 69.

Accordingly, Patent Owner’s first argument, that Weaver and Kotzin are “addressed to entirely different problems,” does not undermine Petitioner’s persuasive showing. PO Resp. 56. Kotzin may be directed to a different problem than Weaver, but that is because Kotzin is trying to solve the problem *with* systems like Weaver’s. *See* Ex. 1042 ¶ 69. Thus, we agree with Petitioner that one of ordinary skill in the art would have looked to Kotzin to improve upon, and thus modify, Weaver.

Yet the defect in Patent Owner’s argument goes deeper because it misconstrues the law. Patent Owner quotes a Federal Circuit decision for the proposition that “[p]rior art references that address different problems are less likely to ‘support an inference that the skilled artisan would consult both of them simultaneously.’” PO Resp. 56 (quoting *Broadcom Corp. v. Emulex Corp.*, 732 F.3d 1325, 1334 (Fed. Cir. 2013); citing *In re Pennington*, 241 F.2d 750, 793 (CCPA 1957)). Patent Owner’s selective quotation of *Broadcom* implies that two prior art references directed to different problems are not combinable. But that is far from what *Broadcom* states.

The issue in *Broadcom* was whether a person of ordinary skill in the art would have modified a reference (“Pickering”) to include a “data path.” *Broadcom*, 732 F.3d at 1334. The trial court had concluded “that Pickering

and the '150 patent [i.e., the patent at issue] addressed two different problems.” *Id.* (emphasis added). Then the Federal Circuit observed, “prior art references that address different problems may not, depending on the art and circumstances, support an inference that the skilled artisan would consult both of them simultaneously.” *Id.* (citing *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1366 (Fed. Cir. 2012) (finding invention nonobvious in part when none of the “reference[s] relate to the [problem] described in the patents”)). Patent Owner misreads the preceding quote to require a comparison of problems within the references. But that is wrong, not least because *Broadcom* considered obviousness over a *single* reference (Pickering). Reading the parenthetical to this passage clarifies that the issue in *Broadcom* was whether the “reference relate[s] to the [problem] described in the patents”—i.e., the patent at issue. *See id.* (quoting *Kinetic Concepts*, 688 F.3d at 1366 (emphasis added)). And as Patent Owner does not analyze whether Weaver or Kotzin were directed to a different problem than the '147 patent, Patent Owner’s reliance on *Broadcom* is misplaced.

Patent Owner also relies on an early case from the Federal Circuit’s predecessor court, the Court of Customs and Patent Appeals. PO Resp. 56 (citing *In re Pennington*, 241 F.2d 750, 793 (CCPA 1957)). Patent Owner supplies the following quotation from *Pennington*: “[D]espite the entirely different problems with which each of these two references is concerned, the board would nevertheless modify either of the apparatuses shown by the disclosure of the other. This we cannot do” *Id.* (quoting *Pennington*, 241 F.2d at 793). But Patent Owner again quotes selectively. The omitted text in this quote states in part, “[t]his we cannot do, *for the foregoing considerations* compel us to conclude that one skilled in the art . . . would

not have made the combination.” *Pennington*, 241 F.2d at 793 (emphasis added). Patent Owner glosses over those “foregoing considerations,” which included not only that the references described different problems, but also that they disclosed very different mechanical structures and that modifying one reference “would . . . serve no useful purpose, but in fact would detract from [its function].” *Id.* The facts here differ significantly from those in *Pennington*, as the modifications proposed by Kotzin would have served a useful purpose by explicitly improving upon systems like Weaver’s. *See, e.g.*, Ex. 1042 ¶ 69.

