

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MEDIATEK INC. and
NXP USA, INC.
Petitioner,

v.

BELL NORTHERN RESEARCH, LLC,
Patent Owner.

IPR2023-01414
Patent 8,416,862 B2

Before JEFFREY W. ABRAHAM, JOHN D. HAMANN, and
RUSSELL E. CASS, *Administrative Patent Judges*.

ABRAHAM, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background and Summary*

Mediatek Inc. and NXP USA, Inc. (collectively “Petitioner”) filed a Petition for an *inter partes* review (Paper 1 (“Pet.”)) challenging claims 1–4 and 9–12 of U.S. Patent No. 8,416,862 B2 (Ex. 1001 (“the ’862 Patent”)). Bell Northern Research, LLC (“Patent Owner”) elected to waive its Preliminary Response. Paper 8.

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314 (2018); 37 C.F.R. § 42.4(a) (2023). The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted “unless the Director determines . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

For the reasons set forth below, we determine the information presented in the Petition establishes a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims. Accordingly, we institute an *inter partes* review.

B. *Related Matters*

The parties identify several judicial proceedings in which the ’862 patent was or is at issue, including the following proceedings involving Petitioner: *Bell Northern Research, LLC v. Qualcomm Inc.*, Case No. 8-23-cv-01065 (C.D. Cal.); *Bell Northern Research, LLC v. NXP Semiconductors, N.V.*, Case No. 1-23-cv-00633 (W.D. Tex.); and *Electronic Devices and Semiconductor Devices Having Wireless Communication Capabilities and Components Thereof*, Inv. No. 337-TA-1367 (USITC). Pet. 2–4; Paper 6; Paper 9.

C. The '862 Patent (Ex. 1001)

The '862 patent relates to wireless communications using beamforming. Ex. 1001, 1:20–22. The '862 patent describes that, “[i]n general, beamforming is a processing technique to create a focused antenna beam by shifting a signal in time or in phase to provide gain of the signal in a desired direction and to attenuate the signal in other directions.” Ex. 1001, 2:67–3:4. The '862 patent explains that, “[i]n order for a transmitter to properly implement beamforming (i.e., determine the beamforming matrix $[V]$), it needs to know properties of the channel over which the wireless communication is conveyed.” Ex. 1001, 3:14–17. For example, the receiver may “determine the channel response (H)” and “provide it as the feedback information” to the transmitter. Ex. 1001, 3:19–22.

The '862 patent explains that one issue with this feedback approach is the size of the feedback packet “may be so large that, during the time it takes to send it to the transmitter, the response of the channel has changed.” Ex. 1001, 3:22–25. To reduce the size of the feedback packet, “the receiver may decompose the channel using singular value decomposition (SVD) and send information relating only to a calculated value of the transmitter’s beamforming matrix (V) as the feedback information.” Ex. 1001, 3:26–30. According to the '862 patent, “[w]hile this approach reduces the size of the feedback information, its size is still an issue for a [multiple-input-multiple-output (MIMO)] wireless communication.” Ex. 1001, 3:33–35. Therefore, according to the '862 patent, a need exists “for reducing beamforming feedback information for wireless communications.” Ex. 1001, 3:49–51.

Figure 7 of the '862 patent, shown below, illustrates an embodiment of the invention for providing beamforming feedback information from a receiver to a transmitter. Ex. 1001, 13:25–27.

