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Paper No. 29
Entered: February 26, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC. and OCLARO, INC.,
Petitioner,

v.

OYSTER OPTICS, LLC,
Patent Owner.

Case IPR2017-01881
Patent 8,913,898 B2

Before JAMESON LEE, JESSICA C. KAISER, and JOHN R. KENNY, *Administrative Patent Judges.*

Opinion for the Board filed by Administrative Patent Judge KENNY.

Opinion Concurring filed by Administrative Patent Judge LEE.

KENNY, *Administrative Patent Judge*

DECISION
Final Written Decision
35 U.S.C. § 318(a)

I. INTRODUCTION

This *inter partes* review, instituted pursuant to 35 U.S.C. § 314, challenges the patentability of claims 14–22 and 24 ("challenged claims") of U.S. Patent No. 8,913,898 B2 (Ex. 1002, "the challenged patent"), owned by Oyster Optics, LLC ("Patent Owner"). We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

For the reasons discussed below, we determine Petitioner has not proved by a preponderance of the evidence that any of the challenged claims are unpatentable.

A. Procedural History

Cisco Systems, Inc. and Oclaro, Inc. (collectively, "Petitioner") filed a Petition for *inter partes* review of the challenged claims based on eight asserted grounds. Paper 1 ("Pet.") Patent Owner filed a Preliminary Response. Paper 7 ("Prelim. Resp.").

Petitioner relies on the following references in the Petition:

Reference		Issue/Copyright Date	Exhibit
Ade	U.S. Patent No. 5,347,601	Sept. 13, 1994	Ex. 1024
Corke	U.S. Patent No. 5,510,917	Apr. 23, 1996	Ex. 1005
Hooijmans	Coherent Optical System Design[1]	1994	Ex. 1008
Ikeda	U.S. Patent No. 7,016,612	Mar. 21, 2006, filed May 28, 1999	Ex. 1033
Kobayashi	U.S. Patent No. 6,404,281	June 11, 2002, filed Nov. 14, 2000	Ex. 1025
Roberts '840	U.S. Patent No. 5,969,840	Oct. 19, 1999	Ex. 1009

[1] Pieter W. Hooijmans, *Coherent Optical System Design* 64–72 (1994).

Petitioner asserts the following grounds:

Ground	Claim(s) Challenged	Reference(s)
1	14–15, 20–22, and 24	Corke and Ade
2	16	Corke, Ade, and Ikeda
3	17–18	Corke, Ade, and Hooijmans
4	19	Corke, Ade, and Kobayashi
5	14–15, 20–22, and 24	Roberts ’840 and Ade
6	16	Roberts ’840, Ade, and Ikeda
7	17–18	Roberts ’840 , Ade, and Hooijmans
8	19	Roberts ’840, Ade, and Kobayashi

Pet. 23–74.

Initially, we instituted an *inter partes* review of all challenged claims, but on only the first four asserted grounds. Paper 11 (“Inst. Dec.”), 2, 10, 45–46. Subsequently, pursuant to *SAS Institute v. Iancu*, 138 S. Ct. 1348 (2018), we expanded the already instituted review to include all asserted grounds. Paper 14, 2–3.

After we expanded the *inter partes* review to encompass all asserted grounds, Oyster Optics, LLC (“Patent Owner”) filed a Patent Owner Response to the Petition (Paper 16, “PO Resp.”), to which Petitioner filed a Reply (Paper 19, “Pet. Reply”), and to which Patent Owner filed a Sur-Reply (Paper 23, “Sur-Reply”).

A final oral hearing was held on November 20, 2018. A transcript of the hearing is included in the record. Paper 27 (“Hr’g Tr.”).

B. Related Proceedings

The Patent Owner indicates that the challenged patent is at issue in the following lawsuits:

Oyster Optics, LLC v. Infinera Corp., Case No. 2:16-cv-01295 (E.D. Tex.);

Oyster Optics, LLC v. NEC Corp., Case No. 2:16-cv-01296 (E.D. Tex.);

Oyster Optics, LLC v. Nokia Corp., Case No. 2:16-cv-01297 (E.D. Tex.);

Oyster Optics, LLC v. ZTE Corp., Case No. 2:16-cv-01298 (E.D. Tex.) (dismissed without prejudice);

Oyster Optics, LLC v. Fujitsu Network Commc'n, Inc., Case No. 2:16-cv-01299 (E.D. Tex.);

Oyster Optics, LLC v. Ericsson Inc., Case No. 2:16-cv-01300 (E.D. Tex.) (dismissed without prejudice);

Oyster Optics, LLC v. Cisco Sys., Inc., Case No. 2:16-cv-01301 (E.D. Tex.);[2]

Oyster Optics, LLC v. Coriant America Inc., Case No. 2:16-cv-01302 (E.D. Tex.);

Oyster Optics, LLC v. Huawei Tech. Co. Ltd., Case No. 2:16-cv-01303 (E.D. Tex.);

Oyster Optics, LLC v. Ciena Corp., Case No. 2:17-cv-00511 (E.D. Tex.) (transferred to N.D. Cal.); and

Oyster Optics, LLC v. Ciena Corp., Case No. 4:17-cv-05920 (N.D. Cal.).

Patent Owner identifies the following IPRs as related proceedings:

Case No.	**Patent-at-Issue**
IPR2017-01719	6,469,816
IPR2017-01720	6,594,055

[2] Petitioner also identifies this litigation. Pet. 1.

Case No.	Patent-at-Issue
IPR2017-01724	6,594,055
IPR2017-01725	6,469,816
IPR2017-01870	8,913,898
IPR2017-01871	7,620,327
IPR2017-01874	8,374,511
IPR2017-01882	7,620,327
IPR2017-02146	8,374,511
IPR2017-02173	7,620,327
IPR2017-02189	6,476,952
IPR2017-02190	6,476,952
IPR2018-00070	8,913,898
IPR2018-00146	9,363,012

Paper 8, 2–4.

In another proceeding, Patent Owner identified IPR2018-00257, IPR2018-00258, and IPR2018-00259 as related to this proceeding. *See* IPR2018-00257, Paper 11, 3–4.

C. The Challenged Patent

The challenged patent is directed to a transceiver card for a telecommunications box for transmitting data over a first optical fiber and receiving data over a second optical fiber. Ex. 1002, Abstr. A transceiver has a transmitter and a receiver. *See, e.g.*, Ex. 1024 (Ade), Abstr. The disclosed transceiver card includes a transmitter for transmitting data over the first optical fiber and a receiver for receiving data from the second optical fiber. Ex. 1002, 2:30–32. The card also includes an energy level detector. *Id.* at 2:43–44.

Figure 1 of the challenged patent is reproduced below:

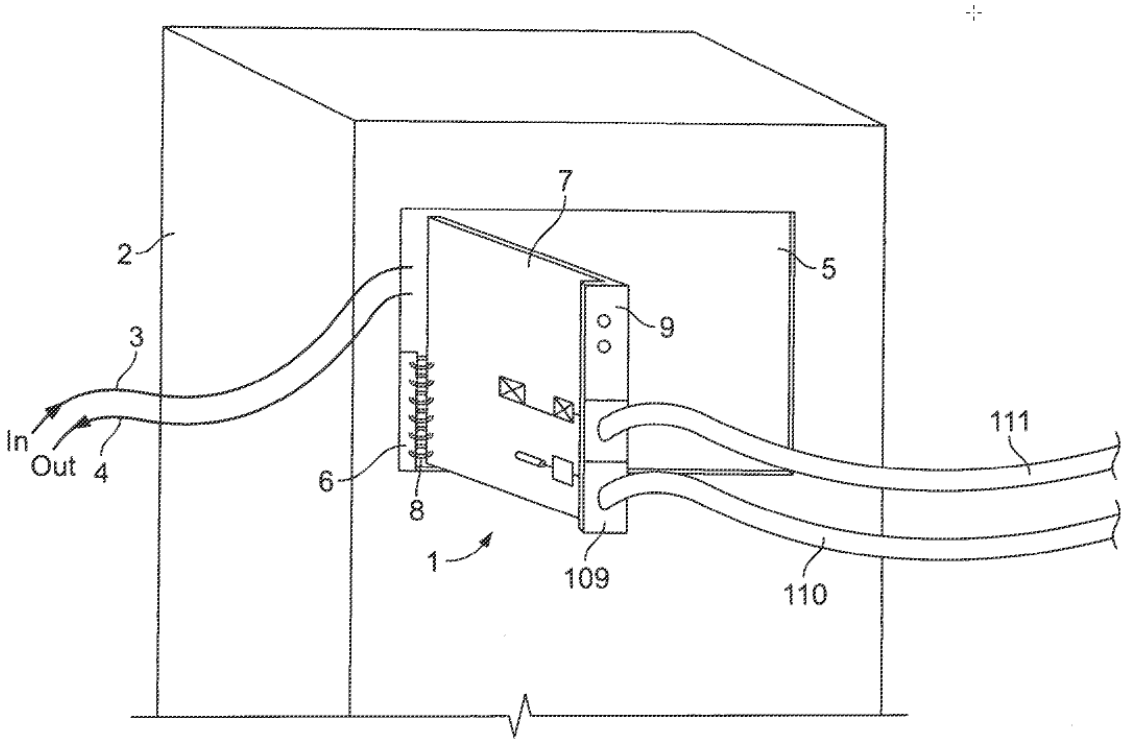


FIG. 1

Figure 1 is a schematic diagram of a transceiver card located in a telecommunications box. Ex. 1002, 4:1–2. An existing telecommunications box 2, for example a multiplexor, is refitted to include transceiver card 1. *Id.* at 4:11–13. Transceiver card 1 includes faceplate 9 and backplane 7, which preferably is a printed circuit board. *Id.* at 4:22–23. Faceplate 9 has fiber connector 109 for connecting to output fiber 110 and input fiber 111. *Id.* at 4:26–28. "Alternately, a single fiber for inputting and outputting signals could be provided." *Id.* at 4:28–29.

Figure 2 of the challenged patent is reproduced below:

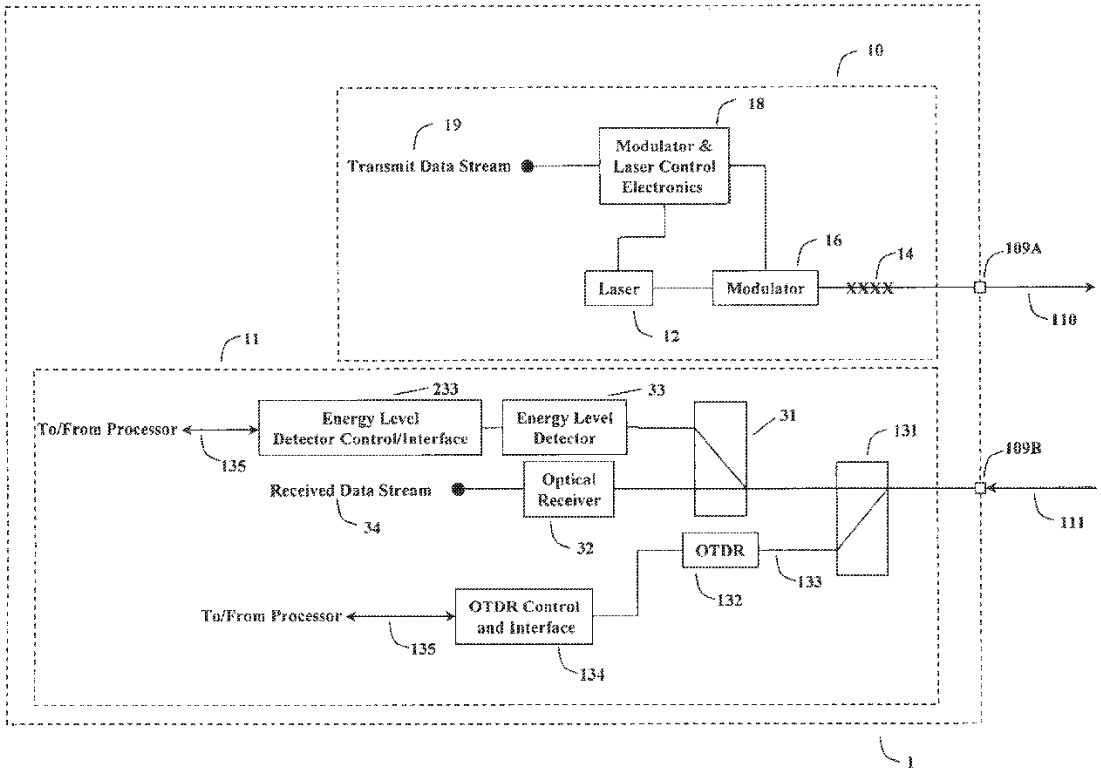


Figure 2

Figure 2 shows transceiver card 1 in more detail. Ex. 1002, 4:30–31. As indicated, transmitter 10 transmits signals over optical fiber 110 via output 109A. *Id.* at 4:31–32, Fig. 2. Transmitter 10 includes a single laser 12, for example a semiconductor laser emitting a narrow band of light at approximately 1550 nm, or at other wavelengths. *Id.* at 4:32–34. Light emitted from laser 12 passes through modulator 16, for example an amplitude or phase modulator, which is located next to or is a part of the same package as laser 12. *Id.* at 4:34–37. The light may be depolarized by depolarizer 14. *Id.* at 4:37–38. Electronic controller 18, preferably disposed on backplane 7, controls modulator 16. *Id.* at 4:38–40. Input data 19 is

provided to controller 18, which then controls modulator 16 to modulate the light from laser 12 as a function of input data 19. *Id.* at 4:41–43.

