IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

TQ DELTA, LLC, Plaintiff; v. ADTRAN, INC., Defendant.	Civil Action No. 14-954-RGA

MEMORANDUM OPINION

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June 9, 2020

/s/ Richard G. Andrews
ANDREWS, U.S. DISTRICT JUDGE:

Before me is Defendant Adtran, Inc.'s Motion for Summary Judgment of Invalidity (D.I. 966) and Plaintiff TQ Delta, LLC's Motion for Summary Judgment of No Invalidity (D.I. 960). I have considered the briefing. (D.I. 967, 989, 1003; D.I. 961, 984, 1006). Because genuine disputes of material fact remain, both motions are denied.

I. BACKGROUND

The asserted patents relate to Digital Subscriber Line (DSL) technology, which is a way to connect to the Internet using copper telephone lines. (D.I. 963, Ex. A, "Zimmerman Report," ¶ 65). I bifurcated the case into separate trials for each patent family. (D.I. 369). The present motions are about the Family 4 patents: U.S. Patent Nos. 7,292,627 ('627 patent), 8,090,008 ('008 patent), and 8,073,041 ('041 patent). Plaintiff is asserting claim 26 of the '627 patent, claim 14 of the '008 patent, and claim 14 of the '041 patent.

The purpose of the Family 4 patents is to lower the peak-to-average power ratio (PAR) of transmitted signals. ('627 patent at 1:18-22). The PAR of a signal is the ratio of the maximum power that the signal reaches to the average power of the signal over a period of time. (*Id.* at 1:60-64). Reducing PAR is desirable because a high PAR can cause signal "clipping" (which degrades the signal), or it requires a system that consumes high amounts of power. (D.I. 959, Ex. B, "Madisetti Infringement Report," ¶ 60).

The patents address PAR in "multicarrier communications systems," such as DSL. ('627 patent at 3:24-37). These systems transmit signals simultaneously across multiple frequency channels, which are also called "carriers." (*Id.* at 1:26-32). The systems convey information by modulating the phases and amplitudes of the carrier signals. (Madisetti Infringement Report ¶

46). Some phases and amplitudes represent "0," while others represent "1." (*Id.*). DSL uses a technique called "Discrete MultiTone" (DMT) to modulate the carrier signals. (Zimmerman Report ¶ 66). With a technique known as Quadrature Amplitude Modulation (QAM), a single carrier signal can represent multiple bits at once (such as "000" or "001"). (Madisetti Infringement Report ¶ 47). Thus, a DMT symbol is made up of a set of QAM symbols. (*Id.* ¶ 49). A DSL system may transmit 4000 DMT symbols per second. (*Id.*). This process allows users to send and receive information over the Internet.

If the data is insufficiently random though, the amplitudes of multiple carriers can align, which results in a high peak power (and thus a high PAR). (Zimmerman Report ¶ 76). The Family 4 patents address this problem by "substantially scramb[ling] the phase characteristics of the carrier signals." ('627 patent at 2:38-40).

II. LEGAL STANDARDS

A. Summary Judgment

"The court shall grant summary judgment if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." FED. R. CIV. P. 56(a). The moving party has the initial burden of proving the absence of a genuinely disputed material fact relative to the claims in question. *Celotex Corp. v. Catrett*, 477 U.S. 317, 330 (1986). Material facts are those "that could affect the outcome" of the proceeding, and "a dispute about a material fact is 'genuine' if the evidence is sufficient to permit a reasonable jury to return a verdict for the nonmoving party." *Lamont v. New Jersey*, 637 F.3d 177, 181 (3d Cir. 2011) (quoting *Anderson v. Liberty Lobby, Inc*., 477 U.S. 242, 248 (1986)). The burden on the moving party may be discharged by pointing out to the district court that there is an absence of evidence supporting the non-moving party's case. *Celotex*, 477 U.S. at 323.

