

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AT&T SERVICES, INC., AND NOKIA OF AMERICA CORP.,
Petitioner

v.

ADAPTIVE SPECTRUM AND SIGNAL ALIGNMENT, INC.,
Patent Owner

Case IPR2025-00395
U.S. Patent No. 7,428,669

**PATENT OWNER PRELIMINARY RESPONSE
UNDER 37 C.F.R. § 42.107(a)**

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PATENT OWNER'S EXHIBIT LIST

Exhibit No.	Description
2001	Interim Processes for PTAB Workload Management Memorandum (March 26, 2025)
2002	First Amended Docket Control Order [131], <i>Adaptive Spectrum and Signal Alignment, Inc. v. AT&T Inc. et al.</i> , Case No. 2:24-cv-00029-JRG-RSP (E.D. Tex.) filed March 6, 2025
2003	Second Amended Docket Control Order [141], <i>Adaptive Spectrum and Signal Alignment, Inc. v. AT&T Inc. et al.</i> , Case No. 2:24-cv-00029-JRG-RSP (E.D. Tex.) filed March 28, 2025
2004	Order Accepting Joint Stipulation and Motion to Dismiss All Claims and Defenses [144], <i>Adaptive Spectrum and Signal Alignment, Inc. v. AT&T Inc. et al.</i> , Case No. 2:24-cv-00029-JRG-RSP (E.D. Tex.) filed April 14, 2025
2005	Complaint [1], <i>Adaptive Spectrum and Signal Alignment, Inc. v. AT&T Inc. et al.</i> , Case No. 2:24-cv-00029-JRG-RSP (E.D. Tex.) filed January 19, 2024
2006	Claim Construction Order [142], <i>Adaptive Spectrum and Signal Alignment, Inc. v. AT&T Inc. et al.</i> , Case No. 2:24-cv-00029-JRG-RSP (E.D. Tex.) filed April 1, 2025
2007	FAQs for Interim Processes for PTAB Workload Management, USPTO available at https://www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management
2008	Order Granting Motion to Dismiss All Claims and Defenses Related to U.S. Patent No. 7,428,669 [119], <i>Adaptive Spectrum and Signal Alignment, Inc. v. AT&T Inc. et al.</i> , Case No. 2:24-cv-00029-JRG-RSP (E.D. Tex.) filed February 6, 2025
2009	Tau Beta Pi, <i>Marconi Prize</i> , at https://www.tbp.org/about/Dist/Marconi.cfm (last accessed May 10, 2025)

Exhibit No.	Description
2010	IEEE, <i>IEEE Alexander Graham Bell Medal 3</i> (2025), at https://corporate-awards.ieee.org/wp-content/uploads/bell-rl.pdf (last accessed May 10, 2025)
2011	National Science & Technology Medals Foundation, <i>John Cioffi</i> , at https://nationalmedals.org/laureate/john-cioffi/ (last accessed May 10, 2025)

I. INTRODUCTION

The Board should deny the Petition because Petitioner has not met its burden to show a reasonable likelihood that any of claims 1-4, 11, 14-17, 19-20, 23, and 26-29 (the “challenged claims”) of U.S. Patent No. 7,428,669 (“the ’669 patent”) are unpatentable. The Petition presents two invalidity grounds that are nearly identical and are flawed in similar ways. Because neither ground presents compelling reasons as to why any of the challenged claims of the ’669 patent should be found unpatentable, the Board should deny the Petition.

As further explained herein, Grounds 1 and 2 are deficient for similar reasons due to Cooper and Klayman being substantially the same. Specifically, both Cooper and Klayman share a common inventor and were both assigned to Motorola, Inc. They both also share nearly identical Titles and disclosures. These disclosures—even when presented in combination with Li in both grounds—still do not render the challenged claims obvious for at least the following reasons:

First, Petitioner fails to adequately explain why a person of ordinary skill in the art (POSITA) would have been motivated to modify either Cooper or Klayman to use Digital Subscriber Line (DSL) technology or to implement DSL modems as described in Li. Neither Cooper nor Klayman are directed to DSL technology or DSL modems and neither mention “DSL” at all. Rather, Petitioner primarily relies on a single use of the term “twisted pair wires” in both references to make the leap

to DSL. This rationale is fraught with hindsight bias and improperly uses the '669 patent as a roadmap to assemble the combination. The Board should reject such theories as identically applied in both Grounds and reject the Petition.

