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Paper No. 9
Filed: September 20, 2016

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SPRINT SPECTRUM L.P., CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS, and AT&T MOBILITY LLC,
Petitioner,

v.

ADAPTIX, INC.,
Patent Owner.

Case IPR2016-00824
Patent 8,934,375 B2

Before KALYAN K. DESHPANDE, TREVOR M. JEFFERSON, and J. JOHN LEE, *Administrative Patent Judges.*

DESHPANDE, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

Sprint Spectrum L.P., Cellco Partnership d/b/a Verizon Wireless, and AT&T Mobility LLC (collectively, "Petitioner") filed a Petition requesting an *inter partes* review of claims 2, 4–8, 11, 13, 14, 18, 20–24, 27, 29, and 30 of U.S. Patent No. 8,934,375 B2 (Ex. 1101, "the '375 patent"). Paper 4 ("Pet."). Adaptix, Inc. ("Patent Owner") filed a Preliminary Response. Paper 8 ("Prelim. Resp."). We have jurisdiction under 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted "unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." After considering the Petition, the Preliminary Response, and associated evidence, we conclude that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing unpatentability of claims 2, 4, 6, 8, 18, 20, 22, and 24 of the '375 patent. Thus, we institute an *inter partes* review of claims 2, 4, 6, 8, 18, 20, 22, and 24 of the '375 patent. We further conclude that Petitioner has not demonstrated a reasonable likelihood that it would prevail in showing the unpatentability of claims 5, 7, 11, 13, 14, 21, 23, 27, 29, and 30 of the '375 patent. Therefore, we do not institute an *inter partes* review of claims 5, 7, 11, 13, 14, 21, 23, 27, 29, and 30 of the '375 patent.

A. Related Proceedings

Petitioner indicates that the '375 patent is the subject of the following proceedings: *Adaptix, Inc. v. AT&T Mobility LLC,* Case No. 6:15-cv-43 (E.D. Texas), *Adaptix, Inc. v. Sprint Spectrum, L.P.,* Case No. 6:15-cv-44 (E.D. Texas), and *Adaptix, Inc. v. Cellco Partnership d/b/a Verizon Wireless*, Case No. 6:15-cv-45 (E.D. Texas). Pet. 59–60.

IPR2016-00823, filed concurrently, also challenges the '375 patent. *Sprint Spectrum L.P. v. Adaptix, Inc.*, Case IPR2016-00823 (PTAB date) (Paper 9) ("IPR2016-00823 Inst. Dec.").

B. The '375 Patent (Ex. 1101)

The '375 patent discloses methods and apparatuses for allocating subcarriers in an orthogonal frequency division multiple access (OFDMA) system. Ex. 1101, 2:27–29. Accordingly, each of multiple subscribers measures performance parameters for a plurality of subcarriers, selects multiple candidate subcarriers with good performance, and provides information regarding respective candidate subcarriers to a base station. *Id.* at 3:24–29. The performance parameter measurements may be based upon pilot symbols provided by the base station. *Id.* at 5:36–46. Upon receiving the information from the subscribers, the base station selects subcarriers from the candidate subcarriers to be allocated for use by each subscriber. *Id.* at 3:37–39. Subsequently, the base station informs each subscriber of its respective subcarrier allocation. *Id.* at 3:55–57. This process is repeated periodically and/or when channel deterioration is observed. *Id.* at 6:63–7:15.

Figure 1B, reproduced below, is a flow diagram of one embodiment of the process for allocating clusters of subcarriers to subscribers.

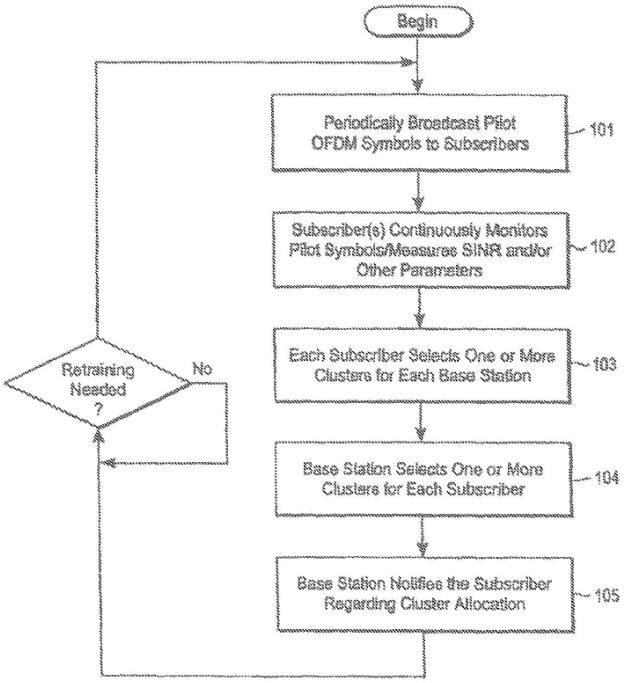

FIG. 1B

In accordance with the process depicted above in Figure 1B, each base station periodically broadcasts pilot OFDM symbols to every subscriber (step 101). *Id.* at 5:36–38. Each subscriber continuously monitors the reception of the pilot symbols and measures associated performance parameters (step 102). *Id.* at 5:47–50. Then, each subscriber selects one or more clusters with good performance and feeds back to the base station information regarding these candidate clusters (step 103). *Id.* at 5:50–55. The base station then selects, for each subscriber, one or more clusters from among the candidate clusters (step 104). *Id.* at 6:18–20. The base station notifies each subscriber about the cluster allocation at step 105. This process may be repeated, as further depicted in Figure 1B. *Id.* at 6:63–65.