Optical signals are received from fiber 111 at input 109B of connector 109. Ex. 1002, 4:53–54, Fig. 2. Receiver 11 includes two coupler/splitters 31 and 131, each functioning as a splitter. *Id.* at 4:55–56. Splitter 131 splits off a portion of the received light and sends it into fiber 133 to be provided to OTDR 132 (optical time-domain reflectometer). *Id.* at 4:64–66. Splitter 31 then splits off a portion of the remaining light to direct a part of the optical energy into an energy level or tap detector 33 and sends the residual light to optical receiver 32. *Id.* at 4:66–5:2. Optical receiver 32 converts the optical signal to electronic form to yield received electronic data stream 34. *Id.* at 5:2–5.

Detector 33 monitors the light energy in fiber 111 via the light energy coupled to the detector by splitter 31. Ex. 1002, 5:11–12. If the amplitude drops during monitoring, which may indicate a tap, detector 33 provides an alert and can, for example, send an electronic signal to the processor via bus 135 to indicate a drop or increase in the optical energy level, sound an alarm, or alert network maintenance personnel. *Id.* at 5:12–19. Energy level detector control circuit 233 controls the alarm threshold and energy detection and provides output indications from the energy detection circuit to a processor via bus 135, which may be shared with OTDR control circuit 134. *Id.* at 5:11–24.

Figure 3 of the challenged patent is reproduced below:

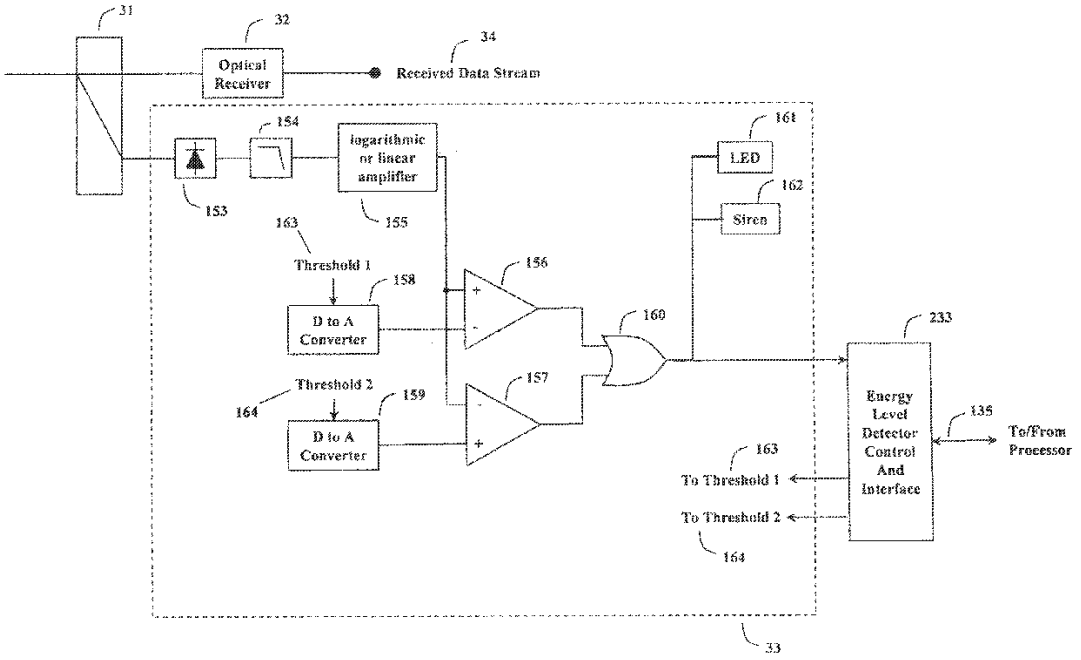


Figure 3

Figure 3 shows energy level detector 33 in more detail. Ex. 1002, 5:25–26. As indicated, photodetector 153 measures the optical signal coupled to the input of energy level detector 33 by coupler/splitter 31. *Id.* at 5:31–33. The output of photodetector 153 is an electrical voltage whose level correlates to the optical power at the input to photodetector 153. *Id.* at 5:33–37. The electrical signal may be conditioned and scaled by either a logarithmic or linear amplifier 155. *Id.* at 5:42–44. The electrical signal, after being scaled by the linear or logarithmic amplifier 155, is compared to reference voltages by comparators 156 and 157. *Id.* at 5:60–6:5. The outputs of comparators 156 and 157 are provided to OR gate 160. *Id.* at Figure 3. An alarm state exists when OR gate 160 is high. *Id.* at 6:5–6.

D. Illustrative Claim

Of the challenged claims, claim 14 is the sole independent claim, and is reproduced below:

> 14. A transceiver card for a telecommunications box for transmitting data over a first optical fiber and receiving data over a second optical fiber, the transceiver card comprising:
>
> a transmitter having a laser, a modulator, and a controller configured to receive input data and control the modulator to generate a first optical signal as a function of the input data;
>
> a fiber output optically connected to the transmitter and configured to optically connect the first optical fiber to the transceiver card;
>
> a receiver configured to receive a second optical signal from the second optical fiber and to convert the second optical signal to output data;
>
> a fiber input optically connected to the receiver and configured to optically connect the second optical fiber to the transceiver card; and
>
> an energy level detector configured to measure an energy level of the second optical signal, the energy level detector including a threshold indicating a drop in amplitude of the second optical signal.

E. Real Parties in Interest

Petitioner identifies Cisco Systems, Inc.; Lumentum Holdings, Inc.; Lumentum Operations LLC.; Lumentum Inc.; Oclaro Technology Ltd.; Prota Merger Sub, Inc.; and Oclaro, LLC, as real parties in interest. Paper 28. Patent Owner identifies Oyster Optics, LLC, as a real party interest. Paper 6, 2.

II. DISCUSSION

A. Whether this Proceeding Must be Dismissed on the Basis that the Partial Institution was Unlawful

Patent Owner argues: "The Board's partial institution decision (Paper 11) was unlawful under 35 U.S.C. § 314, and the Board cannot correct that unlawful order by issuing an unauthorized Order (Paper 14) attempting to modify the institution decision outside of the statutory period for issuing institution decisions." PO Resp. 13. Patent Owner asserts:

> First, the Board's "modification" of its prior institution decision improperly attempts to address, without the statutorily-mandated rulemaking, how to govern a proceeding covering all challenged claims, including those challenged claims for which a petitioner fails to establish a reasonable likelihood of prevailing. Second, the Board lacks authority to modify an unlawful institution decision once the statutory timeframe for issuing an institution decision has expired.

Id. For those reasons, Patent Owner asserts the issuance of a final written decision in this case would be improper and seeks dismissal of the Petition. *Id.* at 18. For the reasons discussed below, we reject both aspects of Patent Owner's reasoning and decline to dismiss the Petition on these bases.

1.

In the Decision on Institution, we determined that Petitioner demonstrated a reasonable likelihood of prevailing on some claims and grounds, but did not demonstrate a reasonable likelihood of prevailing on other claims and grounds. We are not persuaded by Patent Owner's argument that, absent promulgation of new rules, we are precluded from reaching a final written decision with respect to the claims and grounds for which Petitioner was determined to not have presented a reasonable likelihood of success at the time of institution of review. The current rules

already cover the situation in which, at the time of institution of review, the Board determines that there are claim(s) and ground(s) for which the Petitioner has not shown a reasonable likelihood of prevailing at trial.

Specifically, Patent Owner cites 37 C.F.R. § 42.108(a) (2016), which allowed the Board to "authorize the review to proceed on all or some of the challenged claims and on all or some of the grounds of unpatentability asserted for each claim," and 37 C.F.R. § 42.108(b) (2016), which allowed the Board to "'deny some or all grounds for unpatentability for some or all of the challenged claims' prior to institution of *inter partes* review." PO Resp. 14. Patent Owner further cites 37 C.F.R. § 42.108(c), which provides: "*Inter partes* review shall not be instituted for a ground of unpatentability unless the Board decides that the petition supporting the ground would demonstrate that there is a reasonable likelihood that at least one of the claims challenged in the petition is unpatentable."

None of these referenced parts of 37 C.F.R. § 42.108 requires exclusion of any claim or ground from an instituted proceeding—including those for which the Board has determined that Petitioner has not shown a reasonable likelihood that it would prevail in establishing unpatentability. Thus, the rules that were in effect at the time of institution of review in this proceeding already covered the situation in which the trial includes challenged claims and corresponding grounds of unpatentability for which the Petitioner has not shown a reasonable likelihood of prevailing.

Patent Owner further notes:

> In implementing these final rules, the Agency stated, "The Board will identify the grounds upon which the review will proceed on a claim-by-claim basis. Any claim or issue not included in the authorization for review is not part of the review." *See* 77 Fed.

> Reg. 48,689. Indeed, the Agency specifically stated that the regulation ***did not adopt*** comments requesting that "all challenged claims to be included in the *inter partes* review when there is a reasonable likelihood of prevailing with respect to one challenged claim." *See* 77 Fed. Reg. 48,702–03.

PO Resp. 15. As is the case with 37 C.F.R. § 42.108, however, such statements do not indicate the Board is *prohibited* from including all challenged claims in the *inter partes* review—including when a petitioner shows a reasonable likelihood of success at trial with respect to just some (or even only one) of the challenged claims and just some (or even only one) of the asserted grounds of unpatentability. *See, e.g.*, *FMC Techs., Inc. v. OneSubsea IP UK Ltd.*, Case IPR2016-00378, 2016 WL 5219870 (PTAB June 30, 2016) (instituting review "on all the challenged claims and on all of the asserted grounds, as raised in the Petition," upon finding a reasonable likelihood of success with respect to one claim).

In short, Patent Owner asserts that in the circumstances of this case, issuing a final written decision on all challenged claims and grounds identified in the Petition is "contrary to and specifically rejected by the regulations promulgated by the Agency to govern *inter partes* review," and that the Board may not depart from those regulations. PO Resp. 16. According to Patent Owner, issuing a final written decision here would be improper. *Id.* at 18. For reasons discussed above, we disagree with and reject Patent Owner's contention that issuing a final written decision with respect to all challenged claims and grounds identified in the Petition, where the panel preliminarily determines that Petitioner has failed to show a

reasonable likelihood of success in prevailing as to some grounds, is contrary to regulation.

2.

We are not persuaded that the statutory due date under 35 U.S.C. § 314(b) for determining whether to institute an *inter partes* review was violated in this proceeding.

Patent Owner asserts that under 35 U.S.C. § 314(b), the due date for determining whether to institute *inter partes* review is three months from the date of filing of a preliminary response, if a preliminary response has been filed; or, if no preliminary response has been filed, then three months from the last date on which such a preliminary response may be filed. PO Resp. 14. We agree with Patent Owner's articulation of the due date for the Board to determine whether to institute *inter partes* review. We also agree with Patent Owner that in this case, because Patent Owner filed a preliminary response on November 28, 2017 (Paper 7), the due date for the Board to determine whether to institute review was February 28, 2018. *Id.*

According to Patent Owner, however, the Board's complete determination of whether to institute an *inter partes* review did not occur until May 7, 2018 (Paper 14). PO Resp. 17. Patent Owner explains:

> The Board's Institution Decision (Paper 11) issued on February 27, 2018, but this Institution Decision partially instituted in a manner that the Supreme Court has confirmed was not in accordance with law. *SAS*, 138 S.Ct. 1348, 1355 ("The Director's claimed 'partial institution' power appears nowhere in the text of § 318 or anywhere else in the statute for that matter.") The Board's modification Order (Paper 14) attempted to bring

> the content of the Board's Institution Decision into compliance with § 314(a), but the modification Order also fails to comport with the governing statute by violating the mandatory timing of institution decisions, 35 U.S.C. § 314(b).

Id. at 14.

We determine that Patent Owner's contention is misplaced because the question decided by the Supreme Court in *SAS* was not whether a partial institution decision was null and void, as though the Board never determined whether to institute an *inter partes* review, but whether the Board must issue a final written decision with respect to the patentability of every patent claim challenged by a petitioner. In *SAS*, the Supreme Court framed the issue before it this way:

> When the Patent Office initiates an inter partes review, must it resolve *all* of the claims in the case, or may it choose to limit its review to only *some* of them? The statute, we find, supplies a clear answer: the Patent Office must "issue a final written decision with respect to the patentability of *any* patent claim challenged by the petitioner." 35 U.S.C. § 318(a) (emphasis added). In this context, as in so many others, "any" means "every." The agency cannot curate the claims at issue but must decide them all.

SAS, 138 S. Ct. at 1353. We recognize that the Supreme Court explained: "The Director, we see, is given only the choice 'whether' to institute an inter partes review. That language indicates a binary choice—either institute review or don't." *Id.* But that is not a holding that the Board's institution decision in *SAS* was null and void. Rather, the Court in *SAS* simply recognized that the Board instituted review, but incorrectly limited the scope of the review. *SAS* did not preclude a scope correction by the Board, including where the time of correction is after the due date for the Board to decide whether to institute review. Similarly, the Federal Circuit,

subsequent to the Supreme Court's decision in *SAS* and for the Board proceeding underlying *SAS*, did not vacate the Board's initial institution decision in that proceeding. *SAS Institute, Inc. v. ComplementSoft, LLC*., 2015-1346, Order, D.I. 89 at 1–2 (Fed. Cir. June 18, 2018); *see also AC Techs. S.A. v. Amazon.com, Inc.*, 912 F.3d 1358, 1365 (Fed. Cir. 2019) ("[N]either § 314(b)'s timing requirements nor § 314(d)'s limits on appealability alter the Board's statutory obligation to rule on all claims and grounds presented in the petition.") (citing *SAS*, 138 S. Ct. at 1356).

Here, the Board's decision on whether to institute review (Paper 11) was issued on February 27, 2018. The subsequent order (Paper 17) correcting the scope of review, dated May 7, 2018, did not change the fact that the Board decided on February 27, 2018 to institute review.

