

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EMERSON ELECTRIC CO.,
Petitioner,

v.

IP CO., LLC,
Patent Owner.

Case IPR2017-00252
Patent 8,000,314 B2

Before LYNNE E. PETTIGREW, STACEY G. WHITE, and
CHRISTA P. ZADO, *Administrative Patent Judges*.

WHITE, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background

Emerson Electric Co. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) seeking to institute an *inter partes* review of claims 1, 4, 10, 11, and 15–19 of U.S. Patent No. 8,000,314 B2 (Ex. 1001, “the ’314 patent”) pursuant to 35 U.S.C. §§ 311–319. IP Co., LLC (“Patent Owner”) filed a Preliminary Response. (Paper 6, “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.”

Petitioner contends the challenged claims are unpatentable under 35 U.S.C. § 103 on the following specific grounds (Pet. 29–75):

References	Claim(s) Challenged
Jubin ¹ and Fifer ²	1, 10, and 11
Jubin, Fifer, APA, ³ and Cerf ⁴	4

¹ John Jubin & Janet D. Tornow, *The DARPA Packet Radio Network Protocols*, Proceedings of the IEEE, Vol. 75, No. 1, Jan. 1987 (Ex. 1003) (“Jubin”).

² William C. Fifer & Frederick J. Bruno, “The Low-Cost Packet Radio,” Proceedings of the IEEE, Vol. 75, No. 1, January 1987 (“Fifer”) (Ex. 1004)

³ Petitioner relies upon the disclosures found in column 7, lines 33 through 37 of the ’314 patent as Admitted Prior Art (“APA”). See Pet. 26.

⁴ Vinton G. Cerf & Peter T. Kirstein, *Issues in Packet-Network Interconnection*, Proceedings of the IEEE, Vol. 66, No. 11, Nov. 1978 (Ex. 1008) (“Cerf”).

References	Claim(s) Challenged
Jubin, Fifer, and Layer Net ⁵	1
Jubin, Fifer, APA, Cerf, and Layer Net	4 and 15–19
Jubin, Fifer, APA, Cerf, Layer Net, and Schwartz ⁶	4 and 15–19
Kahn, ⁷ Burchfiel, ⁸ Schwartz, and Cerf	4

Our factual findings and conclusions at this stage of the proceeding are based on the evidentiary record developed thus far (prior to Patent Owner’s Response). This is not a final decision as to patentability of claims for which *inter partes* review is instituted. Our final decision will be based on the record as fully developed during trial. For reasons discussed below, we institute *inter partes* review of claims 1 and 4 of the ’314 patent and we deny Petitioner’s request to institute an *inter partes* review of claims 10, 11, and 15–19.

B. Related Proceedings

We have been informed that *SIPCO, LLC, v. Emerson Electric Co.*, No. 6:15-cv-00907-JRG-KNM (E.D. Tex.), which has been transferred to the Northern District of Georgia and consolidated with Civil Action No.

⁵ Anu Bhatnagar and Thomas G. Robertazzi, “Layer Net: A New Self Organizing Network Protocol,” IEEE Military Comm. Conf. (MILCOM 90), Sept-Oct 1990, 845 (Ex. 1005) (“Layer Net”).

⁶ Mischa Schwartz, TELECOMMUNICATION NETWORKS: PROTOCOLS, MODELING AND ANALYSIS, Addison-Wesley Pub. Co., 1987 (Ex. 1009) (“Schwartz”).

⁷ Robert E. Kahn, *Advances in Packet Radio Network Protocols*, Proceedings of the IEEE, Vol. 66, No. 11, Nov. 1978 (Ex. 1006) (“Kahn”).

⁸ J. Burchfiel et al., *Functions and structure of a packet radio station*, National Computer Conference presented paper, 1975 (Ex. 1007) (“Burchfiel”).

C. The '314 Patent

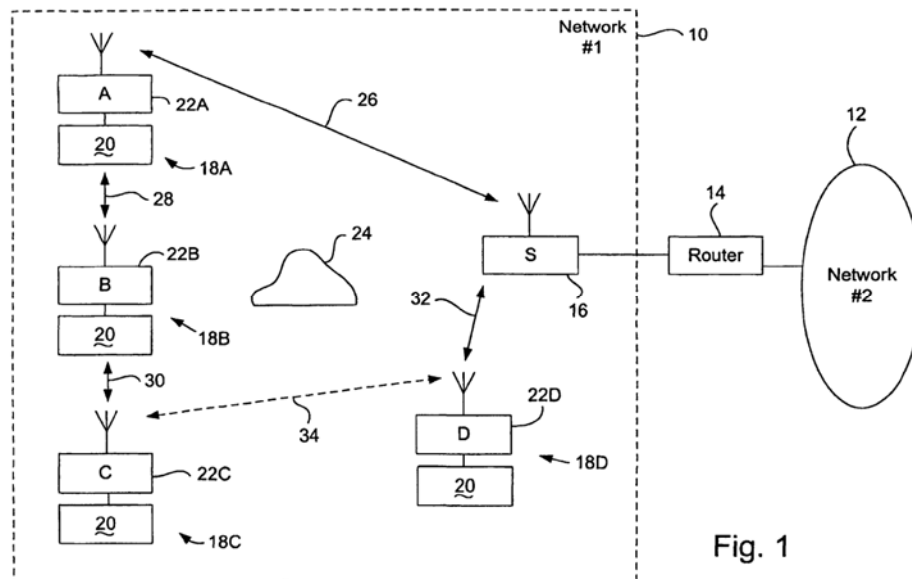


Figure 1 shows wireless network 10 that is in communication with second network 12. *Id.* at 7:18–22. Wireless network 10 includes one or more servers 16 that may act as a gateway between the two networks. *Id.* at 7:42–46. Servers include a digital controller that “maintains a map of the links of the first network and provides a map to the first network clients on request.” *Id.* at 5:53–55. The network also includes any number of clients 18. *Id.* at 7:64–67. Servers implement processes for receiving and transmitting data packets from the clients. *Id.* at 5:6–9. Clients implement processes for

receiving and transmitting data packets to and from the server and other clients. *Id.* at 5:9–11. “Preferably, the client process of each of the clients initiates, selects, and maintains a radio transmission path (‘link’) to the server . . . [and] also constantly searches for improved paths to the server.” *Id.* at 5:11–15, 5:19–21.