C. Illustrative Claims

Petitioner challenges claims 2, 4–8, 11, 13, 14, 18, 20–24, 27, 29, and 30 of the '375 patent. Pet. 4–58. All of the challenged claims depend,

directly or indirectly, from independent claims 1 and 17. Claims 2 and 5 are illustrative of the claims at issue and are reproduced below:

> 2. The method of claim 1, wherein the plurality of feedback clusters at the second time is different than the plurality of feedback clusters at the first time.

Ex. 1101, 17:54–56.

> 5. The method of claim 4**,** wherein at least one subcarrier of the first plurality of subcarriers in the first time slot is different than all of the subcarriers of the second plurality of subcarriers in the second time slot.

Ex. 1101, 18:1–4.

D. The Alleged Grounds of Unpatentability

The information presented in the Petition sets forth proposed grounds of unpatentability of claims 2, 4–8, 11, 13, 14, 18, 20–24, 27, 29, and 30 of the '375 patent under 35 U.S.C. § 103(a) as follows (*see* Pet. 7–58):[1]

References	**Claims Challenged**
Ritter,[2] Gesbert,[3] and Thoumy[4]	2, 8, 14, 18, 24, and 30
Ritter, Gesbert, Thoumy, and Gitlin[5]	4–7, 11, 13, 20–23, 27, and 29
Thoumy, Gesbert, and Gitlin	6–8, 11, 13, 22–24, 27, and 29
Thoumy, Gesbert, and Ritter	2, 14, 18, and 30

[1] Petitioner supports its challenge with the Declaration of Richard D. Gitlin, Sc.D. (Ex. 1102).
[2] The parties refer to Exhibit 1104 as "Ritter,"" which is an English translation of DE 198 00 953 Cl. The German patent document has been entered as Exhibit 1103.
[3] U.S. Patent No. 6,760,822 B1; issued July 6, 2004 (Ex. 1105) ("Gesbert").
[4] U.S. Patent No. 7,039,120 B1; issued May 2, 2006 (Ex. 1107) ("Thoumy").
[5] U.S. Patent No. 6,018,528; issued January 25, 2000 (Ex. 1106) ("Gitlin").

References	Claims Challenged
Thoumy, Gesbert, Gitlin, and Ritter	4, 5, 20, and 21

II. ANALYSIS

A. 35 U.S.C. § 325(d)

Patent Owner argues that "[t]hree of the four references relied on by the Petitioners were considered . . . during the prosecution of the '375 patent." Prelim. Resp. 3 (citing Ex. 1113,[6] 118, 122, 127). Specifically, Patent Owner argues that the '375 patent claims priority to five applications, and the Examiner substantively discussed Ritter in at least two of the prior applications. *Id.* at 4. Patent Owner further argues that the Examiner "considered Gesbert in three of the prior applications and considered Gitlin in one of the prior applications." *Id.* Patent Owner represents that the Examiner has been notified that two of the prior applications, now two patents, were the subject of two *inter partes* reviews, and additionally represents that Ritter, Gesbert, and Gitlin were identified by defendants in various litigation proceedings. *Id.* Patent Owner appears to rely on this information in arguing that the Board should deny the Petition under 35 U.S.C. § 325(d) because it raises substantially the same prior art or arguments previously presented to the Office. *Id.* at 1.

Petitioner seeks *inter partes* review of claims 2, 4–8, 11, 13, 14, 18, 20–24, 27, 29, and 30 of the '375 patent. Pet. 1. Petitioner does not

[6] Patent Owner cites Exhibit 1013, which is not in the record for IPR2016-00824. We understand this to be a typographical error and assume Patent Owner intended to cite Exhibit 1113.

specifically address 35 U.S.C. § 325(d) in its Petition, but does note that during prosecution of the '375 patent, Patent Owner submitted five Information Disclosure Statements, citing over 1,400 references. *Id.* at 3–4. Petitioner asserts that the Examiner noted "the number of references submitted is unreasonably large in quantity and without any indication of relevancy." *Id.* (quoting Ex. 1113).

The Board has discretion to decline to institute an *inter partes* review under 35 U.S.C. § 314(a). One factor the Board may take into account when exercising that discretion is whether "the same or substantially the same prior art or arguments previously were presented to the Office." 35 U.S.C. § 325(d) ("[i]n determining whether to institute or order a proceeding" for *inter partes* review, "the Director may take into account" that factor, and "reject the petition" on that basis).

We are not persuaded to use our discretion to deny this Petition under 35 U.S.C. § 325(d). Patent Owner merely asserts that Gesbert has been considered in three prior applications and Gitlin has been considered in one prior application. Prelim. Resp. 4. Patent Owner similarly asserts only that the Examiner substantively discussed Ritter in at least two prior applications. *Id.* Patent Owner, however does not discuss to what extent Ritter, Gesbert, and Gitlin have been considered in the prosecution of the '375 patent. The fact that Gesbert and Gitlin were considered in other patent applications, and Ritter was discussed separately in other applications, is not determinative as to whether "the same or substantially the same prior art or arguments" were presented in the prosecution of the '375 patent. That is, absent persuasive evidence that Ritter, Gesbert, and Gitlin were presented to, and considered by, the Examiner during the prosecution of the '375 patent, we do not

consider Ritter, Gesbert, and Gitlin to have been previously presented before the Office in a manner sufficient to warrant denial of the Petition.