The burden then shifts to the non-movant to demonstrate the existence of a genuine issue for trial. *Matsushita Elec. Indus. Co. v. Zenith Radio Corp.*, 475 U.S. 574, 586–87 (1986); *Williams v. Borough of West Chester, Pa.*, 891 F.2d 458, 460–61 (3d Cir. 1989). A non-moving party asserting that a fact is genuinely disputed must support such an assertion by: "(A) citing to particular parts of materials in the record, including depositions, documents, electronically stored information, affidavits or declarations, stipulations . . . , admissions, interrogatory answers, or other materials; or (B) showing that the materials cited [by the opposing party] do not establish the absence . . . of a genuine dispute . . . ." FED. R. CIV. P. 56(c)(1).

When determining whether a genuine issue of material fact exists, the court must view the evidence in the light most favorable to the non-moving party and draw all reasonable inferences in that party's favor. *Scott v. Harris*, 550 U.S. 372, 380 (2007); *Wishkin v. Potter*, 476 F.3d 180, 184 (3d Cir. 2007). A dispute is "genuine" only if the evidence is such that a reasonable jury could return a verdict for the non-moving party. *Anderson*, 477 U.S. at 247–49. If the non-moving party fails to make a sufficient showing on an essential element of its case with respect to which it has the burden of proof, the moving party is entitled to judgment as a matter of law. *See Celotex Corp.*, 477 U.S. at 322.

B. Anticipation

A patent is invalid as anticipated under 35 U.S.C. § 102 if "the four corners of a single, prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation." *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000). "[A]nticipation by inherent disclosure is appropriate only when the reference discloses prior art that must necessarily include the unstated limitation." *Transclean Corp. v.*

Bridgewood Servs., Inc., 290 F.3d 1364, 1373 (Fed. Cir. 2002). "[A]nticipation is a question of fact, including whether an element is inherent in the prior art." *In re Gleave*, 560 F.3d 1331, 1334-35 (Fed. Cir. 2009).

C. Obviousness

A patent is invalid as obvious under 35 U.S.C. § 103 if "the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made." *Kahn v. Gen. Motors Corp.*, 135 F.3d 1472, 1479 (Fed. Cir. 1998). "Obviousness is a question of law based on underlying factual findings: (1) the scope and content of the prior art; (2) the differences between the claims and the prior art; (3) the level of ordinary skill in the art; and (4) objective considerations of nonobviousness." *In re Morsa*, 713 F.3d 104, 109 (Fed. Cir. 2013) (citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966)).

To show a patent is obvious, a party "must demonstrate by clear and convincing evidence that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so." *InTouch Techs., Inc. v. VGO Commc'ns, Inc.*, 751 F.3d 1327, 1347 (Fed. Cir. 2014) (cleaned up). The overall inquiry into obviousness though must be "expansive and flexible." *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415 (2007).

III. DISCUSSION

A. Does Stopler Anticipate Claim 26 of the '627 Patent?

Defendant argues that claim 26 of the '627 patent is anticipated by an older patent, U.S. Patent No. 6,625,219, called "Stopler." (D.I. 968, Ex. 16, "Stopler"). Claim 26, a dependent claim, recites: "The transceiver of claim 20 wherein the value varies with each DMT symbol." Claim 20, in turn, discloses:

> A multicarrier modulation transceiver that uses a transmission signal having a plurality of carrier signals for modulating an input bit stream, each carrier signal having a phase characteristic associated with the input bit stream, wherein the multicarrier modulation transceiver is capable of associating each carrier signal with a value determined independently of any input bit value carried by that carrier signal, 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 carrier signal with the phase characteristic of that carrier signal so as to *substantially scramble the phase characteristics of the plurality of carrier signals*.

('627 patent, claim 20). Plaintiff counters that Stopler is missing the following element: "substantially scramble the phase characteristics of the plurality of carrier signals." I construed this phrase to mean: "adjust the phase characteristics of the carrier signals by varying amounts to produce a transmission signal with a reduced peak-to-average power ratio (PAR)." (D.I. 333). Defendant seeks summary judgment of invalidity, while Plaintiff seeks summary judgment of no invalidity.

Like the Family 4 patents, Stopler is directed to data communications. (Stopler at Abstract). Stopler, however, addresses a different problem. Instead of trying to lower PAR, Stopler seeks to mitigate interference. (*Id.*). Specifically, Stopler uses a "diagonalization scheme" in which data packets are spread over the various carriers over time, reducing the effect that a burst of noise would have on an individual user's packets. (*Id.* at 5:64-67).