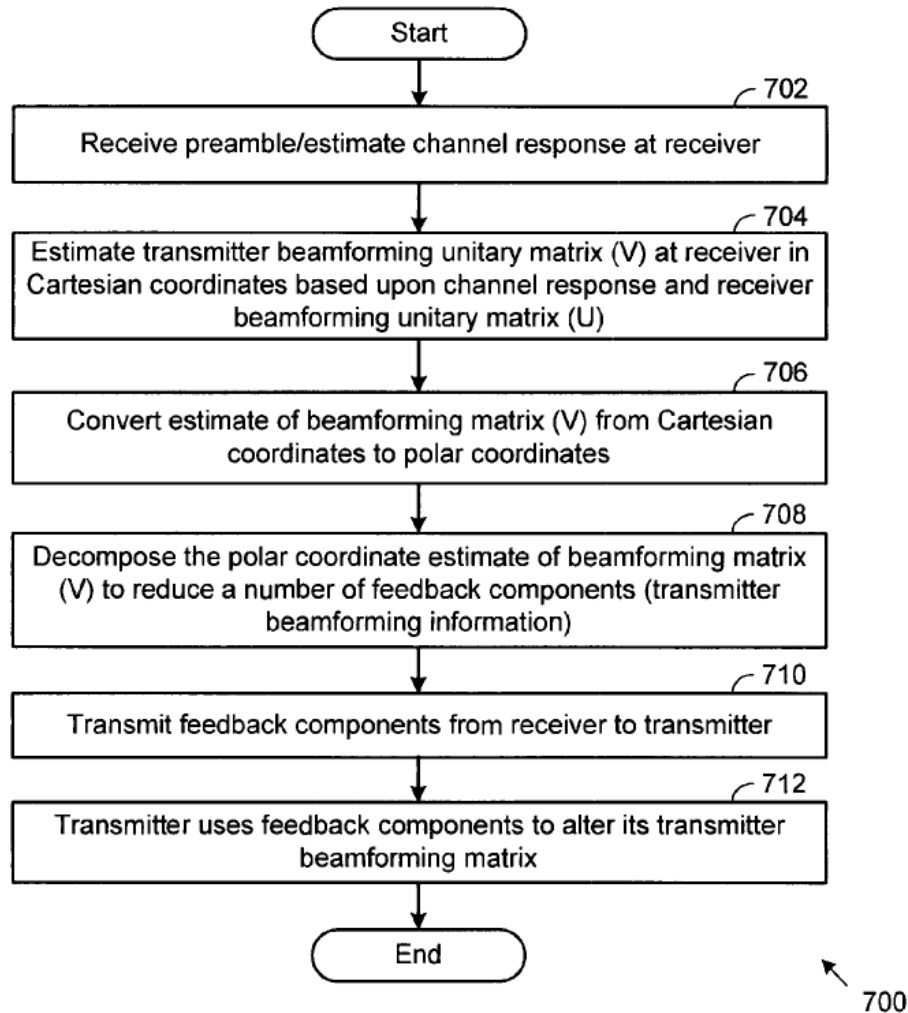


FIG. 7

Figure 7 illustrates a method of providing beamforming feedback information for MIMO wireless communication systems. Ex. 1001, 2:33–35, 13:25–27, 13:31–32. At step 702, a wireless communication device receives a preamble sequence from a transmitting wireless device and estimates a channel response (H) from the preamble sequence using “any number of techniques that are known in the art.” Ex. 1001, 13:43–44. Next,

at step 704, the receiving wireless device determines an estimated transmitter beamforming unitary matrix (V) based on the channel response and a known receiver beamforming unitary matrix (U). Ex. 1001, 13:44–47. The '862 patent explains that the channel response (H), the estimated transmitter beamforming unitary matrix (V), and known receiver beamforming unitary matrix (U) are related by the equation $H=UDV^*$, where D is a diagonal matrix. Ex. 1001, 13:47–51.

In the embodiment shown in Figure 7, the receiving wireless device produces V in Cartesian coordinates and then converts V to polar coordinates (step 706). Ex. 1001, 13:54–58. The receiving wireless device then decomposes V to produce the transmitter beamforming information (step 708) and sends the beamforming information to the transmitting wireless device (step 710). Ex. 1001, 13:58–62, 14:4–6. The transmitting wireless device then uses the feedback components to generate a new beamforming matrix (V), which the device uses for subsequent transmissions (step 712). Ex. 1001, 14:9–13.

The '862 patent discloses that, according to one embodiment, the decomposition operations of step 708 employ a Givens Rotation operation. Ex. 1001, 13:63–65. The '862 patent explains that the Givens Rotation relies on the observation that, for a particular condition, some of the angles “are redundant” and thus, “the set of angles fed back to the transmitting wireless device are reduced.” Ex. 1001, 13:65–14:3.

