

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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2WIRE, INC.,  
Petitioner,

v.

TQ DELTA LLC,  
Patent Owner.

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Case IPR2015-00240  
Patent 8,090,008 B2

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Before KALYAN K. DESHPANDE, JUSTIN T. ARBES, and  
TREVOR M. JEFFERSON, *Administrative Patent Judges*.

ARBES, *Administrative Patent Judge*.

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

Petitioner 2Wire, Inc. filed a Petition (Paper 2, “Pet.”) to institute an *inter partes* review of claims 1 and 14 of U.S. Patent No. 8,090,008 B2 (Ex. 1001, “the ’008 patent”) pursuant to 35 U.S.C. §§ 311–19. Patent Owner TQ Delta LLC filed a Preliminary Response (Paper 11, “Prelim. Resp.”). We have jurisdiction under 35 U.S.C. § 314. Pursuant to 35 U.S.C. § 314(a), the Director may not authorize an *inter partes* review unless the information in the petition and preliminary response “shows that 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 that follow, we have decided not to institute an *inter partes* review.

## I. BACKGROUND

### A. *The ’008 Patent*

The ’008 patent pertains to multicarrier communications systems, such as digital subscriber line (DSL) systems using discrete multitone modulation (DMT), where a transmitter communicates over a communication channel by modulating “[c]arrier signals (carriers) or sub-channels spaced within a usable frequency band of the communication channel.” Ex. 1001, col. 1, ll. 33–39. In such a system, the phase and amplitude of the modulated carrier signals typically “can be considered random” because they “result from the modulation of an arbitrary sequence of input data bits comprising the transmitted information.” *Id.* at col. 1, ll. 48–52. In some situations, however, the phases of the modulated carriers may combine to produce a spike in the transmitted signal, which increases the peak-to-average power ratio (PAR) of the signal, i.e., the “ratio of the instantaneous peak value (i.e., maximum magnitude) of a signal parameter

(e.g., voltage, current, phase, frequency, power) to the time-averaged value of the signal parameter.” *Id.* at col. 1, l. 60–col. 2, l. 25. According to the ’008 patent, PAR is an important consideration in designing a DMT communication system because an increased PAR can result in high power consumption or clipping of the transmission signal. *Id.* at col. 2, ll. 8–27. Therefore, there was a need in the art for a system that can “effectively scramble the phase of the modulated carrier signals in order to provide a low PAR for the transmission signal.” *Id.* at col. 2, ll. 28–30.

Figure 1 of the ’008 patent is reproduced below.

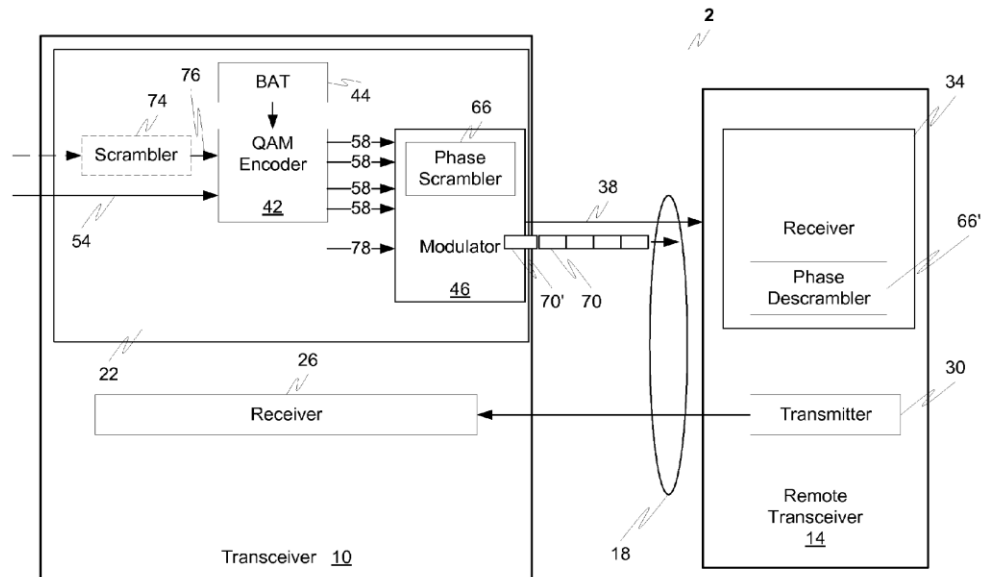


FIG. 1

Figure 1 above depicts transceiver 10 communicating transmission signal 38 over communication channel 18 (e.g., a pair of twisted wires of a telephone line) to remote transceiver 14. *Id.* at col. 3, ll. 25–50. Quadrature amplitude modulation (QAM) encoder 42 maps input serial data bit stream 54 in the time domain into parallel QAM symbols 58 in the frequency domain. *Id.* at col. 3, l. 63–col. 4, l. 1. Modulator 46 modulates each carrier signal with a