D. Illustrative Claim

Petitioner challenges claims 1, 4, 10, 11, and 15–19 of the ’314 patent, of which claims 1, 4, 10, and 15 are independent. Claim 1 is illustrative of the challenged claims and is reproduced below:

1. A wireless network system comprising:
 - a first node including a first node controller and a first node radio modem, said first node controller implementing a first node process that includes controlling said first node radio modem, said first node process including receiving and transmitting data packets via said first node radio modem;
 - a plurality of second nodes each including a second node controller and a second node radio modem, said second node controller implementing a second node process that includes controlling of said second node radio modem, said second node process including receiving and transmitting data packets via said second node radio modem, wherein said second node process of each of said second nodes includes selecting a radio transmission path to said first node that is direct or through at least one of the remainder of said plurality of second nodes; and
- wherein said selected path to said first node utilizes the least number of other second nodes, such that said transmission path from each of said second nodes to said first node is optimized and the first node controller implements changes to upgrade the selected transmission

path in response to a request from at least one of said second nodes.

Ex. 1001, 22:56–23:13.

II. ESTOPPEL UNDER 35 U.S.C. § 315

A petitioner that has received a final written decision on a particular patent claim may not request or maintain subsequent proceedings on a ground that it “reasonably could have raised” during the prior proceeding as to that claim. *See Dell Inc. v. Elecs. & Telecomms. Research Inst.*, Case IPR2015-00549, slip op. 4–6 (PTAB Mar. 26, 2015) (Paper 10) (representative). This prohibition is provided in § 315(e)(1) of the Patent Act, which recites

[t]he petitioner in an inter partes review of a claim in a patent under this chapter that results in a final written decision under section 318(a), or the real party in interest or privy of the petitioner, may not request or maintain a proceeding before the Office with respect to that claim on any ground that the petitioner raised or reasonably could have raised during that inter partes review.

35 U.S.C. § 315(e)(1); *see* 37 C.F.R. § 42.73(d)(1). Petitioner filed a petition in IPR2015-01901, and in that matter, claims 10 and 12–19 of the ’314 patent were the subject of a final written decision. *Emerson Elec. Co., v. IPCO, LLC*, Case IPR2015-01901, slip op. at 32 (PTAB Mar. 8, 2017) (Paper 28) (holding claims 10 and 12–19 to be unpatentable) (“1901 proceeding” or “IPR 1901”).

Petitioner now seeks to institute *inter partes* review of claims including 10 and 15–19, which were the subject of a final written decision in the 1901 proceeding. “[E]stoppel is applied on a claim-by-claim basis.” *Westlake Servs., LLC v. Credit Acceptance Corp.*, Case CBM2014-00176,

2015 WL 9699417, at *2 (PTAB May 14, 2015) (precedential). Thus, Petitioner may not “request or maintain” an *inter partes* review of claims 10 and 15–19 “on any ground that the petitioner raised or reasonably could have raised during [the 1901 proceeding].” 35 U.S.C. § 315(e)(1).

Trial was instituted on the following grounds in the 1901 proceeding:

References	Basis	Claim(s)
Meier ⁹ and Gollnick ¹⁰	§ 103	10
Kahn, Jubin, Burchfiel, and Schwartz	§ 103	12
Kahn, Jubin, Burchfiel, Schwartz, and Cerf	§ 103	13–19

IPR 1901 Paper 9, 31.

The legislative history of the America Invents Act broadly describes grounds that “reasonably could have [been] raised” as encompassing “prior art which a skilled searcher conducting a diligent search reasonably could have been expected to discover.” 157 Cong. Rec. S1375 (daily ed. Mar. 8, 2011) (statement of Sen. Kyl); *see id.* at S1376 (statement of Sen. Kyl) (“This [estoppel] effectively bars such a party or his real parties in interest or privies from later using inter partes review . . . against the same patent, since the only issues that can be raised in an inter partes review . . . are those that could have been raised in [an] earlier post-grant or inter partes review.”); 157 Cong. Rec. S952 (daily ed. Feb. 28, 2011) (statement of Sen. Grassley) (“It also would include a strengthened estoppel standard to prevent petitioners from raising in a subsequent challenge the same patent issues that were raised or reasonably could have been raised in a prior challenge.”).

⁹ U.S. Patent No. 5,394,436, Feb. 28, 1995 (IPR 1901 Ex. 1008, “Meier”).

¹⁰ U.S. Patent No. 5,940,771, Aug. 17, 1999 (IPR 1901 Ex. 1009, “Gollnick”).

Claim 10 now stands challenged as unpatentable over Jubin and Fifer. Jubin was asserted in the 1901 proceeding. Petitioner does not allege that there was any reason that Fifer could not have been asserted at that time. We note that Fifer is cited in the text of Jubin as providing additional description of the packet radios discussed in Jubin. *See* Ex. 1003, 30 n.14. Claims 15–19 are alleged to be unpatentable over Jubin, Fifer, APA, Cerf, and Layer Net with or without Schwartz. Jubin, Cerf, and Schwartz all were asserted as part of instituted grounds in the 1901 proceeding.