B. Level of Ordinary Skill in the Art

An ordinarily skilled artisan is a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC, Inc*., 57 F.3d 1573, 1579 (Fed. Cir. 1995). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *Id.* The prior art of record can also reflect the level of ordinary skill in the art. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

In a declaration submitted with the Petition, Petitioner's expert, Daniel Blumenthal, Ph.D., testifies that an ordinarily skilled artisan would have a Bachelor of Science Degree in Electrical Engineering or a related field and have at least five years of experience in designing optical transmission systems, or would have a Master of Science in Electrical

Engineering or a related field. Ex. 1003 ¶ 33. In our Institution Decision, we adopted this definition by Dr. Blumenthal with the modification of changing "at least five years of experience" to "five years of experience," thereby closing an otherwise open range of experience. Inst. Dec. 15 n. 5.

In a declaration submitted with Patent Owner's Response, Patent Owner's expert, Keith Goossen, PhD., testifies that another modification should be made. Ex. 2026 ¶ 25. Dr. Goossen testifies that merely having a Master of Science degree in Electrical Engineering would not provide an individual with ordinary skill because: "An M.S. in Electrical Engineering can be completed without taking any optical transmission systems courses." Ex. 2026 ¶ 25. According to Dr. Goossen, to have ordinary skill, a person having fewer than five years of experience in designing optical transmission systems would need to have an Master of Science in Electrical Engineering[3] and to have taken extensive coursework in optical transmission systems. *Id.*

In the Reply and in the accompanying supplemental declaration by Dr. Blumenthal (Ex. 1039), neither Petitioner nor Dr. Blumenthal dispute the modification made in the Institution Decision or the modification that Dr. Goossen proposes. In the Patent Owner Response, Patent Owner similarly does not dispute the modification made in the Institution Decision. Having

[3] Dr. Goossen addresses Dr. Blumenthal's inclusion of a M.S. in Electrical Engineering in the definition of the level of skill in the art, but does not address Dr. Blumenthal's inclusion of M.S. degrees in related fields. Ex. 2026 ¶ 25. Because Dr. Goossen did not object to Dr. Blumenthal's inclusion B.S. degrees in related fields, we surmise that he did not intend to exclude M.S. degrees in related fields from the definition of level of skill in the art. *Id.* Our analysis in this Decision, however, would not be affected by the inclusion or exclusion of M.S. degrees in related fields from the definition of the level of skill in the art in this case.

reviewed the prior art asserted in this proceeding and having considered the testimony by both declarants, we adopt Dr. Blumenthal's definition as modified by the Institution Decision and Dr. Goossen's proposal. Therefore, we find that an ordinarily skilled artisan would have a Bachelor of Science Degree in Electrical Engineering or a related field and five years of experience in designing optical transmission systems, or would have a Master of Science in Electrical Engineering or a related field with extensive coursework in optical transmission systems. Our analysis in this Decision, however, would be the same if we were to apply Dr. Blumenthal's original, unmodified definition or that definition with just Dr. Goossen's proposed modification.

C. Claim Construction

In an *inter partes* review where (as here) the petition was filed before November 13, 2018, claims of an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b) (2017).[4] Consistent with the broadest reasonable construction standard, claim terms are presumed to have their ordinary and customary meaning as understood by one of ordinary skill in the art in the context of the entire patent disclosure at the time of the invention. *In re Translogic Tech.*, Inc., 504 F.3d 1249, 1257 (Fed. Cir. 2007). An inventor may provide a meaning for a term that is

[4] A recent amendment to this rule does not apply here because the Petition was filed on July 27, 2017. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340; 51,340 (Oct. 11, 2018).

different from its ordinary meaning by defining the term in the specification with "reasonable clarity, deliberateness, and precision." *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). But limitations are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). In addition, the Board may not "construe claims during an *inter partes* review so broadly that its constructions are unreasonable under general claim construction principles." *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015). Finally, only terms which are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *Vivid Techs., Inc. v. Am. Sci. & Eng'g. Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

In the Petition, Petitioner does not propose a construction for any claim term. Instead, Petitioner merely proposes that the challenged claims "should each be construed according [to] the broadest reasonable interpretation in view of the specification." Pet. 23. In its Preliminary Response, Patent Owner does not propose construing any claim term. Prelim. Resp. 14–15. In our Institution Decision, we construed the phrase "laser having a transmitter" and determined the preamble of claim 14 was limiting. Inst. Dec. 12–14. For this Decision, we do not need to construe the phrase "laser having a transmitter" because the dispositive issues addressed in this Decision regarding the asserted obviousness of claim 14 do not involve that limitation. We need only determine whether the recitations of "a transceiver card," "a first optical fiber," and "a second optical fiber" in the preamble are limiting. To make the subsequent analysis more readable, however, we also address whether the first and second optical fibers are

separate receive and transmit fibers, even though the parties do not dispute that issue.

1. The Preamble Recitations of a Transceiver Card, a First Optical Fiber, and a Second Optical Fiber Are Claim Limitations

In our Institution Decision, we determined that the preamble of claim 14 was limiting. Inst. Dec. 14. We noted that both the Petitioner in the Petition and the Patent Owner in the Preliminary Response treat the preamble of claim 14 as limiting. *Id.* at 14. We also explained that the terms "a transceiver card," "a first optical fiber," and "a second optical fiber" in the preamble, respectively, provide antecedent bases for the terms "the transceiver card," "the optical fiber," and "the second optical fiber" in the body of claim 14. *Id.*

Following institution, in its Patent Owner Response, Patent Owner argues that we should reach the same conclusion for this Decision. PO Response 12–13. Patent Owner asserts that both parties treat the recitations in the preamble of claim 14 as limitations. *Id.* at 12. Further, Patent Owner argues that the terms "a transceiver card," "a first optical fiber," and "a second optical fiber" provide antecedent bases for elements in the body of claim 14. *Id.* Thus, Patent Owner asserts that we should at least construe the recitations of "a transceiver card," "a first optical fiber," and "a second optical fiber" in the preamble to be claim limitations. PO Response 12–13. In its Reply, Petitioner presents no arguments or evidence against construing these terms as limitations and does not dispute that it treated the recitation of these terms as limiting. Pet. Reply, *passim.*

"[W]hether to treat a preamble as a claim limitation is determined on the facts of each case in light of the claim as a whole and the invention described in the patent." *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952

(Fed. Cir. 2005) (quoting *Storage Tech. Corp. v. Cisco Sys., Inc.*, 329 F.3d 823, 831 (Fed. Cir. 2003)). If the body of the claim "sets out the complete invention," the preamble is not ordinarily treated as limiting the scope of the claim. *Schumer v. Lab. Computer Sys., Inc.*, 308 F.3d 1304, 1310 (Fed. Cir. 2002). But the preamble is limiting if it recites essential structure that is important to the invention or necessary to give meaning to the claim. *NTP, Inc. v. Research In Motion, Ltd.*, 418 F. 3d 1282, 1305–06 (Fed. Cir. 2005); *SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1284 n.2 (Fed. Cir. 2005). That means if the claim drafter "chooses to use both the preamble and the body to define the subject matter of the claimed invention, the invention so defined, and not some other, is the one the patent protects." *Bicon*, 441 F.3d at 953 (quoting *Bell Commc'ns Research, Inc. v. Vitalink Commc'ns Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995) (emphasis omitted)). Further, when the limitations in the body of the claim "rely upon and derive antecedent basis from the preamble, then the preamble may act as a necessary component of the claimed invention." *Eaton Corp. v. Rockwell Int'l Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003).

Here, both parties treat the preamble of claim 14 as limiting. Pet. 29–31; PO Resp. 12–13. And neither party disputes our conclusion in the Institution Decision, which we repeat here, that "a transceiver card," "a first optical fiber," and "a second optical fiber," respectively, provide antecedent bases for the terms "the transceiver card," "the optical fiber," and "the second optical fiber" in the body of claim 14. Inst. Dec. 14. Further, Patent Owner argues that we should construe at least the terms "a transceiver card," "a first optical fiber," and "a second optical fiber" as limitations, and Petitioner provides no reason not to. PO Response 12–13; Pet. Reply,

passim. Accordingly, we construe the recitations of "a transceiver card," "a first optical fiber," and "a second optical fiber" in the preamble of claim 14 as claim limitations. Because it is not necessary for this Decision to address whether the recitation of "a communications box" is also a limitation, we decline to address that issue in this Decision.

2. The Recited First and Second Optical Fibers Are Separate Transmit and Receive Fibers

Patent Owner asserts that the first and second optical fibers recited by claim 14 must be separate transmit and receive fibers. PO Resp. 21. Petitioner does not dispute this assertion. Pet. Reply, *passim*. Petitioner, in fact, relies only on separate receive and transmit fibers for its showing of obviousness. Pet. 30–31 ("a first optical fiber (i.e., Ade's 'optical fiber 48') and . . . a second optical fiber (i.e., Ade's 'a separate fiber')."), cite omitted; Pet. 57–58 ("As described above with reference to Ground 1, Ade discloses the remaining aspects of Element 14[p]."). Therefore the parties do not dispute that the first and second optical fibers recited by claim 14 must be separate receive and transmit fibers.

For clarity, we, nevertheless, address why we agree with Patent Owner that the first and second optical fibers recited by claim 14 must be separate receive and transmit fibers. In particular, the parties dispute whether an ordinarily skilled artisan would have combined Corke and Ade to yield separate transmit and receive fibers, rather than merely a bidirectional fiber that would both transmit and receive signals. PO Resp. 21–32; Pet. Reply 3–9. Although Petitioner does not argue that a bidirectional fiber disclosed in Corke or Ade would constitute the recited first and second optical fibers, to avoid any mistaken impression that such a fiber could, we address why it could not.

Claim 14 itself specifies that the first optical fiber is for transmission, reciting "*transmitting* data over a *first optical fiber*" and "a fiber output optically connected to the *transmitter* and configured to optically connect the *first optical fiber* to the transceiver card." Similarly, claim 14 indicates that the second optical fiber is for reception, reciting "*receiving* data over a *second optical fiber*," "a receiver configured to *receive* a second optical signal from the *second optical fiber*," and "a fiber input optically connected to the *receiver* and configured to optically connect the *second optical fiber* to the transceiver card."

The specification of the challenged patent similarly teaches that, with two optical fibers, one is for transmission and the other is for reception. In particular, the specification describes a fiber for outputting signals from the transceiver card (output fiber 110) and a fiber for inputting signals to the transceiver card (input fiber 111). Ex. 1002, 4:26–28. Transmitter 10 "transmits signals over optical fiber 110." *Id.* at 4:31–32. And "[o]ptical signals are received at connector 109 from fiber 111." *Id.* at 4:53–54.

Further, claim 14 separately recites the first and second optical fibers, which indicates the fibers are distinct. When "a claim lists elements separately, 'the clear implication of the claim language' is that those elements are 'distinct component[s]' of the patented invention." *Becton, Dickinson & Co. v. Tyco Healthcare Grp.*, 616 F.3d 1249, 1255 (Fed. Cir. 2010) (quoting *Gaus v. Conair Corp.*, 363 F.3d 1284, 1288 (Fed. Cir. 2004)); *see also Regents of Univ. of Minnesota v. AGA Med. Corp.*, (holding that recited first and second disks are separate disks); *Engel Indus., Inc. v. Lockformer Co.*, 96 F.3d 398 (Fed. Cir. 1996) (holding that a "second portion" and a "return portion," "logically cannot be one and the same").

And there is no other recitation in claim 14 or any of its dependent claims that indicates the first and second optical fiber can be the same fiber. *CAE Screenplates, Inc. v. Heinrich Fiedler GmbH & Co.*, 224 F.3d 1308, 1317 (Fed. Cir. 2000).

The specification of the challenged patent also indicates that the first and second optical fibers are distinct by disclosing that a single fiber that both transmits and receives signals is an alternative to first and second optical fibers, rather than constituting those fibers. Ex. 1002, 4:28–29. In particular, after describing first and second optical fibers (output fiber 110 and input fiber 111), the specification states: "*Alternately*, a single fiber for inputting and outputting signals could be provided." *Id.* (emphasis added).

In light of Patent Owner's undisputed assertion that the recited first and second optical fibers are separate transmit and receive fibers, the language of claim 14, and the specification of the challenged patent, we agree with Patent Owner that first and second optical fibers are separate transmit and receive fibers.

D. The Burden of Proof

To prevail in challenging Patent Owner's claims, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). "In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes review* petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l*

Graphics, Inc., 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in an *inter partes review*). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing "mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

E. The Law on Obviousness

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) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). One seeking to establish obviousness must articulate sufficient reasoning to support the conclusion of obviousness. *See In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) ("To satisfy its burden of proving obviousness, a petitioner . . . must . . . articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness." (citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007))). Prior art references must be "considered together with the knowledge of one of ordinary skill in the pertinent art." *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (citation omitted). Also, "it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." *In re Preda*, 401 F.2d 825, 826 (CCPA 1968). Further, although common sense, common wisdom, and common knowledge may be properly considered in an obviousness analysis, they "cannot be used as a wholesale substitute for

reasoned analysis and evidentiary support, especially when dealing with a limitation missing from the prior art references specified." *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361–62 (Fed. Cir. 2016).