Accordingly, we decline to use our discretion and deny this Petition because only some of the prior art were considered during the prosecution of other related patent applications.

B. Claim Construction

The Board interprets claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142–46 (2016). Under the broadest reasonable construction standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech. Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

1. "Pilot Symbols"

Petitioner argues that the term "pilot symbols" should be construed to mean "symbols, sequences, or signals known to both the base station and subscriber." Pet. 5 (citing Exs. 1111, 1112). Petitioner asserts that the '375 patent specification discloses that "pilot symbols, often referred to as a sounding sequence or signal, are known to both the base station and the subscribers." *Id.* (citing Ex. 1101, 5:38–40). Patent Owner does not proffer a construction for this term.

Although the '375 patent does not provide an express definition for "pilot symbols," we adopt Petitioner's construction of "pilot symbols" as "symbols, sequences, or signals known to both the base station and subscriber," for the purposes of this decision.

2. "Cluster"

Petitioner argues that the term "cluster" is expressly defined in the '375 patent specification as "a logical unit that contains at least one physical subcarrier." Pet. 5–6 (citing Ex. 1101, 5:20–21). Patent Owner argues that the term "cluster" should be construed as "being at least two subcarriers" because each of independent claims 1 and 17 recite that "each feedback cluster of the plurality of feedback clusters being at least two subcarriers." Prelim. Resp. 9.

On this record, we construe "cluster" to mean "a logical unit that contains at least one physical subcarrier" based on the '375 patent specification's express definition for "cluster." Indeed, independent claims 1 and 17 recite "each feedback cluster of the plurality of feedback clusters being at least two subcarriers" and, therefore, impart the limitation of "at least two subcarriers." However, on this record, we do not import this limitation into the term "cluster" itself.

Additionally, we note that the term "cluster" is not synonymous with "subcarrier." The claims recite the terms "cluster" and "subcarrier," and the '375 patent specification provides a different context for each of these terms. For example, claim 1 recites "each feedback cluster . . . being at least two subcarriers," and the '375 patent specification discloses a "cluster can contain consecutive or disjoint subcarriers. The mapping between a cluster and its subcarriers can be fixed or reconfigurable." Ex. 1101, 5:22–24. Therefore, a cluster is a "logical unit that contains at least one physical subcarrier," but is different than a "subcarrier."

3. "Diversity Cluster"

Petitioner argues that the term "diversity cluster" should be construed to mean "a cluster containing multiple subcarriers with at least some of the subcarriers spread far apart over the spectrum." Pet. 6 (citing Ex. 1102 ¶ 34). Petitioner asserts that the '375 patent specification describes a "diversity cluster" as a cluster "containing multiple subcarriers with at least some of the subcarriers spread far apart over the spectrum." *Id.* (citing Ex. 1101, 14:28–30). Patent Owner does not proffer a construction for this term. For the purposes of this decision, we adopt Petitioner's construction of "diversity cluster" as "a cluster containing multiple subcarriers with at least some of the subcarriers spread far apart over the spectrum."

4. "Coherence Cluster"

Petitioner argues that the term "coherence cluster" should be construed to mean "a cluster containing multiple subcarriers close to each other." Pet. 6 (citing Ex. 1102 ¶ 35). Petitioner asserts that the '375 patent specification describes a "coherence cluster" as a cluster "containing multiple subcarriers close to each other." *Id.* (citing Ex. 1101, 14:27–28). Patent Owner does not proffer a construction for this term. For the purposes of this decision, we adopt Petitioner's construction of "coherence cluster" as "a cluster containing multiple subcarriers close to each other."

5. "Coherence Bandwidth"

Petitioner argues that the term "coherence bandwidth" should be construed to mean "the bandwidth within which the channel response remains roughly the same." Pet. 6 (citing Ex. 1102 ¶ 36). Petitioner asserts that the '375 patent specification describes "coherence bandwidth" as a "the bandwidth within which the channel response remains roughly the same."

Id. (citing Ex. 1101, 11:55–60). Patent Owner does not proffer a construction for this term. For the purposes of this decision, we adopt Petitioner's construction of "coherence bandwidth" as "the bandwidth within which the channel response remains roughly the same."

C. Obviousness of Claims 2, 8, 14, 18, 24, and 30 over Ritter, Gesbert, and Thoumy

Petitioner contends that claims 2, 8, 14, 18, 24, and 30 of the '375 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Ritter, Gesbert, and Thoumy. Pet. 10–33. For the reasons discussed below, the evidence on this record indicates there is a reasonable likelihood that Petitioner would prevail in showing that claims 2, 8, 18, and 24 of the '375 patent are unpatentable under 35 U.S.C. § 103(a) as obvious. Petitioner provides a detailed analysis, supported by evidence, identifying sections of the prior art as teaching the limitations of claims 2, 8, 18, and 24. *Id.* Petitioner further provides the Declaration of Dr. Richard D. Gitlin in support of its analysis. *See* Ex. 1102. For the reasons discussed below, based on the evidence of record, there is not a reasonable likelihood that Petitioner would prevail in showing that claims 14 and 30 of the '375 patent are unpatentable under 35 U.S.C. § 103(a) as obvious.