As to APA, this was asserted in the alternative to Cerf in the 1901 proceeding. *See* 1901 IPR Paper 3, 37–46. There, Petitioner asserted that either Cerf or APA would teach the claimed gateway. *Id.* at 36. We found that Cerf provided a sufficient teaching and thus, we did not need the alternative teaching from APA for the asserted ground. 1901 IPR, slip. op. at 21. We note that in both the instant case and the 1901 proceeding Petitioner relies upon the exact same passage from the '314 patent as admitted prior art. *Compare* 1901 IPR Paper 3, 14 *with* Pet. 26. We also note that in this Petition, Petitioner refers to APA as an additional teaching to Cerf or as an alternative to Cerf. *See e.g.*, Pet. 47 (“In other words, using a gateway, such a taught by *Cerf or APA*, in the packet radio network of Jubin. . .”) (emphasis added). In addition, APA is part of the challenged patent and thus, the document containing the patentee’s admissions was at issue in all stages of the prior proceeding. As to Layer Net, Petitioner does not allege that there was any reason that Layer Net, an article from a 1990 edition of an IEEE journal, could not have been asserted at that time. On the record before us, we are not persuaded that Petitioner has demonstrated that a skilled searcher conducting a diligent search would not have been expected

to discover Fifer and Layer Net. Thus, for all of the foregoing reasons, we are persuaded that the asserted grounds of Jubin and Fifer and Jubin, Fifer, APA, Cerf, and Layer Net with or without Schwartz are grounds that Petitioner reasonably could have asserted against claims 10 and 15–19 in IPR2015-01901. Therefore, we determine that Petitioner is estopped under 35 U.S.C. § 315(e)(1) from requesting or maintaining this proceeding as to claims 10 and 15–19. *See Westlake*, 2015 WL 9699417, at *1–2.

We do not apply estoppel to claim 11 because, while it was challenged in the 1901 petition, it was not part of the final written decision in that matter because no grounds were instituted as to that claim. *See Westlake*, 2015 WL 9699417, at *1–2. As to claims 1 and 4, they were not challenged in the 1901 petition, so estoppel does not apply to those claims.

For the foregoing reasons, we deny Petitioner’s request to institute an *inter partes* review of claims 10 and 15–19.

III. APPLICATION OF 35 U.S.C. § 325(d)

Patent Owner argues that the Petition should be denied under 35 U.S.C. §§ 314(a) and 325(d). Prelim. Resp. 4–12. According to Patent Owner, “Petitioner proposes rejections against many of the same claims that it challenged in IPR2015-01901,” and thus, Petitioner is seeking “a total of five bites at the apple for claim 10 and four bites at the apple against claims 11, 15, 16, 17, 18, and 19.” *Id.* at 1. As discussed above, however, we have found Petitioner to be estopped from pursuing its challenges as to claims 10 and 15–19. Thus, Patent Owner’s arguments as to those claims are moot. As such, claims 1, 4, and 11 are the only claims that remain at issue in this Petition. Therefore, we must determine whether to exercise our discretion to

not institute *inter partes* review of claims 1, 4, and 11 under §§ 314(a) and 325(d).

Under the circumstances presented in this case, we decline to exercise our discretion under §§ 314(a) and 325(d). First, claims 1 and 4 were not asserted against Petitioner until after the filing of the 1901 petition. Pet. 10. Thus, exercising our discretion in that circumstance could encourage gamesmanship on behalf of patent owners by encouraging them to file suit and then wait to assert some claims later in a district court proceeding after a petition has been filed. Second, Petitioner's assertions against claim 11 in this matter have significant differences from the assertions directed towards that claim in the 1901 proceeding. Thus, we are persuaded that we should not exercise our discretion under 35 U.S.C. §§ 314(a) and 325(d).

IV. CLAIM CONSTRUCTION

A. Introduction

In an *inter partes* review, “[a] claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.” 37 C.F.R. § 42.100(b). Under this standard, we construe claim terms using “the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant’s specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997). We presume that claim terms have their ordinary and customary meaning. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Petitioner seeks construction of the terms “selecting a transmission path,” “first node,” and “changes to upgrade the selected transmission.” Pet. 15–19. Patent Owner opposes Petitioner’s constructions and provides explicit constructions for “selecting a radio transmission path to said first/server node,” “transmission path of a second node to the gateway,” and “a map of transmission paths of the first network.” Prelim. Resp. 17–25. Based on the issues currently before us, we discern a need to address the proper construction of the term “selecting a radio transmission path to said first node.” At this time, no other terms require express construction. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”).

B. Construction of “Selecting a Radio Transmission Path to Said First Node”

Claim 1 recites, in relevant part, “selecting a radio transmission path to said first node.” Petitioner asserts that this term should be given the same meaning as we gave to a similar term in the 1901 proceeding. Pet. 15. In that case we construed “selecting a radio transmission path to said server node” to mean “choosing the entire path from the client to the server including the identification of all nodes in the path.” *Id.* Patent Owner argues that a broader construction would be appropriate because there are other ways to describe the path between the nodes. Prelim. Resp. 18–21. Patent Owner’s contention is that the proper construction is “choosing a path to the server including an identification of an entire path from the client to the server.” *Id.* at 21. Based on our review of the issues before us, we determine that it is unnecessary to determine whether this broader

construction would be correct. The Federal Circuit has cautioned that “only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.” *Vivid Techs.*, 200 F.3d at 803. Thus, we decline to decide whether the interpretation sought by Patent Owner would be the broadest reasonable interpretation. Therefore, we determine that the construction of “selecting a radio transmission path to said first node” is at least broad enough to encompass “choosing the entire path from the second node to the first node including the identification of all nodes in the path.”

V. ANALYSIS

We turn to Petitioner’s asserted grounds of unpatentability to determine whether Petitioner has met the threshold of 35 U.S.C. § 314(a).

A. Analysis of Asserted Grounds Based on Jubin

1. Overview of Jubin

Jubin provides a description of the state of the Defense Advanced Research Projects Agency (“DARPA”) Packet Radio Network (also known as PRNET) in 1986. Ex. 1003, 21, col. 1. Figure 4 of Jubin is reproduced below.

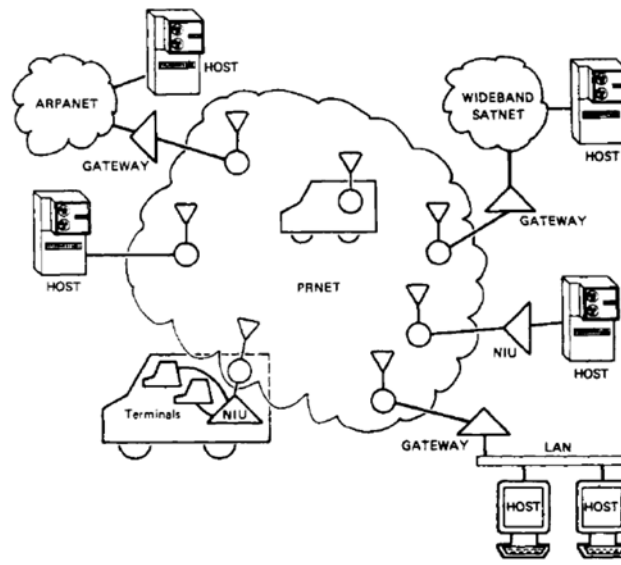


Fig. 4. Packet radio network in the Internet.

