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Paper 14
Date: August 26, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DISH NETWORK LLC,
Petitioner,

v.

ENTROPIC COMMUNICATIONS, LLC,
Patent Owner.

IPR2024-00462
Patent 7,889,759 B2

Before LYNNE H. BROWNE, BARBARA A. PARVIS, and
FREDERICK C. LANEY, *Administrative Patent Judges*.

LANEY, *Administrative Patent Judge*.

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

I. INTRODUCTION

DISH Network LLC ("Petitioner") filed a Petition (Paper 2 ("Pet.")) requesting *inter partes* review of claims 1–3 ("challenged claims") of U.S. Patent No. 7,889,759 B2 (Ex. 1001, "the '759 patent"). Entropic Communications, LLC ("Patent Owner") filed a Preliminary Response. Paper 8 ("Prelim. Resp.").

Under 35 U.S.C. § 314(a), an *inter partes* review may not be instituted unless the information presented in the petition and any 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 provided below, we determine that Petitioner has not demonstrated a reasonable likelihood that it will prevail in showing the unpatentability of at least one challenged claim. Accordingly, we do not institute *inter partes* review of the '759 patent.

I. BACKGROUND

A. Real Parties-in-Interest

Petitioner identifies itself, as well as, DISH Network Corporation, Dish Network Service LLC, and Dish Network California Service Corporation as the real parties-in-interest. Pet. 91. Patent Owner names itself as the real party-in-interest. Paper 7, 1.

B. Related Matters

Both parties identify the following district court proceeding involving assertion of patents against Petitioner: *Entropic Communications, LLC v. DISH Network Corporation et al.*, Case No. 2-23-cv-01043 (C.D. Cal.). Pet. 91; Paper 7, 1. The parties likewise identify the following district court proceedings in which the '759 patent has been asserted: *Entropic*

Communications, LLC v. DirecTV, LLC f/k/a DirecTV, Inc. et al., Case No. 2-23-cv-05253 (C.D. Cal.); *Entropic Communications, LLC v. Comcast Corporation et al.*, Case No. 2-23-cv-01048 (C.D. Cal.); *Entropic Communications, LLC v. Cox Communications, Inc. et al.*, Case No. 2-23-cv-01047 (C.D. Cal.); *Entropic Communications, LLC v. Charter Communications, Inc.*, Case No. 2-23-cv-00050 (E.D. Tex.); and *Entropic Communications, LLC v. ViXS Systems, Inc. et al.*, Case No. 3-13-cv-01102 (S.D. Cal.). Pet. 91; Paper 7, 1–2. Lastly, the we note IPR2024-00452, in which Comcast Corporation has filed a petition for *inter partes* review of the claims in the '759 patent.

C. The '759 Patent

The '759 patent is titled "Broadband Cable Network Utilizing Common Bit-Loading." Ex. 1001, code (54). The '759 patent describes a broadband cable network ("BCN") with nodes that communicate through network channels with each other using a multi-carrier modulation technique, such as "bit-loaded orthogonal frequency division multiplexing (OFDM)." Ex. 1001, 7:19–20. "Bit loading is the process of optimizing the bit distribution to each of the channels to increase throughput." *Id.* at 7:12–14.

The process includes determining a common bit-loading modulation scheme for broadcasting/multi-casting from a transmitting node (e.g., A) to multiple receiving nodes (e.g., B, C). Ex. 1001, code (57), 6:55–7:4. The '759 patent depicts this in Figure 5, reproduced below, with NODE A sending the same message to NODEs B and C over Channel A-BC (paths 508). *Id.*