1. Ritter (Ex. 1104)

Ritter discloses methods and systems for allocating radio resources in an OFDMA system comprising a base station and multiple mobile stations. Ex. 1104, 3–5, 13–14.[7] As described in Ritter, each mobile station measures the quality of various segments of the frequency spectrum, determines a

[7] Exhibit 1104 includes page numbers indicated by the publication itself, and different page numbers provided by Petitioner. Our references are to the page numbers of the exhibit as provided by Petitioner.

preferred segment to use for communications with the base station, and provides information to the base station regarding the preferred segment. *Id.* at 5–6, 13–14. The quality measurements may be based on the relative amplitudes of data symbols received on all sub-channels by a mobile station. *Id.* at 9–10. The base station evaluates the received information and allocates a respective segment for communications with each mobile station. *Id.* at 6–7.

2. Gesbert (Ex. 1105)

Gesbert discloses methods and systems for selecting a mode for encoding data for transmission in a wireless communication channel between a transmit unit and a receive unit. Ex. 1105, Abstract, 2:56–59. Data encoded in accordance with an initial mode is transmitted from the transmit unit to the receive unit. *Id.* at 2:59–61. Quality parameters are sampled in the data received by the receive unit. *Id.* at 2:61–62. And a subsequent mode for encoding the data is selected based on first-order and second-order statistical parameters of the quality parameters. *Id.* at 2:59–65. As described in Gesbert, a mode may include a modulation rate and a coding rate. *Id.* at 3:6–37. The modulation rate and data rate of a mode may be indexed by a mode number for identification. *Id.* at 3:37–39. Quality parameters may include signal-to-interference and noise ratio (SINR), signal-to-noise ratio (SNR), and/or power level. *Id.* at 3:1–3. The subsequent mode may be selected in order to maximize a channel communication parameter such as maximum data capacity, signal quality spectral efficiency, and/or channel throughput. *Id.* at 3:46–51.

3. Thoumy (Ex. 1107)

Thoumy discloses methods and systems for dynamic allocation of carrier frequencies in systems using multi-carrier type modulation. Ex. 1107, 1:9–12. As described in Thoumy, the transmission reliability of carrier frequencies is dynamically estimated, and a significance measurement is attributed to each group of data to be transmitted via the carrier frequencies. *Id.* at Abstract. The most significant data are transmitted over the most reliable carrier frequencies at that time, and less significant data are transmitted over carrier frequencies of decreasing reliability in decreasing order of significance. *Id.* at Abstract, 5:29–35.

4. Analysis

The evidence set forth by Petitioner indicates there is a reasonable likelihood that Petitioner will prevail in showing that claims 2, 8, 18, and 24 are unpatentable under 35 U.S.C. § 103(a) as obvious. *See* Pet. 10–33. The evidence set forth by Petitioner does not indicate that there is a reasonable likelihood that Petitioner will prevail in showing that claims 14 and 30 are unpatentable under 35 U.S.C. § 103(a) as obvious. *Id.*

Petitioner and Patent Owner present the same arguments, based on the same evidence, as those presented in IPR2016-00823. As discussed in our Decision on Institution in IPR2016-00823, Petitioner has demonstrated a reasonable likelihood it will prevail in showing claims 1 and 17 of the ’375 patent are obvious under 35 U.S.C. § 103(a) in view of Ritter, Gesbert, and Thoumy. IPR2016-00823 Inst. Dec., 13–22. We, therefore, incorporate our analysis from IPR2016-00823 for independent claims 1 and 17 of the ’375 patent and determine Petitioner has shown sufficiently that the combination

of Ritter, Gesbert, and Thoumy teaches or suggests each limitation of independent claims 1 and 17, for the same reasons. *See id.*

Claims 2, 8, 14, 18, 24, and 30 depend from independent claims 1 and 17, and are discussed below.

a. Claims 2 and 18

Claims 2 and 18 recite "the plurality of feedback clusters at the second time is different than the plurality of feedback clusters at the first time." Petitioner argues Ritter discloses a mobile station taking measurements of the quality of various segments, and because Ritter's segments comprise multiple subcarriers, one of skill in the art would understand Ritter's disclosure of measuring the quality of "various segments" to mean that the subscriber unit can measure different segments at different times. Pet. 30 (citing Ex. 1104, 13, 28). Petitioner additionally argues that Ritter recognizes that the best suited segments for communication vary with changing channel conditions, and, therefore, one of ordinary skill in the art would understand that the "system described in Ritter could include a different plurality of feedback clusters at a second time." *Id.* (citing Ex. 1104, 14, 16; Ex. 1102 ¶ 110).