different QAM symbol 58 so that the signals have the phase and amplitude associated with the respective QAM symbol 58 (and input serial bit stream 54). *Id.* at col. 4, ll. 10–22. Phase scrambler 66 in modulator 46 calculates a phase shift for each carrier signal and combines the calculated phase shift with the phase characteristic of the respective carrier signal. *Id.* at col. 4, l. 48–col. 5, l. 4, col. 6, ll. 41–53. Phase scrambler 66 calculates the phase shift for a carrier signal by (1) determining one or more values “independently of the QAM symbols 58, and, therefore, independently of the bit value(s) modulated onto the carrier signal,” and (2) solving a “predetermined equation” using the value associated with the carrier signal. *Id.* at col. 4, ll. 48–53, 64–67. For example, the value for a carrier signal may be “derived from one or more predefined parameters, such as a pseudo-random number generator.” *Id.* at col. 4, ll. 53–58. According to the ’008 patent, the use of a value determined independently of the input bit values results in a lower PAR for the transmission signal. *Id.* at col. 2, l. 34–col. 3, l. 3. Transceiver 10 combines all of the carrier signals to form the transmission signal that is sent to remote transceiver 14. *Id.* at col. 8, ll. 17–22.

### *B. Challenged Claims*

Claims 1 and 14 of the ’008 patent recite:

1. A method for scrambling phase characteristics of carrier signals in a first multicarrier transceiver that uses a plurality of carrier signals for modulating a bit stream, wherein each carrier signal has a phase characteristic associated with the bit stream, the method comprising:

associating each carrier signal with a value determined independently of any bit value of the bit stream carried by that

respective carrier signal, the value associated with each carrier signal determined using a pseudo-random number generator;

computing a phase shift for each carrier signal based on the value associated with that carrier signal; and

combining the phase shift computed for each respective carrier signal with the phase characteristic of that carrier signal so as to substantially scramble the phase characteristics of the plurality of carrier signals, wherein multiple carrier signals corresponding to the scrambled carrier signals are used by the first multicarrier transceiver to modulate the same bit value.

14. A multicarrier system including a first transceiver that uses a plurality of carrier signals for modulating a bit stream, wherein each carrier signal has a phase characteristic associated with the bit stream, the transceiver capable of:

associating each carrier signal with a value determined independently of any bit value of the bit stream carried by that respective carrier signal, the value associated with each carrier signal determined using a pseudo-random number generator;

computing a phase shift for each carrier signal based on the value associated with that carrier signal; and

combining the phase shift computed for each respective carrier signal with the phase characteristic of that carrier signal to substantially scramble the phase characteristics of the plurality of carrier signals, wherein multiple carrier signals corresponding to the scrambled carrier signals are used by the first transceiver to modulate the same bit value.

### *C. The Prior Art*

Petitioner relies on the following prior art:

Alleged admitted prior art in the Specification of the '008 patent at col. 1, ll. 33–47, col. 3, ll. 25–37, and Fig. 1 (Ex. 1001), and in U.S. Provisional Patent Application No. 60/164,134 (Ex. 1015) (“Admitted Prior Art”) (described at pages 17–18 of the Petition);

U.S. Patent No. 5,694,415, issued Dec. 2, 1997 (Ex. 1009, “Suzuki ’415”);

U.S. Patent No. 5,903,614, issued May 11, 1999 (Ex. 1003, “Suzuki ’614”);

U.S. Patent No. 6,301,268 B1, filed Mar. 10, 1998, issued Oct. 9, 2001 (Ex. 1004, “Laroia”);

U.S. Patent No. 6,781,951 B1, filed Oct. 22, 1999, issued Aug. 24, 2004 (Ex. 1008, “Fifield”); and

ANSI T1.413-1998, DRAFT AMERICAN NATIONAL STANDARD FOR TELECOMMUNICATIONS, NETWORK AND CUSTOMER INSTALLATION INTERFACES—ASYMMETRIC DIGITAL SUBSCRIBER LINE (ADSL) METALLIC INTERFACE (John Bingham & Frank Van der Putten, eds., 1998) (Ex. 1006, “T1.413”).