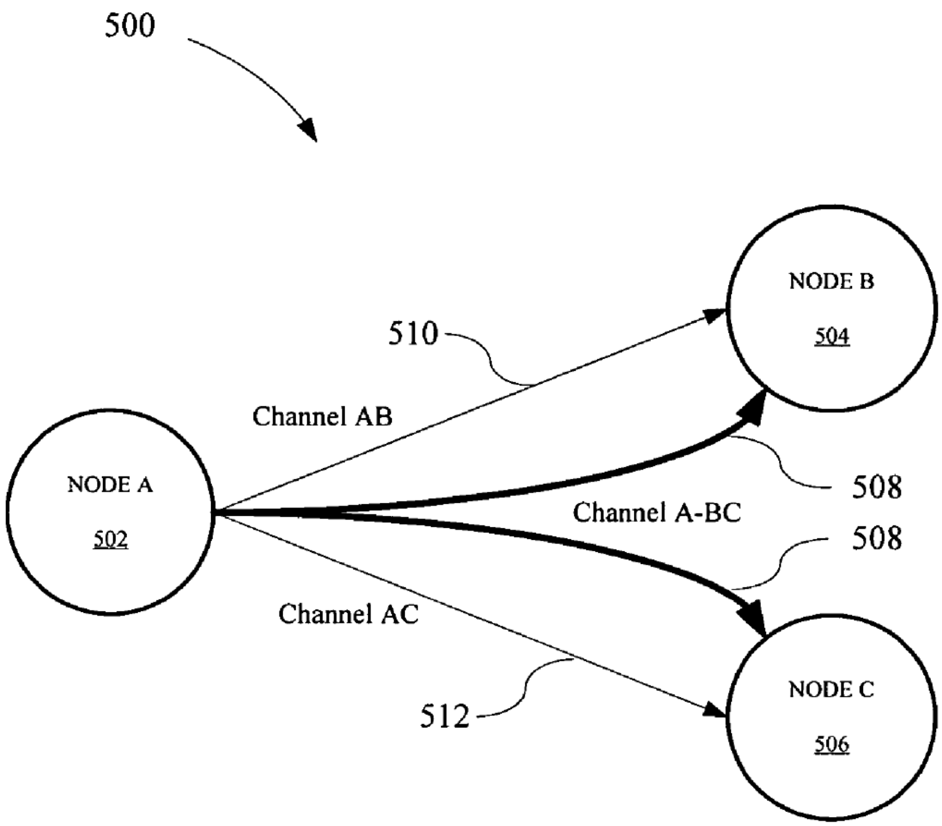

Figure 5 is a "functional diagram showing the communication between the different nodes shown in the BCN." *Id.* at 5:1–3. The different physical and electrical attributes of paths 510, 512 dictate the most-efficient bit-loading modulation scheme for each path. *Id.* at 7:5–12. The '759 patent determines and uses a common bit-loading modulation scheme to facilitate node-to-node communications between various types of customer premises equipment (CPEs) within a BCN within a building (e.g., a home). *Id.* at 3:63–4:3.

As part of the process, the transmitting node (A) sends a probe signal to the receiving nodes (B, C), the receiving nodes reply with a bit-loading modulation scheme, and the transmitting node determines a common scheme from the responses. Ex. 1001, 10:58–11:28.

Figures 10A–10C, reproduced below, illustrate the methodology used for determining the common bit-loading scheme from plural schemes for different transmission paths. Ex. 1001, 10:15–57.

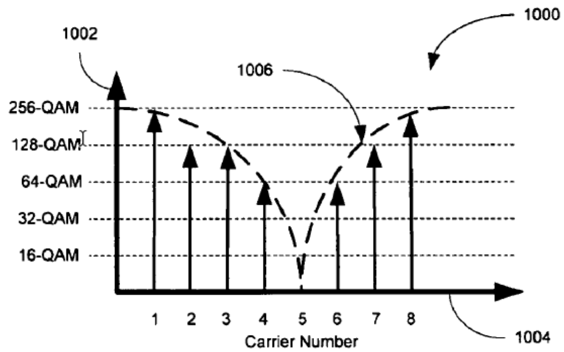

FIG. 10A

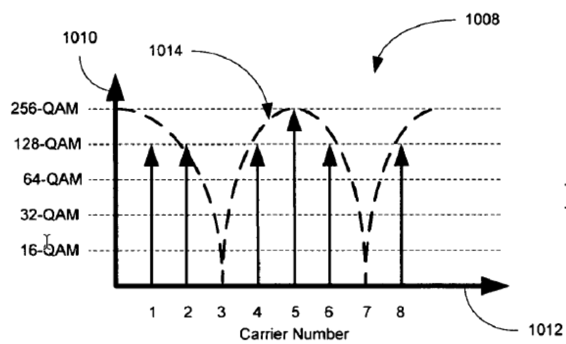

FIG. 10B

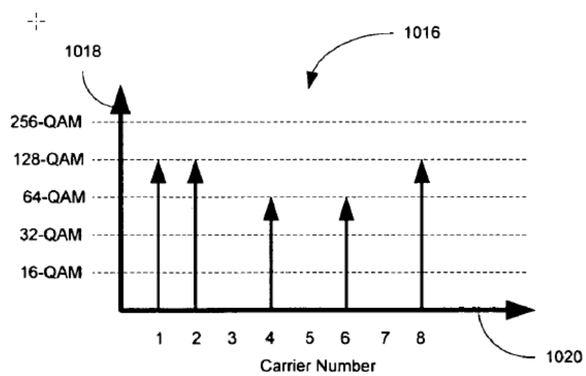

FIG. 10C

Figure 10A depicts a plot of the bit-loading constellation size (QAM order) versus carrier number for the AB channel (path 510) shown in above Figure 5. *Id.* Figure 10B depicts the same for the AC channel (path 512). *Id.* And Figure 10C shows plots that graphically represent the "common bit-loaded modulation scheme" determined for the A-BC channel path between node A and nodes B and C. *Id.* This "common bit-loaded modulation scheme" is the result of "comparing the carrier number signals from the AB channel in FIG. 10A and the corresponding carrier number signals from the AC channel in FIG. 10B and choosing the lowest corresponding modulation value for each carrier number." *Id.* Thus, the "common bit-loaded modulation scheme" of Figure 10C uses 128-QAM for carriers 1, 2, and 8; 64-QAM for carriers 4 and 6; and carriers 3, 5, and 7 are kept OFF. *Id.*

D. Illustrative Claim

Petitioner challenges claims 1–3 of the '759 patent. Pet. 2. Claims 1–3 are all independent claims. Independent claim 1, reproduced below, is illustrative of the claimed subject matter.

> 1. [1pre[1]] A method for determining a common bit-loading modulation scheme for communicating between a plurality of nodes in a broadband cable network ("BCN"), the method comprising:
>
> [1a] transmitting a probe signal from a transmitting node within the plurality of nodes to a sub-plurality of receiving nodes within the plurality of nodes;
>
> [1b] receiving a plurality of response signals from the sub-plurality of receiving nodes wherein each response signal includes a bit-loading modulation scheme determined by a corresponding receiving node; and
>
> [1c] determining the common bit-loading modulation scheme from the received plurality of response signals;
>
> [1d] receiving the probe signal at one receiving node of the plurality of receiving nodes through a channel path of transmission;

[1] Herein, we use Petitioner's designations for the limitations of claim 1. Pet. i–vi.

[1e] determining the transmission characteristics of the channel path at the one receiving node; and

[1f] transmitting a response signal from the one receiving node to the transmitting node,

[1g] wherein the transmission characteristics of the channel path are determined by measuring the signal-to-noise ("SNR") characteristics of the received probe signal at the one receiving node and

[1h] wherein determining a common bit-loading modulation scheme includes:

[1i] comparing a plurality of bit-loading modulation schemes from the corresponding received plurality of response signals; and

[1j] determining the common bit-loading modulation scheme in response to comparing the plurality of bit-loaded modulation schemes.