D. Illustrative Claim

Among the challenged claims (claims 1–4 and 9–12), claims 1 and 9 are independent. Claim 9 is illustrative of the subject matter of the challenged claims and is reproduced below:

9. [9p] A wireless communication device comprising:

[9a] a plurality of Radio Frequency (RF) components operable to receive an RF signal and to convert the RF signal to a baseband signal; and

[9b] a baseband processing module operable to:

[9c] receive a preamble sequence carried by the baseband signal;

[9d] estimate a channel response based upon the preamble sequence;

[9e] determine an estimated transmitter beamforming unitary matrix (V) based upon the channel response and a receiver beamforming unitary matrix (U);

[9f] decompose the estimated transmitter beamforming unitary matrix (V) to produce the transmitter beamforming information; and

[9g] form a baseband signal employed by the plurality of RF components to wirelessly send the transmitter beamforming information to the transmitting wireless device.

Ex. 1001, 17:16–35 (formatting and labels added to correspond with Petitioner’s designation of claim limitations (Pet., Table of Claims)).

Independent claim 1 is a method claim with limitations that correspond to those recited in claim 9. Ex. 1001, 16:8–26.

E. Asserted Unpatentability Challenges

Petitioner asserts that claims 1–4 and 9–12 are unpatentable based on the following challenges:

Claims Challenged	35 U.S.C. § ¹	References
1–4, 9–12	103	Li-748, ² Tong, ³ Mao ⁴
1–4, 9–12	103	Tong, Mao
1, 3, 4, 9, 11, 12	103	Li-054, ⁵ Mao
2, 10	103	Li-054, Mao, Yang ⁶
1, 3, 4, 9, 11, 12	103	Poon, ⁷ Mao

Petitioner relies on the declaration testimony of Dr. Jonathan Wells (Ex. 1003).

II. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art would have had “a Bachelor’s degree in Electrical Engineering, Computer Engineering, Computer Science, or a related field, and at least 2 years of experience in the field of wireless communication, or had equivalent education, work, or

¹ The relevant sections of the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, took effect on March 16, 2013. Because the ’862 patent has an effective filing date prior to the effective date of the applicable AIA amendments, the pre-AIA version of § 103 applies.

² US 7,236,748 B2, filed Sept. 30, 2004, issued June 26, 2007 (Ex. 1004).

³ US 2008/0108310 A1, filed June 22, 2005, published May 8, 2008 (Ex. 1005).

⁴ US 7,312,750 B2, filed Mar. 4, 2005, issued Dec. 25, 2007 (Ex. 1006).

⁵ US 2006/0092054 A1, filed Sept. 8, 2004, published May 4, 2006 (Ex. 1007).

⁶ Yang et al., *Reducing the Computations of the Singular Value Decomposition Array Given by Brent and Luk*, SIAM J. MATRIX ANAL. APPL., Vol. 12, No. 4, pp. 713–725 (Oct. 1991) (Ex. 1008).

⁷ US 7,710,925 B2, filed June 23, 2004, issued May 4, 2010 (Ex. 1009).

experience in this field.” Pet. 12 (citing Ex. 1003 ¶ 23). Patent Owner does not challenge Petitioner’s definition or offer its own.

In light of the record before us, and for purposes of this Decision, we adopt Petitioner’s proposal regarding the level of ordinary skill in the art. Based on our review of the ’862 patent and the prior art of record, we determine that the definition offered by Petitioner comports with the qualifications a person would have needed to understand and implement the teachings of the ’862 patent and the prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that specific findings regarding ordinary skill level are not required “where the prior art itself reflects an appropriate level and a need for testimony is not shown”) (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985)).

B. Claim Construction

In an *inter partes* review, we construe claim terms according to the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. “Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

Petitioner argues that the plain and ordinary meaning of the claim language should apply, and we do not need to formally construe any claim

terms for purposes of this Decision. Pet. 12–13.⁸ Patent Owner does not address claim construction. *See* Paper 8.

After considering the arguments and information presented in the Petition, we determine that it is not necessary to construe any terms for purposes of this Decision. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”)).