F. Asserted Obviousness over Corke and Ade

1. Overview of Corke

Corke relates to optical communication monitoring and to a control device for connection with optical fibers. Ex. 1005, 1:11–13. Figures 1(a) and 1(b) of Corke are reproduced below:

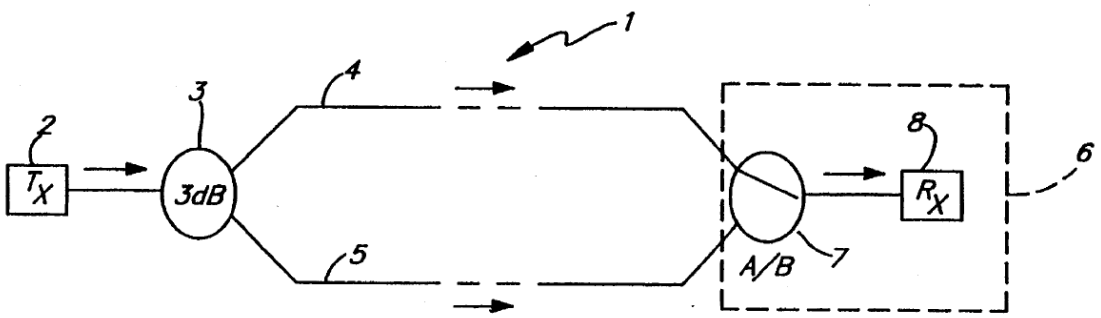


FIG. 1a

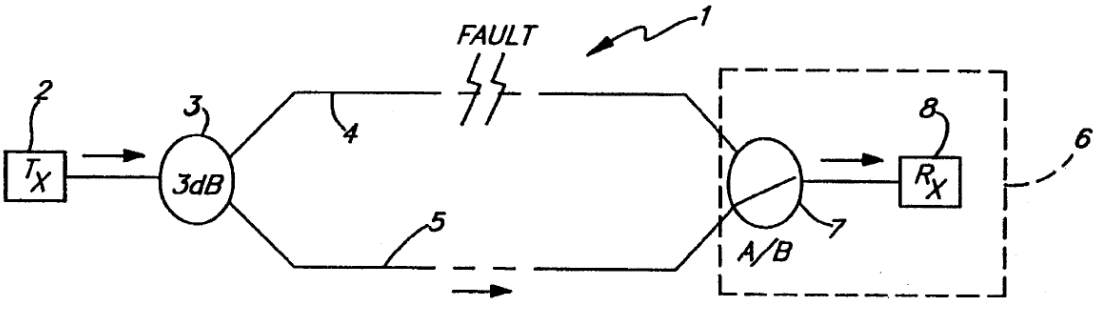


FIG. 1b

Ex. 1005, Figs 1(a), 1(b).

Figures 1(a) and 1(b) are schematic representations of optical communications system 1, which includes signal transmitter unit 2, 3dB coupler 3, primary optical fiber 4, secondary optical fiber 5, and communication and control device 6. Ex. 1005, 5:8–10, 36–46.

Communication and control device 6 includes switching means 7 that directs signals to receiver 8 from either primary optical fiber 4 or secondary optic fiber 5. *Id.* at 5:46–49.

In both Figures 1(a) and 1(b), signal transmitter unit 2 transmits signals to 3dB coupler 3, which directs the signals onto both optical fibers 4 and 5. Ex. 1005, 5:38–44. Figure 1(a) shows system 1 in normal use, where both optical fibers 4 and 5 are operating correctly. *Id.* at 5:49–54. In that case, switch means 7 directs signals from primary optical fiber 4 to receiver 8. *Id.* Figure 1(b) shows system 1 when primary optical fiber 4 is faulty. *Id.* at 5:54–57. In that case, switch means 7 directs signals from secondary optical fiber 5 to receiver 8. *Id.* As illustrated, the communication along optical fibers 4 and 5 is unidirectional: traveling from the 3dB coupler to switch 7, not vice versa.

Figure 2 of Corke, which illustrates a preferred embodiment of communication monitoring and control device 6, is reproduced below:

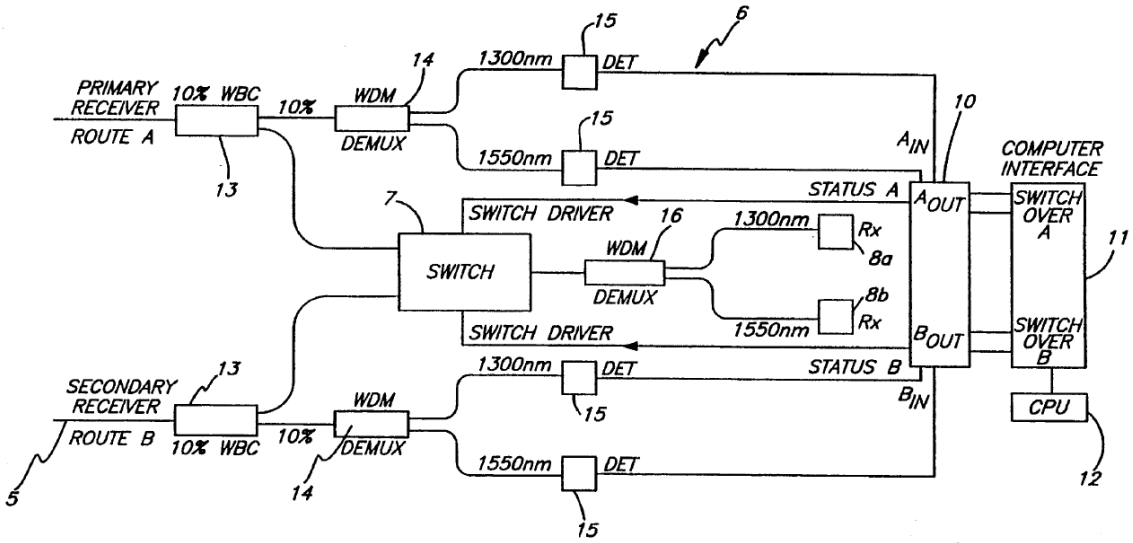


FIG. 2

Ex. 1005, Fig. 2, 5:61–63.

As shown in Figure 2, communication monitoring and control device 6 includes control circuit 10, tap couplers 13, wave division demultiplexers 14, photodetectors 15, and wave division demultiplexer 16. Ex. 1005, 6:1–21. Tap couplers 13 connect the device to respective primary and secondary optical fibers labeled as "PRIMARY RECEIVER" for "ROUTE A" and "SECONDARY RECEIVER" for "ROUTE B." *Id.* at Fig. 2. In this embodiment, each of the incoming optical fibers is tapped by a corresponding tap coupler to direct ten percent of the incoming light to a corresponding demultiplexer 14, which outputs 1300 nm and 1550 nm demultiplexed signals to associated photodetectors 15. *Id.* at 6:3–16. Each tap coupler 13 directs ninety percent of the light from its associated incoming optical fibers to switch 7, which is a single pole, double throw optical switch. *Id.* at 5:63–64, 6:16–21. The output of switch 7 is connected to demultiplexer 16, which provides 1300 nm and 1550 nm demultiplexed signals to receivers 8a and 8b, respectively. *Id.*

Tap couplers 13 continuously divert ten percent of the incoming signals to detectors 15, so that both the primary and secondary incoming optical fibers are monitored continuously at each wavelength independently. Ex. 1005, 6:22–26. If both optical fibers are in "good condition," control circuit 10 defaults to controlling switch 7 to direct signals of the primary optical fiber to receivers 8a and 8b. *Id.* at 6:26–29. If a fault occurs in the primary optical fiber, as detected by a sufficient drop in intensity at a corresponding detector, and if sufficient signal intensity is detected on the secondary optical fiber, control unit 10 causes switch 7 to direct signals from the secondary optical fiber to receivers 8a and 8b. *Id.* at 6:30–40.

Figure 3 of Corke is reproduced below:

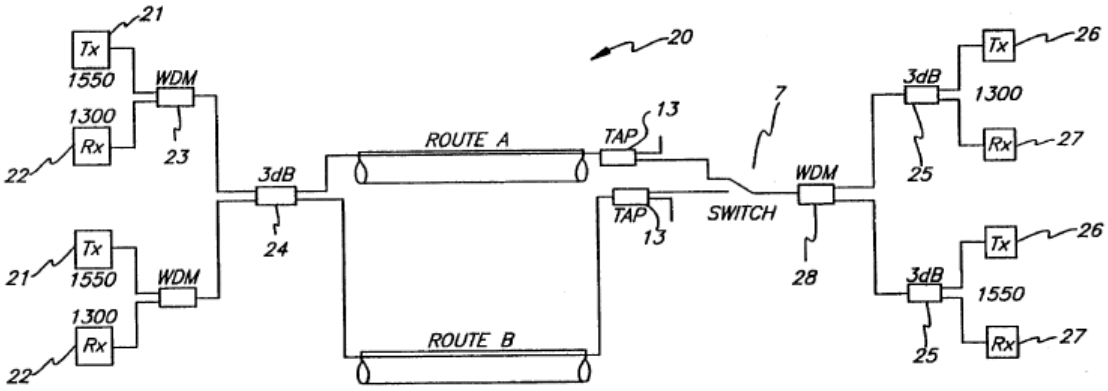


FIG. 3

Figure 3 illustrates an alternative embodiment of a communications system incorporating Corke's invention. Ex. 1005, 5:14–16. As shown, in this embodiment, transmit ports 21 and receive ports 22 are on one end of system 20. *Id.* at 7:59–60. The other end contains both transmit ports 26 and receive ports 27. *Id.* at 7:63–65. Routes A and B lie between the two ends of this system. *Id.* at 7:61–63. Corke notes that the "use of the few added components" in system 20 "allows the system 20 to be used for route-protected bi-directional communications." *Id.* at 7:65–67.

Figure 4 of Corke is reproduced below:

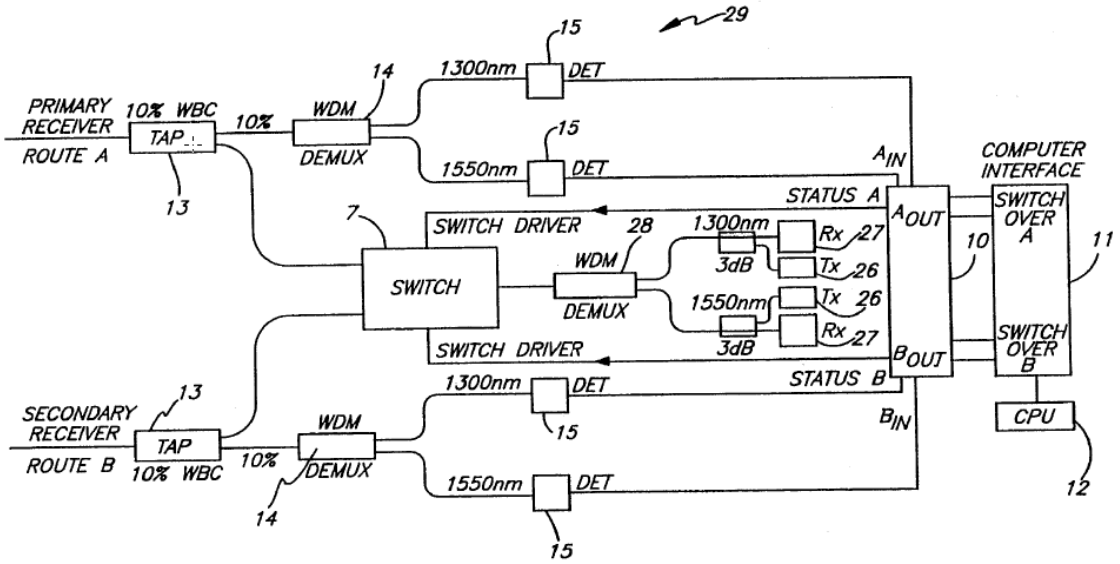


FIG. 4

Figure 4 illustrates another alternative embodiment of Corke's optical communication control device (29) for use in system 20. Ex. 1005, 5:17–19. As shown, device 29 is similar to device 6 of Figure 2, with the exceptions that device 29 contains transmit circuits 26 (in addition to receive circuits 27) and additional 3 db couplers for bidirectional communication. *Id.* at 8:5–10.

2. Overview of Ade

Ade is directed to an integrated transceiver, i.e., transmitter and receiver formed on a common substrate. Ex. 1024, 1:17–19. Specifically, Ade states:

> According to the present invention, an integrated optical receiver/transmitter (transceiver) employs a substrate made from a III-V category semiconductor material; a waveguide modulator is fabricated above the substrate, is responsive to a modulation signal, receives input light, and provides a modulated transmit light along a first integrated rib (or channel) waveguide; a waveguide-integrated photodetector is fabricated above the

> substrate to detect receive[d] light propagating along a second integrated rib waveguide and to provide a receive signal indicative of the intensity of the receive light.

Id. at 2:6–17.