Second, Petitioner fails to demonstrate that Cooper or Klayman teach selecting, transmitting, or adjusting a “Codeword Composition Ratio (CCR).” While both Cooper and Klayman describe a “parameter pair” that describes aspects of a code word, neither teaches a particular ratio value such as the claimed CCR or the selection, transmission, or adjustment of such a value.

Third, Petitioner fails to demonstrate that Cooper or Klayman teach the claimed “control signal” or transmitting the “control signal” to a “DSL modem.” Specifically, Petitioner has not identified any control signal in the references that specifies both the CCR and an identification of a Forward Error Correcting (FEC) encoding scheme as stated in Claim 14.

For at least these reasons, Petitioner has not met—and cannot meet—its burden to show a reasonable likelihood that any of the challenged claims are unpatentable. Accordingly, the Board should deny institution of the Petition.

II. THE '669 PATENT

The '669 patent has a compelling story that highlights its innovation. The inventor of the '669 patent, Dr. John M. Cioffi, who is often referred to as the “father of DSL,” is renowned for his transformative contributions to

telecommunications, having received numerous prestigious accolades, including the Marconi Prize,¹ the IEEE Alexander Graham Bell Medal,² and most recently was awarded the National Medal of Technology and Innovation by the President, recognizing his enduring impact on communications technology.³ Dr. Cioffi initially served as a member of the technical staff at Bell Labs and then worked at IBM Research. He then ventured to Stanford University, where he served as a professor for decades, playing a significant role in pioneering advancements in

¹ Tau Beta Pi, *Marconi Prize*, at <https://www.tbp.org/about/Dist/Marconi.cfm> (last accessed Jan. 21, 2025) (EX2009).

² IEEE, *IEEE Alexander Graham Bell Medal* (2025), at <https://corporate-awards.ieee.org/wp-content/uploads/bell-rl.pdf> (last accessed Jan. 21, 2025) (“For pioneering discrete multitone modem technology as the foundation of the global DSL industry.”) (EX2010).

³ National Science & Technology Medals Foundation, *John Cioffi*, at <https://nationalmedals.org/laureate/john-cioffi/> (last accessed Jan. 21, 2025) (“For advancements that helped bring high-speed Internet to the world. The digital subscriber line that he helped invent ignited the growth of the digital age, vastly increasing people’s access to information, reshaping the global economy, and transforming how we work, communicate, and find community.”) (EX2011).

telecommunications and broadband technology beginning in the late 1980s. In 2003, he founded Adaptive Spectrum and Signal Alignment, Inc., the assignee of the '669 patent, to continue developing and commercializing innovative communications technologies. Those innovations now enhance internet connectivity for over 120 million households worldwide. In short, Dr. Cioffi is a recognized visionary who often looked in directions that others either scoffed at or were not even thinking about to achieve breakthroughs in communications technologies.

Such is the case with the innovations claimed in the '669 patent. For example, use and adjustment of a Codeword Composition Ratio (CCR) to enhance adaptive Forward Error Correction (FEC) in DSL modems—the focus of independent claims 1 and 14—provided enhanced DSL performance. Namely, the innovations allowed for “adjustments to the transmission error rate of a communications system using data codewords, without affecting the latency of data transmission.” EX1001, 5:47-50. “This transmission error rate adjustment is accomplished using changes to a codeword composition ratio [CCR].” EX1001, 5:50-55. The '669 patent explains that “the composition of codewords used in FEC/interleaving is adjusted to meet the target BER [bit error rate], while leaving the latency unaffected (or possibly reduced).” EX1001, 5:55-62. Such innovations in DSL technology and DSL modems allowed for adaptive adjustments, improving

the performance of DSL systems.

The contrast between the compelling backstory of the '669 patent and the superficial, conclusory nature of the Petition are illuminating. This contrast brings into focus Petitioner's failure to meet its burden of demonstrating a reasonable likelihood any challenged claims will be found unpatentable. For this reason, the Board must deny this Petition.

III. PERSON OF ORDINARY SKILL IN THE ART (POSITA)

For purposes of this Preliminary Response, Patent Owner applies Petitioner's level of skill for a person of ordinary skill in the art (POSITA). Pet., 8.

IV. CLAIM CONSTRUCTION

For purposes of this Preliminary Response, Patent Owner agrees the *Phillips* standard applies. Without taking a position on Petitioner's proposed constructions for the "means for" limitations, this Preliminary Response analyzes the Petition's positions using these constructions. Pet., 5-7. Patent Owner, however, reserves the right to contest these constructions during the proceeding.