We do note, however, that limitation [9f] refers to producing “the transmitter beamforming information,” but the phrase “transmitting beamforming information” does not appear earlier in claim 9. We, therefore, question whether there is proper antecedent basis for “the transmitter beamforming information” in [9f]. We invite the parties to address this issue to clarify the language in claim 9 during the course of the proceeding.

C. Asserted Obviousness Over Li-748, Tong, and Mao

Petitioner contends that claims 1–4 and 9–12 of the ’862 patent are unpatentable under 35 U.S.C. § 103 as obvious over Li-748, Tong, and Mao. Pet. 6, 15–46.

⁸ Petitioner states that “Patent Owner and other parties briefed claim construction issues in other district court litigation and held a *Markman* hearing, followed by a claim construction order.” Pet. 12. Petitioner indicates that the court did not adopt any proposed construction, determining that the plain and ordinary meaning of the claim language was recognizable. Pet. 12–15. Petitioner also argues that it would prevail even if Patent Owner argues for, and the Board adopts, any of the constructions addressed in the other proceedings. Pet. 12–15.

1. Li-748 (Ex. 1004)

Li-748 is a U.S. patent titled “Closed Loop Feedback in MIMO Systems.” Ex. 1004, code (54). Li discloses reducing feedback bandwidth in a MIMO system by “representing a beamforming matrix using orthogonal generator matrices.” Ex. 1004, code (57), 1:12–14. Li-748 states MIMO systems typically transmit channel state information from a receiver to a transmitter, and the transmitter “may then utilize the information to do beam forming.” Ex. 1004, 1:12–14. According to Li-748, “[t]ransmitting channel state information consumes bandwidth that might otherwise be available for data traffic.” Ex. 1004, 1:12–17.

Li-748 discloses that “channel state information may be represented by an n by n unitary beamforming matrix V determined using a singular value decomposition (SVD) algorithm.” Ex. 1004, 2:52–57. Li-748 further discloses that, “in a straightforward implementation, the receiver sends each element of the unitary matrix V back to the transmitter,” which “involves sending information related to the $2n^2$ real numbers for any n by n complex unitary matrix, where n is the number of spatial channels in the MIMO system.” Ex. 1004, 2:57–62.

In some embodiments, Li-748 teaches representing the beamforming matrix V “by n^2-1 real numbers instead of $2n^2$ real numbers.” Ex. 1004, 2:63–65. Li-748 explains that “[b]y sending n^2-1 real numbers instead of $2n^2$ real numbers to represent the beamforming matrix, the feedback bandwidth may be reduced.” Ex. 1004, 2:65–67.

2. *Tong (Ex. 1005)*

Tong is a U.S. patent application publication titled “Closed Loop MIMO Systems and Methods.” Ex. 1005, code (54). Figure 1 of Tong, below, shows a schematic diagram representation of one embodiment of Tong’s communication system.

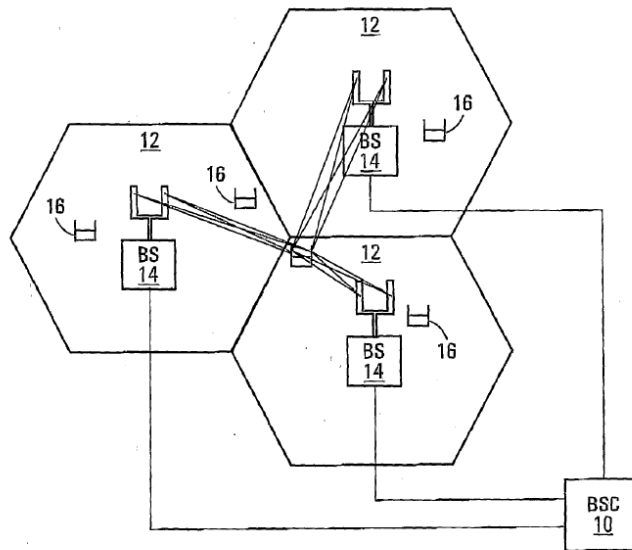


FIG. 1

Figure 1 above illustrates base station controller (BSC) 10, which controls wireless communications with multiple cells 12 served by corresponding base stations (BS) 14. Ex. 1005 ¶ 73. Tong discloses that each base station 14 facilitates communications with mobile terminals 16 within the cell associated with the corresponding base station. Ex. 1005 ¶ 73.