Figure 4 of Jubin depicts PRNET with its packet radios (“PRs”) and associated host computers and user terminals. *Id.* at 23, col. 1. PRNET includes a plurality of PRs, each comprising a digital subsystem and a radio subsystem. *Id.* at 22, col. 1. Figure 4 also depicts a gateway connecting the PRNET to the internet. *Id.* at 23, col. 1.

“The PRNET features fully distributed network management. Each packet radio gathers and maintains enough information about network topology so that it can make independent decisions about how to route data through the network to any destination, even before it is given a packet to deliver or forward.” *Id.* at 23, col. 2. Jubin discloses storing network information in three tables, (1) neighbor table, (2) tier table, and (3) device table. *Id.*

A PR’s neighbor table maintains a list of PRs that are one hop away from that PR and information about the quality of the links to those PRs. *Id.* at 24, col. 1; *see id.* at Fig. 5. Neighbor tables are populated using Packet Radio Organization Packets (“PROPs”). *Id.* at 23, col. 2–24, col. 1. PROPs are broadcast by a PR every 7.5 seconds. *Id.* at 23, col. 1. These packets

announce the existence of the PR and information about the network's topology from the perspective of the broadcasting PR. *Id.* at 24, col. 1.

The tier table allows a PR to track how many hops away it is from each of the other PRs in the network. *Id.* at 24, col. 2; *see id.* at Fig. 5. "The goal of the tier table is always to maintain the 'best' information about how to get to a destination packet radio. The 'best' route is currently defined as the shortest route with good connectivity on each hop." *Id.* This table is updated as conditions change. *Id.* Finally, the device table maintains a listing of the network's device to PR mapping. *Id.* at 25, col. 1.

In PRNET, "a packet traverses a single path through the network, and is acknowledged at every packet radio along the path." *Id.* at 25, col. 2. This routing of packets is accomplished by using a PR's routing tables and the packet's header information. *Id.* The header includes fields such as the identity of the source of the packet, the identity of the previous PR, and the identity of the destination PR. *Id.*

2. Overview of Fifer

Fifer is a paper titled "The Low-Cost Packet Radio." Ex. 1004. Fifer describes the state of packet radios in 1986. *Id.* at 33. Fifer was cited in Jubin as providing further description of the PRs. Ex. 1003, 30 n.14. In addition, Jubin was published in the same issue of the IEEE Proceedings as Fifer and Fifer appears to be the article directly after Jubin. Ex. 1014 ¶ 25; Ex. 1003, 32 (showing last page of Jubin as page 32 of the IEEE Proceedings); Ex. 1004, 33 (showing the first page of Fifer as page 33 of the same issue of the IEEE Proceedings). Figure 2 of Fifer is reproduced below.

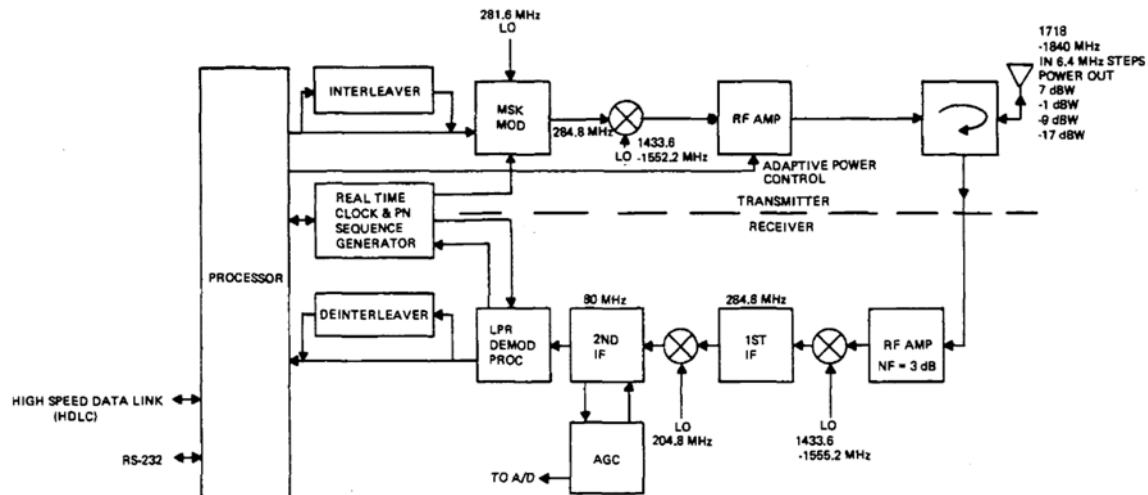


Fig. 2. LPR system basic block diagram.

Figure 2 of Fifer depicts a block diagram of a low cost packet radio (“LPR”).
Ex. 1004, 36.

3. *Analysis of Asserted Ground of Obviousness Based on Jubin and Fifer*

Petitioner argues that claims 1 and 11 are unpatentable under 35 U.S.C. § 103(a) over Jubin and Fifer. Pet. 29–43. Petitioner’s assertions are supported by a declaration from Dr. Stephen Heppe. Ex. 1014.

a. *Claim 1*

Petitioner’s assertions regarding claim 1 may be summarized as follows: Petitioner asserts that Jubin’s PRs teach the recited first and second nodes. Pet. 30–32. Petitioner asserts that Fifer provides a detailed description of the recited modem and controller found in each of the first and second nodes. *Id.* at 30–31. According to Petitioner, Jubin’s discussion of PRs maintaining their own optimal tier table teaches the recited selection of the transmission path utilizing the least number of second nodes. *Id.* at 35. Petitioner also relies on Jubin to teach the recited first controller implementing changes to upgrade the path in response to a request from a second node. *Id.* Petitioner asserts that this limitation is taught by Jubin’s

disclosure of using PROP packets to disseminate “good” news and “bad” news regarding changes to the network’s topology and then implementing changes to the PR’s tier table in response to the receipt of “bad” news regarding changes to the topology. *Id.* at 35–36. Petitioner asserts that it would have been obvious to one of ordinary skill in the art to combine the teachings of Jubin and Fifer because Fifer would have provided additional details regarding Jubin’s PRs and this combination would have provided a predictable result. *Id.* at 31.