V. GROUND 1 – COOPER AND LI DO NOT RENDER OBVIOUS ALL ELEMENTS OF THE INDEPENDENT CLAIMS 1 AND 14

As further explained below, Ground 1 is deficient for several reasons.⁴

⁴ Because Petitioner presents an analysis of independent Claim 14 prior to analyzing Claim 1, this POPR addresses the claims in kind. Claim 1 is patentable for

First, Petitioner's theories for why a POSITA would have been motivated to combine Cooper and Li are fraught with hindsight bias and improperly use the '669 patent as a roadmap to assemble the combination. Indeed, Cooper does not mention using "DSL" technology or "modems" at all, so there would have been no motivation for a POSITA to modify Cooper to use Li's technology.

Second, Ground 1 is also deficient because the combination does not teach (1) selecting, transmitting, or adjusting a "Codeword Composition Ratio (CCR)" or (2) the claimed "control signal" or transmitting the "control signal" to a "DSL modem."

Because Ground 1 contains numerous deficiencies and flaws, the Board should deny the Petition to conserve the Board's valuable time and resources.

A. Petitioner fails to demonstrate why a POSITA would have been motivated to modify Cooper to implement DSL modems

At the outset, Cooper does not mention "DSL" or "modems" at all. Given this silence, it is no wonder that Petitioner's theories for modifying Cooper to implement Li's alleged DSL modem teachings are confused and flawed.

Specifically, Petitioner fails to establish why a POSITA viewing Cooper would have been motivated to modify Cooper's operations to incorporate DSL modem

reasons similar to those presented for Claim 14 in view of its own respective patentable features.

technology. This fatal flaw demonstrates that Ground 1 is deficient.

Petitioner's primary argument is that "Cooper discloses twisted pair copper wires." Pet., 11. Based solely on this observation, Petitioner asserts that a POSITA would have modified Cooper to incorporate Li's DSL modem technology. *Id.* First, this observation alone is not sufficient to establish that a POSITA would have been motivated to modify Cooper to incorporate Li. "It does not suffice to meet the motivation to combine requirement to recognize that two alternative arrangements . . . were both known in the art." *Virtek Vision Int'l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 886-87 (Fed. Cir. 2024). Simply noting that Cooper uses twisted pair lines does not provide a sufficient motivation to modify Cooper to implement DSL technology. As the Federal Circuit has consistently explained, "obviousness concerns whether a skilled artisan not only could have made but **would have been motivated to make** the combinations or modifications of prior art to arrive at the claimed invention." *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (emphasis added). Here, the mere observation that Cooper mentions twisted pair copper wires does not provide a motivation to modify Cooper's functionality.

Second, to underscore Petitioner's failure to establish a motivation to combine Cooper and Li, even Cooper explains that using a twisted pair copper wire is not the preferred way of implementing its process. EX1006, 4:9-11. Rather,

Cooper affirmatively states: “In the preferred embodiment, the communication medium 115 is hybrid optical fiber and coaxial cable.” *Id.* This may be similar to the “CableComm™ System currently deployed by Motorola, Inc.” EX1006, 1:28-36; *see also id.*, 4:43-47 (“in the preferred embodiment of the CableComm™ System, the communications medium is hybrid fiber coaxial cable”). Thus, Cooper does not suggest implementing DSL technology or using a DSL modem.

Petitioner additionally argues that a “POSITA would have recognized [the] benefits of using DSL modems that are compliant with current ADSL standards” such as those “discussed in [the] background of the ’669 Patent.” Pet., 12.

Petitioner further argues that “[u]sing modems compliant with recent standards enables reliable communication with a wide range of modems within a DSL network.” *Id.* But these statements again reflect Petitioner’s improper use of hindsight bias to construct the Cooper-Li combination.

As previously explained, nothing in Cooper suggests implementing its process in any DSL technology or the need to modify its process to be compliant with an ADSL standard such as G.992.1 or G.992.2. Rather, Petitioner has clearly used the ’669 patent and its novel DSL innovations as a roadmap to argue that a POSITA would have been motivated to modify Cooper to use DSL technology. This is improper hindsight and must be rejected. “Defining the problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to

obviousness.” *Insite Vision Inc. v. Sandoz, Inc.*, 783 F.3d 853, 859 (Fed. Cir. 2015); *see also ActiveVideo Networks, Inc. v. Verizon Comm’s, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012).