Ex. 1001, 12:28–60.

E. Evidence

Petitioner relies on the prior art references in the table below.

Name	Reference	Exhibit
Carhart	US 6,622,304 B1, issued Sept. 16, 2003	1009
Grube	US 5,495,483, issued Feb. 27, 1996	1010
Shibutani	US 2003/0002518 A1, published Jan. 2, 2003	1012
Cai	US 6,205,410 B1, issued Mar. 20, 2001	1013
Flammer	US 6,480,497 B1, issued Nov. 12, 2002	1014

Petitioner also relies on the Declaration of Tim A. Williams, Ph.D. (Ex. 1004) to support its contentions that the challenged claims are unpatentable.

Patent Owner relies on the Declaration of Samuel H. Russ, Ph.D. (Ex. 2003) to support its contentions that the Petition is deficient.

F. Asserted Grounds

Petitioner asserts that the challenged claims of the ’759 patent are unpatentable based on the grounds in the table below (Pet. 2):

Claims Challenged	35 U.S.C. §[2]	Reference/Basis
1–3	103(a)	Carhart, Grube
1–3	103(a)	Carhart, Grube, Shibutani
1	103(a)	Carhart, Grube, Cai
2, 3	103(a)	Carhart, Grube, Shibutani, Cai, Flammer

II. ANALYSIS

Each ground in this Petition depends on Petitioner’s contention that the Carhart/Grube combination discloses or suggests the selection and combination achieved by the ’759 patent; more specifically, recited limitations [1pre]–[1c]. *See* Pet. 16–41, 51, 55, 60–62, 67, 69, 70, 73, 75, 78, 81, 84. Petitioner relies on the same evidence and reasoning to support its contention that combining Carhart and Grube in the manner proposed is nothing more than an improvement that is a predictable use of prior art elements according to their established functions. *See id.* at 17–26, 31–41, 51, 55, 60–62, 67, 69, 70, 73, 75, 78, 81, 84. Patent Owner asserts, however, that the underpinning of Petitioner’s obviousness contention for combining Carhart and Grube in the manner proposed is deficient and, therefore, dispositive of the Petition because it undermines Petitioner’s ability to show

[2] The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the challenged claims of the ’759 patent have an apparent effective filing date before March 16, 2013, the pre-AIA version of § 103 applies. *See* Ex. 1001, code (22).

that there is a reasonable likelihood at least one of the challenged claims is unpatentable. *See* Prelim. Resp. 32–44. For the reasons discussed below, we agree with Patent Owner.

A. Legal Standard

Petitioner has the burden of proof. *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) ("In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.").

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, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when available, evidence such as commercial success, long felt but unsolved needs, and failure of others.[3] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *see KSR*, 550 U.S. at 407 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls."). The Court in *Graham* explained that these factual inquiries promote "uniformity and definiteness," for "[w]hat is obvious is not a

[3] The present record does not include any objective evidence of nonobviousness.

question upon which there is likely to be uniformity of thought in every given factual context." *Graham*, 383 U.S. at 18.

The Supreme Court made clear that we apply "an expansive and flexible approach" to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. To support this conclusion, however, it is not enough to show merely that the prior art includes separate references covering each separate limitation in a challenged claim. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires 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." *Id.*; *see also Orexo AB v. Actavis Elizabeth LLC*, 903 F.3d 1265, 1273 (Fed. Cir. 2018) ("The question is not whether the various references separately taught components of the '330 Patent formulation, but whether the prior art suggested the selection and combination achieved by the '330 inventors.").

In determining whether there would have been a motivation to combine prior art references to arrive at the claimed invention, it is insufficient to simply conclude the combination would have been obvious without identifying any reason *why* a person of skill in the art would have made the combination. *Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F.3d 1358, 1366 (Fed. Cir. 2017). As factfinders, we also must, on the one hand, be aware "of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning," and, on the other hand, "take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR*, 550 U.S. at 418, 421.

Applying these general principles, we consider the evidence and arguments of the parties.

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art (a skilled artisan) would have had

> a degree in electrical engineering, computer engineering, or a related field and experience working in signal processing and/or communication systems/networks, e.g., a bachelor's and three or more years of experience; a master's and at least one year of experience; or a doctorate and some work experience.

Pet. 9 (citing Ex. 1004 ¶¶ 24–25). Patent Owner does not contest Petitioner's proposed definition of the level of ordinary skill in the art. *See generally* Prelim. Resp.

For purposes of this Decision, we adopt Petitioner's proposal as reasonable and consistent with the '759 patent specification and the prior art.

C. Claim Construction

We interpret the challenged claims

> using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.100(b). Under that standard, we generally give claim terms their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history.

Phillips v. AWH Corp., 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc). "The Board is required to construe 'only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.'" *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Petitioner states that "[b]ecause the Challenged Claims are obvious under any reasonable interpretation, no express constructions are required in this proceeding." Pet. 3. Patent Owner does not contest Petitioner's position on this point. *See generally* Prelim. Resp. We are in accord. For the purposes of this Decision, we determine no claim terms require express construction. *See Vivid Techs., Inc.*, 200 F.3d at 803.