Figure 1 of Ade is reproduced below:

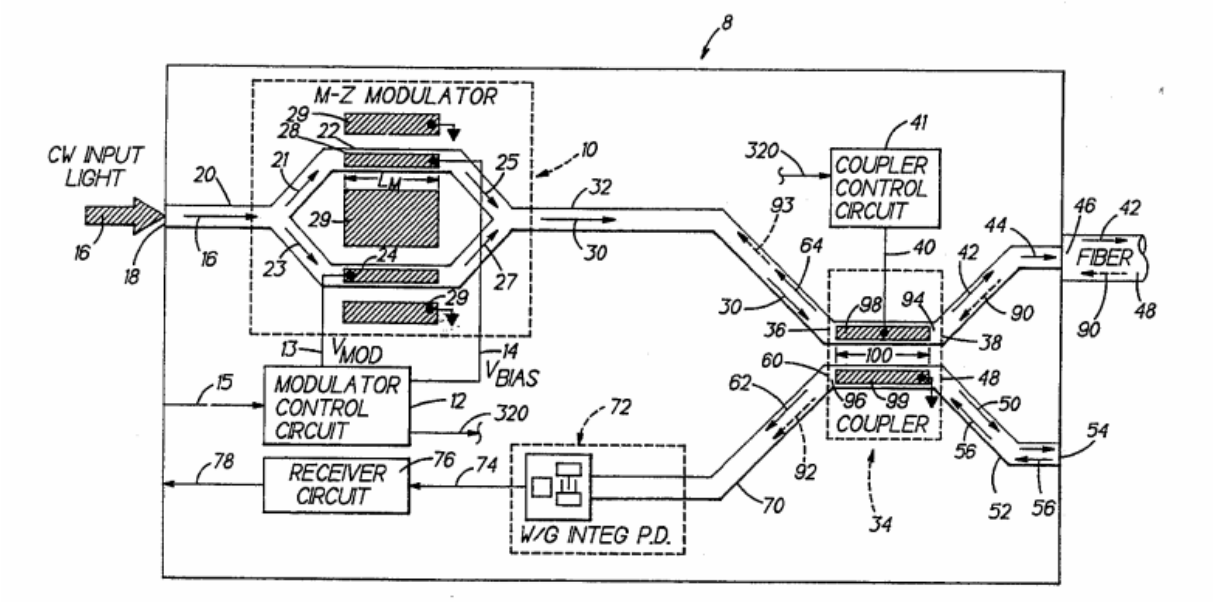


Figure 1 illustrates a top view of an optical-electronic integrated circuit transceiver according to Ade. Ex. 1024, 3:8–10. Integrated optical receiver/transmitter (transceiver) 8 includes waveguide modulator (transmitter) 10, which is driven by modulator control circuit 12 on lines 13 and 14 in response to an input signal on line 15 from a source off the transceiver chip. *Id.* at 3:62–68. Ade states: "The Mach-Zehnder waveguide-modulator [transmitter] 10 receives continuous wave (cw) input light 16 from an external source, e.g., a laser (not shown)." *Id.* at 4:3–5. "The light 16 enters the device at an input port 18 and travels along a strip loaded waveguide 20" to modulator 10. *Id.* at 4:5–11. Modulator 10 phase modulates the incoming light and provides phase-modulated light waves 25 and 27 on waveguide arms 22 and 24. *Id.* at 4:28–31. Phase-modulated

light waves 25 and 27 are recombined to form modulated optical signal 30 which travels along waveguide 32 to port 36 of coupler 34. *Id.* at 4:32–35. Despite providing phase-modulated light waves 25 and 27, M-Z modulator 10 performs "an exemplary amplitude modulation scheme." Ex. 1003 ¶ 101; *see also* Ex. 2026 ¶ 52 ("Ade relies on amplitude modulation."); Ex. 1024, 7:35–44. With regard to transmitting optical signal 30, Ade describes:

> When the coupler 34 is in a first (or "bar") state, it couples a predetermined percentage (e.g., 75%) of the modulated light 30 to a port 38, in response to a coupler signal on a line 40 (discussed hereinafter) from a coupler control circuit 41, which exits the port 38 as coupled modulated light 42. The light 42 from the port 38 travels along a rib waveguide 44 to a transceiver output port 46 where the light 42 is transmitted from (exits) the transceiver.

Ex. 1024, 4:38–49.

Ade further describes that "[a]n optical fiber 48 is attached to the output port 46 in a known way and allows the coupled modulated (transmit) light 42 to propagate to a distant location from the transceiver." Ex. 1024, 4:38–46. And optical fiber 48 also receives light: "Receive light 90 traveling along the optical fiber 48 enters the transceiver 8 at the port 46 and travels along the rib waveguide 44 to the port 38 of the coupler 34." *Id.* at 4:38–49.

With regard to receiving light, Ade further describes:

> When the coupler 34 is operating in a second (or "cross") state, the coupler 34, couples a predetermined percentage (e.g., 75%) of the light 90 from the port 38 "across" to the port 60, in response to the coupler signal on the line 40 (discussed hereinafter), which exits as light 92. The light 90 travels along the rib waveguide 70 to the optical detector 72 which provides signals having a magnitude indicative of the light 92 incident thereon, on the line 74 to the receiver circuit 76.

Id. at 5:8–19.

Ade describes further that when the transceiver is in a "receive mode," coupler 34 is placed in the "cross" state to allow receive light 90 to be received by optical detector 72. *Id.* at 5:55–58. In addition, Ade describes that when the transceiver is in a "transmit mode," coupler 34 is placed in the "bar" state to allow modulated light 30 from modulator 10 to be coupled to output port 46. *Id.* at 5:58–62.

Ade also describes an embodiment in which separate optical fibers are used for transmitting data and receiving data. Ex. 2024, 16:24–33. The parties term this "Ade's two-fiber embodiment." Pet. 19-20; PO Resp. 24; Ex. 1003 ¶ 61. In this two-fiber embodiment, transmitted light exits port 46, and received light enters through port 54, via optical fiber 48 and a separate optical fiber, respectively. Ex. 1024, 16:24–33; Ex. 1003 ¶ 61.

3. Analysis of Claim 14

As described below, first, Petitioner does not provide a sufficient rationale for combining Ade's first and second optical fibers with Corke's optical power detectors. Second, although Petitioner proposed, at oral argument, a modification to the prior art and a different rationale for that modification, we find that Petitioner did not fairly present that rationale in the Petition, and that even if we were to consider it, Petitioner's rationale for that modification is not sufficient. Third, Petitioner has not proved that its proposed combination of Corke and Ade would yield an energy level detector indicating a drop in amplitude, as recited by claim 14. Accordingly, for the reasons discussed below, we find Petitioner has not proved that Corke and Ade would render claim 14 obvious.

a. Petitioner does not provide a sufficient rationale for combining Ade's first and second optical fibers with Corke's optical power detectors

Petitioner proposes combining Ade's transmitters and receivers with Corke's device containing optical power detectors by modifying Corke's device with Ade's transceiver: "it would have been obvious to combine Ade's transceiver with Corke's 'device.'" Pet. 30. As Petitioner states, "The proposed combination . . . includes a single card with Corke's optical power detectors and Ade's receiver, transmitter, and modulator with control circuitry." Pet. 26. Petitioner maps Corke's optical power detectors and its associated control circuitry to the energy level detector recited by claim 14. Pet. 35 ("Corke's 'detector 15' and the associated control circuitry . . . is an energy level detector."). Petitioner's proposed combination also includes the two optical fibers from Ade's two-fiber embodiment: "Accordingly, the combination of Corke and Ade discloses a transceiver card (i.e., Ade's 'transceiver 8'), for a telecommunications box (i.e., Corke's housing with 'front/panel') for transmitting data over a first optical fiber (i.e., Ade's 'optical fiber 48') and receiving data over a second optical fiber (i.e., Ade's 'a separate fiber')." Pet. 30–31 (citing Ex. 1003 ¶ 150). Because Patent Owner does not dispute that fiber 48 and the separate optical fiber in Ade's two-fiber embodiment are the first and second optical fibers recited by claim 14, respectively, for brevity, we refer to those fibers as Ade's first and second optical fibers. PO Resp. 21–32.

Below, we first address the rationale provided in the Petition for combining Corke and Ade's teachings. Next, we address Patent Owner's arguments that an ordinarily skilled artisan would not want to make the proposed combination, and then we address the Petitioner's rebuttal to

Patent Owner's arguments, including an argument made at the oral hearing that we find was not made in the Petition and is insufficient in any event.

i. The Petition does not provide a sufficient rationale for combining Ade's first and second optical fibers with Corke's energy level detector

In the Petition, Petitioner does not provide a sufficient rationale for combining Ade's first and second optical fibers with Corke's optical power detectors. Although Petitioner explains why an ordinarily skilled artisan might be motivated to combine Ade's integrated transceiver and Corke's device with optical power detectors, Petitioner does not sufficiently explain why that artisan would also include Ade's first and second optical fibers in that combination.

In the Petition, Petitioner addresses Ade's integrated transceiver and Corke's device and explains: "A POSITA would have recognized that Corke's 'device' would benefit from combination with Ade's integrated transceiver." Pet. 26; *see also* Ex. 1003 ¶ 83. According to Petitioner, the known benefit of such a combination is that "implementing transmitters and receivers on the same card (rather than on separate cards) would reduce the total number of cards in a communications system, thereby reducing the cost and complexity of the system." Pet. 26 (citing Ex. 1003 ¶ 83). According to Petitioner, an ordinarily skilled artisan would have recognized that this reduction in cards would advantageously save space: "A POSITA would have recognized the benefits of including Corke's transmitter and receiver in a single physical device, such as a card (i.e., saving physical space by reducing the number of separate cards in a system)." Pet. 28.

Petitioner further asserts that the combination "would have been an obvious combination of prior art elements according to known methods to

yield only predictable results." Pet. 27. According to Petitioner, "[c]ombining a receiver and transmitter into a single card would have been obvious because there is no interaction between the transmitter and the receiver." *Id.* (citing Ex. 1003 ¶ 83). Dr. Blumenthal similarly testifies: "there is no synergy (or interaction) between the transmitter and receiver." Ex. 1003 ¶83.

Petitioner also argues that implementing Corke's device with Ade's integrated transceiver would have been obvious because, in combination on a single chip or card, Ade's transmitter and receiver with Corke's energy level detectors "do no more than they would in separate, sequential operation." Pet. 27–28. And Petitioner asserts that the proposed combination "would yield only predictable results (a single card that performs the same functions as Corke's devices 6 and 29)." *Id.* at 28–29. Dr. Blumenthal reaches the same conclusion. Ex. 1003 ¶ 83.

The above arguments by Petitioner and the above testimony by Dr. Blumenthal may explain why an ordinarily skilled artisan would have been motivated to combine Ade's integrated transceiver with Corke's optical power detectors, but they do not sufficiently explain why an ordinarily skilled artisan would have included Ade's first and second optical fibers. Petitioner presents no evidence that Ade's integrated transceiver inherently utilizes Ade's first and second optical fibers. To the contrary, as Petitioner admits, Ade discloses embodiments with a transceiver that do not use those fibers: "many of the example embodiments in Ade utilize a single bidirectional optical fiber that serves as both the input and the output."[5] Pet.

[5] With a bidirectional optical fiber, optical signals are transmitted in both directions along the fiber. Ex. 2026 ¶ 28. With a unidirectional fiber,

19; *see* also Ex. 1003 ¶ 61. The embodiment of Ade Figure 1, shown with coupler 32, does not use Ade's first and second optical fibers. Ex. 1024, Fig. 1 (optical fiber 48, surface 54, reflected light 56), 4:50–53.

Petitioner does not argue, or provide evidence showing, that its stated rationale of saving space by reducing cards and complexity would motivate an ordinarily skilled artisan to include Ade's first and second optical fibers in its proposed combination. Pet. 23–38. And we have no independent reason to believe that rationale would have motivated an ordinarily skilled artisan to include Ade's first and second fibers in that combination (i.e., we have no reason to believe that two fibers would consume less space than one fiber).

Although the Petition and the cited testimony of Dr. Blumenthal indicate that the transmitter and receiver do not interact with each other in Ade's two-fiber embodiment, neither the Petition nor Dr. Blumenthal explain why such a lack of interaction would have motivated a skilled artisan to use the two optical fiber embodiment. Pet. 27–29; Ex. 1003 ¶ 83. And such a reason or rationale is also not readily apparent. Petitioner proposes using both Ade's transmitter and receiver in its combination, so it is unclear why those devices would need to not interact with each other to be used for that combination.

Further, Petitioner has not shown that, even if an ordinarily skilled artisan were to use the transceiver from Ade's two-fiber embodiment, the ordinarily skilled artisan would have used Ade's first and second optical

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optical signals are transmitted in only a single direction along the fiber. *Id.* ¶ 29.

fibers in that combination. Pet. 23–38. One of Petitioner's annotated figures indicates that if the transmitters and receivers in Corke's device were to be replaced with other transmitters and receivers from Ade or another source, Corke's device would still have bidirectional optical fibers. *Id.* at 25. In the Petition at page 25, Petitioner presents an annotated version of Corke Figure 4, which shows Corke device 29 with transmitters and receivers. In that figure, Petitioner identifies Corke's transmitters and receivers and shades them red. *Id.* As shown, Petitioner identifies Rx 27, Tx 26, and two 3dB couplers as the receiver/transmitters. *Id.* And, as shown, replacing those components would not change the fiber input/output in that device. *Id.* Therefore, even after replacing the receivers/transmitters in that annotated figure with Ade's integrated transceiver from its two-fiber embodiment, the device would still use a single bidirectional optical fiber at the fiber input/output, rather than two optical fibers for connection to the transceiver card as recited by claim 14. Ex. 2026 ¶¶ 46–47.

Accordingly, we find that Petitioner in the Petition has not provided a sufficient rationale for combining Ade's first and second optical fibers with Corke's energy level detector.

ii. Patent Owner's evidence that an ordinarily skilled artisan would not have combined Ade's first and second optical fibers with Corke's device is persuasive

Citing the testimony of Dr. Goossen, Patent Owner provides reasons why an ordinarily skilled artisan would not have wanted to combine Ade's first and second optical fibers with Corke's device. PO Resp. 21–31. Dr. Goossen explains that it is typically less expensive to use one bidirectional fiber instead of two unidirectional fibers because one bidirectional fiber requires fewer components. Ex. 2026 ¶ 29. Further, Dr. Goossen testifies

that using Ade's first and second optical fibers would eliminate the safeguard in Corke's devices with transceivers of determining "if a fiber used for transmission is compromised by monitoring received signals over that fiber." *Id.* ¶ 45.

Corke discloses that in its embodiments with bidirectional communications (i.e., the embodiments with transceivers): "performance of a wave length moving in one direction through a route determines route quality for transmission in the other direction, as well." Ex. 1005, Abstr. As a result, Dr. Goossen testifies that because Corke's device monitors the received signals on a bidirectional fiber: "when a primary bidirectional fiber is damaged or severed, a node in Corke's system decides to switch to a secondary route for transmission and reception of optical signals based on the quality of received signals." Ex. 2026 ¶ 31 (citing Ex. 1005, 1:11–17, 5:42–44).

Dr. Goossen testifies that this advantage of determining the route for transmission based on the quality of the received signals would be lost in a combination, such as Petitioner's, with two unidirectional fibers because "there would be no direct monitoring by the transmitting node of any characteristic of the unidirectional transmission fiber . . . ." *Id.* ¶ 36. To use the quality of the received signals to determine the path of the transmitted signals, according to Dr. Goossen, the "use of bidirectional fibers in Corke's bidirectional communication embodiments is necessary." *Id.* As a result, Dr. Goossen testifies that "Corke's reliable transmission safeguard is lost in Petitioners' modification." *Id.* ¶ 44.