Finally, Petitioner argues that a POSITA would have had a “reasonable expectation of success in combining Cooper and Li” because integrating Li’s DSL modems “into Cooper’s DSL communication system [would] enable use of the twisted pair copper wires.” Pet., 12-13. First, this statement is inconsistent with, and also conflicts with, Petitioner’s position that Cooper already implements DSL technology over twisted pair copper wires. If it were true that Cooper uses DSL—which it is not—a POSITA would not have needed to implement Li to **enable** the use of DSL because Cooper would have already been capable of DSL communications. But second, Petitioner’s argument is still wrong because—as previously explained—Cooper does not describe a DSL communication system at all. Cooper primarily and preferably describes communications occurring over a “hybrid optical fiber and coaxial cable.” EX1006, 4:9-11. Cooper’s mere mention of twisted pair copper wires does not mean that it describes or implements a DSL system. *See* EX1006, 4:11-15 (listing “twisted pair copper wires” as one option among several other non-preferred wired and wireless options). Thus, nothing in Cooper indicates that a POSITA would have had a reasonable expectation of success in implementing Li’s DSL modem because Cooper does not implement

DSL communications.

In summary, none of Petitioner's proffered reasons for combining Cooper and Li are persuasive. Outside of improper hindsight bias, Petitioner has not explained why a POSITA would have been motivated to modify Cooper to implement DSL technology or Li's DSL modems. Because Petitioner has failed to sufficiently establish a motivation to combine Cooper and Li, Ground 1 is deficient and should be rejected.

B. Cooper and Li do not teach selecting, transmitting, or adjusting a “Codeword Composition Ratio (CCR)”

Cooper's use of a “parameter pair (n, k)” does not sufficiently disclose the claimed selecting or adjusting of a “*Codeword Composition Ratio (CCR)*” because a parameter pair is not a *ratio* that represents a relationship between payload and parity bytes. This deficiency makes clear that Cooper does not disclose “selecting,” “transmitting,” or “adjusting” a CCR as recited in independent claims 1 and 14.

As Petitioner acknowledges, the '669 patent describes a “*Codeword Composition Ratio (CCR)*” as a “*quantity* or *value* that represents the relation between the payload and parity bytes in the applicable FEC coding scheme.” EX1001, Abstract (emphasis added); *see also id.*, 4:10-13, 4:22-26, 9:25-28. The '669 patent provides an example of such a CCR as the ratio of the number of payload data bytes to the number of total data bytes:

$$\text{CCR} = \frac{\text{Payload data bytes}}{\text{Total data bytes}} \text{ OR } (\text{Payload bytes}) : (\text{Total bytes})$$

EX1001, 9:20-22.

In this case, the CCR still reflects a specific *ratio value* rather than independent or individual parameters. As reflect in independent claim 14, the specific CCR or ratio value is *selected, transmitted in a control signal, and adjusted*.

Cooper does not describe the selection or use of such a CCR value to optimize DSL modem performance. As Petitioner admits, Cooper uses a “parameter pair (n, k).” Pet., 15; EX1006, 6:17-26, 6:67-7:3, 10:30-37. Cooper explains that “‘n’ is the code word size and ‘k’ is the block size (i.e., the number of information bytes). An n-byte codeword therefore consists of k information bytes plus (n–k) error correcting code bytes.” EX1006, 6:23-28. While Cooper accounts for bytes in a codeword, this does not describe designating or using a particular ratio value (i.e., a CCR) to represent a relationship between payload and parity bytes as described in the ’669 patent. Indeed, Cooper describes the “parameter pair (n, k)” values separately and does not even use the term “ratio” at all. Thus, Cooper’s description of “parameter pair (n, k)” does describe the claimed *selecting, transmitting in a control signal, or adjusting* of a CCR as recited in claim 14 and similarly claim 1.

Because Petitioner has failed establish that Cooper teaches *selecting, transmitting in a control signal, or adjusting* a CCR as recited in claims 1 and 14, Ground 1 is deficient and should be rejected.

C. Cooper and Li do not teach the claimed “control signal” or transmitting the “control signal” to a “DSL modem”

In presenting the combination of Cooper and Li, Petitioner fails to clearly identify a “control signal specifying the CCR and the FEC coding scheme” that is transmitted to a DSL modem as recited in claim 14 and similarly recited in claim 1. Pet., 16-17, 35.