Figure 3 of Tong, below, is a block diagram of the internal circuitry of mobile terminal 16. Ex. 1005 ¶ 77.

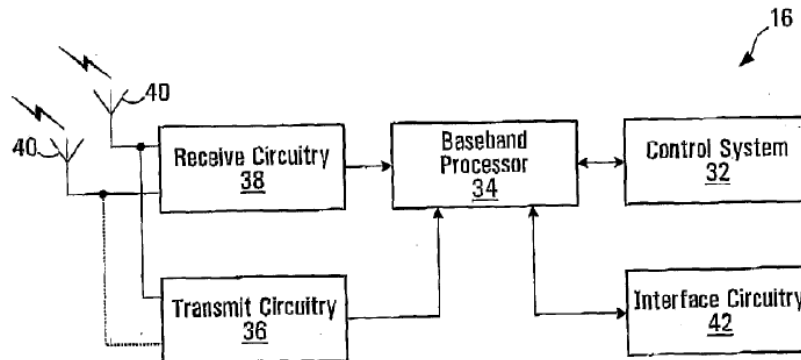


FIG. 3

As illustrated in Figure 3, mobile terminal 16 includes control system 32, baseband processor 34, transmit circuitry 36, receive circuitry 38, multiple antennas 40, and user interface circuitry 42. Ex. 1005 ¶ 77. Tong discloses that “receive circuitry 38 receives radio frequency signals bearing information from one or more base stations 14.” Ex. 1005 ¶ 77. Tong explains that a low noise amplifier and filter “cooperate to amplify and remove broadband interference from the signal for processing,” and “[d]ownconversion and digitization circuitry . . . will then downconvert the filtered, received signal to an intermediate or baseband frequency signal, which is then digitized into one or more digital streams.” Ex. 1005 ¶ 77.

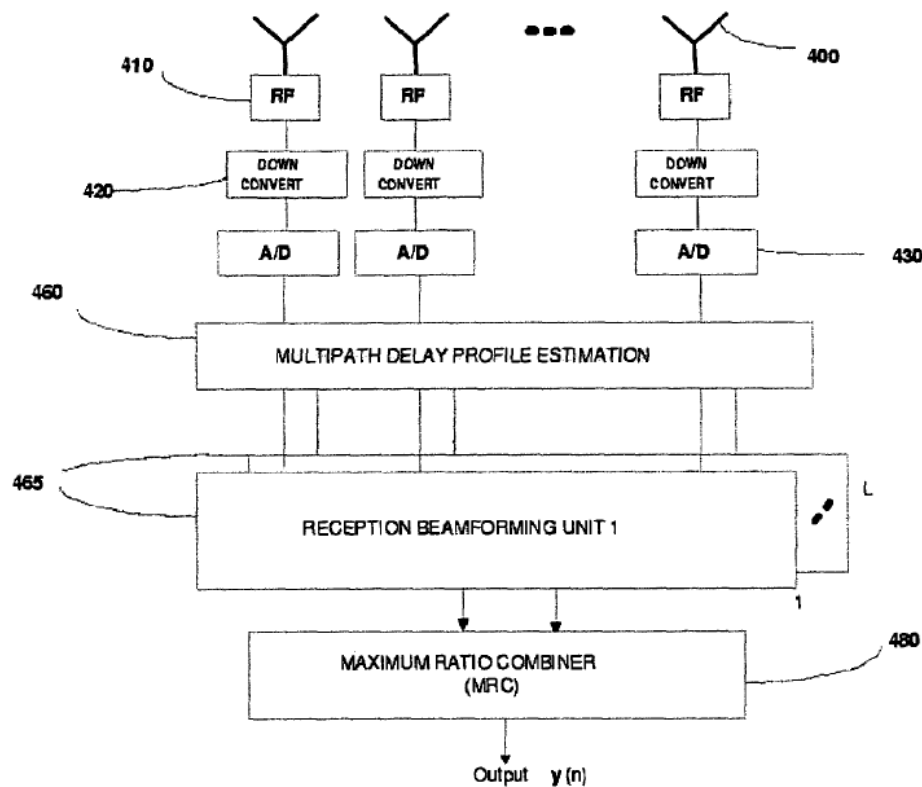
Tong also discloses an embodiment in which the beamforming unitary matrix V is determined through SVD and “is fed back from the receiver to the transmitter using Givens feedback.” Ex. 1005 ¶ 222. According to Tong, the V matrix is decomposed by the Givens transform to produce a series of matrices, which “can then be uniquely represented by two parameters θ and C .” Ex. 1005 ¶ 223. These parameters are quantized and fed back to the transmitter over the MIMO feedback channel. Ex. 1005