Patent Owner argues Ritter fails to disclose performing the measurement "at a second time," as recited by claims 2 and 18. Prelim. Resp. 24–25 (citing Ex. 1104, 14). Patent Owner argues that because Ritter fails to disclose a second measurement at a second time, Ritter cannot disclose the plurality of feedback clusters at the second time is different than the plurality of feedback clusters at the first time. *Id.*

We are not persuaded by Patent Owner's argument. Petitioner argues that Ritter discloses measuring "various segments." Pet. 30 (Ex. 1104, 13,

28). As discussed in our analysis of claim 1, Petitioner also shows Ritter discloses that "the best suited segments for communication can be determined at any time," and Gesbert further discloses repeating the measurement steps to account for changing conditions of the channel. Pet. 24–25 (citing Ex. 1104, 8–9; Ex. 1105, 11:20–25); *see* IPR2016-00823 Inst. Dec., 15–16. On this record, we determine that Petitioner has demonstrated a reasonable likelihood that a person with ordinary skill in the art would understand that the measurements at different times, as disclosed by Ritter and Gesbert, combined with Ritter's disclosure of segments or clusters, teaches a different plurality of feedback clusters at a second time. *See* Pet. 30.

b. Claims 8 and 24

Claim 8 recites "the receiving of the first allocation of OFDMA subcarriers is receiving a first allocation of at least one coherence cluster." Claim 24 recites similar limitations. As discussed above, Petitioner argues that "coherence cluster" means "a cluster containing multiple subcarriers close to each other." Petitioner argues that Ritter discloses subcarriers with a separation of only several kilohertz between adjacent carriers, and, accordingly, discloses a "coherence cluster." Pet. 31 (citing Ex. 1104, 16; Ex. 1102 ¶¶ 102–103); *see* section II.B.4. On this record, we determine that Petitioner has demonstrated a reasonable likelihood it will prevail in demonstrating that claims 8 and 24 are unpatentable.

Patent Owner argues that dependent claims 8 and 24 depend from independent claims 1 and 17, and, thus, are patentable due to their dependency from patentable independent claims. Prelim. Resp. 10. We are not persuaded by this argument for the same reasons discussed with respect

to claims 1 and 17 in IPR2016-00823. *See* IPR2016-00823 Inst. Dec., 12–22.

c. Claims 14 and 30

Claims 14 and 30 depend from claims 9 and 25 respectively. We determine that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to claims 9 and 25 in IPR2016-00823 based on the same arguments and evidence presented here. *See* IPR2016-00823 Inst. Dec., 22–24. Accordingly, we determine that Petitioner has not demonstrated a reasonable likelihood it will prevail as to claims 14 and 30 for the same reasons. *Id.*

5. Conclusion

On this record, we are persuaded that Petitioner has shown a reasonable likelihood that claims 2, 8, 18, and 24 of the '375 patent are obvious over a combination of Ritter, Gesbert, and Thoumy.

On this record, we are not persuaded that Petitioner has shown a reasonable likelihood that claims 14 and 30 of the '375 patent are obvious over a combination of Ritter, Gesbert, and Thoumy.

D. Obviousness of Claims 4–7, 11, 13, 20–23, 27, and 29 over Ritter, Gesbert, Thoumy, and Gitlin

Petitioner contends that claims 4–7, 11, 13, 20–23, 27, and 29 of the '375 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Ritter, Gesbert, Thoumy, and Ritter. Pet. 33–42. For the reasons discussed below, the evidence, on this record, indicates there is a reasonable likelihood that Petitioner would prevail in showing that claims 4, 6, 20, and 22 of the '375 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Ritter, Gesbert, Thoumy, and Gitlin. *Id.* Petitioner provides a detailed analysis, supported by evidence, identifying sections of the prior art as

teaching the limitations of claims 4, 6, 20, and 22. *Id.* Petitioner further cites Dr. Gitlin's Declaration in support of its analysis. *See* Ex. 1102. For the reasons discussed below, the evidence, on this record, indicates there is not a reasonable likelihood that Petitioner would prevail in showing that claims 5, 7, 11, 13, 21, 23, 27, and 29 of the '375 patent are unpatentable under 35 U.S.C. § 103(a) as obvious.

1. Gitlin (Ex. 1106)

Gitlin discloses methods and systems for allocating a communications medium using time-frequency-code slicing. Ex. 1106, Abstract. As described in Gitlin, a communications medium may be divided into a plurality of time-frequencies slices that may be allocated to users according to their various transmission requirements. *Id.* at 3:1–5. Time-frequency slices may be allocated on non-contiguous or contiguous frequency bands. *Id.* at Abstract, 3:5–7.

2. Analysis

The evidence set forth by Petitioner indicates there is a reasonable likelihood that Petitioner will prevail in showing that claims 4, 6, 20, and 22 are unpatentable under 35 U.S.C. § 103(a) as obvious. Pet. 10–33. The evidence set forth by Petitioner does not indicate that there is a reasonable likelihood that Petitioner will prevail in showing that claims 5, 7, 11, 13, 21, 23, 27, and 29 are unpatentable under 35 U.S.C. § 103(a) as obvious. *Id.*

a. Claims 4 and 20

Claim 4 depends from claim 3, which depends from independent claim 1. Claim 20 depends from claim 19, which depends from independent claim 17. As discussed in our Decision on Institution in IPR2016-00823, we determine that Petitioner has shown a reasonable likelihood that the

limitations of claims 1 and 17 were taught or suggested by the combination of Ritter, Gesbert, and Thoumy, and the limitations of claims 3 and 19 were taught or suggested by the combination of Ritter, Gesbert, Thoumy, and Gitlin. IPR2016-00823 Inst. Dec., 12–22, 25–27.

Claim 4 recites:

> the first allocation of OFDMA subcarriers includes a cluster identifier that identifies a first plurality of subcarriers in a first time slot and a second plurality of subcarriers in a second time slot, at least two subcarriers of the first plurality of subcarriers and of the second plurality of subcarriers being disjoint.