At the outset, Cooper does not disclose selecting a CCR for the previously explained reasons. Section V.B. Because Cooper does not select a CCR, Cooper does not teach transmitting a control signal containing a CCR to a DSL modem even when combined with Li. *Id.*

But beyond this deficiency, Cooper also does not describe a “control signal” that is transmitted to a DSL modem to inform the DSL modem of the specified “FEC encoding scheme.” EX1001, Claim 14. Petitioner has not identified any control signal that instructs a modem to use a particular FEC encoding scheme. *See* Pet., 16-17.

In contrast to Cooper’s disclosure, the ’669 patent explains that different FEC coding schemes may be used. EX1001, 3:50-57, 6:53-59, 9:25-28, 14:24-30, 16:34-44. For example, while a DSL modem may use “Reed-Solomon coding,”

other “coding systems” may also be employed, and “[t]he present invention can be used in any data transmission system that uses codeword-type data structures.” *Id.*, 6:53-59. Beyond this, different Reed-Solomon encoding schemes that account for “Impulse Noise Protection (INP)” or “Maximum Interleaving Delay” may also be used. *Id.*, 3:50-57, 16:34-44, Claim 11. To account for these options and variations, the ’669 patent describes sending a control signal indicating the particular FEC encoding scheme to the DSL modem to inform the modem of which scheme to use. EX1001, Claim 14.

Cooper provides no such teaching. While Cooper may discuss changing “forward error correction configuration parameters,” Cooper does not describe providing a notification of the particular FEC encoding scheme to use. Pet., 16-17; EX1006, 7:43-62. This is clear from Petitioner’s theory that relies on Cooper’s “parameter pair (n, k)” to allegedly teach both the claimed CCR and the FEC coding scheme. Pet., 16. First, the claimed “CCR and the FEC coding scheme” are clearly recited as two different claim elements that must be specified by the “control signal.” Petitioner’s reliance on Cooper’s “parameter pair (n, k)” to allegedly teach both elements is therefore flawed. Second, even considering “parameter pair (n, k),” nothing in these parameters identifies a particular FEC encoding scheme to use. Pet., 16; EX1006, 6:23-26. Rather, these parameters are more akin to inputs used by a particular FEC coding scheme (e.g., used by a Reed-

Solomon FEC coding scheme) rather than specifying the FEC coding scheme itself. *See* EX1006, 6:23-33. Thus, Petitioner’s reliance on Cooper’s “parameter pair (n, k)” also does not teach a controlling signal that specifies an FEC coding scheme. EX1001, Claim 14.

Because Petitioner has failed to establish that Cooper teaches the claimed “control signal” as recited in claims 1 and 14, Ground 1 is deficient and should be rejected.

VI. GROUND 2 – KLAYMAN AND LI DO NOT RENDER OBVIOUS ALL ELEMENTS OF THE INDEPENDENT CLAIMS 1 AND 14

At the outset, Ground 2 is nearly identical to Ground 1. This is no surprise since both Klayman and Cooper share a common inventor (Stephen Schroeder) and were both assigned to Motorola, Inc. EX1006, (73), (75); EX1007 [73], [75]. The references also have nearly identical Titles: “Apparatus and Method for Providing Optimal Adaptive Forward Error Correction in Data Communications” versus “Apparatus and Method for Adaptive Forward Error Correction in Data Communications.” EX1006, (54); EX1007 [54]. Based on these similarities as well as the similarities in specifications, Petitioner’s arguments based on Klayman are substantially the same as those presented for Cooper. Thus, Petitioner’s theories based on Klayman are also flawed for the same reasons previously presented.

Section V.

A. Petitioner fails to demonstrate why a POSITA would have been motivated to modify Klayman to implement DSL modems

Petitioner's rationale for combining Klayman with Li is identical to the rationale presented for combining Cooper with Li. *Compare* Pet., 39-41, *with* Pet., 11-13. It is also deficient for the same reasons.

At the outset, Klayman does not mention "DSL" or "modems" at all. Given this silence, it is no wonder that Petitioner's theories for modifying Klayman to implement Li's alleged DSL modem teachings are confused and flawed. Specifically, Petitioner fails to establish why a POSITA viewing Klayman would have been motivated to modify Klayman's operations to incorporate DSL modem technology. This fatal flaw demonstrates that Ground 2 is deficient.