¶¶ 223, 224. Tong states that “[b]y decomposing the SVD-based unitary V matrix into Givens matrices, the V matrix can be represented by n^2-n independent complex parameters.” Ex. 1005 ¶ 227.

3. Mao (Ex. 1006)

Mao is a U.S. patent titled “Adaptive Beam-Forming System Using Hierarchical Weight Banks for Antenna Array in Wireless Communication System.” Ex. 1006, code (54). Figure 1 of Mao, below, schematically depicts one embodiment of its receiver beam-forming system. Ex. 1006, 7:34–36.

FIG. 1



As illustrated in Figure 1 above, Mao's receiver beam-forming system includes an antenna array with M antenna elements 400, radio frequency (RF) units 410, down converters 420, analog-to-digital (A/D) units 430, multipath delay profile estimation unit 460, beamforming unit 465, and Maximum Ratio Combiner 480. Ex. 1006, 7:36–59. Mao explains that in its system, antenna elements 400 receive and transmit RF signals, and the RF units and frequency converters are configured to “transform received RF signals to receive analog base-band signals and transform analog transmit base-band signals into . . . transmit RF signals.” Ex. 1006, 3:28–36.

4. Analysis

a. Independent claim 9

Petitioner contends that Li-748 discloses an electronic system that may be used in a wireless network and operates as a wireless communications device, as recited in the preamble of claim 9. Pet. 27 (citing Ex. 1004, 7:57–60, 8:60–64, 9:32–46, Figs. 1, 4).

Limitation 9[a] recites “a plurality of Radio Frequency (RF) components operable to receive an RF signal and to convert the RF signal to a baseband signal.” Ex. 1001, 17:17–19. For this limitation, Petitioner directs us to Li-748's disclosure of antennas 410 for sending and receiving signals and physical layer 430 that “includes an *RF receiver to receive signals and perform 'front end' processing* such as low noise amplification (LNA), filtering, [and] frequency conversion.” Pet. 28 (quoting Ex. 1004, 9:66–10:6). Petitioner contends, based on testimony from Dr. Wells, that a person of ordinary skill in the art would have understood the “front end” processing disclosed in Li-748 to include the common technique of

converting an RF signal to a baseband signal for further processing. Pet. 28 (citing Ex. 1003 ¶ 76).

Petitioner further contends that Tong also demonstrates converting RF signals to baseband signals was a common and well-known practice for wireless communication devices. Pet. 28–29. In particular, Petitioner directs us to Tong’s disclosure of “receive circuitry” that receives radio frequency signals and “[d]ownconversion and digitization circuitry” that converts the received signal to a baseband signal, which is then digitized. Pet. 29 (citing Ex. 1005 ¶¶ 74, 77, 88, 94–95).

Petitioner argues that a person of ordinary skill in the art would have implemented Li-748’s device in view of Tong to convert received RF signals to baseband signals to “advantageously and properly prepare for a digital conversion (to a digital signal) for processing by the digital electronics of the mobile device.” Pet. 29 (citing Ex. 1003 ¶ 78). Petitioner also argues that applying Tong’s suggestion of receiving and converting RF signals to baseband signals involved merely the application of a known technique to a known system, leading to predictable results. Pet. 30 (citing Ex. 1003 ¶ 79).