Therefore, Dr. Goossen opines that an ordinarily skilled artisan "would not have been motivated to modify Corke in view of Ade's

embodiment having separate transmit and receive fibers because this would have eliminated Corke's ability to determine if a fiber used for transmission is compromised by monitoring received signals over that fiber." *Id.* ¶ 45. We credit this testimony by Dr. Goossen and find that an ordinarily skilled artisan would not have substituted Ade's first and second optical fibers for Corke's bidirectional fibers. Therefore, an ordinarily skilled artisan would not have combined Corke and Ade as proposed by Petitioner in the Petition.

iii. Petitioner's rebuttal arguments are not persuasive.

In the Reply, Petitioner does not offer any evidence contradicting Dr. Goossen's testimony that the proposed combination by Petitioner would have eliminated the ability of Corke's device for bidirectional communications to determine if a fiber used for transmission is compromised by monitoring the quality of the received signal. Pet. Reply 3–9. Instead, Petitioner argues that Corke does not teach that its devices must have that advantage. *Id.* In particular, Petitioner argues that Corke teaches (i) embodiments without protection switching and (ii) embodiments that can provide some protection switching with unidirectional fibers, even though Petitioner does not contend that protection switching with the latter includes determining a transmission path by monitoring the quality of a received signal. *Id.*

Petitioner argues the following passage from Corke discloses embodiments without protection switching: "[t]he same monitoring system can also be employed simply to provide performance information to an operator or computerized management system or to automatically control an alarm to trigger a diagnostic sequence." Pet. Reply 3–4 (quoting Ex. 1005, 11:2–8). The passage continues: "Thus the invention, in addition to its

importance to actuating the switching between routes, has other important applications as well." Ex. 1005, 11:6–8. Based on this disclosure, Petitioner argues, and Dr. Blumenthal testifies, that an ordinarily skilled artisan would not limit the disclosure of the combination of Corke and Ade to require protection switching. Pet. Reply 4; Ex. 1039 ¶ 9.

Petitioner's argument and Dr. Blumenthal's testimony, however, miss the point. The fact that Corke may not require protection switching does not provide a sufficient rationale for a combination of Corke and Ade lacking such switching. The mere fact that such a combination is possible in light of Corke's disclosure does not motivate an ordinarily skilled artisan to actually make that combination. *Personal Web Technologies LLC v. Apple, Inc.*, 848 F.3d 987 (Fed. Cir. 2017). In *Personal Web Technologies*, the Federal Circuit reviewed a decision where the Board found "that the combination of Woodhill and Stefik *would have allowed for* the selective access features of Stefik to be used with Woodhill's content-dependent identifiers feature." *Id.* at 993 (quoting *Apple, Inc. v. PersonalWeb Techs., LLC*, Case IPR2013-00596, 2015 WL 177147, at *8 (PTAB March 25, 2015)) (emphasis by the Federal Circuit). The Federal Circuit held "that reasoning seems to say no more than that a skilled artisan, once presented with the two references, would have understood that they *could be* combined." *Id.* (emphasis original). The Federal Circuit determined that the mere fact that the references could be combined, however: "does not imply a motivation to pick out those two references and combine them to arrive at the claimed invention." *Id.* at 993–94; *see also Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) ("[O]bviousness 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."); *InTouch Techs., Inc. v. VGO Commc'ns., Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014).

Petitioner also argues that Corke does not require the use of bidirectional fibers, noting that the device of Corke Figure 2 uses unidirectional fibers and provides some protection switching. Reply 5–6 (citing Ex. 1038, 40:7–16; 63:18–64:14). Again, this argument misses the point. The fact that Corke may not require the use of bidirectional fibers does not by itself provide a motivation for using separate unidirectional optical fibers with Corke's device for bidirectional communications. And Petitioner does not argue or offer any evidence that the device in Corke Figure 2 has the advantage for bidirectional communications that the device in Corke's bidirectional embodiments, such as Corke Figure 4, has: using the quality of a received signal to determine the path for transmission. Pet. 23–38; Pet. Reply 3–9. The mere fact that the unidirectional fibers could be used in place of bidirectional fibers for bidirectional communications, losing the advantage Corke teaches exists for bidirectional communications, does not provide a motivation for using two unidirectional fibers. To the contrary, it suggests that, in order to retain the disclosed advantage of the bidirectional fiber, an ordinarily skilled artisan would not have used the two unidirectional fibers.

Petitioner also argues that the disclosed advantage of these fibers is irrelevant for the embodiment of Corke Figure 2 (Pet. Reply 6), but that argument also misses the point. The disclosed advantage is irrelevant for the device of Corke Figure 2 because that device only discloses unilateral communications: it has a receiver, but not a transmitter. Ex. 1005, Fig. 2.

Therefore, the disclosed advantage of bidirectional fibers for bidirectional communications (using the quality of a received signal to determine the path for transmission) is not relevant to the device of Corke Figure 2, which has only unidirectional communications and only has a receiver. *Id.* That fact, however, is of little import to Petitioner's proposed combination, which by necessity includes both a transmitter for transmitting data and receiver for receiving data, as recited in claim 14. And, as discussed above, Corke discloses, that for bidirectional communications with transmitters and receivers, bidirectional fibers are advantageous. *See, e.g.*, Ex. 1005, Abstr.

In the Reply, Petitioner argues that Corke Figure 2 has an undisclosed transmitter: "A POSITA would have understood the node incorporating the receiver in [Corke] FIG. 2 would have also included a transmitter." Pet. Reply 7 (citing Ex. 1039 ¶ 13). As a result, Petitioner contends that, when combined with Ade, Corke Figure 2 would have resulted in the use of separate transmit and receive fibers. *Id.* at 7–8 (citing Ex. 1039 ¶ 13). Under 37 C.F.R. § 42.23(b), this argument is belated and will not be considered. A transmitter and a receiver are recited elements of claim 14. Therefore, Petitioner needed to identify the transmitters, receivers, and first and second optical fibers that it is relying upon in the Petition. And in the Petition, Petitioner specifically identified the transmitters and receivers in Corke Figures 2 and 4 and Ade Figure 1. Pet. 23–38. Under 37 C.F.R. § 42.23(b), Petitioner could not wait until its Reply to identify the purported transmitter in Corke Figure 2 that Corke does not disclose.

Even if we were to consider Petitioner's argument regarding Corke's undisclosed transmitter, however, we would not be persuaded by it. Corke discloses that a difference between the optical communication device (29) in

Corke Figure 4 and the optical communication device (6) in Corke Figure 2 is that the former includes transmit circuits 26: "device 29 is similar to device 6 . . . except that transmit circuits 26 are included." Ex. 1005, 8:3–10. If device 6 of Corke Figure 2 has a transmitter as alleged by Petitioner, and as testified to by Dr. Blumenthal, Corke would have not have identified the presence of a transmitter in device 29 as being one of the differences between devices 6 and 29. Further, Petitioner cannot rely on Dr. Blumenthal's testimony to fill in the missing transmitter in device 6. *Arendi*, 832 F.3d at 1361–62. In particular, Dr. Blumenthal testifies that applications exist that use both transmitters and receivers and extrapolates from that fact that the receiver in Corke Figure 2 would also have a transmitter. Ex. 1039 ¶ 13. Dr. Blumenthal, however, provides no support for that extrapolation. *Id.* Moreover, as discussed above, Corke expressly identifies the transmitter and receiver in Corke Figure 4, but identifies no transmitter in Corke Figure 2. And Dr. Blumenthal provides no explanation why, if a transmitter actually exists in the embodiment of Corke Figure 2, Corke does not identify it. *Id.* Unsupported extrapolations by an expert cannot establish the existence of a critical claim limitation. *Arendi*, 832 F.3d at 1361–62

Petitioner also argues that in the Petition it relied only on the embodiment of Corke Figure 2 for its proposed combination and that embodiment does not require bidirectional fibers. Pet. Reply 5. Petitioner asserts that it only cited Corke Figure 4 to support the notion of co-locating transmitters and receivers. *Id.* In light of its purported, exclusive reliance of Corke Figure 2, Petitioner argues, therefore, its stated rationale for including Ade's first and second optical fibers in its combination is sufficient. *Id.* at 5–9. As discussed above, however, the mere fact that Corke Figure 2 or any

other embodiment in Corke does not require bidirectional fibers does not provide a reason to include Ade's two unidirectional fibers in Petitioner's combination. A lack of preclusion is not enough of a rationale to support an obviousness combination. Moreover, we do not agree that, in the Petition, Petitioner relied only on Corke Figure 2 for its combination. The Petition proposed implementing "'device 6' (Fig. 2), or 'device 29' (Fig. 4)" on a single optical card. Pet. 25. And the Petition also described the result of Petitioner's combination as "a single card that performs the same functions as Corke's devices 6 and 29." *Id.* at 28–29. Device 29 is shown in Corke Figure 4. Ex. 1005, Fig. 4. In sum, Petitioner's rebuttal arguments in its Reply regarding its proposed combination are not persuasive.

v. Petitioner has not provided a sufficient rationale for combining Ade's first and second optical fibers with Corke's energy level detector

In sum, we find Petitioner has not provided a sufficient rationale for combining Corke's optical power detectors with Ade's first and second optical fibers. The mere fact that an ordinarily skilled artisan could have made that combination does not mean an ordinarily skilled artisan would have done so. Further, we credit the testimony by Dr. Goossen that an ordinarily skilled artisan would not have wanted to include Ade's first and second optical fibers in that combination due to expense and the resulting loss in the ability of the system to determine a path for transmission based on the quality of a received signal.

b. Petitioner's proposed modification at oral argument was untimely and, in any event, is not adequately supported

As discussed above, in its Petition, Petitioner proposed modifying one of Corke's devices 6 or 29 based on Ade's teachings of an integrated

transceiver and first and second optical fibers. At oral argument, Petitioner proposed a different modification, arguing that an ordinarily skilled artisan could have modified Ade's two-fiber embodiment to add Corke's optical power detectors. Hr'g Tr. 14:23–15:6. Petitioner argued that the Petition's description of the combination of Corke and Ade encompasses this proposed modification to Ade's two-fiber embodiment. *Id.* Patent Owner disagreed, arguing that the Petition does not disclose modifying Ade's two-fiber embodiment by adding Corke's energy level detectors and that Petitioner could not wait until oral argument to propose this modification. *Id.* at 39:6–21, 45:17–47:4.

As set forth below, we agree with the Patent Owner that the Petition does not describe modifying Ade's two-fiber embodiment by adding Corke's optical power detectors and that Petitioner waited until oral argument to propose this modification. Therefore, as discussed below, we will not consider this proposed modification to Ade's two-fiber embodiment. We also find that, even if we were to consider it, Petitioner has not provided a sufficient rationale to support this proposed modification.

First, however, we discuss whether we need to address this argument because it was presented only at oral argument and a party cannot raise new arguments during oral argument. *Dell Inc. v. Acceleron*, LLC, 884 F.3d 1364, 1369 (Fed. Cir. 2018). We, nevertheless, address it because the concurrence finds that, at oral argument, Petitioner disavowed arguing that an ordinarily skilled artisan would have modified one of Corke's embodiments to include Ade's transceiver chip. Concurrence 8 ("[M]odifying one of Corke's embodiments to include Ade's transceiver chip is argument Petitioner's counsel represents Petitioner did not make in

the Petition."). The concurrence further indicates that our discussion (above) of the merits of Petitioner's proposed modification to Corke's device is unnecessary and the focus of our opinion should be on whether Petitioner's proposed modification to Ade's two-fiber embodiment was timely. *Id.*

We, however, are not as certain as the concurrence that Petitioner disavowed modifying Corke's device based on Ade's integrated transceiver. For example, one statement by Petitioner at oral argument could be interpreted as expressly indicating that Petitioner intended for its proposed combination to encompass modifying Corke's device. In particular, counsel addressed a specific modification to Corke's device that counsel argued would involve bodily combination. Hr'g Tr. 18:21–24. Counsel nevertheless argued that Petitioner's proposed combination would encompass that specific modification: "if you want to include a combination that has all of what's in Corke, you could use Figure 2. So in the bodily incorporation mode of the combination, you would put a transceiver chip into Figure 2." *Id.* Accordingly, we find Petitioner's counsel did not clearly disavow modifying Corke's devices, and, therefore, we address the merits of Petitioner's arguments for such a modification in the sections above.

In light of the concurrence, we address below Petitioner's arguments regarding modifying Ade's two-fiber embodiment. Like the concurrence, we find that Petitioner did not timely raise this proposed modification and, therefore, we should not consider it. Further, in light of Petitioner's belated presentation of this proposed modification, as the concurrence indicates, we could choose not to address whether Petitioner has provided a sufficient rationale for that proposed modification. For completeness, however, we,

nevertheless, address that issue and find that even if we were to consider that proposed modification, Petitioner has not provided a sufficient rationale for it.

i. Petitioner waited until oral argument to propose modifying Ade's two fiber embodiments with Corke's optical power detectors.