Petitioner's primary argument is that "Klayman discloses twisted pair wires." Pet., 39. Based solely on this observation, Petitioner asserts that a POSITA would have modified Klayman to incorporate Li's DSL modem technology. *Id.* First, this observation alone is not sufficient to establish that a POSITA would have been motivated to modify Klayman to incorporate Li. "It does not suffice to meet the motivation to combine requirement to recognize that two alternative arrangements . . . were both known in the art." *Virtek Vision*, 97 F.4th at 886-87. Simply noting that Klayman uses twisted pair lines does not provide a sufficient motivation to modify Klayman to implement DSL technology. As the Federal Circuit has consistently explained, "obviousness concerns whether a skilled artisan

not only could have made but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.” *Belden*, 805 F.3d at 1073 (emphasis added). Here, the mere observation that Klayman mentions twisted pair copper wires does not provide a motivation to modify Klayman’s functionality.

Second, to underscore Petitioner’s failure to establish a motivation to combine Klayman and Li, even Klayman explains that using a twisted pair copper wire is not the preferred way of implementing its process. EX1007, 3:1-3. Rather, Klayman affirmatively states: “In the preferred embodiment, communications media 115 and 116 are hybrid optical fiber and coaxial cable.” EX1007, 3:1-3. This may be similar to the “CableCommTM System currently deployed by Motorola, Inc.” EX1007, 1:18-25; *see also id.*, 3:39-43 (“in the preferred embodiment of the CableCommTM System, the communications medium is hybrid fiber coaxial cable”), 12:8-11. Thus, Klayman does not suggest implementing DSL technology or using a DSL modem.

Petitioner additionally argues that a “POSITA would have recognized [the] benefits of using DSL modems that are compliant with current ADSL standards” such as those “discussed in [the] background of the ’669 Patent.” Pet., 40. Petitioner further argues that “[u]sing modems compliant with recent standards enables reliable communication with a wide range of modems within a DSL

network.” *Id.* But these statements again reflect Petitioner’s improper use of hindsight bias to construct the Klayman-Li combination.

As previously explained, nothing in Klayman suggests implementing its process in any DSL technology or the need to modify its process to be compliant with an ADSL standard such as G.992.1 or G.992.2. Rather, Petitioner has clearly used the ’669 patent and its novel DSL innovations as a roadmap to argue that a POSITA would have been motivated to modify Klayman to use DSL technology. This is improper hindsight and must be rejected. “Defining the problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to obviousness.” *Insite Vision*, 783 F.3d at 859; *see also ActiveVideo Networks*, 694 F.3d at 1327.

Finally, Petitioner argues that a POSITA would have had a “reasonable expectation of success in combining Klayman and Li” because integrating Li’s DSL modems “into Klayman’s DSL communication system [would] enable use of the twisted pair copper wires.” Pet., 40-41. First, this statement is inconsistent with, and also conflicts with, Petitioner’s position that Klayman already implements DSL technology over twisted pair copper wires. If it were true that Klayman uses DSL—which it is not—a POSITA would not have needed to implement Li to **enable** the use of DSL because Klayman would have already been capable of DSL communications. But second, Petitioner’s argument is still wrong

because—as previously explained—Klayman does not describe a DSL communication system at all. Klayman primarily and preferably describes communications occurring over a “hybrid optical fiber and coaxial cable.” EX1007, 3:1-3. Klayman’s mere mention of twisted pair copper wires does not mean that it describes or implements a DSL system. *See* EX1007, 3:3-8 (listing “twisted pair wires” as one option among several other non-preferred wired and wireless options). Thus, nothing in Klayman indicates that a POSITA would have had a reasonable expectation of success in implementing Li’s DSL modem because Klayman does not implement DSL communications.

In summary, none of Petitioner’s proffered reasons for combining Klayman and Li are persuasive. Outside of improper hindsight bias, Petitioner has not explained why a POSITA would have been motivated to modify Klayman to implement DSL technology or Li’s DSL modems. Because Petitioner has failed to sufficiently establish a motivation to combine Klayman and Li, Ground 2 is deficient and should be rejected.

B. Klayman and Li do not teach selecting, transmitting, or adjusting a “Codeword Composition Ratio (CCR)”

Similar to the reasons presented in Section V.B, Klayman in combination with Li does not teach the claimed *selecting, transmitting, or adjusting* of a “*Codeword Composition Ratio (CCR)*” as recited in independent claims 1 and 14. Like Cooper, Klayman’s disclosure of a “parameter pair ‘such as (n, k)

parameters” and generally optimizing an amount of error correction does not teach the claimed CCR or the CCR’s function. Pet., 43; Section V.B.