Patent Owner argues that the disclosures of Jubin and Fifer are insufficient to teach the limitations of claim 1. Specifically, Patent Owner asserts that the cited art does not teach (1) “selecting a radio transmission path to said first node” (Prelim. Resp. 34–38) or (2) a “first node controller implements changes to upgrade the selected transmission path in response to a request from at least one of said second nodes” (*id.* at 38–40).

Patent Owner asserts that Jubin does not teach “selecting a radio transmission path to said first node” because (1) Jubin’s PRs are not selecting a path to a server in the network (*id.* at 37–38) and (2) Jubin’s hops are not radio transmission paths (*id.* at 35–36). First, Patent Owner asserts that Jubin’s system cannot teach the recited limitation because it has neither clients nor a server. *Id.* at 35. We are not persuaded by this argument. Claim 1 does not recite a client or a server. The claim instead recites first and second nodes. On the current record, we presume that this is a deliberate choice by the patentee because other claims, for example claim 10, use the terms client and server. Thus, we are persuaded that claim 1 is not limited to client-server systems. Patent Owner further asserts that Jubin’s PRs do not select the recited path “because the gateway (or any other

destination device outside the PRNET) is only connected to the wireless network via a wired interface.” *Id.* at 37. Claim 1, however, does not recite a gateway nor does it speak of a “destination device.” Claim 1, instead, recites transmission paths from the second nodes to the first node. On the current record, we are not persuaded that the first node is limited to a gateway or other “destination device.” Petitioner asserts that “Jubin discloses a routing methodology that allows each of the packet radios, or ‘second nodes,’ to select routes to another packet radio.” Pet. 32. On this record, we are persuaded that assertion is supported by disclosures in Jubin. For example, Jubin discloses that “[e]ach packet radio gathers and maintains enough information about network topology so that it can make independent decisions about how to route data through the network to any destination, even before it is given a packet to deliver or forward.” Ex. 1003, 23 col. 2.

Patent Owner goes on to argue that Jubin’s hops are not radio transmission paths. Prelim. Resp. 35. Specifically, Patent Owner contends that “Jubin’s PRs only select one next hop to a destination. Therefore, Jubin’s PR does not select an entire path description including all intermediate PRs along that path.” *Id.* at 36. Petitioner asserts that “Jubin maintains a ‘tier table,’ which shows direct connections (tier 1) and connections through another route (tier 2 or more).” Pet. 33. Figures 2 and 5 of Jubin are reproduced below.

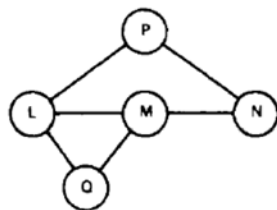


Fig. 2. Small packet radio network.

TIER TABLE		
Destination PR	Next-PR In Route	Tier
N	N	0
M	M	1
P	P	1
L	M	2
Q	M	2

Fig. 5. Typical tier table for PR N.

Figure 2 depicts a small packet radio network with PRs L, M, N, Q, and P. *Id.* at 32. Figure 5 illustrates a tier table for PR N of the network displayed in Figure 2. *Id.* at 32–33. The tier table contains information for each destination in the network including the number of hops (for example Q is tier 2 and thus it is two hops away) and the next PR that should receive the packet in order to route a packet to a particular destination. Thus, PR N knows that to send a packet to PR Q the packet must be sent to PR M (1st hop) and then PR M will send the packet to Q (2nd hop). Therefore, in this example, PR N knows the entire path to be traversed from PR N to PR Q. In addition, Petitioner directs us to Jubin’s disclosure of routing information in the headers of packets. *Id.* at 34. Jubin’s packets contain source, destination, and next hop for each packet. *Id.* Jubin provides an example in which the header contains all of the nodes necessary to transmit a packet from PR L to PR N. *Id.* On this record, we are persuaded that these disclosures would have taught one of ordinary skill in the art the claimed selection of a transmission path to a first node.

Next, Patent Owner argues that Jubin does not teach that a “first node controller implements changes to upgrade the selected transmission path in response to a request from at least one of said second nodes.” Prelim. Resp. 38–40. Patent Owner asserts that the proper construction of the claim term “request” is “the act or an instance of asking for something.” *Id.* at 39. According to Patent Owner, Jubin’s PROP packets are not requests because these messages “are not asking for anything.” *Id.* Petitioner asserts that Jubin’s PROP packets “are used to build and maintain neighbor tables, tier tables and device tables.” Pet. 36. According to Petitioner, “Jubin teaches that, ‘[t]he goal of the tier table is always to maintain the ‘best’ information

about how to get to a destination packet radio. The ‘best’ route is currently defined as the shortest route with good connectivity on each hop.” *Id.* (quoting Ex. 1003, 24). Petitioner relies upon Jubin’s PROP packets and packet headers to teach updating the PR’s routing tables to contain the best routes. *Id.* at 36–37. In support of Petitioner’s arguments, Dr. Heppe testifies that

any packet that demands a response packet is an implicit request for an upgrade to the first node’s routing tables, regardless of any other purpose of the data exchange. Thus, when a node in Jubin sends a packet demanding a response to another node, it also ‘requests’ that the first node controller upgrade a previously selected path.

Ex. 1014 ¶ 72. We find Petitioner’s contentions to be persuasive. We note that Patent Owner does not provide any argument or evidence to support its proposed construction.¹¹ On this record, we are persuaded that the term “request” is broad enough to encompass Jubin’s PROP packets and headers that send information to the PRs and then implicitly request the receiving PR to upgrade its routing tables based on the information received. Thus, we are persuaded Jubin’s disclosures would have taught or suggested the disputed limitation to one of ordinary skill in the art. .