*D. The Asserted Grounds*

Petitioner challenges claims 1 and 14 of the ’008 patent on the following grounds:<sup>1</sup>

Reference(s)	Basis
Suzuki ’614, Suzuki ’415, and Admitted Prior Art	35 U.S.C. § 103(a)
Laroia, Suzuki ’415, and T1.413	35 U.S.C. § 103(a)
Fifield, Suzuki ’415, and Admitted Prior Art	35 U.S.C. § 103(a)

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<sup>1</sup> Petitioner states that it “requests cancellation of claims 1 and 14 of the ’008 patent as unpatentable under 35 U.S.C. §§ 102 and 103,” but does not include any ground under 35 U.S.C. § 102 in its Petition. *See* Pet. 14–15.

### *E. Claim Interpretation*

The Board interprets claims using the “broadest reasonable construction in light of the specification of the patent in which [they] appear[.]” 37 C.F.R. § 42.100(b); *see* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012); *In re Cuozzo Speed Techs., LLC*, 778 F.3d 1271, 1278–82 (Fed. Cir. 2015). Petitioner argues that no terms in claims 1 and 14 require interpretation. Pet. 15–16. Patent Owner proposes interpretations for two phrases: “a value determined independently of any bit value” and “wherein multiple carrier signals corresponding to the scrambled carrier signals are used by the first transceiver to modulate the same bit value.” Prelim. Resp. 9–16. After reviewing the parties’ papers, we determine that no claim terms require express interpretation for purposes of this Decision.

## II. DISCUSSION

### *A. Obviousness Based on Suzuki ’614, Suzuki ’415, and Admitted Prior Art*

Petitioner contends that claims 1 and 14 are unpatentable over Suzuki ’614, Suzuki ’415, and Admitted Prior Art under 35 U.S.C. § 103(a). Pet. 27–35. Petitioner relies on Suzuki ’614 for the limitations recited in the preambles of the claims (e.g., transceiver, carrier signals) and “Suzuki ’614 in combination with Suzuki ’415” for the three steps recited in the claims. *Id.* at 27–30. Petitioner provides a claim chart citing various portions of Suzuki ’614 and Suzuki ’415, and states that the claim chart is supported by the Declaration of Krista S. Jacobsen, Ph.D. *Id.* at 27, 31–35 (citing Ex. 1002 ¶¶ 157–200, App. A1).

We are not persuaded that Petitioner has established a reasonable likelihood of prevailing on its asserted ground based on Suzuki '614, Suzuki '415, and Admitted Prior Art. “Section 103(a) forbids issuance of a patent when ‘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, 405 (2007). A patent claim, however, “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *Id.* at 418. “Rather, obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention.” *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). For an obviousness analysis, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR*, 550 U.S. at 418. Further, an assertion of obviousness “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

Petitioner does not explain sufficiently in the Petition why a person of ordinary skill in the art would have had reason to combine the teachings of Suzuki '614, Suzuki '415, and Admitted Prior Art to achieve the method of claim 1 or system of claim 14. Petitioner merely alleges that the claims



would have been “obvious” in view of the three items of prior art, and describes how Suzuki ’614 and Suzuki ’415 allegedly teach various aspects of the claims. *See* Pet. 27–30. For example, with respect to the step of “associating each carrier signal with a value determined independently of any bit value of the bit stream carried by that respective carrier signal,” Petitioner acknowledges that Suzuki ’614 does not “describe the details” of how the reference generates random phase shift data for each subcarrier, and argues that Suzuki ’415 teaches the generation of M-bit random numbers, which, according to Petitioner, are “determined independently of any bit value” because they are random. *Id.* at 28–29 (citing Ex. 1009, col. 1, ll. 52–55, col. 3, ll. 25–30, col. 4, ll. 22–34). Petitioner then argues as follows:

It would have been obvious to combine Suzuki ’614 with Suzuki ’415 in order to produce the subject matter of Claim 1. For example, it would have been obvious to compute the random phases disclosed in Suzuki ’614 in the manner disclosed in Suzuki ’415 in order to produce the random phase shifts used in Suzuki ’614.

*Id.* at 30 (citations omitted).