As described above and as further discussed here, the Petition describes modifying Corke's "device" with Ade's integrated transceiver.[6] Pet. 26 (citing Ex. 1003 ¶ 83). The Petition uses the term "Corke's device" to refer to the embodiments of Corke Figures 2 and 4: "Corke states that the embodiments described in Figures 2 and 4 are implemented on a single 'device.'" *Id.* at 25. And consistent with Petitioner's usage, Corke refers to the embodiments shown in Corke Figures 2 and 4 as devices 6 and 29, respectively. Ex. 1005, 5:61–63, 8:3–5. Petitioner argues, however, that "Corke does not expressly state that "device 6" (Fig. 2), or "device 29" (Fig. 4) are implemented on a single optical card." *Id.* at 25. So Petitioner proposes adding Ade's teachings of a transceiver implemented on a single integrated circuit to Corke's device. *Id.* Petitioner asserts: "A POSITA would have recognized that Corke's 'device' would benefit from combination with Ade's integrated transceiver." *Id.* at 26. The Petition,

[6]The concurrence indicates that Petition is ambiguous with regard to how the teachings of Corke and Ade are combined. Concurrence 7. We recognize that the Petition did not provide much (and, in fact, did not provide a sufficient amount of) detail regarding how an ordinarily skilled artisan would combine the teachings of those two references. That lack of sufficient detail is another defect in the Petition. We, nevertheless, find that the Petition did unambiguously propose modifying Corke's device with Ade's integrated transceiver.

therefore, discloses modifying Corke's device 6 or device 29 based on Ade's integrated transceiver.

The Petition, however, does not disclose modifying Ade's two-fiber embodiment based on the teachings of Corke's optical power detectors. In the Petition's discussion of combining Corke and Ade, the only statement made about Ade's two-fiber embodiment is that the transmitters and receivers in the two-fiber embodiment do not interact with each other. *Id.* at 27 (see also Section IV.A.1., pp. 23–29). The following sentence in the Petition ties that statement to Petitioner's proposed modification of Corke's device: "Therefore, *implementing Corke's device with Ade's transceiver* is obvious because, in combination on a single chip or card, Corke's transmitter and receivers with energy level detectors 'do no more than they would in separate, sequential operation.'" *Id.* (emphasis added, cite omitted). Therefore, the Petition does not disclose modifying Ade's two fiber embodiment by adding Corke's optical power detectors.

Further, Petitioner could not wait until its Reply or later to raise this proposed modification because how an ordinarily skilled artisan would combine Corke and Ade is part of Petitioner's affirmative showing for obviousness. 37 C.F.R. § 42.23(b). Regarding the Reply, we do not see anywhere in that Reply where Petitioner raised this proposed modification. Pet. Reply 3–9. And oral argument is not an appropriate forum for raising a new argument. *Dell Inc.*, 884 F.3d at 1369 ("Unless [the Board] chose to exercise its waiver authority under 37 C.F.R. § 42.5(b), the Board was obligated to dismiss [an] untimely argument . . . that . . . was raised for the first time during oral argument."); Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,768 (Aug. 14, 2012) ("No new evidence or arguments

may be presented at the oral argument."). Accordingly, we will not consider Petitioner's proposed modification to Ade's two-fiber embodiment because Petitioner did not present that proposed modification in its Petition.

ii. Even if we were to consider Petitioner's proposed modification to Ade's two fiber embodiment, Petitioner has not provided a sufficient rationale for that modification.

Even if we were to consider Petitioner's proposed modification to Ade's two fiber embodiment, Petitioner has not provided a sufficient rationale for it. The rationale that Petitioner presents in its Petition is that, based on Ade's teachings, it would have been advantageous to combine a transmitter, receiver, and modulator with associated control circuitry onto a single chip or card. Pet. 23–29 (Section IV.A.1). That rationale may explain why an ordinarily skilled artisan would have modified Corke's embodiments to include Ade's integrated transceiver. It does not, however, explain why that artisan would have added an optical power detector to Ade's two-fiber embodiment, which already has an integrated transceiver. *Id.*

At oral hearing, Petitioner's counsel argued that energy level detectors were commonly used with receivers and that common usage provides a sufficient rationale for modifying Ade's two-fiber embodiment to add Corke's optical power detectors. Hr'g Tr. 7:14–8:6. We disagree. That rationale is too general to support Petitioner's proposed modification because the question before us is not whether energy level detectors and receivers are ever used together but rather whether an ordinarily skilled artisan would have used both (with the other elements of claim 14) in Petitioner's proposed combination. And Petitioner does not provide any specific reason why one would have added Corke's energy level detectors to

Ade's two-fiber embodiment. Ade itself indisputably discloses a receiver, yet Petitioner does not contend that Ade discloses an energy level detector. Pet. 34–36. And the purportedly common use of the energy level detectors with receivers was not enough to motivate Ade to include an energy level detector with its receiver. Therefore, consistent with that fact, we find that the purportedly common use of an energy level detector with receivers by itself is an insufficient rationale for Petitioner's proposed modification to Ade's two-fiber embodiment.[7]

[7] In its Reply, Petitioner argues that Ade suggests placing a photodetector on the same card as its transmitter and receiver. Pet. Reply. 12. Petitioner argues that suggestion would motivate the placement of Corke's energy level detector on Ade's chip in its proposed combination of Corke and Ade. *Id.* That argument, however, does not provide the requisite rationale for modifying Ade's two-fiber embodiment by adding Corke's energy level detector because it does not address why an ordinarily skilled artisan would have used Corke's energy level detector with such an embodiment. Instead, it addresses only where such an energy level detector would be placed if an ordinarily skilled artisan were motivated to use an energy level detector in a combination of Corke and Ade. Petitioner does not even present this argument in the sections of the Reply addressing reasons for combining Corke and Ade. *Id.* at 3–9. Rather, Petitioner presents this argument in a section addressing why the combination of Corke and Ade would teach or suggest the particular claim limitation of a transceiver card comprising an energy level detector. *Id.* at 12–13. Further, to the extent it is asserted that this argument suggests a motivation to modify Ade's two-fiber embodiment, Petitioner improperly waited until its Reply to present this proposed modification to Corke and Ade and its rationales for those modifications. 37 C.F.R. § 42.23(b).

c. Petitioner has not proved that the energy level detector in its proposed combination includes a threshold indicating a drop in amplitude

We find that the Petitioner has not proved that its proposed combination of Corke and Ade would teach or suggest an "energy level detector including a threshold indicating a drop in amplitude of the second optical signal," as recited by claim 14. As discussed above, Petitioner proposes combining Corke's detectors and Ade's transceivers. Petitioner argues, and Dr. Blumenthal testifies, that Corke's detectors have the recited threshold because they "are used to determine whether the average power (or average 'amplitude') of the received signal drops below a threshold." Pet. 38 (citing Ex. 1005, 2:46–49, 2:58–67, 8:11–30; 9:2–7, 9:36–45; Ex. 1003 ¶¶ 158, 176). Petitioner argues, and Dr. Blumenthal testifies, that, therefore, in Petitioner's proposed combination Corke's detectors would have the recited threshold. Pet. 38; Ex. 1003 ¶¶ 158–159, 176.

Patent Owner disagrees. PO Resp. 39–41. Dr. Goossen testifies that Ade's transceiver uses amplitude modulation and would do so in Petitioner's proposed combination. Ex. 2026 ¶ 52. Dr. Goossen further testifies that an ordinarily skilled artisan would have recognized that, with an amplitude modulated signal, a drop in average intensity would not correlate to a drop in amplitude. Ex. 2026 ¶¶ 52–53. According to Dr. Goossen, an amplitude modulated signal would have numerous drops in amplitude that would not be detected by a measure of average intensity or average amplitude. *Id.* ¶ 54. Further, Dr. Goossen testifies that an ordinarily skilled artisan would not have modified Corke's energy level detector to detect a drop in amplitude because, with an amplitude modulated signal, a drop in amplitude

is not an indicator of a drop in energy. *Id.* ¶¶ 54, 56. We credit this testimony by Dr. Goossen.

Petitioner responds, and Dr. Blumenthal testifies, that, even with amplitude modulated signals, Corke's measurement of average intensity would measure a drop in amplitude. Pet. Reply 13–17; Ex. 1039 ¶ 39. Dr. Blumenthal testifies that detecting energy requires some aggregation over time or averaging; that the disclosed embodiments of the challenged patent detect changes in average output; and that a threshold for average intensity would also be a threshold for average amplitude because amplitude and intensity can be correlated. Ex. 1039 ¶¶ 25–30. Dr. Blumenthal further testifies that Corke's energy level detector would detect a drop in average amplitude in response to signal degradation from a tip or kink/fault of the fiber. *Id.* ¶ 30. In addition, Petitioner argues that dependent claim 18 would be rendered superfluous if claim 14 were interpreted to require phase-modulated signals. Pet. Reply 15. And Petitioner notes that the challenged patent discloses amplitude modulation. *Id.*

Having considered both sides' arguments and the submitted evidence, we find that Petitioner has not sufficiently proved that its proposed combination of Corke and Ade would include an energy level detector with the recited threshold.

First, we agree with Patent Owner and Dr. Goossen, that Ade's transceivers would use amplitude modulation in Petitioner's proposed combination. We credit Dr. Goossen's testimony to that effect. Ex. 2026 ¶ 52; *see also* Ex. 1024, 7:35–44. Although Petitioner states that it does "not accede to Patent Owner's assertion that the Corke-Ade combination is limited to amplitude-modulation," Petitioner presents no argument or

evidence to rebut Dr. Goossen's testimony that the transceivers in Petitioner's combination would use amplitude modulation. Reply 17 n.4. In fact, Petitioner maps Ade's M-Z modulator 10, input light 16, waveguides 32, 94, and 44, and optical fiber 48 to the recited transmitter. Pet. 30 (annotated figure). And Petitioner admits that M-Z modulator 10 is "configured for amplitude modulation." Pet. 46–47. Similarly, Dr. Blumenthal testifies that M-Z modulator 10 performs "an exemplary amplitude modulation scheme." Ex. 1003 ¶ 101.

Although Petitioner argues (Pet. 46–47) and Dr. Blumenthal testifies (Ex. 1003 ¶ 101) that Ade is not limited to the use of that particular modulator or modulation scheme, neither Petitioner nor Dr. Blumenthal proposes using any other modulator or modulation scheme in their combination of Corke and Ade.[8] Reply 13–17; Ex. 1039 ¶¶ 24–30. And neither Petitioner nor Dr. Blumenthal relies on the purported existence of any other alleged modulator or modulation scheme to rebut Dr. Goossen's testimony that the proposed combination would use amplitude modulation. Reply 13–17; Ex. 1039 ¶¶ 24–30. Accordingly, we find that Ade's transceivers would use amplitude modulation in Petitioner's proposed combination.

[8] For its challenge to claims 17 and 18 based on Corke, Ade, and Hooijmans, Petitioner argues that Hooijmans suggests using other modulation schemes. Pet. 48 ("A POSITA would have found it obvious to use Hooijmans' phase modulation schemes in Corke's optical equipment."). Even for those claims, however, Petitioner does not rely upon the modulation schemes disclosed by Hooijmans to show that the combination of Corke, Ade, and Hooijmans has an energy level detector with the recited threshold. Pet. 46–50.

Second, we find that Petitioner has not shown that, in its proposed combination, Corke's detector would include the recited threshold. It is undisputed that, with amplitude modulated signals, the "amplitude of the optical signals drops and rises based on the information to be transmitted." Ex. 2026 ¶ 51. And Petitioner does not argue or offer evidence that Corke's energy level detector would detect the drops in amplitude that occur based on that transmitted information. Instead, Petitioner argues Corke's detector need not do so. Reply Br. 13–14 ("Patent Owner argues that the threshold claim element requires monitoring the amplitude associated with each and every bit of the optical signal . . . . This is wrong . . . ."). Petitioner argues that the threshold limitation is satisfied by merely detecting a drop in *average* amplitude and comparing it to a threshold, which Petitioner argues Corke's detectors do. Pet. 38 ("Corke states that the 'detectors' are used to determine whether the average power (or average amplitude) of the received signal drops below a threshold."); Reply 16 ("[A] POSITA would understand a threshold representing a particular average intensity also represents an average amplitude."); *see also* Ex. 1003 ¶ 158; Ex. 1039 ¶ 26.

We disagree, however, that, for amplitude modulated signals, merely detecting drops in average amplitude satisfies the threshold limitation of claim 14. The limitation recites a threshold for a drop in amplitude, not a drop in average amplitude. Petitioner does not dispute that Corke's detector would not detect the numerous drops in amplitude that occur in an amplitude modulated signal based on the data the signal is transmitting. Logically, in fact, if the average amplitude of the signal were to remain constant, Corke's detector would not detect any drop in amplitude or average amplitude despite numerous amplitude drops. Under these circumstances, we find that

Petitioner has not sufficiently proved that, in its proposed combination, Corke's detector has the recited threshold indicating a drop in amplitude.

We are also unpersuaded by Petitioner's arguments that the challenged patent indicates that average amplitude, energy, and amplitude are essentially the same. Pet. Reply 14–15. Petitioner does not direct us to evidence in the challenged patent that equates the terms average amplitude and amplitude. *Id.* And we do not interpret the challenged patent as doing so. The patentee chose to use the same word "amplitude" in claim 14 that it used in the term "amplitude modulated signals" in its specification. Petitioner has given us no reason to distinguish those two uses of "amplitude."

Similarly, the fact that the embodiments in the challenged patent may use some averaging for the output of the photodetectors is also of no significance. Pet. Reply 14. Patent Owner has not argued that claim 14 prohibits the use of any averaging; rather Patent Owner argues, and we agree, that determining a drop in amplitude is not synonymous with determining a drop in average amplitude. PO Resp. 39–41. Similarly, the fact that energy level detection might require some aggregation does not mean that the detection of amplitudes includes the aggregation or averaging of amplitudes. Similarly, Petitioner's argument that the detection of a drop in average amplitude might detect some of the same fiber breaks as a drop in amplitude (Pet. Reply 14) does not change the fact that claim 14 recites a drop in amplitude, not average amplitude.

We also disagree with Petitioner's argument that, because the challenged patent describes amplitude modulation, amplitude and average amplitude should be equated because it would be difficult, for energy

detection, to meaningfully measure drops in amplitude with amplitude modulated signals. Pet. Reply 15. The fact that it would purportedly be more difficult to use a drop in amplitude with an amplitude modulated signal to make a meaningful energy measurement, however, does not mean that the term amplitude must be interpreted to include average amplitude. The challenged patent indicates that using a drop in amplitude to detect a drop in energy is more difficult with amplitude modulated signals. Ex. 1002, 4:44–53 ("[C]onventional amplitude-modulated transmitters and receiver . . . may also be used. The phase modulated signals have the advantage . . . since the amplitude of the optical signal is constant and thus a drop in the optical signal level is more easily detected."). Therefore, the patentee was well aware of the difficulties in detecting energy level drops by measuring a drop in amplitude with amplitude modulated signals when reciting a threshold involving a drop in amplitude in claim 14.