D. Petitioner's Rationale for Combining Carhart and Grube in the Manner Recited Is Deficient

Challenged independent claims 1–3 all recite "a plurality of nodes in a broadband cable network" including "a transmitting node" that: (1) "transmit[s] a probe signal" to "receiving nodes"; (2) "receiv[es] a plurality of response signals" that include "a bit-loading modulation scheme determined by a corresponding receiving node"; and (3) "determin[es] [a] common bit-loading modulation scheme from the received plurality of response signals." Ex. 1001, 12:28–41, 12:61–13:6, 13:29–41. Each ground in this Petition therefore depends on Petitioner's contention that, with Grube in view, it would have been obvious to modify a node in Carhart to transmit a probe signal to the other respective nodes and determine a common bit-loading modulation scheme from the various bit-loading modulation schemes determined and provided by each of the other respective nodes that received a probe signal. *See* Pet. 16–41, 51, 55, 60–62, 67, 69, 70, 73, 75, 78, 81, 84. After studying the submissions of both parties and the evidence of record, however, we determine there is insufficient support for that contention to satisfy Petitioner's burden for institution of *inter partes* review. And because this deficiency is dispositive of the Petition, we focus our discussion below accordingly, after we first provide an overview of Carhart and Grube.

1. Carhart (Ex. 1009)

Carhart, titled "Interface System For Computing Apparatus And Communications Stations," is directed "to a centralized computing architecture using a broadband home signal distribution system for transmitting data and video display signals between a plurality of communications stations, for instance personal computers and video display devices." Ex. 1009, code (54), 1:14–19. Carhart teaches a system that "includes a two-way signal path for facilitating communication between the centralized computing apparatus and the communications stations" by utilizing a frequency sensitive splitter/ reflector employed for reflecting input signals generated from the communications stations, and output signals, generated from the computing apparatus, along the signal path. *Id.* code (57). The splitter/reflector blocks signals from the communications stations and the computing apparatus from moving onto the cable television system (CATV) while allowing signals from the CATV system to move through the splitter/reflector, onto the signal path to the communications stations and computing apparatus. *Id.*

2. Grube (Ex. 1010)

Grube, titled "Method And Apparatus for Allocating Carrier Channels," is directed to providing "a one-to-many and/or many-to-one communication system infrastructure that utilizes existing telephone lines while providing the highly reliable service subscribers of wireless communication systems expect." Ex. 1009, code (54), 4:18–26. The solution, Grube teaches, is to configure a primary site with the ability to generate a lowest common denominator (LCD) call bit loading table for a particular call service. *Id.* at 7:66–8:14.

To generate this LCD call bit loading table, Grube describes the primary site as first transmitting a training signal to each of the plurality of secondary sites. Ex. 1009, 7:32–35. "The training signal is a [Discrete Multi-Tone (DMT)] symbol comprised of a plurality of signals modulated on the each of the carrier channels having a constant magnitude. *Id.* at 13:50–52. Grube explains that "[e]ach of the secondary sites calculate the bit loading information from a spectral response of the output transmission path, wherein the bit loading information indicates, for each carrier channel, the number of bits that the carrier channel can support." *Id.* at 13:53–57. The secondary sites save the bit loading information for each carrier channel into an outbound bit loading table. *Id.* at 14:56–58. The primary site then issues a request to the secondary sites to collect each of the outbound bit loading tables created. *Id.* at 13:45–61, 16:11–17. Once the primary site has received the requested outbound bit loading tables from the respective secondary sites, Grube may generate an LCD call bit loading table. *Id.* at 14:7–9. To do so, Grube details that the primary site generally "determin[es], for each carrier channel within the bit loading tables, a lowest bit loading value, having obtained the lowest value for each carrier channel, a lowest common denominator (LCD) outbound control channel bit loading table is generated." *Id.* at 14:9–13.

Grube discloses that the primary site utilizes the LCD bit loading table to "select[], based on bandwidth requirements of the control channel, at least one carrier channel to act as the outbound control channel." Ex. 1009, 14:13–17, 18:5–7. After selecting the outbound control channel, "the primary site transmits a signal to all the secondary sites indicating the carrier channel allocations as the control channel" and "[i]n general, the outbound control channel is used to transmit control information from the primary site to the plurality of secondary sites." *Id.* at 18:8–13. And, "[h]aving transmitted the control channel message to the secondary sites, the process is complete." *Id.* at 18:13–15.

3. *Petitioner Does Not Demonstrate Sufficiently That a Skilled Artisan Would Have Combined the Teachings of Carhart and Grube in the Manner Claimed*

a) *Petitioner's Position*

Petitioner begins explaining its motivational reasoning by stating "Carhart presents a base system/network that uses a BCN [(broad cable network)] to facilitate communication between a central unit and multiple remote units." Pet. 16 (citing Pet. § IV.A.1; Ex. 1004 ¶¶ 92–111). In that referenced portion of the Petition (§ IV.A.1), Petitioner highlights that

> Carhart explains that, in the 1990's, telecommunications companies began using frequency division multiplexing (FDM) to deliver telephone, data, and video services over broadband cable. As these services were introduced, engineers began to use the coaxial cables that were already installed in homes to establish local area networks ("LANs") to connect devices within the home. By connecting devices in the home, engineers enabled new in-home, connected multimedia and entertainment experiences. As Carhart explains, installing new cables in a home was costly, and existing solutions for interconnecting devices were inadequate because they required network modifications.

> To address these shortcomings, Carhart developed a network with a centralized computer that uses existing coaxial cables to communicate with remote stations, e.g., televisions and interface devices. To do so, Carhart utilizes a splitter/reflector to direct signals through the cable network, like the ’759 patent. For example, Carhart’s Figure 2 depicts a PC that can communicate with multiple remote devices via a coaxial network. Carhart explains that connecting the devices as shown in Figure 2 (and other embodiments) allows the devices to connect to the Internet and realize additional functionality, e.g., multi-player videogaming, without incurring the costs of multiple computers.