For all of the foregoing reasons, we are persuaded that Petitioner has made a sufficient showing that the disclosures of Jubin and Fifer would have taught or suggested the subject matter of claim 1 to one of ordinary skill in the art.

¹¹ Patent Owner cites to § V of its Preliminary Response as providing the explanation for its proposed construction. Prelim. Resp. 39 n.55. That section, however, does not discuss the meaning of the term “request.”

b. Claim 11

Claim 11 depends from claim 10. Petitioner relies upon the disclosures of Jubin and Fifer to teach the subject matter of claim 11. Pet. 37–43. Unlike claim 1, claims 10 and 11 contain specific references to server nodes and client nodes. Petitioner asserts that “the same analysis of Jubin as compared to claim 1 also applies to claim 10.” *Id.* at 38. As such, Petitioner argues that Jubin’s PRs relied upon to teach claim 1’s first and second nodes also teach the client and server nodes of claims 10 and 11. *Id.* at 37–38. We are not persuaded by this contention. The terms client and server have an established meaning in the art. *See* Ex. 1001, 1:23–28 (distinguishing client server networks from peer-to-peer networks that operate without the use of servers); *see also id.* at 1:50–55 (discussing a server computer on the Internet and “a client machine, e.g., a user’s personal computer connected to the Internet”). Jubin’s system is a fully distributed peer-to-peer network that does not contain a centralized server. *See* Ex. 1003, 22, col. 1–23, col. 2. Thus, we are not persuaded that Jubin’s PRs would have taught the claimed client and server nodes.

Petitioner also asserts that the recited server would have been taught by the devices attached to Jubin’s PRs. Pet. 38. Patent Owner contends that Jubin’s devices are outside “of the PRNET subnet [and] have no knowledge of or control over how information propagates within it.” Prelim. Resp. 32. Jubin discloses that “the network appears as a black box providing packet communication service between pairs of user devices.” Ex. 1003, 23 col. 1. Jubin further states that, “[t]he device-to-PR mapping is totally transparent to the user and to the device.” *Id.* at 25, col. 1. Thus, we are not persuaded that Jubin’s devices would have taught or suggested the claimed server.

Therefore, we are persuaded that Petitioner has not shown sufficiently that the disclosures of Jubin and Fifer would have taught or suggested the subject matter of claim 11 to one of ordinary skill in the art.

4. Analysis of Asserted Ground of Obviousness Based on Jubin, Fifer, APA, and Cerf

Independent claim 4 is alleged to be obvious over the teachings of Jubin, Fifer, APA, and Cerf. Pet. 43–51. Petitioner’s allegations are supported by a declaration from Dr. Stephen Heppe. Ex. 1014.

a. Overview of Cerf

Cerf is a paper titled “Issues in Packet-Network Interconnection.” Ex. 1008. Cerf “introduces the wide range of technical, legal, and political issues associated with the interconnection of packet-switched data communication networks.” *Id.* at Abstract. One of the issues addressed in Cerf is the interconnection of networks using different protocols. *Id.* at 1387, col. 1. Cerf defines a protocol translator as “[a] collection of software, and possibly hardware, required to convert the high level protocols used in one network to those used in another.” *Id.* at 1387, col. 2. Cerf’s Protocol Translation Gateways translate the packets from one network for use in another network. *Id.* at Fig. 13, 1398, col. 2–1399, col. 1.

b. Claim 4

Petitioner’s allegations regarding claim 4 may be summarized as follows: According to Petitioner, Jubin’s PRs “are associated with gateways to the Internet, wideband satellite, and a local area network (LAN).” Pet. 43 (internal citations omitted). Petitioner contends that Jubin’s gateways allow devices on PRNET to communicate with devices on other networks and thus, one of ordinary skill in the art would have understood that hosts attached to Jubin’s PRs could both send and receive packets across

networks. *Id.* at 45. As discussed in Jubin, the hosts run standard protocols “which ensure ‘the end-to-end communication between hosts is reliable and robust.’” *Id.* (quoting Ex. 1003, 22 col. 2). Petitioner also relies on Cerf to teach the use of gateways to connect networks. *Id.* (citing Ex. 1014 ¶¶ 103–104). As described by Petitioner, Cerf’s gateways “translate packets from one protocol on one network to a second protocol on a second network.” *Id.* at 47 (citing Ex. 1008, 1398 col. 2–1399 col. 1). Further, Petitioner argues that APA “conced[ed] that gateways and other networking devices were ‘well-known to those skilled in the art.’” *Id.* at 46 (quoting Ex. 1001, 7:33–37). Petitioner relies upon APA’s explanation that “server 16 merely performs the function of a prior art gateway including the ‘translation service’ of converting packets to the appropriate format used on differing networks.” *Id.* (citing Ex. 1001, 7:44–54). Petitioner asserts that Jubin teaches the recited changes to a transmission path. *Id.* at 49–50. Petitioner describes Jubin’s routes as bidirectional and contends that Jubin’s routing tables are used to determine the best path to follow for a given destination. *Id.* at 49. Specifically, Petitioner relies on Jubin’s PROP packets, data packet headers, and tier tables as discussed above in relation to claim 1. *See id.* at 49–50. Petitioner asserts that it would have been obvious to one of ordinary skill in the art to incorporate the gateways described in APA and Cerf into Jubin’s packet radio network in order to provide for improved inter-network communication. *Id.* at 47–48.

Patent Owner contends that the asserted prior art fails to teach “a controller configured to implement changes to a transmission path from the second node to the first node based upon viable network paths observed by the second node.” Prelim. Resp. 45–47. Specifically, Patent Owner argues

that Jubin's PROP packets and tier table fail to teach the recited changes to the transmission path. *Id.* This argument, however, is substantially similar to Patent Owner's argument regarding claim 1 and is unpersuasive for the same reasons discussed above. We find Petitioner's contentions regarding claim 4 to be persuasive and thus, on this record, we determine that Petitioner has made a sufficient showing that the disclosures of Jubin, Fifer, APA, and Cerf would have taught or suggested the subject matter of claim 4 to one of ordinary skill in the art.