For example, like Cooper, Petitioner again references Klayman’s “parameter pair ‘such as (n, k) parameters.’” Pet., 43; EX1007, 5:60-65. But Klayman’s “parameter pair” is not a *ratio* that represents a relationship between payload and parity bytes. Section V.B; EX1001, Abstract. Rather, like Cooper, the “n” code word size and “k” block size values are described separately and are not considered as a ratio. EX1007, 5:60-65. Indeed, Klayman does not use the term “ratio” at all. In this manner, while Klayman may account for code word and block sizes, this does not describe designating or using a particular ratio value (i.e., a CCR) to represent a relationship between payload and parity bytes as described in the ’669 patent. EX1001, Abstract, 4:10-13, 4:22-26, 9:20-28. Klayman’s use of a parameter pair (n, k) therefore does not describe the selection or use of such a CCR value to optimize DSL modem performance as recited in claims 1 and 14.

Because Petitioner has failed to establish that Klayman teaches *selecting*, *transmitting in a control signal*, or *adjusting* a CCR as recited in claims 1 and 14, Ground 2 is deficient and should be rejected.

C. Klayman and Li do not teach the claimed “control signal” or transmitting the “control signal” to a “DSL modem”

In presenting the combination of Klayman and Li, Petitioner fails to clearly identify a “control signal specifying the CCR and the FEC coding scheme” that is

transmitted to a DSL modem as recited in claim 14 and similarly recited in claim 1. Pet., 44-46, 63-64.

At the outset, Klayman does not disclose selecting a CCR for the previously explained reasons. Section VI.B. Because Klayman does not select a CCR, Klayman does not teach transmitting a control signal containing a CCR to a DSL modem even when combined with Li. *Id.*

But beyond this deficiency, Klayman also does not describe a “control signal” that is transmitted to a DSL modem to inform the DSL modem of the specified “FEC encoding scheme.” EX1001, Claim 14. Petitioner has not identified any control signal that instructs a modem to use a particular FEC encoding scheme. *See* Pet., 44-46.

In contrast to Klayman’s disclosure, the ’669 patent explains that different FEC coding schemes may be used. EX1001, 3:50-57, 6:53-59, 9:25-28, 14:24-30, 16:34-44. For example, while a DSL modem may use “Reed-Solomon coding,” other “coding systems” may also be employed, and “[t]he present invention can be used in any data transmission system that uses codeword-type data structures.” *Id.*, 6:53-59. Beyond this, different Reed-Solomon encoding schemes that account for “Impulse Noise Protection (INP)” or “Maximum Interleaving Delay” may also be used. *Id.*, 3:50-57, 16:34-44, Claim 11. To account for these options and variations, the ’669 patent describes sending a control signal indicating the particular FEC

encoding scheme to the DSL modem to inform the modem of which scheme to use.
EX1001, Claim 14.

Klayman provides no such teaching. While Klayman may discuss changing “forward error correction parameters,” Klayman does not describe providing a notification of the particular FEC encoding scheme to use. Pet., 44-45; EX1007, 6:65-7:3. This is clear from Petitioner’s theory that relies on Klayman’s transmission of forward error correction parameters like parameter pair (n, k) to allegedly teach both the claimed CCR and the FEC coding scheme. Pet., 44-45. First, the claimed “CCR and the FEC coding scheme” are clearly recited as two different claim elements that must be specified by the “control signal.” Petitioner’s reliance on Klayman’s “parameter pair (n, k)” to allegedly teach both elements is therefore flawed. Second, even considering “parameter pair (n, k)” or any of Klayman’s other “forward error correction parameters,” Petitioner has not identified any parameter that specifies a particular FEC encoding scheme to use. Pet., 44-45 (citing EX1007, 5:55-65). Rather, these parameters are more akin to inputs used by a particular FEC coding scheme (e.g., used by a Reed-Solomon FEC coding scheme) rather than specifying the FEC coding scheme itself. *See* EX1007, 6:65-7:3 (describing **using** the parameters for upstream transmissions). Thus, Petitioner’s reliance on Klayman’s parameters also does not teach a controlling signal that specifies an FEC coding scheme. EX1001, Claim 14.