Stopler does not discuss PAR, but it does briefly suggest phase scrambling: "In order to randomize the overhead channel symbols, a phase scrambling sequence is applied to the output symbols. However, to simplify implementation, the phase scrambler is applied to all symbols, not just the overhead symbols." (*Id.* at 12:24-28). Stopler suggests using a "pseudo-random generator," which produces numbers that correspond with phase rotations of the symbols. (*Id.* at 12:28-45).

Does this technique "adjust the phase characteristics of the carrier signals by varying amounts?" Dr. George Zimmerman, Defendant's expert, points to a table in Stopler showing that the phase rotation could be 0, $\pi/2$, π, or $-\pi/2$ radians. (Zimmerman Report ¶ 211). Thus, Dr. Zimmerman concludes, the phase characteristics in Stopler are adjusted by "varying" amounts. (*Id.*). Dr. Vijay Madisetti, Plaintiff's expert, however, concludes that Stopler "adjust[s] the phase characteristics of all the carrier signals by the same amount of rotation, not by varying amounts as required by the claims." (D.I. 963, Ex. B, "Madisetti Report," ¶ 63). According to Dr. Madisetti, a person of ordinary skill in the art would understand that Stopler's pseudo-random generator produces a single number at a time, and it uses that number to rotate all the carriers within a DMT symbol by a single amount, not "varying" amounts. (*Id.*). The prior art, on its face, does not provide a clear answer. Therefore, it appears there is a genuine dispute of material fact on this question, and summary judgment for either party would be inappropriate.

The experts also disagree on whether Stopler's phase scrambling would reduce the PAR of the transmission signal. According to Dr. Zimmerman, "randomizing the phase characteristics of the carrier signals in Stopler would tend to result in a transmission signal with increased randomness." (Zimmerman Report ¶ 216). "[T]hat increased randomness," Dr. Zimmerman concludes, "more frequently results in a decreased PAR from the unadjusted transmission signal." (*Id.*). Dr. Madisetti, on the other hand, argues that Stopler's phase scrambling "does not result in a transmission signal with a reduced PAR." (Madisetti Report ¶ 57). He explains that "[a]djusting the phase characteristics of each of the carrier signals by the same amount within a DMT symbol but altering that amount over time does not result in reduced PAR of a transmission signal." (*Id.* ¶ 71). Dr. Zimmerman disagrees that this is how Stopler functions. Instead, he concludes, "Stopler describes a phase scrambling sequence applied to all QAM

symbols that make up a single DMT symbol" and that "[o]ne of ordinary skill in the art would understand that the phase adjustments vary from carrier to carrier within a single DMT symbol in Stopler." (D.I. 969, Ex. D, "Zimmerman Invalidity Reply Report" ¶¶ 63-64).

Reducing PAR is clearly not the intended function of Stopler. The patent makes no mention at all of PAR. In *TQ Delta, LLC v. Cisco Sys., Inc.*, the Federal Circuit held that "Stopler provides no express discussion of, nor any connection to, the PAR of a multicarrier transmitter." 942 F.3d 1352, 1362 (Fed. Cir. 2019). In that case, the court found that a patent, which is related to the one asserted here, was not obvious over Stopler and another prior art reference. Anticipation requires a different inquiry than obviousness though. In *Cisco*, the Federal Circuit found there was no credible evidence that a person of ordinary skill would have been motivated to use the phase scrambler in Stopler as a solution to reduce PAR. *Id.* at 1377. While it might be surprising if Stopler inherently reduces PAR without it being an obvious solution to one of skill in the art, the Federal Circuit did not address that question.

The fact that Stopler "provides no express discussion of, nor any connection to" PAR does not settle the matter. "[A] prior art reference may anticipate without disclosing a feature of the claimed invention if that missing characteristic is necessarily present, or inherent, in the single anticipating reference . . . [I]nherent anticipation [does not] require[] recognition in the prior art." *Schering Corp. v. Geneva Pharm.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003). Therefore, given the conflicting expert opinions on how a person of ordinary skill would read Stopler, I find there is a genuine dispute of material fact and deny both motions for summary judgment on this issue.