B. Analysis of Asserted Ground Based on Kahn, Burchfiel, Schwartz, and Cerf

1. Overview of Kahn

Kahn discusses "the basic concepts of packet radio." Ex. 1006, Abstract. In particular, Kahn describes PRNET, a multi-hop, multiple access packet radio network. *Id.* at 1469, col. 1. Kahn notes that the network "should be capable of internetting in such a way that a user providing a packet address in another net can expect his network to route the associated packet to a point of connection with the other net or to an intermediate (transit) net for forwarding." *Id.* at 1470, col. 1.

In PRNET, "all network control protocols which can have global effect are specifically initiated by one or more entities in the network called *stations*." *Id.* at 1477, col. 1. Each station "is aware of all operational radios in the network." *Id.* "The station determines the route to each of these radios and plays an active role in initializing, organizing, and maintaining the operational network. In particular, all routes are assigned by the station to minimize [packet radio ('PR')] cost and complexity." *Id.* Each station "deduces the overall connectivity of the network . . . and determines good

routes to itself from each of the radios in its subset. The station then distributes to each radio in its subset the route from that radio to the station. This process is known as *labeling*.” *Id.* In the event of a failure or condition change in the network, “routes will be dynamically reassigned by the station to satisfy the minimum-delay criteria.” *Id.* at 1480, col. 1.

2. Overview of Burchfiel

Burchfiel is titled “Functions and Structure of a Packet Radio Station.” Ex. 1007, Title. The prototypical station in Burchfiel is implemented in a Digital Equipment Corp. PDP-11, which is interfaced to ARPANET. *Id.* at 246, col 1. As described in the reference, “control functions performed by a station include initialization of the [Packet Radio Network (“PRN”)], dynamic routing changes, and multi-station coordination.” *Id.* at 247, col. 1. Packet Radio Units (“PRUs”) are “labelled” by stations and once a PRU is labelled it then contains routing parameters. *Id.*

Once the station has labelled all PRU’s and established connections to them, the information for maintaining these connections is entered into the station’s *connection table*. This contains the status information described above for handling the connection protocol. As terminals come ‘on-line’ within the PRN, each terminal is also given a connection to its controlling station, and this information is added to the station’s connection table.

Id. at 247, col. 2. The station’s connection table “holds all status information for every connection being maintained by the station.” *Id.* at 250, col. 1. The station constructs routes for each device and each “route is stored as part of the connection status in the connection table when the connection is established.” *Id.*

3. *Analysis of Asserted Obviousness of Claim 4*

Petitioner alleges that claim 4 would have been rendered obvious by the combined teachings of Kahn, Burchfiel, Schwartz, and Cerf. Pet. 65–75.¹² Petitioner’s assertions may be summarized as follows: “Kahn discloses a station node (i.e., the claimed ‘first node’) that serves as a gateway and also contains a radio section that corresponds to the claimed ‘data packet receiver.’ It also contains a ‘gateway process’ that corresponds to the claimed ‘first converter’ and the ‘first transmitter.’” Pet. 69. Burchfiel provides further information regarding Kahn’s stations. *Id.* at 65.

“Burchfiel teaches that a single PDP-11 computer comprises the station and gateway.” *Id.* Petitioner further relies upon Burchfiel to teach forwarding packets into another network after their header format is converted into that of the destination network. *Id.* at 68. Kahn cites Cerf as part of its discussion of gateways. Ex. 1006, 1494, col. 2. n.34. Petitioner relies upon Cerf to teach the concept of a gateway that translates packets from one protocol to another and transmits the translated packets into a second network. Pet. 69. Schwartz provides specific algorithms that could be used to optimize routing based on “shortest-path, least-cost and minimum delay, and specifically addresses a minimum-hop routing algorithm where the weight or cost of each link (hop) is set equal to 1.” *Id.* at 74 (internal citations omitted) (citing Ex. 1009, 260–262, 275, 280, 285, 295). Petitioner relies upon Kahn’s teaching that “[a]s network conditions change (terminal movement, repeater failure or recovery, changes in hop reliability, and

¹² APA is also cited as an additional reference to teach the recited gateways. Pet. 68–69. We are persuaded that this additional teaching is not necessary so it is not part of the instituted ground.

changes in network congestion) routes will be dynamically reassigned by the station to satisfy the minimum-delay criteria.” *Id.* at 71 (quoting Ex. 1006, 1480). Petitioner asserts that Kahn’s routing changes are based on each PR’s observation of links. *Id.* at 72; *see* Ex. 1006, 1477 (“[E]ach radio reports which other radios it can hear along with raw or processed information for the station to determine the quality of the transmission path between these radios.”). According to Petitioner, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of Burchfiel and Cerf into Kahn “in order to provide communications between networks, expanding the usefulness of networks.” *Id.* at 69 (citing Ex. 1014 ¶¶ 123–124). Petitioner asserts that one of ordinary skill in the art would have looked to Schwartz for further information on routing algorithms to use in Kahn. *Id.* at 74.

Patent Owner contends that the recited art does not teach the path to the first node is chosen from the group consisting essentially of the path to first node through the least possible number of additional second nodes, the path to the first node through the most robust additional second nodes, the path to the first node through the second nodes with the least amount of traffic, and the path to the first node through the fastest second nodes.