Claim 20 recites similar limitations. Petitioner argues Ritter teaches "a subscriber unit receiving allocations of OFDMA subcarriers that include a cluster identifier." Pet. 35–36. Petitioner specifically argues that "Ritter describes the base station assigning segments of subcarriers, where the segments (clusters) are identified as Sx, Sa, and Sm." *Id.* at 36 (citing Ex. 1104 14, 19–20). Petitioner argues that "Sx, Sa, and Sm each constitutes a cluster identifier that identifies a plurality of subcarriers in a time slot." *Id.* Petitioner argues that "Gitlin teaches allocations wherein some subcarriers of an allocation are disjoint from other subcarriers, both within the same time slot and across two different time slots." *Id.* (citing Ex 1106, Fig. 6). Accordingly, Petitioner argues that the combination of Ritter, Gesbert, Thoumy, and Gitlin discloses the limitations of claims 4 and 20. *Id.* (citing Ex. 1102 ¶¶ 115–118, 122). In view of Petitioner's arguments and associated evidence, we are persuaded that Petitioner is reasonably likely to prevail in demonstrating that claims 4 and 20 are obvious in view of Ritter, Gesbert, Thoumy, and Gitlin.

Patent Owner argues that dependent claims 4 and 20 depend from dependent claims 3 and 19, which depend from independent claims 1 and 17, and, thus, are patentable due to their dependency from patentable independent claims. Prelim. Resp. 29–30. We are not persuaded by this argument for the same reasons discussed with respect to claims 1, 3, 17, and 19 in IPR2016-00823. *See* IPR2016-00823 Inst. Dec., 12–22, 25–27.

b. Claims 5 and 21

Claims 5 and 21 recite "at least one subcarrier of the first plurality of subcarriers in the first time slot is different than all of the subcarriers of the second plurality of subcarriers in the second time slot." Petitioner argues that a frequency band as disclosed in Gitlin is a cluster of subcarriers. Pet. 35. Petitioner then argues that the combination of Ritter, Gesbert, Thoumy, and Gitlin teaches the limitations of claims 5 and 21 because one of ordinary skill in the art would understand from Gitlin that a user could be allocated one frequency band (i.e., cluster of subcarriers) in the first time slot and a different frequency band (i.e., cluster of subcarriers) in the second time slot. Pet. 37. Petitioner points to Figure 6 of Gitlin, reproduced below, as depicting an example of such an allocation, where frequency band F1 is assigned in time slot S1 and frequency band F2 is assigned in time slot S2. *Id.*

FIG. 6

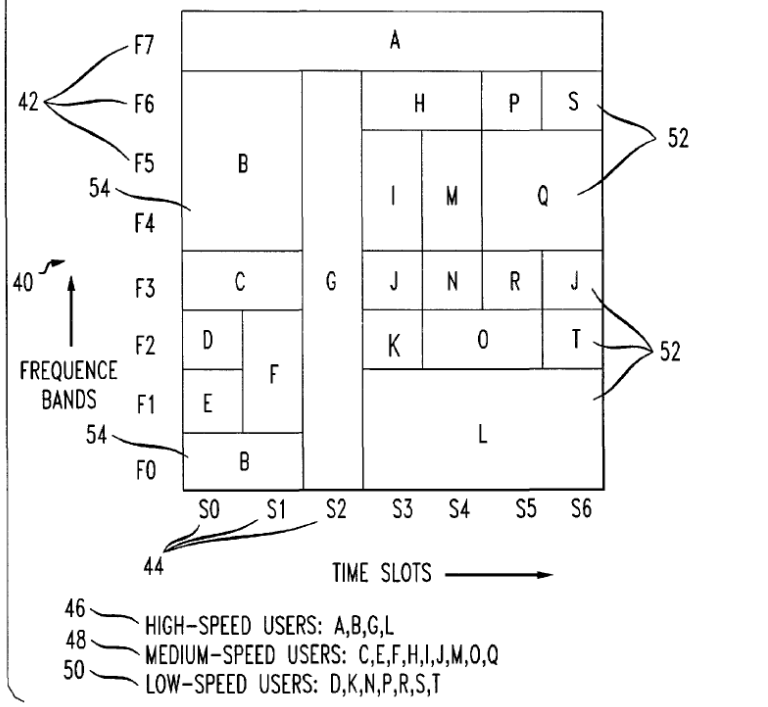

Figure 6 is an illustration of frequency band and time slot assignments for various users, with frequency bands depicted along the vertical axis, and time slots depicted along the horizontal axis.

As depicted in Figure 6 of Gitlin, user F is allocated frequency bands F1–F2 in time slot S1 and user G is allocated frequencies bands F0–F6 in time slot S2. Ex. 1106, Fig. 6, 5:47–60. Petitioner argues that this configuration shows that a user could be allocated one frequency band (i.e., F1) in the first time slot (i.e., S1) and a different frequency band (i.e., F2) in the second time slot (i.e., S2). Pet. 37. From this, Petitioner concludes that Gitlin discloses subcarriers allocated in the first time slot are different from all of the subcarriers allocated in the second time slot. *Id.*

We, however, are not persuaded by Petitioner's argument. Figure 6 of Gitlin discloses that in time slot S1, frequency bands F1 and F2 are assigned

to user F. Ex. 1106, Fig. 6. In time slot S2, frequency bands F0, F1, F2, F3, F4, F5, and F6 are assigned to user G. *Id.* Therefore, frequency bands F1 and F2 are assigned in both time slots S1 and S2. Therefore, all of the frequency bands (i.e., cluster of subcarriers) between time S1 and S2 are not different, as required by claims 5 and 21.