Additionally, Petitioner cites Klayman's description of informing a "receiving unit" of "what type of error correcting code is to be employed by the transmitting unit, for proper decoding and error correction." EX1007, 5:29-35; Pet., 44-45. Petitioner also cites the transmission of revised forward error correction parameters in step 370 of Klayman's Figure 4. Pet., 44-54; EX1007, 8:39-47. But these descriptions also do not teach the features recited in Claim 14. As stated in Claim 14, the claimed "control signal" is transmitted to a DSL modem transmitter and must specify both a CCR and an FEC coding scheme. EX1001, Claim 14. Despite Petitioner's attempt to piece together disparate portions from Klayman, nothing in Klayman discloses the claimed "control signal."

Because Petitioner has failed to establish that Klayman teaches the claimed "control signal" as recited in claims 1 and 14, Ground 2 is deficient and should be rejected.

VII. EVEN IF PETITIONER FAILS TO MEET ITS BURDEN FOR LESS THAN ALL OF THE CHALLENGED CLAIMS AND/OR PROPOSED GROUNDS, THE BOARD SHOULD STILL DENY THE PETITION

As explained herein, Patent Owner has identified several deficiencies in Petitioner's arguments, each of which should prove fatal to the Petition. Nonetheless, should the Board ultimately determine that Petitioner met its burden for some claims, but has failed to meet its burden of establishing unpatentability for fewer than all of the challenged claims of the '669 patent, the Petition should

still be denied in order to conserve the Board’s valuable time and resources. *See* PTAB Workload Management Memo, EX2001, 3; *Chevron Oronite Co. v. Infineum USA L.P.*, IPR2018-00923, Paper 9 at 10–11 (P.T.A.B. Nov. 7, 2018).

The same holds true should the Board ultimately determine that Petitioner met its burden for one, but not both of its proposed sets of invalidity grounds.

Pursuant to 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.” But even when a petitioner demonstrates a reasonable likelihood of prevailing with respect to one or more claims, institution of review remains discretionary. *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1356 (2018) (“[Section] 314(a) invests the Director with discretion on the question whether to institute review” (emphasis omitted)); *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an IPR proceeding.”). 35 U.S.C. § 316(b) also provides that, when determining whether to exercise its discretion, the Board should consider the effect of any regulations on “the efficient administration of the Office [and] the ability of the Office to timely complete proceedings.” Additionally, 37 C.F.R. § 42.1(b) provides that the Board should also take into account the requirement to construe the rules to “secure the just,

speedy, and inexpensive resolution of every proceeding.” Office guidance, published November 20, 2019, also explains that the Board may consider the number of claims and grounds that meet and do not meet the reasonable likelihood standard when deciding whether to institute *inter partes* review under 35 U.S.C. § 314(a). Patent Trial and Appeal Board Consolidated Trial Practice Guide November 2019, p. 64 (Nov. 20, 2019), available at <https://www.uspto.gov/TrialPracticeGuideConsolidated> (“2019 Office Guidance”) (“[T]he panel will evaluate all the challenges and determine whether, in the interests of efficient administration of the Office and integrity of the patent system, the entire petition should be denied.”).

Here, should the Board determine that Petitioner has failed to meet its burden of establishing unpatentability for some but fewer than all of the challenged claims of the ’669 patent as discussed in Sections V and VI, the Petition should still be denied in order to conserve the Board’s valuable time and resources. EX2001, 3; *Deeper, UAB. v. Vexilar, Inc.*, IPR2018-01310, Paper 7 at 43 (P.T.A.B. Jan. 24, 2019) (finding that because Petitioner only demonstrated a reasonable likelihood of prevailing with respect to a subset of the 23 challenged claims, “instituting a trial with respect to all twenty-three claims . . . would not be an efficient use of the Board’s time and resources.”). Similarly, should the Board determine that Petitioner has failed to meet its burden of establishing

unpatentability for some but not all grounds, the Petition should again be denied in order to conserve the Board's valuable time and resources. EX2001, 3; 2019 Office Guidance, p. 64; 35 U.S.C. § 316(b); 37 C.F.R. § 42.1(b).

VIII. CONCLUSION

Because the Petition fails to show a reasonable likelihood that any of the challenged claims are unpatentable as obvious in view of the cited art, the Board must deny institution.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))

1. This Patent Owner Preliminary Response complies with the type-volume limitation of 14,000 words, comprising 5,478 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

2. This Patent Owner Preliminary Response complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14-point Times New Roman font.

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CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e))

I certify that the above-captioned **PATENT OWNER PRELIMINARY RESPONSE UNDER 37 C.F.R. § 42.107(a)** and associated Exhibits 2001-2011 were served in their entireties on May 12, 2025, upon the following parties via electronic mail:

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