(2) Teaching Away

Patent Owner also contends that Kotzin teaches away from Weaver because Kotzin is “largely incompatible with Weaver’s system.” PO Resp. 56. The combination, Patent Owner asserts, would have required “significant modifications in Weaver’s physical architecture,” including by adding several hardware components shown in Kotzin Figures 4 and 8. *Id.* at 59 (citing Ex. 2039 ¶¶ 73–78). Patent Owner further argues that modifying Weaver with Kotzin’s data splitting would have “undercut Weaver’s objective of facilitating faster hard handoff decisions” because Kotzin’s process “requires additional processing steps,” such as subdividing channel information and sending related control information. *Id.* at 60–61 (citing Ex. 1006, 15:15–22). Patent Owner further contends that employing hard handoff in Kotzin’s system would have been “significantly slower” and “more unreliable” due to subdividing the data. *Id.* at 61 (citing Ex. 2039 ¶¶ 82, 83). Finally, Patent Owner asserts that combining the references would have “result[ed] in catastrophic link failure” because Kotzin

subdivides information, and the failure of one diversity path would have resulted in data loss. *Id.* (citing Ex. 2039 ¶¶ 81, 83).

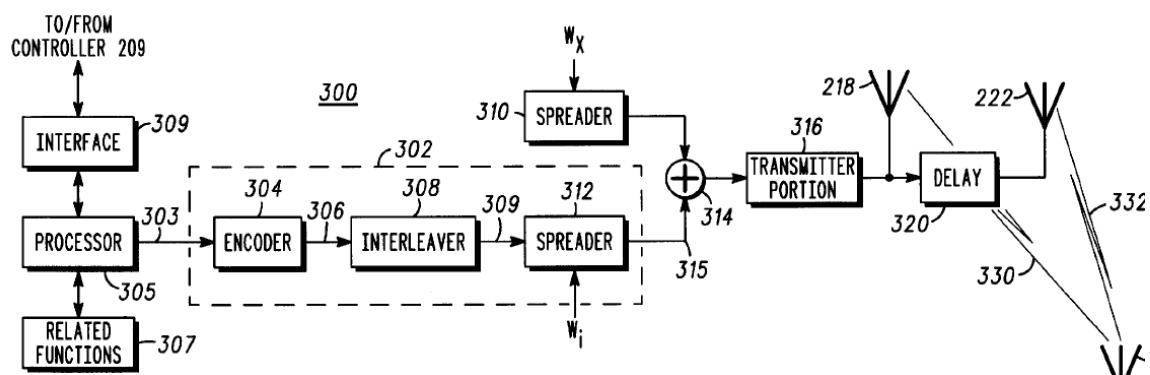
In the Reply, Petitioner disputes that the combination would have required “significant modifications” to Weaver’s architecture. Reply 24. Petitioner contends that instead, Kotzin proposes only “minor modifications” to improve Weaver’s system. *Id.* (citing Ex. 1042 ¶¶ 71, 99). For example, Petitioner points to Kotzin’s addition of only a few components to improve on the prior art system of Figure 3, which is like Weaver’s. *Id.* at 25 (citing, e.g., Ex. 1006, 8:21–24). According to Petitioner, the subdivision of data in Kotzin would have resulted in improved “diversity gain,” which Petitioner argues undercuts Patent Owner’s allegation about “catastrophic link failure” in the combination. *Id.* at 26 (citing Ex. 1006, 13:60–14:7; Ex. 1042 ¶ 73).

Finally, Petitioner calls into question Patent Owner’s argument that implementing Kotzin’s techniques in Weaver would have resulted in handover that is “significantly slower” because there is no evidence in the record to support this assertion. *Id.* at 26–27. “In fact,” Petitioner asserts, “Kotzin discusses using its techniques in handover scenarios, so there is no teaching away.” *Id.* at 27 (citing Ex. 1006, 10:44–48; 11:42–48; Ex. 1042 ¶¶ 89–92).