Furthermore, claims 5 and 21 indirectly depend from independent claims 1 and 17, which are directed to "a subscriber unit" and, therefore, claims 5 and 21 are directed to that same subscriber unit. As argued by Patent Owner, frequency band F1 in time slot S1 is allocated to user "F" and frequency band F2 in time slot S2 is allocated to user "G." Prelim. Resp. 30–32. Therefore, the frequency bands in Figure 6 of Gitlin are not allocated to the same "subscriber unit" in different time slots, as required by claims 5 and 21.

Petitioner alternatively argues Thoumy discloses that the given number of subcarriers allocated in a time slot can be less than the number that was previously allocated, and, thus, at least one subcarrier allocated in the first time slot would not be allocated in the second time slot. Pet. 37 (citing Ex. 1107, 11:61–64). Therefore, as further argued by Petitioner, at least one subcarrier in the first time slot would be different from all of the subcarriers allocated in the second time slot. *Id.* We are not persuaded by this argument from Petitioner. Claims 5 and 21 directly depend from claims 4 and 20, and, therefore, the subcarriers and time slots recited in claims 5 and 21 are from a single allocation of subcarriers and time slots to a subscriber unit. As argued by Patent Owner, the cited portions of Thoumy are directed to subcarriers in multiple subsequent allocations as opposed to a single allocation. *See* Prelim. Resp. 33–34.

Accordingly, we are not persuaded that Petitioner has shown that one of ordinary skill in the art would understand the combination of Ritter, Gesbert, Thoumy, and Gitlin teaches or suggests that at least one subcarrier of the first plurality of subcarriers in the first time slot for the subscriber unit (e.g., user) is different than all of the subcarriers of the second plurality of subcarriers in the second time slot, for the same subscriber unit, as required by claims 5 and 21.

c. Claims 6 and 22

Claim 6, which depends from claim 1, recites "the receiving of the first allocation of OFDMA subcarriers is receiving a first allocation of at least one diversity cluster." Claim 22, which depends from claim 17, recites similar limitations. Petitioner argues a "diversity cluster" should be construed to mean "a cluster containing multiple subcarriers with at least some of the subcarriers spread far apart over the spectrum." Pet. 6 (citing Ex. 1102 ¶ 34). As discussed above, we adopt Petitioner's proffered construction of a "diversity cluster." Petitioner further argues that Gitlin discloses an allocation of OFDMA subcarriers with at least some of the subcarriers spread far apart. *Id.* at 38. Petitioner specifically argues that Figure 6 of Gitlin shows an allocation of frequency bands F0 and F4–F6 to User B, in which the subcarriers in frequency bands F0 and F4–F6 are spread far apart over the frequency spectrum. *Id.* (citing Ex. 1106, 5:47–51, Fig. 6). In view of Petitioner's arguments and associated evidence, we are persuaded that Petitioner is reasonably likely to prevail in demonstrating that claims 6 and 22 are obvious in view of Ritter, Gesbert, Thoumy, and Gitlin.

Patent Owner argues that dependent claims 6 and 22 depend from dependent claims 1 and 17, and, thus, are patentable due to their dependency

from patentable independent claims. *See* Prelim. Resp. 29–30. We are not persuaded by this argument for the same reasons discussed with respect to claims 1 and 17 in IPR2016-00823. *See* IPR2016-00823 Inst. Dec., 12–22.

d. Claims 7 and 23

Claims 7 and 23 depend from claims 6 and 22, respectively. Claims 7 and 23 recite "the at least one diversity cluster includes two or more subcarriers spread farther apart than a coherence bandwidth of a respective channel." Petitioner argues "coherence bandwidth" should be construed to mean "the bandwidth within which the channel response remains roughly the same." Pet. 6–7 (citing Ex. 1102 ¶ 36). As discussed above, we adopt Petitioner's proffered construction of "coherence bandwidth." Petitioner further argues that Gitlin discloses an allocation of OFDMA subcarriers that teaches the limitations of claims 7 and 23. *Id.* at 39. Petitioner, referring to Figure 6 of Gitlin, argues that "Gitlin teaches allocation of a diversity cluster of subcarriers to User B comprising frequency bands F0 and F4-F6, where each set of subcarriers is at the band edge." *Id.* (citing Ex. 1107, 5:47–51, Fig. 6). Petitioner concludes that "[o]ne of ordinary skill in the art in 2000 would understand that this arrangement is a diversity cluster, and that the subcarriers of frequency band F0 and the subcarriers of frequency band F6 are spread farther apart than the coherence bandwidth." *Id.*

We are not persuaded that Petitioner has shown a reasonable likelihood it will prevail in demonstrating that claims 7 and 23 are obvious over Ritter, Gesbert, Thoumy, and Gitlin. Petition provides no evidence indicating what bandwidth in Figure 6 of Gitlin should be interpreted as the "coherence bandwidth," as construed above. *See* Section II.B.5. That is, Petitioner provides no evidence identifying a bandwidth depicted in Figure 6

within which the channel response remains roughly the same. Further, Petitioner provides no evidence that Gitlin discusses or otherwise indicates the channel response of the frequency bands depicted in Figure 6.