B. Does Jones Anticipate Claim 14 of the ’008 Patent or Claim 14 of the ’041 Patent?

Defendant argues that U.S. Patent No. 6,657,949, called “Jones,” anticipates claim 14 of the ’008 patent and claim 14 of the ’041 patent. Claim 14 of the ’008 patent discloses:

> 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.

(’008 patent, claim 14).

Claim 14 of the ’041 patent discloses:

> A multicarrier system including a first transceiver that uses a plurality of carrier signals for receiving a bit stream, wherein each carrier signal has a phase characteristic associated with the bit stream, the transceiver capable of receiving the bit stream, wherein:
>
> each carrier signal is associated 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 by a pseudo-random number generator*, a phase shift for each carrier signal is based on:
>
> the value associated with that respective carrier signal, and
>
> the combining of a phase shift for each carrier signal with the phase characteristic of that respective carrier signal so as to *substantially scramble* the phase characteristics of the plurality of carrier signals, multiple carrier signals corresponding to the plurality of phase shifted and scrambled carrier signals are used by the first multicarrier transceiver to demodulate a same input bit value of the received bit stream.

(’041 patent, claim 14).

First, Plaintiff responds that, in Jones, values are not determined by a "pseudo-random number generator"—an element of both asserted claims. Second, Plaintiff argues that Jones does not produce a "transmission signal" with reduced PAR, as I construed the claims to require. Both parties have moved for summary judgment.

Jones is directed to digital communications systems that use "orthogonal frequency division multiplexing" (OFDM), which "divides the available spectrum within a channel into narrow subchannels." (D.I. 963, Ex. G, "Jones," at 2:2-4). In a "burst," each subchannel in an OFDM system transmits one data symbol. (*Id.* at 2:4-5). Jones claims "[s]ystems and methods for efficient multiplexing of multiple access requests from disparate sources within a single OFDM burst." (*Id.* at 2:51-53).

Does Jones disclose a "pseudo-random number generator?" Jones describes a phase scrambling technique in at least one embodiment. (*Id.* at 5:30-6:24). According to Defendant's Dr. Zimmerman, this phase scrambling technique uses pseudo-random numbers. (Zimmerman Report ¶ 1216). According to Plaintiff's Dr. Madisetti, the numbers are generated sequentially, and are therefore not random or pseudo-random. (Madisetti Report ¶ 138).

Jones teaches:

> The phase scrambling pattern consists of a series of values ranging from 0 to 3. A phase scrambling storage block generates the values of the pattern in succession. A complex exponential block represents the translation of the values ranging from 0 through 3 into four possible phase rotation values: 0, $\pi/2$, π, $3\pi/2$.

(Jones at 6:1-6).

Dr. Madisetti focuses on the fact that Jones describes the pattern as being "in succession." According to Dr. Madisetti, a person of ordinary skill would understand that to mean "that the pattern of values is 0, 1, 2, 3, 0, 1, 2, 3, etc., and the pattern of

corresponding phases shifts would be: for carrier 1, 0 phase shift; for carrier 2, π/2 phase shift; for carrier 3, π phase shift; for carrier 4, 3π/2; for carrier 5, 0 phase shift; etc. Thus, there is nothing random or pseudo-random about Jones's 'phase scrambling.'" (Madisetti Report ¶ 138).

Defendant responds that Jones is using "in succession" to mean merely "one after the other," not that the numbers must be in order. (D.I. 967 at 8). Dr. Zimmerman points to a passage of Jones which states that selecting a different tone set would result in a shift to a "different section" of the phase scrambling pattern. (Zimmerman Report ¶ 1216; Jones at 5:59-62). According to Dr. Zimmerman, this shift would occur if the phase scrambling sequence were random, but not necessarily if it were periodic or constant. Therefore, Dr. Zimmerman concludes that a person of ordinary skill would infer that the number generator in Jones is pseudo-random. (Zimmerman Report ¶ 1216). Given these conflicting expert opinions, I am unable to grant summary judgment for either side.