Petitioner next contends that processor 460 and memory 470 disclosed in Li-748 provide a baseband processing module, as recited in limitation [9b], that receives a preamble sequence carried by the baseband signal and estimates a channel response based on the preamble sequence, as limitations [9c] and [9d] require. Pet. 32–34 (citing Ex. 1004, Fig. 2, 3:31–34 (disclosing that “the transmitter may send training symbols to the receiver,” “the receiver may evaluate H and compute the matrix V’,” and “the receiver may feedback parameters representing V to the transmitter”), 8:4–7 (disclosing that “channel state information is estimated from received

signals” and “channel state information may include the channel state matrix H ”), 10:16–22; Ex. 1003 ¶¶ 80–85).

Petitioner also contends that Li-748 teaches that the baseband processing module determines an estimated transmitter beamforming matrix (V) based on the channel response and a receiver beamforming unitary matrix (U), as recited in limitation [9e]. Pet. 34–35. For this limitation, Petitioner directs us to Li-748’s disclosure that “[a] transmit beamforming matrix may be found using” the well-known SVD equation $H=UDV$. Pet. 34–35 (citing Ex. 1004, 3:19–32, Fig. 2; Ex. 1003 ¶¶ 86–87).

Limitation [9f] requires the baseband processing module to be operable to “decompose the estimated transmitter beamforming unitary matrix (V) to produce the transmitter beamforming information.” Ex. 1001, 17:28–30. Petitioner contends that a person of ordinary skill in the art would have recognized Li-748 teaches or suggests a reduction or decomposition of the transmit beamforming matrix in view of its disclosure that, in some embodiments, “the beamforming matrix V is represented by n^2-1 real numbers instead of $2n^2$ real numbers,” and “[b]y sending n^2-1 real numbers instead of $2n^2$ real numbers, the feedback bandwidth *may be reduced*.” Pet. 35 (quoting Ex. 1004, 2:63–67).

Petitioner also argues that a person of ordinary skill in the art would have known this feature was widely known and used in wireless communication devices based on Tong’s disclosure that after an SVD is performed on channel matrix H , “the V matrix is decomposed by the Givens transform 330 to produce a series of matrices,” and “[b]y decomposing the SVD-based unitary V matrix into Givens matrices, the V matrix can be represented by n^2-n independent complex parameters.” Pet. 36 (quoting Ex. 1005 ¶¶ 223, 227 (Petitioner’s emphasis omitted)). Petitioner also points

out that Tong states its solution would “reduce the amount of feedback required” and allow the transmitter receiving the beamforming information to “verify the integrity of the received matrix V .” Pet. 36–37 (quoting Ex. 1005 ¶¶ 222, 226).

In view of these advantages, Petitioner asserts that a person of ordinary skill in the art would have implemented Tong’s Givens-rotation-based decomposition techniques in Li-748’s device. Pet. 36–37. Petitioner also contends that implementing Tong’s techniques would have been the mere application of a known technique to a known system ready for improvement to yield predictable results. Pet. 37 (citing Ex. 1003 ¶ 91).

Limitation [9g] requires the baseband processing module be operable to “form a baseband signal employed by the plurality of RF components to wirelessly send the transmitter beamforming information to the transmitting wireless device.” Ex. 1001, 17:31–34. Petitioner contends Li-748 discloses that its receiver may feedback parameters representing V to the transmitter. Pet. 37–38 (citing Ex. 1004, 3:31–39, Fig. 2). Petitioner also argues Tong and Mao teach or suggest forming baseband signals for transmission using RF components. Pet. 38–40 (citing Ex. 1005 ¶¶ 76, 79, 87, 94–95, Figs. 2–5; Ex. 1006, 3:28–36, 6:34–35; Ex. 1003 ¶¶ 92–96). Petitioner further argues implementing the teachings of Tong and Mao in Li-748 would have involved “merely the application of a known technique (*e.g.*, forming a baseband signal employed by the plurality of RF components) to a known system (Li-748’s device) ready for improvement to yield predictable results.” Pet. 41 (citing Ex. 1003 ¶ 97).

Patent Owner does not present any arguments regarding claim 9. *See* Paper 8.