Petitioner’s first statement that it “would have been obvious” to combine Suzuki ’614 with Suzuki ’415 is conclusory and does not demonstrate a reason to combine. *See KSR*, 550 U.S. at 417–18; *Unigene*, 655 F.3d at 1360; *In re Chaganti*, 554 F. App’x 917, 922 (Fed. Cir. 2014) (“It is not enough to say that there would have been a reason to combine two references because to do so would ‘have been obvious to one of ordinary skill.’ Such circular reasoning is not sufficient—more is needed to sustain an obviousness rejection.” (citation omitted)). Petitioner’s second statement also is insufficient, as it merely states the *result* of the asserted combination,

i.e., the basic components of Suzuki '614 performing the random number calculations described in Suzuki '415. It does not offer any rationale to modify the basic components of Suzuki '614 to perform the calculations of Suzuki '415, or explain why an ordinarily skilled artisan would have incorporated the phase shift calculations of Suzuki '415 into the system of Suzuki '614. Further, the mere fact that Suzuki '614 does not describe the “details” of its random phase shift data does not mean that a person of ordinary skill in the art would have looked to the particular calculations of Suzuki '415. *See* Pet. 28–29. Indeed, as Patent Owner correctly points out, Suzuki '614 only discloses the end result of phase shifts, without any detail as to how the phase shifts are calculated. *See* Prelim. Resp. 19–20; Ex. 1003, col. 6, l. 36–col. 7, l. 18, Fig. 6. Accordingly, Petitioner has not set forth, in the Petition, a rationale for combining the calculations of Suzuki '415 with Suzuki '614 in reaching a conclusion of obviousness.

Likewise, Petitioner does not explain sufficiently why a person of ordinary skill in the art would have had reason to combine any Admitted Prior Art teachings with those of Suzuki '614 and Suzuki '415. *See* Pet. 27. Petitioner's asserted ground is based on the combination of Suzuki '614, Suzuki '415, and Admitted Prior Art, but Petitioner does not cite anything from the Admitted Prior Art in its analysis of the ground in the Petition, or identify any reason why a person of ordinary skill in the art would have combined any Admitted Prior Art teachings with those of the other cited references. *See id.* at 27–35. Accordingly, Petitioner has not provided, in the Petition, sufficient explanation of a reason to combine the various teachings of the prior art. *See* 37 C.F.R. § 42.104(b)(4)–(5); Prelim. Resp. 23–25.

We recognize that the Declaration of Dr. Jacobsen (Ex. 1002) includes additional discussion regarding the combination of Suzuki '614, Suzuki '415, and Admitted Prior Art. *See, e.g.*, Ex. 1002 ¶¶ 196–200. That analysis, however, is not discussed adequately in the Petition itself, as Petitioner only includes blanket citations to forty-four paragraphs and a twenty-three-page appendix of the Declaration. *See* Pet. 27–30 (citing Ex. 1002 ¶¶ 157–200, App. A1). A petition seeking *inter partes* review must identify “[h]ow the construed claim is unpatentable under the statutory grounds identified” and “where each element of the claim is found in the prior art,” and must explain the “relevance of the evidence to the challenge raised,” because the Board may “give no weight to the evidence where a party has failed to state its relevance or to identify specific portions of the evidence that support the challenge.” 37 C.F.R. § 42.104(b)(4)–(5); *see also* 37 C.F.R. § 42.22(a)(2) (a petition must include a “full statement of the reasons for the relief requested, including a detailed explanation of the significance of the evidence”). Dr. Jacobsen’s analysis is not reflected in the Petition itself, and cannot be incorporated in the Petition by reference. *See* 37 C.F.R. § 42.6(a)(3) (“Arguments must not be incorporated by reference from one document into another document.”); *Cisco Sys., Inc. v. C-Cation Techs., LLC*, Case IPR2014-00454, slip op. at 7–10 (PTAB Aug. 29, 2014) (Paper 12) (informative) (noting that “[o]ne purpose of the prohibition against incorporation by reference is to eliminate abuses” of the page limits established for the parties’ substantive papers, and that citing “large portions of another document, without sufficient explanation of those portions, amounts to incorporation by reference”). Consequently, we do not consider

information presented in the Declaration but not discussed sufficiently in the Petition.

Petitioner has not demonstrated a reasonable likelihood of prevailing on its assertion that claims 1 and 14 are unpatentable over Suzuki '614, Suzuki '415, and Admitted Prior Art.