Prelim. Resp. 51–53. Patent Owner argues that Kahn does not teach this limitation because it states that routes will be chosen in order to satisfy “minimum-delay criteria.” *Id.* at 51. Patent Owner asserts that “a route with minimum delay is not necessarily a route through [the] fastest client nodes.” *Id.* Petitioner argues that “[m]inimum delay corresponds to the claimed ‘fastest nodes’ because over-the-air transmission always occurs at the speed of light. Any delay is attributable to one or more conditions within the

radios/nodes.” Pet. 73. Patent Owner persuasively argues that “minimum delay criteria” can be associated with things other than the fastest nodes. Prelim. Resp. 51. For example, Patent Owner notes that delay can be minimized by taking into account the traffic loads of specific nodes in the system. *Id.*

Petitioner, however, also relies on the disclosures of Schwartz to teach this limitation. Pet. 73. Schwartz teaches that routing algorithms are based on “assigning a ‘cost’ measure to each link (or possibly even each node) in the network. The ‘cost’ could be a fixed quantity related to such parameters as link length, speed, or bandwidth of link (transmission capacity).” Ex. 1009, 260; *see also id.* at 285 (discussing the “least-cost” algorithm including the customization of this algorithm to deal with overloading of nodes and selecting paths with the least number of links and highest transmission speed). Patent Owner argues that Schwartz alone does not teach this limitation, but Patent Owner’s argument does not take into account the interplay between the teachings of Schwartz and Kahn. Petitioner relies upon Schwartz to teach an algorithm to be used by Kahn’s system. Pet. 73–74. It is the combination that we find to be persuasive and not the teachings of Schwartz alone.

According to Patent Owner, Petitioner does not suggest why a person of ordinary skill would have modified Kahn’s routing to use Schwartz’s algorithm. Prelim. Resp. 54. Kahn, however, does not provide a specific algorithm in regard to the “minimum-delay criteria.” Patent Owner also asserts that Schwartz’s algorithms would not have been used in Kahn because the algorithms described therein were directed to decentralized networks. *Id.* at 55. Schwartz, however, discusses the use of its routing

algorithms in both centralized and decentralized networks. Ex. 1009, 270. On this record, we are persuaded that one of ordinary skill in the art would have looked to a textbook such as Schwartz to find specific algorithms that could be used to implement Kahn's network. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007). Thus, for all of the foregoing reasons, we are persuaded that Petitioner has presented sufficient evidence to show that the subject matter of claim 4 was taught by the combined disclosures of Kahn, Burchfiel, Cerf, and Schwartz, and that a person of ordinary skill in the art would have combined the references in the manner asserted by Petitioner.

C. Analysis of Asserted Secondary Considerations

As discussed above, on the current record, we are persuaded that the limitations of claims 1 and 4 have been taught by the prior art. Notwithstanding what the teachings of the prior art would have suggested to one with ordinary skill in the art at the time of the invention, the totality of the evidence submitted, including objective evidence of nonobviousness, may lead to a conclusion that the claimed invention would not have been obvious to one with ordinary skill in the art. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). Thus, in order to determine whether these claims would have been obvious we need to examine Patent Owner's arguments and evidence of secondary considerations of nonobviousness. *See Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1339 (Fed. Circ. 2016) ("It is well-established that 'evidence rising out of the so-called 'secondary considerations' must always when present be considered en route to a determination of obviousness.'") (internal citations omitted).

First, we must determine whether Patent Owner has shown sufficiently a nexus between the challenged claims and its evidence of nonobviousness. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995). Patent Owner asserts that the '314 patent solved a long-felt need and that it achieved unexpected results. Prelim. Resp. 58. As to the contentions of long-felt need, Patent Owner cites several articles that identify excess overhead as a problem related to routing in wireless networks. *Id.* at 61–62. Patent Owner, however, at this juncture in the proceeding has not provided evidence that the '314 patent solved this need. Thus, at this time we do not have sufficient evidence to show that a nexus exists between the alleged long-felt need and the '314 patent.

As to unexpected results, Patent Owner contends that contrary to expectations at the time, the solution of the '314 patent resulted in only minimal additional overhead related to adding nodes. Prelim. Resp. 65. On this record, however, we do not have evidence of “some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected” that tends to indicate nonobviousness. *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995). On the current record, we do not have evidence sufficient to establish that these asserted secondary considerations would show nonobviousness. Thus, after evaluating Patent Owner’s arguments regarding secondary considerations, we are persuaded on this record that Petitioner has demonstrated there is a reasonable likelihood it would prevail in establishing that claims 1 and 4 would have been obvious over the previously discussed prior art references.

D. Remaining Grounds Challenging the Claims of the '314 Patent

Pursuant to 35 U.S.C. § 316(b), rules for *inter partes* proceedings were promulgated to take into account the “regulation on the economy, the integrity of the patent system, the efficient administration of the Office, and the ability of the Office to timely complete proceedings.” The promulgated rules provide that they are to “be construed to secure the just, speedy, and inexpensive resolution of every proceeding.” 37 C.F.R. § 42.1(b). As a result, and in determining whether to institute an *inter partes* review of a patent, the Board, in its discretion, may “deny some or all grounds for unpatentability for some or all of the challenged claims.” 37 C.F.R. § 42.108(b).

The other asserted grounds are substantially similar to those instituted and those other grounds are based on the same art discussed above with additional alternative teachings from Layer Net and Schwartz. Based on the record before us, we exercise our discretion and decline to institute review based on any of the other asserted grounds advanced by Petitioner that are not identified below as being part of the trial. *See* 37 C.F.R. § 42.108(a).

VI. CONCLUSION

For the foregoing reasons, we determine Petitioner has demonstrated there is a reasonable likelihood it would prevail in establishing the unpatentability of claims 1 and 4 of the '314 patent. We are not persuaded by Petitioner's allegations regarding claim 11 and we determine that Petitioner's is estopped from pursuing it challenges against claims 10 and 15–19. At this stage of the proceeding, the Board has not made a final determination as to the patentability of any challenged claim or any underlying factual and legal issues.

VII. ORDER

For the reasons given, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is hereby instituted as to claims 1 and 4 of the '314 patent on the following grounds:

1. Claim 1 would have been obvious under 35 U.S.C. § 103 over the combined teachings of Jubin and Fifer;
2. Claim 4 would have been obvious under 35 U.S.C. § 103 over the combined teachings of Jubin, Fifer, APA, and Cerf; and
3. Claim 4 would have been obvious under 35 U.S.C. § 103 over the combined teachings of Kahn, Burchfiel, Schwartz, and Cerf.

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, *inter partes* review of the '314 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial; and

FURTHER ORDERED that no ground other than that specifically provided above is authorized.

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