Id. at 10–11 (citing Ex. 1009, code (57), 1:14–18, 2:4–8, 2:13–3:67, 4:43–49, 6:14–27, 7:24–26, 8:13–22, 16:23–40; Ex. 1004 ¶¶ 69–77).

Petitioner then jumps to Grube and contends that it “discloses a method for establishing a network with ‘one-to-many or many-to-one communications’ that ensures sufficient bandwidth for reliable communication between multiple sites.” Pet. 16 (citing Ex. 1010, 4:19–26; Pet. § IV.A.2). And in that referenced portion of the Petition (§ IV.A.2), Petitioner highlights that “Grube focuses on improving reliability and bandwidth over existing wiring, e.g., telephone lines, to facilitate data transmission without compromising other services.” *Id.* at 12 (citing Ex. 1010, 2:48–3:17; Ex. 1004 ¶¶ 78–91).

Grube does so, Petitioner contends, by “us[ing] FDM with discrete multi-tone (“DMT”) modulation to facilitate communication between a primary site and multiple secondary sites” and “Grube’s DMT system uses multicarrier modulation, with quadrature amplitude modulation (‘QAM’) as the modulation scheme, to ensure a central unit communicates efficiently with multiple subscribers.” Pet. 12 (citing Ex. 1010, 3:34–42, 4:19–26, 6:54–67, 34:45–52, Fig. 8). Petitioner notes that “Grube ensures that secondary sites in a multi-unit system have enough bandwidth by, among other things, determining a lowest-common-denominator bit-loading table between each site, and allocating channels based on bandwidth requirements." *Id.* at 13–14 (citing Ex. 1010, 14:33–46, 7:13–8:14). "From the [lowest-common-denominator] bit loading table and bandwidth requirements for the outbound control channel, the primary site selects at least one outbound carrier channel … to function as the outbound control channel." *Id.* at 14 (citing Ex. 1010, 7:43–50). Petitioner notes further that "Grube explains that 'a need exists for a . . . communication system infrastructure that utilizes existing telephone lines while providing the highly reliable service subscribers . . . expect" and that, "[b]y using existing wiring, Grube's method avoids new infrastructure expenses." *Id.* at 16 (citing Ex. 1010, 4:21–26, 57:29–38). Petitioner contends that "Grube represents a suitable, known technique for orchestrating digital communication between a central unit and multiple remote units in networks like Carhart's." *Id.* (citing Ex. 1004 ¶ 93).

Because "Carhart teaches its LAN connects multiple remote devices, e.g., televisions" and the LAN would have been known to "require[] high bandwidth," Petitioner contends that a skilled artisan "would have realized that Grube's DMT modulation scheme addresses both . . . needs, by providing transmission reliability between Carhart's central computer and remote units and by optimizing communication channel bandwidth." Pet. 17 (citing Ex. 1009, 16:16–32, Fig. 6; Ex. 1010, 4:21–26; 57:29–38; Ex. 1004 ¶¶ 94–95). As a result, Petitioner contends, a skilled artisan "would have been motivated to improve Carhart's FDM scheme by implementing Grube's technique." *Id.*

Petitioner represents that a skilled artisan would have understood: (1) "that Grube's use of DMT, channel characterization to determine a common bit-loading table, and bandwidth allocation would have ensured reliable and efficient communication between Carhart's central computer and remote units"; and (2) "that Grube's method would function in Carhart's cables because switching the link medium does not alter Grube's DMT technique." Pet. 17–18 (citing Ex. 1009, 8:13–55; Ex. 1004 ¶ 96), 20 (citing Ex. 1004 ¶ 98). Petitioner contends that, "[b]y employing Grube's process for establishing control channels and allocating bandwidth for data transmissions between nodes, Carhart's LAN would receive the reliability and bandwidth improvements that Grube realizes." *Id.* at 20.

Lastly, Petitioner contends that "Carhart and Grube confront the same problem to be solved: namely, orchestrating data transmission between a central unit and secondary units." Pet. 22 (citing Ex. 1009, 4:52–5:3, 8:61–65; Ex. 1010, 4:18–26, 6:54–64; Ex. 1004 ¶ 103). "This commonality, coupled with Grube's optimized one-to-many and many-to-one technique," Petitioner concludes, "further demonstrates that a POSITA would have been motivated to apply Grube's technique in Carhart." *Id.* at 22–23 (citing Ex. 1004 ¶ 103).

b) Patent Owner's Arguments

In addition to disputing whether Grube is analogous art and whether Grube discloses nodes determining a bit-loading modulation scheme or that send a probe signal (Prelim. Resp. 6–32), Patent Owner argues that "Petitioner fails to demonstrate a [skilled artisan] would be motivated to combine Carhart and Grube as proposed or could do so with a reasonable likelihood of success." Prelim. Resp. 32. Patent Owner summarizes its argument as follows:

> Carhart is concerned with issues relating to a LAN employing coaxial cable. Grube is fundamentally different and concerns a twisted pair telephonic system on a citywide scale. Petitioner fails to prove that a [skilled artisan] would be motivated to combine such disparate references. Even if that could be overlooked, Petitioner fails to identify any fashion in which Carhart would benefit from the proposed combination. Indeed, the problems Grube addresses were addressed in coaxial cable years before Carhart. Fundamentally, Petitioner's combination is driven only by hindsight.

Id. at 33.