Petitioner’s arguments are again more persuasive. We disagree with Patent Owner that Kotzin’s “orthogonal transmit diversity” is incompatible with and teaches away from Weaver. As we explained above, Kotzin describes an explicit improvement to systems like Weaver’s, so it makes little sense that Kotzin would teach away from Weaver. *See id.* Viewed a different way, Kotzin merely describes an alternative approach to that of Weaver, and “[a] reference does not teach away . . . if it merely expresses a

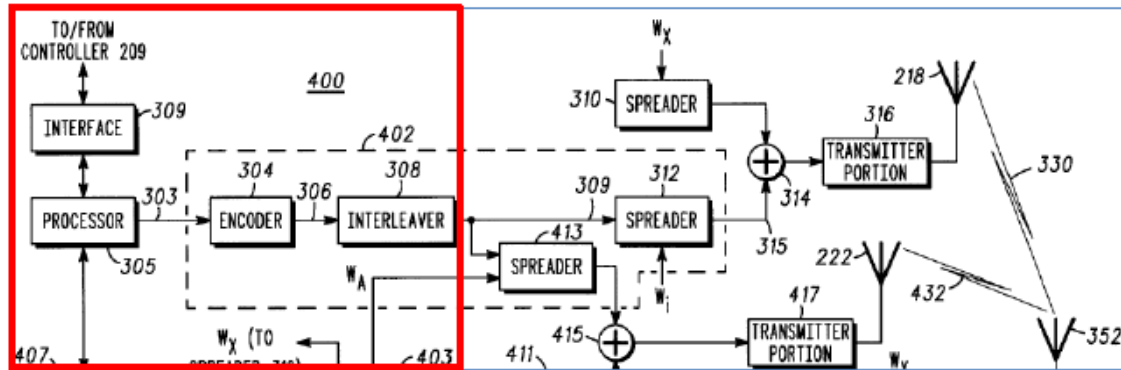
general preference for an alternative invention but does not ‘criticize, discredit, or otherwise discourage’ investigation into the invention claimed.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009). And Patent Owner neither argues, nor does the evidence show, that Kotzin criticizes, discredits, or otherwise discourages investigation into the claimed invention. Rather, Kotzin suggests improvements to systems like Weaver’s, which one of ordinary skill in the art would have reasonably looked to in order to improve upon Weaver’s system.

In any event, Mr. Lanning’s testimony credibly supports Petitioner’s argument that Kotzin’s improvements to systems like Weaver’s would have required only minor changes to Weaver’s system. *See* Ex. 1042 ¶¶ 71, 99; Reply 24. Mr. Lanning testifies that the combination would have added merely a few components—one additional spreader and one additional transmitter—from Kotzin to a system like Weaver’s. Ex. 1042 ¶ 71. Mr. Lanning explains how these two components, shown in Figure 4 of Kotzin, are added to Kotzin’s prior art Figure 3, which he asserts is similar to Weaver’s system. *Id.* Below is the upper portion of Kotzin’s prior art Figure 3:



This portion of Figure 3 depicts a transmitter of a CDMA base station, which includes an interface, processor, a transmitter portion, a spreader, and two antennas, among other components. *See* Ex. 1006, 2:5–7, 5:16–8:12.

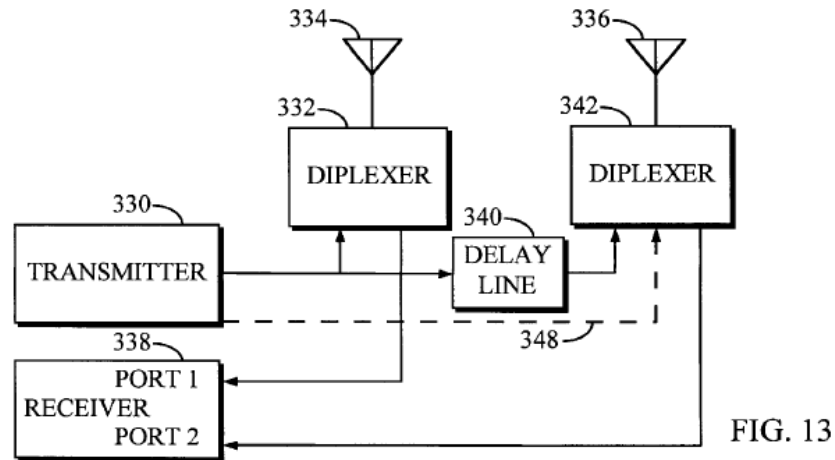
Below depicts part of Weaver’s Figure 4 improvement over prior art Figure 3, annotated by Mr. Lanning:



Id. ¶ 71. Figure 4 depicts an improved transmitter of a CDMA base station. Ex. 1006, 2:8–9. Mr. Lanning drew a red box around the functionality that “Kotzin states ‘are similar in function’ to prior art systems like Weaver’s,” including an interface, processor, encoder, and interleaver. Ex. 1042 ¶ 71. “As can be seen by comparing Kotzin’s Fig. 3 prior art diagram and Kotzin’s Fig. 4 embodiment,” he testifies, “the ‘spreaders’ and ‘transmitter portions’ are also circuits that are used in both figures.” *Id.* Mr. Lanning further explains, “[t]herefore, all the substantial circuitry in prior art systems shown in Fig. 3, and Weaver, is reused in the Kotzin Fig. 4 embodiment. The main difference is that Kotzin’s Fig. 4 uses one additional ‘spreader (413)’ and one additional ‘transmitter portion (417).’” *Id.*

Dr. Nettleton, in contrast, opines that the combination would have required numerous additional components, including “splitters, interleavers, de-interleavers, coherent detectors, encoders, and decoders that operate in a fundamentally different way than Weaver’s system.” Ex. 2039 ¶ 78. It is

true that Figure 13 of Weaver, reproduced below, does not explicitly show such components:



In Weaver’s Figure 13 above, a base station is shown with a small number of components, including a transmitter, receiver, diplexers, antennas, and a delay line. *See* Ex. 1005, 28:45–63. But Mr. Lanning testifies that “[t]he ‘transmitter’ 330 in Weaver’s Figure 13 would have been understood by a POSITA to include all of the elements needed to generate CDMA signals for transmission to different mobile stations, including different spreaders applying different codes and forward error correction.” Ex. 1042 ¶ 68. He further testifies that Kotzin’s prior art Figure 3, in contrast, “is a more detailed diagram illustrating these functional blocks.” *Id.*¹⁴

We find Mr. Lanning’s testimony more persuasive. At his deposition, Dr. Nettleton conceded that Weaver’s system would have performed many functions, none of which are explicitly shown in Weaver’s Figure 13. For example, he testified (1) that Weaver described CDMA technology

¹⁴ Mr. Lanning refers to “Kotzin’s prior art Figure 13” in this passage, but this is an obvious typo that plainly refers to Kotzin Figure 3. *See* Ex. 1042 ¶ 68.

(Ex. 1036, 12:21–25), (2) that Weaver references a pseudorandom noise spreading code (*id.* at 13:15–17), (3) that Weaver references a decoding process (*id.* at 17:19–18:4), and (4) that Weaver’s decoding process would have encompassed forward error correction (*id.* at 18:5–7). Dr. Nettleton’s testimony indicates that Weaver’s system would have been far more complex than his declaration testimony implies. Thus, Dr. Nettleton’s deposition testimony calls into question his declaration testimony that the combination would have required numerous additional components, including “splitters, interleavers, de-interleavers, coherent detectors, encoders, and decoders that operate in a fundamentally different way than Weaver’s system.” *See* Ex. 2039 ¶ 78.

Accordingly, we find Mr. Lanning’s testimony that modifying Weaver with Kotzin would have been minor, adding only a few components, more credible than Mr. Nettleton’s testimony that the combination would have entailed significant modifications to Weaver.