After reviewing the undisputed evidence and arguments Petitioner presents in the Petition, including the relevant portions of the supporting Wells Declaration, we are persuaded Petitioner has established a reasonable likelihood of prevailing in showing that claim 9 is unpatentable under 35 U.S.C. § 103(a) as obvious over Li-748, Tong, and Mao. Petitioner has demonstrated sufficiently for purposes of institution that the combined disclosures of Li-748, Tong, and Mao teach or suggest the subject matter of claim 9, and that a person of ordinary skill in the art would have had reason to combine the teachings as claimed—to implement the device of Li-748 in a manner suggested by Tong and Mao—with a reasonable expectation of success.

b. Dependent claims 10–12

Claim 10 depends from claim 9 and adds that in determining the estimated transmitter beamforming unitary matrix, the baseband processing module is operable to “produce the estimated transmitter beamforming unitary matrix (V) in Cartesian coordinates” and “convert the estimated transmitter beamforming unitary matrix (V) to polar coordinates.” Ex. 1001, 17:36–44. Petitioner relies on Li-748 alone and on Li-748 in combination with Tong for teaching producing V in Cartesian coordinates and converting it to polar coordinates. Pet. 41–44 (citing Ex. 1004, 2:63–65, 3:5–11, 3:19–23; Ex. 1005 ¶¶ 66, 222, 223; Ex. 1003 ¶ 99).

Claim 11 depends from claim 9 and adds “wherein the channel response (H), estimated transmitter beamforming unitary matrix (V), and the receiver beamforming unitary matrix (U) are related by the equation: $H=UDV^*$ where, D is a diagonal matrix.” Ex. 1001, 17:45–52. As discussed above, Petitioner contends Li-748 discloses this equation. Pet. 45 (citing Ex. 1004, 3:19–32, 8:7–11, Fig. 2).

Claim 12 depends from claim 9 and adds “wherein in determining the estimated transmitter beamforming unitary matrix (V) based upon the channel response and the receiver beamforming unitary matrix (U), the baseband processing module performs Singular Value Decomposition (SVD) operations.” Ex. 1001, 17:53–58. Petitioner contends Li-748 discloses using SVD to determine V. Pet. 45–46 (citing Ex. 1004, 3:19–32).

Patent Owner does not present any arguments regarding claims 10–12. *See* Paper 8.

On the current record, Petitioner demonstrates sufficiently that the combination of Li-748, Tong, and Mao teaches or suggests the subject matter of dependent claims 10–12, and provides sufficient reasoning with rational underpinning for combining the teachings as claimed. *See* Pet. 41–46; Ex. 1003 ¶¶ 98–106.

c. Claims 1–4

Petitioner contends that method claims 1–4 correspond to device claims 9–12. Pet. 26. Petitioner asserts that Li-748’s electronic system performs methods for feeding back transmitter beamforming information to a transmitting wireless device, and that the elements of claims 1–4 are rendered obvious for the same reasons as the corresponding portions of claims 9–12. Pet. 26–45.

Patent Owner does not present any arguments regarding claims 1–4. *See* Paper 8.

For the same reasons discussed above with regard to claims 9–12, Petitioner demonstrates sufficiently that the combination of Li-748, Tong, and Mao teaches or suggest the subject matter of claims 1–4, and provides sufficient reasoning with rational underpinning for combining the teachings as claimed. *See* Pet. 26–45.

5. *Summary*

Having reviewed the record, we determine that the information presented establishes a reasonable likelihood that Petitioner would prevail in showing that claims 1–4 and 9–12 of the ’862 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Li-748, Tong, and Mao.

III. CONCLUSION

Because Petitioner has demonstrated a reasonable likelihood that at least one challenged claim of the ’862 patent is unpatentable over the prior art of record, we institute an *inter partes* review. And because we find some grounds sufficient for institution, we institute on all grounds in the petition. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1353 (2018) (“The agency cannot curate the claims at issue but must decide them all.”); *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (interpreting the statute as requiring “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

At this stage of the proceeding, we have not made a final determination with respect to the patentability of any challenged claim or any underlying factual or legal issue.

IV. ORDER

For the reasons given, it is:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–4 and 9–12 of the ’862 patent is instituted with respect to all grounds of unpatentability asserted in the Petition, commencing on the entry date of this Decision; 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 trial.

IPR2023-01414
Patent 8,416,862 B2
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