Patent Owner highlights the differences between Carhart and Grube. In Patent Owner's words: "Carhart and Grube are directed toward fundamentally different systems with different solutions for different problems specific to the type of connections that are employed in Carhart (coaxial cable in a home network) and Grube (twisted pair telephone lines in a citywide network), respectively." Prelim. Resp. 33. Patent Owner's declarant, Dr. Russ, explains that

> systems using coaxial cable and systems using phone lines/twisted pair wires are fundamentally different. The difference between cable and a phone line, even at the time of the '759 patent, was profound. A single phone line carried signal energy up to about 1.1 MHz and, according to Grube, this led to about 10 Mbit/s of data capacity. By contrast, a single cable line on an 860 MHz cable plant carried about 125 6-MHz channels. A single 6-MHz channel can carry 38 Mbit/s using the DOCSIS standard (and 256-QAM modulation). Thus, this single cable could carry 4,750 Mbit/s or about 475 times the data capacity of Grube's twisted pair wire.

Ex. 2003 ¶ 87 (citing Ex. 1010, 2:48–53); *see also id.* ¶¶ 85–86 (citing Ex. 1009, code (57) ("A system for permitting an interface between a centralized in-home computing apparatus and a plurality of remotely situated in-home communications stations is provided"), 1:42–48 ("CATV signals typically use a downstream frequency having a range of from about ***50 MHz to about 550 MHz*** for broadcast transmission. Recently, many CATV systems have been upgraded to support a higher frequency transmission, for example, up to ***860 MHz or 1 GHz***"), 4:43–49 ("Accordingly, it is desirable to provide a cost effective system . . . over existing home coaxial cable wiring schemes without the employment of costly dedicated and proprietary devices"), 4:52–57 ("The present invention makes unique use of new and existing in-home coaxial wiring systems . . . ."); Ex. 1010, 6:54–56 ("Generally, the present invention provides a method and apparatus for establishing a communication system infrastructure utilizing ***low pass transmission path, i.e. twisted pair telephone line***."), 6:65–67 ("The primary site communicates with the plurality of secondary sites via inbound and outbound ***low pass transmission paths***."), 8:46–49 ("Note that, if ***the secondary sites are separated by more than a given geographic distance (12 Kft to 18Kft) from the primary site***, a secondary site repeating the transmission, repeaters 144, 146 may be required."), 9:40–45 ("FIG. 9 illustrates a communication system 160 having a two-wire infrastructure. As shown, the primary site 102 is operably coupled to a plurality of secondary sites 104-108 via a ***twisted pair low pass transmission path 162***. The low pass transmission path is a ***twisted pair copper wire, which may be a telephone line***."), 12:31–32 ("In operation, the DMT receiver 122 receives information from an outbound ***twisted pair 150***"), 13:35–37 ("In this mode, the DMT transmitter 124 places data on allocated carrier channels of the inbound ***twisted pair 148***."), 1:20–21 ([Grube's] wireline links 34-38 are typically ***T1 links***"); Ex. 2005, 1 (a "T1 line" is "a communications transmission service that uses 2 ***twisted pair copper wires*** to transmit and receive data or voice traffic.")). Despite these differences, Patent Owner argues, "Petitioner, fundamentally, gives no convincing account of why a POSITA would be motivated to address issues in Carhart's coaxial cable home LAN via Grube's, citywide, twisted-pair, telephonic system in the normal course of research and development." Prelim. Resp. 35.

Patent Owner argues that, by stating "method would have functioned in Carhart's coaxial cables because switching the link medium does not alter Grube's method," Petitioner's attempts to minimize the differences between Carhart and Grube "fall flat" because no evidence supports Petitioner's contention. Prelim. Resp. 35–36. And Patent Owner asserts that Petitioner's declarant, Dr. Williams, likewise only offers unsubstantiated conclusory statements. *Id.* at 36 (citing Ex. 1004 ¶ 98).

Patent Owner counters with Dr. Russ's explanation of why "Petitioner and Dr. Williams's arguments that telephone wiring teachings are applicable to a coaxial cable environment are wrong." Prelim. Resp. 36. Dr. Russ explains:

> The physical differences between coaxial cable and twisted pair systems manifest themselves in the different problems each system faces. As seen in Carhart (and the '759 patent), the higher frequency transmission results in shorter wavelengths, which in turn cause negative transmission-line effects, even inside buildings. Ex. 2004, 94-96, 99-101. Consequently, devices on a local coaxial cable network have a difficult time communicating with each other. Ex. 1009, 4:14–37 ([Carhart] noting problems with coaxial LAN such as "the present isolation capability of splitter devices in existing coaxial wiring schemes … may prevent… an adequate signal strength from reaching receiving devices of an RF home broad-

> band system," "locally transmitted signals of high strength are more likely to interfere with reception of broadcast video services," and "use of remote cameras… may cause remote camera signals that are transmitted back onto the cable distribution system to interfere with existing cable television services on the cable operator distribution system.").
>
> Grube's twisted-pair system, by contrast, does not face this problem. The twisted pair wire's transmission frequency is lower, and thus, its wavelength is longer. The negative transmission-line effects seen in coaxial cable networks are simply not seen in twisted-pair wiring. This lower transmission frequency, however, means that twisted pair wiring cannot carry enough information to distribute information to multiple users. In accord, Grube addresses a need "for a one-to-many and/or many-to-one communication system infrastructure that utilizes existing telephone lines." Ex. 1010, 4:18–26. Coaxial cable's higher frequency has no such problem. A [skilled artisan] simply would not consider solutions meant for twisted pair wiring's lack of bandwidth to be relevant to the problem of coaxial cable's transmission-line effects within buildings.