Accordingly, we are not persuaded that Petitioner is reasonably likely to prevail in demonstrating that claims 7 and 23 are obvious in view of Ritter, Gesbert, Thoumy, and Gitlin.

e. Claims 11, 13, 27, and 29

Claims 11, 13, 27, and 29 depend from claims 9 and 25, directly or indirectly. As discussed in the Decision on Institution in IPR2016-00823, we are not persuaded that Petitioner has shown a reasonable likelihood that claims 9 and 25 are obvious based on the same arguments and evidence presented here. IPR2016-00823 Inst. Dec., 25–27. Accordingly, we are not persuaded that Petitioner has demonstrated a reasonable likelihood it would prevail as to claims 11, 13, 27, and 29.

6. Conclusion

On this record, we are persuaded that Petitioner has shown a reasonable likelihood that claims 4, 6, 20, and 22 of the ’375 patent are obvious over a combination of Ritter, Gesbert, Thoumy, and Gitlin.

On this record, we are not persuaded that Petitioner has shown a reasonable likelihood that claims 5, 7, 11, 13, 21, 23, 27, and 29 of the ’375 patent are obvious over a combination of Ritter, Gesbert, Thoumy, and Gitlin.

E. Obviousness of Claims 6–8, 11, 13, 22–24, 27, and 29 over Thoumy, Gesbert, and Gitlin; Obviousness of Claims 2, 14, 18, and 30 over

Thoumy, Gesbert, and Ritter; and Obviousness of Claims 4, 5, 20, and 21 over Thoumy, Gesbert, Gitlin, and Ritter

Petitioner contends that claims 6–8, 11, 13, 22–24, 27, and 29 of the '375 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Thoumy, Gesbert, and Gitlin. Pet. 42–56. Petitioner contends that claims 2, 14, 18, and 30 of the '375 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Thoumy, Gesbert, and Ritter. Pet. 56. Petitioner contends that claims 4, 5, 20, and 21 of the '375 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Thoumy, Gesbert, Gitlin, and Ritter. Pet. 56–58.

In part, claim 1 recites:

> providing, by the subscriber unit, a first feedback information relating to a plurality of feedback clusters based on at least the measuring of the first channel information for the plurality of subcarriers based on the first plurality of pilot symbols, each feedback cluster of the plurality of feedback clusters being at least two subcarriers, the first feedback information relating to the plurality of feedback clusters based on the first plurality of pilot symbols includes an index corresponding to a first modulation and coding rate associated with each feedback cluster of the plurality of feedback clusters.

In our Decision on Institution in IPR2016-00823, we determine that Thoumy fails to disclose providing feedback related to clusters. IPR2016-00823 Inst. Dec., 29–30. Specifically, we determine that Thoumy fails to disclose "clusters" as properly construed. Accordingly, we determine that the combination of Thoumy and Gesbert fails to disclose the limitations of claims 1, 9, 15–17, 25, and 31–32 of the '375 patent, and the combination of Thoumy, Gesbert, and Gitlin fails to disclose the limitations of claims 3, 10, 12, 19, 26, and 28 of the '375 patent. *Id.* at 28–32.

Claims 2, 4–8, 11, 13–14, 18, 20–24, 27, 29, and 30 depend from independent claims 1 and 17, and Petitioner relies on the same arguments and evidence as in IPR2016-00823 for the limitations of the independent claims. As such, we determine that the cited prior art fails to disclose these claims for the same reasons discussed with respect to independent claims 1 and 17 in IPR2016-00823. *See id.* On this record, we are not persuaded that Petitioner has shown a reasonable likelihood that claims 2, 4–8, 11, 13–14, 18, 20–24, 27, 29, and 30 of the '375 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over the cited prior art.[8]

G. Conclusion

For the foregoing reasons, we are persuaded that Petitioner has met its burden of showing a reasonable likelihood that claims 2, 4, 6, 8, 18, 20, 22, and 24 of the '375 patent are unpatentable.

For the foregoing reasons, we are not persuaded that Petitioner has met its burden of showing a reasonable likelihood that claims 5, 7, 11, 13, 14, 21, 23, 27, 29, and 30 of the '375 patent are unpatentable.

III. ORDER

After due consideration of the record before us, and for the foregoing reasons, it is:

[8] We note that certain of these grounds, for which Petitioner relies on Thoumy as the primary reference, also incorporate Ritter and, thus, are based on the same combination of prior art as grounds we discussed above as sufficient for institution on some of the same claims. Here, we reject Petitioner's arguments, presented as a separate ground, that rely on Thoumy rather than Ritter for a teaching of the recited "clusters."

ORDERED that pursuant to 35 U.S.C. § 314, an *inter partes* review is hereby instituted as to claims 2, 4, 6, 8, 18, 20, 22, and 24 of the '375 patent on the following grounds:

- claims 2, 8, 18, and 24 as unpatentable under 35 U.S.C. § 103(a) over a combination of Ritter, Gesbert and Thoumy; and
- claims 4, 6, 20, and 22 as unpatentable under 35 U.S.C. § 103(a) over a combination of Ritter, Gesbert, Thoumy, and Gitlin;

FURTHER ORDERED that no other grounds are instituted; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '375 patent is hereby instituted commencing on the entry date of this Order, and 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.

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