Plaintiff's second argument against anticipation by Jones is that Jones does not produce a "transmission" signal with reduced PAR. The asserted claims of the '008 and '014 patents (like the asserted claim of the '627 patent) disclose "substantially scramble the phase characteristics of the plurality of carrier signals." As with the '627 patent, I construed this term to mean: "adjust the phase characteristics of the carrier signals by varying amounts to produce a transmission signal with a reduced peak-to-average power ratio (PAR)." (D.I. 333).

There is no dispute that Jones contemplates reducing PAR. Plaintiff's argument is that Jones reduces the PAR in the "received" signal at a central access point receiver, instead of the "transmission" signal. Plaintiff points to the following sentence in Jones:

"The reason for the phase scrambling is that certain combinations of request access data symbols will result in an excessive peak to mean power ratio (PMPR) for the burst as received." (Jones at 5:49-52). I understand PMPR in Jones to refer to the same thing as PAR in the asserted patents. According to Plaintiff, the words "as received" indicate that Jones is directed to reducing PAR only in received signals. (D.I. 961 at 10). Plaintiff also argues that, during his deposition, Dr. Zimmerman admitted that he had not analyzed if Jones's phase scrambling would result in a transmission signal with reduced PAR:

> Q. Okay. So you didn't do any analysis at all of any reduction in PAR at the transmitter of Jones, correct?
> A. I did not.

(D.I. 963, Ex. I, "Zimmerman Dep. Tr.," at 259:15-18).

Defendant responds that the question was vague, and Plaintiff's counsel had confusingly switched to asking about the transmitter after repeatedly asking about the receiver. (D.I. 984 at 10). Defendant instead relies on Dr. Zimmerman's report, in which he concluded, "One of skill in the art would understand that randomizing the phase characteristics of the carrier signals in Jones would tend to result in a transmission signal with increased randomness," and that such "increased randomness more frequently will tend to result in a decreased PAR from the unadjusted transmission signal." (Zimmerman Report ¶ 1231).

Plaintiff does not identify analysis by its own expert, Dr. Madisetti, on whether Jones reduces PAR of the transmission signal. Dr. Zimmerman's brief answer during a lengthy and complex deposition is not enough to entirely nullify the analysis in his prepared report. It is enough, however, to create a genuine dispute of material fact. Thus, I cannot grant summary judgment that Jones anticipates claim 14 of the '008 patent or claim 14 of the '041 patent.

C. Are the Asserted Claims Obvious?

1. Jones

Defendant argues that even if Jones does not disclose a pseudo-random number generator, that element would have been obvious to one of ordinary skill in the art. (D.I. 966 at 8-9). According to Dr. Zimmerman, "[a] person of ordinary skill in the art would connect scrambling with randomization, and would have been well aware that a pseudo-random number generator was a useful way to introduce such randomization." (Zimmerman Report ¶ 824). Dr. Zimmerman, however, does not explain why a person of ordinary skill would have been motivated to apply a pseudo-random number generator to Jones. *See InTouch Techs.*, 751 F.3d at 1347 ("A party seeking to invalidate a patent on obviousness grounds must demonstrate by clear and convincing evidence that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention.") If Jones can reduce PAR without a pseudo-random number generator, then it is unclear why one of ordinary skill would want to introduce one.

2. Combinations Involving Shively

Defendant argues that all three asserted claims are obvious over U.S. Patent No. 6,144,696, called "Shively," and U.S. Patent No. 5,682,376, called "Hayashino." Plaintiff responds that a person of ordinary skill in the art would not have been motivated to combine Shively and Hayashino to create the claimed inventions. (D.I. 989 at 3).

Shively discloses a bit allocation technique in DSL modems that use DMT transmission. (Shively at 1:5-8, 2:37-40). Specifically, Shively suggests transmitting the same data on multiple subchannels to compensate for noisy environments. (Shively at 15:47-52). Hayashino teaches that high PAR can occur when transmission signals are in phase with each other, and it describes

a process for scrambling the phase characteristics of carrier signals. (Hayashino at 2:65-3:3, 12:27-48; Zimmerman Report ¶¶ 142-143).