*B. Obviousness Based on Laroia, Suzuki '415, and T1.413*

Petitioner's asserted ground of unpatentability based on Laroia, Suzuki '415, and T1.413 under 35 U.S.C. § 103(a) suffers from the same deficiency as its ground based on Suzuki '614, Suzuki '415, and Admitted Prior Art. *See supra* Section II.A; Prelim. Resp. 33–34. Petitioner relies on Laroia for the limitations recited in the preambles of claims 1 and 14 (e.g., transceiver, carrier signals) as well as the “computing” and “combining” steps of each claim, and relies on “Laroia in combination with Suzuki '415” for the step recited in each claim of “associating each carrier signal with a value determined independently of any bit value of the bit stream carried by that respective carrier signal,” citing fifty-one paragraphs and an eighteen-page appendix of Dr. Jacobsen's Declaration. Pet. 36–43 (citing Ex. 1002 ¶¶ 215–65, App. B1). Again, Petitioner argues that the claims would have been “obvious” in view of the three prior art references, but does not identify in the Petition any reason why an ordinarily skilled artisan would have incorporated the phase shift calculations of Suzuki '415 into the system of Laroia. *See id.* at 36–39.

With respect to T1.413, Petitioner argues as follows:

To the extent that some claimed aspect of the transceiver or multicarrier modulation is considered missing in Laroia, it would have been obvious from T1.413 in order to implement

the multicarrier modulation and transmission disclosed in Laroia. It would have been obvious to combine the network structures disclosed in T1.413 to implement them with the multicarrier modulation and transmission systems disclosed in Laroia.

*Id.* at 38 (citations omitted). These conclusory statements are insufficient, and Petitioner cannot rely on the more detailed analysis of Dr. Jacobsen, as that analysis is not discussed or reflected in the arguments made in the Petition itself. *See id.* at 36–43; *KSR*, 550 U.S. at 417–18; *Unigene*, 655 F.3d at 1360; *Chaganti*, 554 F. App’x at 922. Further, it is unclear what “network structures” in T1.413 Petitioner is relying on for the asserted combination, as Petitioner cites four figures and five pages of the lengthy standard document without pointing out any specific features. *See* Pet. 38, 40 (citing Ex. 1006, 10–13, 132, Figs. 2–5). Petitioner has not shown sufficiently a reason to combine the teachings of T1.413 with those of Laroia and Suzuki ’415 or explained sufficiently what aspects of the references would be combined.

Accordingly, Petitioner has not demonstrated a reasonable likelihood of prevailing on its assertion that claims 1 and 14 are unpatentable over Laroia, Suzuki ’415, and T1.413.

*C. Obviousness Based on Fifield, Suzuki ’415, and  
Admitted Prior Art*

Petitioner’s asserted ground of unpatentability based on Fifield, Suzuki ’415, and Admitted Prior Art under 35 U.S.C. § 103(a) is deficient as well. *See* Prelim. Resp. 37–38. Similar to its ground based on Suzuki ’614, Suzuki ’415, and Admitted Prior Art, Petitioner relies on Fifield for the limitations recited in the preambles of claims 1 and 14 (e.g., transceiver,

carrier signals), relies on “Fifield, combined with Suzuki ’415,” for the three steps recited in the claims, relies on “Fifield alone or in combination with Suzuki ’415, and the Admitted Prior Art,” for the limitation of “multiple carrier signals corresponding to the scrambled carrier signals . . . used by the first transceiver to modulate the same bit value,” and cites sixty-five paragraphs and a twenty-three-page appendix of Dr. Jacobsen’s Declaration. Pet. 44–52 (citing Ex. 1002 ¶¶ 252–316, App. C1). Again, Petitioner merely alleges that the claims would have been “obvious,” without explaining in the Petition any reason why a person of ordinary skill in the art would have combined the teachings of the three items of prior art. *Id.* at 44–46. Petitioner also cannot rely on the more detailed analysis of Dr. Jacobsen, which is not discussed sufficiently in the Petition. Accordingly, Petitioner has not demonstrated a reasonable likelihood of prevailing on its assertion that claims 1 and 14 are unpatentable over Fifield, Suzuki ’415, and Admitted Prior Art.

#### *D. Conclusion*

We conclude that Petitioner has not demonstrated a reasonable likelihood that at least one of the challenged claims of the ’008 patent is unpatentable based on the asserted grounds. Therefore, we do not institute an *inter partes* review on any of the asserted grounds as to any of the challenged claims.

### III. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is denied as to all challenged claims of the '008 patent.

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