Id. at 36–37 (citing Ex. 2003 ¶¶ 92–93). Additionally, Patent Owner refers to Dr. Russ's following explanation for why "the physical differences between Carhart's coaxial cable and Grube's twisted-pair wiring causes the two systems to operate on different frequencies":

> Carhart teaches that its system may operate at "greater than 860 MHz" so as not to interfere with the external cable television system, which operates at 50-550 MHZ. Ex. 1009, 11:12–17 ("A signal frequency of greater than 860 MHz may be used with the interface system of the present invention (see FIG. 6) with essentially no spurious emission, and may avoid interference with CATV system signals transmitted along the signal path 23 from the coaxial cable drop 24."), 9:3-4. By contrast, Grube teaches that its "ADSL system incorporates 256 carrier channels beginning at ***25 kilohertz up to 1.1 MHz at so increments of 4 kilohertz***." Ex. 1010, 52:3–6. This difference in frequencies is significant because Carhart's invention relies heavily on a splitter/reflector for filtering and reflecting signals.

> Ex. 1009, 5:21–45. The splitter/reflector is "frequency selective," and "prevents a frequency band below f1 from passing between the centralized computing apparatus and communications station to prevent ghosting and interference caused by reflection of signals having a frequency band below f1." *Id.* at 5:41–45. Grube's method uses low frequencies, which, if applied in Carhart's system, would be prevented "from passing between the centralized computing apparatus and communication station," and, thus, render Carhart's system for communication within the home network completely inoperable.

Id. at 38–39 (citing Ex. 2003 ¶¶ 110–111).

Patent Owner also criticizes Petitioner's alleged motivating benefits as being "either already present in or irrelevant to Carhart's system." Prelim. Resp. 43. Patent Owner argues Petitioner fails to establish that any of the proposed modifications to Carhart's system, in view of Grube, would provide a discernible benefit to Carhart's system. *Id.* at 39.

Regarding giving "Carhart's LAN . . . the reliability and bandwidth improvements that Grube realizes" (Pet. 20), Patent Owner calls out that "Grube must solve the issue of limited bandwidth and reliability because of twisted-pair telephone line's limited bandwidth," which "Grube is able to increase . . . 1.1 MHz." Prelim. Resp. 39 (citing Ex. 2003 ¶¶ 94–96; Ex. 1010, 3:20–22). But increasing bandwidth to 1.1 MHz, according to Patent Owner, "is a trivial amount of bandwidth in the context of Carhart's coaxial cable, which has, comparatively, unlimited bandwidth, and thus is not concerned with improving bandwidth or reliability, especially in the way Grube does by minimizing resource usage." *Id.* at 39–40 (citing Ex. 2003 ¶¶ 94–96). Patent Owner highlights that Carhart teaches that the nodes in the disclosed BCN are "designed to ***utilize the excess unused bandwidth*** on the in-home coaxial cables." *Id.* at 40 (citing Ex. 1009, 8:36–38). Because

"Carhart teaches that it is unconcerned with a potential lack of bandwidth," Patent Owner argues that "Carhart has no need for Grube's alleged technique to 'overcom[e]' an issue Carhart does not have"; in fact, "Carhart not only achieves this aspect of Grube, it does so far better just by virtue of utilizing a coaxial cable system." *Id.*

Similarly, addressing Petitioner's contention that "Grube's method of achieving 'reliability' would also result in increased reliability in Carhart's system" (Pet. 20), Patent Owner argues that contention is unsubstantiated because Carhart and Grube disclose systems that "face different issues with transmission due to their physical differences." Prelim. Resp. 40 (citing Ex. 2003 ¶¶ 97–98). Patent Owner explains,

> Twisted-pair lines are unshielded, and thus have limited bandwidth. Thus, Grube's issues with reliability—and techniques to deal with those issues—stem from the need to manage limited bandwidth between a city's worth of ongoing and potentially incoming calls. By contrast, coaxial cable is shielded and thus has vastly wider bandwidth. The higher frequency transmissions and shorter wavelengths result in negative transmission line effects, such as reflections. Ex. 1009, 4:14–19 (noting "ghosting caused by signal reflections."). In-home coaxial cable networks also utilize splitters, which cause isolation between in-home devices. Ex. 1009, 4:20–26 ("the present isolation capability of splitter devices in existing coaxial wiring schemes . . . may prevent . . . an adequate signal strength from reaching receiving devices"). There is no indication that Grube's techniques to improve reliability in light of limited bandwidth by minimizing resources dedicated to each call would apply to Carhart's problems with reflections and isolation.

Id. at 40–41 (citing Ex. 2003 ¶¶ 97–100). And, finally, Patent Owner characterizes Petitioner's contention that "Grube represents a suitable, known technique for orchestrating digital communication between a central unit and multiple remote units in networks like Carhart's" (Pet. 16) as likewise being unsubstantiated because "Grube's citywide network . . . is not in fact ***like*** Carhart's LAN." *Id.* at 41.

c) Analysis

After studying the contentions and arguments presented by both parties, in view of the evidence of record, we are not persuaded Petitioner has shown with sufficient particularity why a skilled artisan would have modified nodes in Carhart's disclosed BCN, in view of Grube, to perform the recited operations for determining a common bit-loading modulation scheme from received response signals sent by other nodes, which each include a bit-loading modulation scheme determined by the respective node. As Patent Owner observes, when considering what Carhart and Grube teach as a whole, Petitioner's proposed reasons for such a modification of Carhart's disclosed BCN are largely unsubstantiated, weak, and/or improperly rely on hindsight reasoning.[4]

With regard to Petitioner's suggestion that a skilled artisan would have viewed Grube's common bit-loading scheme (i.e., LCD bit-loading table) as providing transmission reliability between Carhart's central computer and remote units and by optimizing communication-channel