We also disagree with Patent Owner’s argument that implementing Kotzin’s signal subdivision into Weaver would have led to “catastrophic link failure.” *See* PO Resp. 61 (citing Ex. 2039 ¶ 83). As Mr. Lanning persuasively testifies, “Dr. Nettleton’s allegations that a POSITA would be concerned about ‘catastrophic link failure’ when the information is subdivided, Ex. 2039, ¶83, is unfounded and belied by the explicit teachings of Kotzin.” Ex. 1042 ¶ 73. Mr. Lanning persuasively points to Kotzin’s disclosure that “[i]mprovement in decoder performance in the mobile station” due to Kotzin’s subdivided data process “contributes significantly to call quality in the mobile station.” *Id.* (citing Ex. 1006, 13:60–14:7). Improved call quality implies a lower, not higher, chance of link failure.

Not only that, but as Petitioner correctly notes, Weaver contemplates a “**second embodiment** where two separate signal paths **carrying a different set of signals** are used.” Reply 21 (quoting Ex. 1005, 29:33–37; Ex. 1042 ¶ 64). That Weaver already contemplated sending separate signals further undercuts Patent Owner’s argument that signal subdivision in the combination would have led to catastrophic link failure. *See* PO Resp. 61.

Likewise, we agree with Petitioner that Patent Owner supplies little evidence that the combination would have resulted in Weaver’s system operating “significantly slower.” Reply at 26–27; PO Resp. 61. Dr. Nettleton asserts that Kotzin’s data subdivision “would require additional processing and signalling to employ its ‘orthogonal transmit diversity’ scheme,” would “necessarily introduce[] a delay,” and “would inevitably require retransmissions to account for errored reception.” Ex. 2039 ¶ 82. But Dr. Nettleton does not adequately explain how such changes would have “significantly” slowed the combined system, or even what “significantly slower” means in any quantifiable terms. *See id.*

In any event, “[a] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.” *Allied Erecting v. Genesis Attachments*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (citation omitted). To the extent that the combined system may have occasionally had a link failure or operated more slowly, we find that a POSITA would have viewed Kotzin’s reduction of self-interference and consequent improved transmission reliability as advantages to combining that would have outweighed Dr. Nettleton’s enumerated, and speculative, disadvantages. *See* Ex. 1003 ¶ 191; Ex. 1042 ¶ 73; Ex. 1006, 13:60–14:7.

For these reasons, Petitioner persuades us that one of ordinary skill in the art would have had reason to combine Kotzin with Weaver.

d. Summary as to Claim 1

Based on the entire record before us, we determine that Petitioner has shown by a preponderance of the evidence that claim 1 would have been obvious over the combination of Weaver and Kotzin.

4. Independent Claim 32

The parties argue claim 32 together with claim 1. Pet. 68, 69, 71, 72; PO Resp. 56–64; Reply 19–28. For the reasons discussed above, we determine that Petitioner has shown by a preponderance of the evidence that claim 32 would have been obvious over the combination of Weaver and Kotzin.

5. Dependent Claims 2–4, 6, and 33–36

Petitioner contends that dependent claims 2–4, 6, and 33–36 would have been obvious over the combination of Weaver and Kotzin. Pet. 66–72. Petitioner provides a detailed analysis explaining where Weaver and Kotzin disclose the additional limitations in dependent claims 2–4, 6, and 33–36. *Id.* Patent Owner does not offer separate arguments for these claims or contest Petitioner’s analysis. *See generally* PO Resp. We also determine that Petitioner has shown by a preponderance of the evidence that claims 2–4, 6, and 33–36 would have been obvious over the combination of Weaver and Kotzin.

IV. CONCLUSION¹⁵

In summary:

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not shown Unpatentable
1–4, 6, 32–36	103(a)	TS-25.331, Motorola Proposal ¹⁶		
1–4, 6, 32–36	103(a)	Weaver, Kotzin	1–4, 6, 32–36	
Overall Outcome			1–4, 6, 32–36	

V. ORDER

It is, therefore,

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 1–4, 6, and 32–36 of the '147 patent are unpatentable; and

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

¹⁵ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

¹⁶ As we noted above, we do not reach this ground because the challenge based on Weaver and Kotzin is dispositive of these claims.

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