According to Dr. Zimmerman, a person of ordinary skill in the art would have recognized that replicating data on multiple carriers (as described in Shively) would have led to high PAR. (Zimmerman Report ¶ 342). A person of ordinary skill would have wanted to reduce the PAR of Shively, Dr. Zimmerman argues, because high PAR can lead to high power consumption or signal clipping. (Zimmerman Report ¶ 344). Finally, Dr. Zimmerman argues a person of ordinary skill would have recognized the phase scrambling technique in Hayashino as a solution to the high PAR of Shively and would have been motivated to combine the two techniques. (Zimmerman Report ¶ 345).

Dr. Madisetti responds that a person of ordinary skill would not have been motivated to combine the two references because Shively has no PAR problem. In Dr. Madisetti's view, Shively is only directed to "long loop" systems, where there are at least 18,000 feet of cable between DSL modems. (Madisetti Report ¶ 78). In that kind of system, according to Dr. Madisetti, PAR is low enough that there are no problems with signal clipping or high-power consumption. (*Id.* ¶¶ 96-101). With no PAR problem, there would be no reason to use Hayashino's PAR reduction technique on Shively's system.

Defendant counters that a person of ordinary skill "would have readily understood that Shively's technique would be useful on loops shorter than 18,000 feet." (D.I. 1003). That, however, is a genuine dispute of material fact. The claims of Shively are not (at least on their face) limited to long loop systems. The issue here though is not the scope of Shively's claims. The issue is whether a person of ordinary skill would have been motivated to combine Shively

and Hayashino. Because there is a genuine dispute over whether Shively has a PAR problem that needs solving, I cannot grant summary judgment for either party.

Dr. Zimmerman also concludes the asserted claims are obvious combinations of Shively and Stopler. (Zimmerman Report ¶ 228). There are two genuine disputes of material fact here. The first is whether Stopler's technique reduces PAR, and the second is, if Stopler does reduce PAR, whether Shively has a PAR problem that would motivate a person of ordinary skill to combine the two techniques. Given these genuine disputes, summary judgment is unwarranted.

3. Combinations Involving Hwang

U.S. Patent No. 6,590,893, called "Hwang," describes a multicarrier communication system using DMT modulation. (Zimmerman Report ¶ 148; Hwang at 5:12-6:21). Defendant argues it would have been obvious to combine Hwang with either Stopler or Hayashino to form the claimed inventions.

According to Dr. Zimmerman, Hwang discloses a redundant transmission technique that would have high PAR. (Zimmerman Report ¶ 427). Plaintiff responds that, unlike other DMT systems, Hwang teaches a "differential encoding scheme," which means that Hwang would not increase PAR. (D.I. 989 at 16-17). With no PAR problem to solve, there would be no motivation to combine Hwang with either Hayashino or Stopler. This is a genuine dispute of material fact that cannot be resolved at summary judgment. Additionally, as discussed, whether Stopler reduces PAR is in dispute.

4. Combinations Involving T1.413-1998

T1.413-1998 is a technical standard for DSL technology published by the American National Standards Institute in 1998. (Zimmerman Report ¶¶ 130-31). Defendant argues the asserted claims are obvious combinations of T1.413-1998 and either Stopler or Hayashino.

Dr. Zimmerman explains that T1.413-1998 describes devices which employ redundant transmission of the same bits during initialization. (Zimmerman Report ¶ 137). This process would create high PAR, Dr. Zimmerman argues, and a person of ordinary skill would have been motivated to lower that PAR using the phase scrambling of either Stopler or Hayashino. Dr. Madisetti responds that simulations show devices described in T1.413-1998 do not have high PAR. (Madisetti Report ¶ 103). Thus, there is a genuine dispute of material fact over whether there would be a motivation to combine T1.413-1998 with Stopler or Hayashino. And again, there is a dispute over whether Stopler reduces PAR.

IV. CONCLUSION

For these reasons, Defendant's Motion for Summary Judgment of Invalidity (D.I. 966) and Plaintiff's Motion for Summary Judgment of No Invalidity (D.I. 960) are denied. I will enter an Order consistent with this Opinion.

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ORDER

For these reasons stated in the accompanying Memorandum Opinion, Defendant's Motion for Summary Judgment of Invalidity (D.I. 966) and Plaintiff's Motion for Summary Judgment of No Invalidity (D.I. 960) are **DENIED**.

IT IS SO ORDERED this 9th day of June 2020.

/s/ Richard G. Andrews
United States District Judge