[4] For our purposes here, we accept Petitioner's contentions that Grube is prior art that discloses or suggests a node determining a common bit-loading modulation scheme from a plurality received response signals that each include a respective bit-loading modulation scheme determined by a separate node. To be clear, "we accept" these contentions about what Grube discloses without making a determination about whether the evidence of record supports such a finding in order to focus our analysis on the dispositive issue, which is whether, in view of Grube, Petitioner demonstrates sufficiently a rationale with a rational underpinning for modifying the nodes in Carhart's BCN system in the manner claimed.

bandwidth, we agree with Patent Owner that this contention is unsubstantiated. Although there is sufficient evidence that Grube's common bit-loading scheme improves upon and benefits infrastructures utilizing telephone lines, Petitioner provides no basis, or minimal at best, to bridge those advantages obtained in the context of Grube's system to Carhart's BCN. The evidence Petitioner cites from Grube and Dr. Williams (Ex. 1010, 2:48–3:17, 3:34–42, 4:18–26, 6:54–67, 7:13–8:14, 14:33–46, 34:45–52, 57:29–38, Fig. 8; Ex. 1004 ¶¶ 92–111) either describes how Grube's bit-loading scheme works in an infrastructure utilizing telephone lines or it represents that the bit-loading scheme is able to satisfy the need for a one-to-many and/or many-to-one communication system within an infrastructure that utilizes existing telephone wires. Dr. Williams's testimony provides little, if any, persuasive information to bridge the gap between how Grube's bit-loading scheme's usefulness within a telephone line infrastructure translates to a skilled artisan into adding similar value within a BCN infrastructure; instead, Dr. Williams largely mirrors the naked assertions Petitioner makes and cites to the same evidence without further substantive reasoning. *See* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

Likewise, no underlying support or reasoning from either Petitioner or Dr. Williams is provided to substantiate the claim that "Grube represents a suitable, known technique for orchestrating digital communication between a central unit and multiple remote units in networks like Carhart's" (Pet. 16). Grube suggest that its technique eliminates high data rate transmission path requirements to expand the usefulness and areas in which communications systems may be established. Ex. 1010, 57:29–38. Petitioner offers no basis for us to determine Grube's technique for ***eliminating*** high data rate transmission path requirements would have been a known technique by skilled artisans for orchestrating digital communication between nodes within a network like Carhart's that necessarily depend on the high data rate transmission paths that a BCN provides.

Left unfulfilled is any clear explanation for why or how Grube's bit-loading scheme would have actually improved or benefited Carhart's system, which Petitioner admits already teaches a network with a centralized computer that uses existing coaxial cables to communicate with remote stations (Pet. 10). For example, Petitioner does not identify a single known shortcoming with Carhart's one-to-many and/or many-to-one communication system infrastructure that a skilled artisan would recognize may be overcome with Grube's bit-loading scheme. To the contrary, as Patent Owner notes, rather than needing a technique Grube teaches to address the lack of "adequate bandwidth" provided by telephone wires (Ex. 1010, 2:1–3), Carhart teaches that its BCN provides excess unused bandwidth (Ex. 1009, 8:36–38). Nor does Petitioner explain why or how a skilled artisan would have viewed Grube's bit-loading scheme to be superior to the schemes Carhart utilizes to form a multi-casting infrastructure. Moreover, Petitioner's admission Carhart teaches that teaches a BCN with a centralized computer that communicates with remote stations, further weakens Petitioner's position because it shows Carhart's infrastructure already accomplishes the same goal that Petition proposes a skilled artisan would have sought to achieve through the proposed modification. *In re NTP, Inc.*, 654 F.3d 1279, 1299 (Fed. Cir. 2011) (stating that the Board's reasoning for the proposed modification was "further weakened" by the fact that the primary reference already discloses the objective sought to be obtained).

The last point we make about Petitioner's reasoning is that it lacks any substantive support for why a skilled artisan would have chosen to configure Carhart's node to have the functionality Grube describes for its primary site. Here again, Petitioner simply concludes that a skilled artisan would have found it obvious to have Carhart's nodes act as Grube's primary site without any evidence that such a correlation was known by skilled artisans or any analysis regarding the roles Carhart's nodes and Grube's primary site play within their respective infrastructures that would have led to that choice. Pet. 20–21. We are mindful that "[c]are must be taken to avoid hindsight reconstruction by using 'the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit.'" *Grain Processing Corp. v. American–Maize Prods. Co.*, 840 F.2d 902, 907 (Fed.Cir.1988) (quoting *Orthopedic Equip. Co. v. United States*, 702 F.2d 1005, 1012 (Fed. Cir. 1983)). Petitioner's failure to provide any clear explanation backed by supporting evidence for why a skilled artisan would have selected Carhart's nodes to modify and perform as the primary site when implementing Grube's bit-loading scheme suggests Petitioner improperly relied on hindsight reasoning to piece together elements to arrive at the claimed invention.

For the above reasons, we are not persuaded that Petitioner has shown with sufficient particularity why it would have been obvious to modify a node in Carhart, in view of Grube, to transmit a probe signal to the other respective nodes and determine a common bit-loading modulation scheme from the various bit-loading modulation schemes determined and provided by each of the other respective nodes that received a probe signal. And as a result, we find Petitioner has not demonstrated a reasonable likelihood of proving that one of ordinary skill in the art would have been motivated to combine Carhart and Grube as proposed. This failing undermines Petitioner's showing as to independent claims 1–3 for all grounds.

III. CONCLUSION

Based on the arguments and evidence presented by the parties, we conclude that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to at least one claim of the '759 patent challenged in the Petition. Therefore, we do not institute an *inter partes* review.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied*, and no *inter partes* review is instituted.

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