We also disagree with Petitioner's argument that the recitation in claim 18 of "wherein the second optical signal comprises a phase-modulated optical signal" means that the term "amplitude" in claim 14 includes average amplitude. Pet. Reply 15–16. Even if we were to accept Petitioner's underlying contention that this recitation in claim 18 means claim 14 encompasses amplitude modulated signals, acceptance of that contention still would not show amplitude in claim 14 includes average amplitude. *Id.* All it means is that claim 14 encompasses an energy level detector that can detect a drop in amplitude with an amplitude modulated signal, not that claim 14 must encompass the energy level detector used in Petitioner's combination. Petitioner has given us no credible evidence that an ordinarily skilled artisan would have been unable to produce an energy level detector

that can detect a drop in amplitude (given the ordinary meaning of that term) with an amplitude modulated signal. Pet. 37–38; Pet. Reply 13–17. Whether an ordinarily skilled artisan would have desired to do so with Corke's application is not an issue for claim differentiation. *See* Ex. 2026 ¶ 54. Claim 14 would still be broader than claim 18 even if an ordinarily skilled artisan might not be interested in utilizing the additional breadth of claim 14 with Corke's application.

In sum, Petitioner has not sufficiently proved that its proposed combination of Corke and Ade would teach or suggest an energy level detector including the recited threshold of claim 14.

d. Conclusion regarding claim 14 and Corke and Ade

As discussed above, we find that Petitioner has not provided sufficient rationale for combining Ade's first and second optical fibers with Corke's device and has not sufficiently proved that its proposed combination of Corke and Ade would have an energy level detector that would detect a drop in amplitude. Accordingly, we determine that Petitioner has not proved that claim 14 would have been obvious over Corke and Ade.

4. Analysis of Claims 15, 20–22, and 24

Claims 15, 20, 21, and 24 depend directly from claim 14. Claim 22 depends from claim 21. Nothing in Petitioner's showing regarding claims 15, 20–22, and 24 remedies the deficiencies set forth above for claim 14. Thus, we determine that Petitioner has not proved that any of claims 15, 20–22, and 24 would have been obvious over Corke and Ade.

G. Asserted Obviousness over Corke, Ade, and Ikeda

Claim 16 depends on claim 14. Nothing in Petitioner's showing regarding claim 16 remedies the deficiencies set forth above for claim 14.

Thus, we determine that Petitioner has not proved that claim 16 would have been obvious over Corke, Ade, and Ikeda.

H. Asserted Obviousness over Corke, Ade, and Hooijmans

Claims 17–18 each depend from claim 14. Pet. 46–49. Nothing in Petitioner's showing regarding claims 17 and 18 remedies the deficiencies set forth above for claim 14.[9] Thus, we determine that Petitioner has not proved that claims 17 and 18 would have been obvious over Corke, Ade, and Hooijmans.

I. Asserted Obviousness over Corke, Ade, and Kobayashi

Claim 19 depends from claim 14. Nothing in Petitioner's showing regarding claim 19 remedies the deficiencies set forth above for claim 14. Thus, we determine that Petitioner has not proved that claim 19 would have been obvious over Corke, Ade, and Kobayashi.

J. Asserted Obviousness over Roberts '840 and Ade

For reasons below, we determine Petitioner has not proved that claims 14–15, 20–22, and 24 would have been obvious over Roberts '840 and Ade.

1. Overview of Roberts '840

Roberts '840 discloses a control system for an optical element such as an optical amplifier in an optical transmission system. Ex. 1009, Abstr. Figure 1 of Roberts '840 is reproduced below:

[9] As mentioned in a prior footnote, although Petitioner argues that Hooijmans discloses phase modulation, Petitioner does not rely upon that disclosure to prove that Corke, Ade, and Hooijmans would teach or suggest an energy level detector with the threshold recited by claim 14. Pet. 46–51.

Fig 1

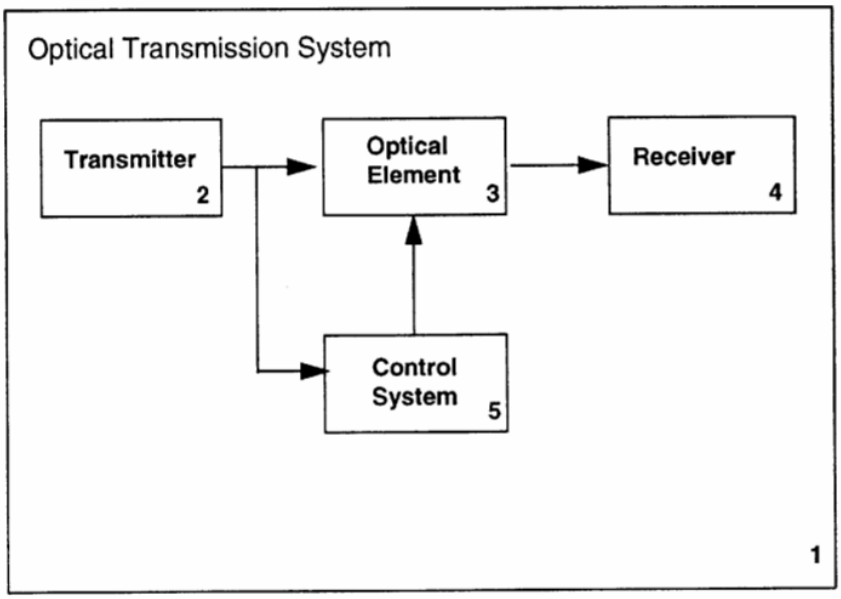


Figure 1 shows an optical transmission system including the control system of Roberts '840. *Id.* at 4:40–41. The optical transmission system of Roberts '840 includes transmitter 2, optical element 3, and receiver 4. *Id.* at 4:66–67. Roberts '840 describes that control system 5 is provided for controlling optical element 3, which can be any optical element that affects the power of the optical signal in a controllable way. *Id.* at 4:67–5:4. Specifically, Roberts '840 states: "Thus [optical element 3] can be an optical amplifier, an optical filter, or an attenuator for example." *Id.* at 5:4–5. Roberts '840 discloses two specific embodiments with an optical amplifier (73). The Figure 7 embodiment contains optical tap 72. *Id.* at 6:23–24. The Figure 10 embodiment contains an external wavelength selective power modifier, such as a filter. *Id.* at 7:32–34.

Figure 2 of Roberts ’840 is reproduced below:

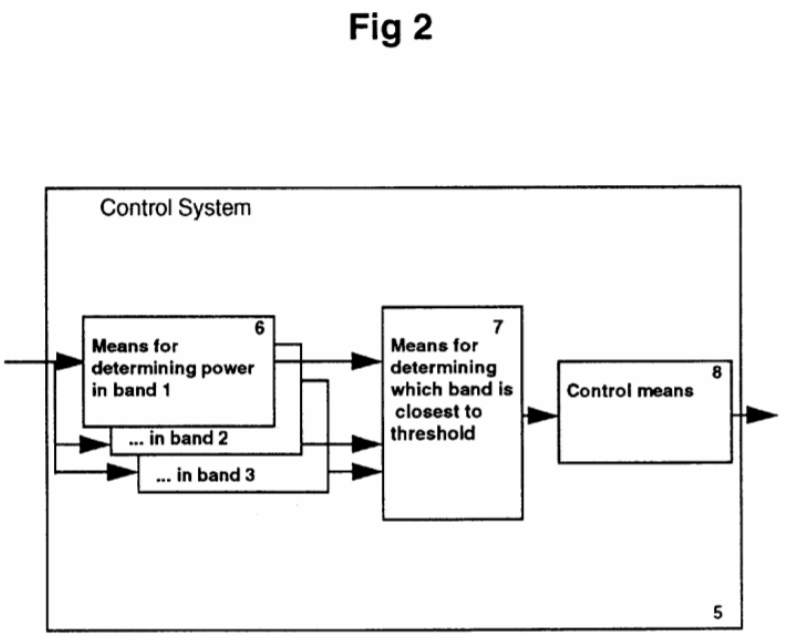


Figure 2 illustrates the schematics of a control system for use in the optical transmission system of Figure 1. *Id.* at 4:42–43. Roberts ’840 describes:

> FIG. 2 shows three elements of the control system. Firstly there is a means 6 for determining the optical signal power in a particular wavelength band. A means 7 is provided for determining which band is closest to a given threshold. A control means 8 is provided for generating a control signal for the optical element on the basis of the optical signal power of one or more of the wavelength bands.

Id. at 5:13–20.

2. Analysis of Claim 14

Petitioner argues that an ordinarily skilled artisan would have modified Roberts ’840’s optical network to include Ade’s “co-located receivers and transmitters (i.e., Ade’s integrated transceiver).” Pet. 56. Petitioner indicates that the combination would implement transmitters and receivers on the same card (rather than on separate cards). *Id.* According to Petitioner, doing so would reduce the total number of cards in the

communications system thereby reducing the cost and complexity of the system. *Id.* Petitioner maps Roberts '840's control system 5 to the recited energy level detector. *Id.* at 59.

We determine that Petitioner has not provided a sufficient rationale for (i) placing the transmitter and receiver on the same card in its proposed combination and (ii) placing Roberts '840's control system on that card.

a. Lack of a sufficient rationale for placing Roberts '840's transmitter and receiver on the same card

As Patent Owner argues, and as our Institution Decision set forth, Roberts '840 describes its receiver as being remotely located from the transmitter. PO Resp. 44; Inst. Dec. 43. Specifically, Roberts '840 states: "Optical power levels could be measured *at a remote location such as the receiver*, and data or control commands communicated to the site of the elements to be controlled." Ex. 1009, 8:26–28 (emphasis added). Roberts '840 further emphasizes the separation between its transmitter and receiver by disclosing placing optical element 3 between transmitter 2 and receiver 4. *Id.* at 1:4–29, 2:22–23, 3:12–16, 8:25–38, Figs. 1, 9, 10. Further, Roberts '840 discloses that its control system controls optical element 3 and/or the output of the transmitter 2 to avoid degradation and distortion due to attenuation of the signal over the optical link from transmitter 2 to receiver 4, further emphasizing the separation between transmitter 2 and receiver 4. *Id.*

As Patent Owner argues, Petitioner, in the Petition, does not provide a sufficient rationale for modifying Roberts '840's optical system to co-locate the transmitter and receiver. PO Resp. 43–45. Petitioner's rationale of saving space by putting the transmitter and the receiver on the same card might suffice for integrating transmitters and receivers that are at the same

location in a system, but it does not provide a sufficient explanation of how or why an ordinarily skilled artisan would have co-located the remotely separated transmitter and receiver in Roberts ’840.

In the Reply, Petitioner does not provide any explanation why an ordinarily skilled artisan would have placed Roberts ’840’s remotely separated transmitter and receiver on the same chip. Pet. Reply, 20–22. Instead, Petitioner argues that “[w]hile Roberts ‘840 discloses transmitter 2 and receiver 4 as separate nodes that are remote from one another, that does not require receiver 2 to be remote from all transmitters.” *Id.* at 20 (emphasis omitted). And Dr. Blumenthal testifies that an ordinarily skilled artisan would recognize that, in Roberts ’840, the node containing receiver 4 typically would also contain a transmitter: “the node at the right side of the system of Figure 1 (shown as having a receiver 4) would typically include *both* a (i) transmitter to transmit information to the node at the left side of Figure 1 and (ii) a receiver to receive information from the node at the left side of Figure 1.” Ex. 1039 ¶ 35. Further, in light of Roberts ’840’s disclosure regarding measuring optical power, Dr. Blumenthal testifies: “Accordingly, a POSITA would understand that the node incorporating the receiver would include a transmitter to communicate the measured values at the receiver.” *Id.* ¶ 36. Petitioner argues that this purported transmitter in the node with receiver 2 is the transmitter Petitioner would combine with receiver 2 to yield the claimed invention. Pet. Reply 21 (“Accordingly, a POSITA would understand that the receiving node would include a transmitter to communicate the measurements. Thus, the combination of the energy level detector of Roberts ‘840 with Ade is apt and consistent with the disclosure of Roberts ’840.”) (citations omitted).

We, however, will not consider Petitioner's argument regarding the purported transmitter in the node with receiver 2 because Petitioner improperly waited until its reply to identify it. Reply Br. 20–22; 37 C.F.R. § 42.23(b). A transmitter is a recited element in claim 14, and combining Roberts 840's transmitter and receiver onto one card is a critical part of Petitioner's showing. Claim 14 recites a transceiver card comprising a transmitter and a receiver. Therefore, Petitioner needed to identify this purported transmitter in its Petition. 37 C.F.R. § 42.23(b). Even if we were to consider this argument, however, we would find it unpersuasive. Petitioner merely relies on Dr. Blumenthal's testimony that applications with transmitters and receivers were known, and then extrapolates to the conclusion that a transmitter would exist in the node with receiver 2. Pet. Reply 20–22 (citing Ex. 1039 ¶¶ 34–38). Dr. Blumenthal, however, provides no support for that extrapolation. Ex. 1039 ¶ 35. And Petitioner cannot rely on an unsupported extrapolation from its expert to establish the existence of a transmitter, a recited element of claim 14, that Petitioner is including in its proposed combination. *Arendi*, 832 F.3d at 1361–62.

In sum, Petitioner has not provided a sufficient rationale for placing the transmitter and receiver on the same card for its proposed combination of Roberts '840 and Ade.

b. Lack of sufficient teaching or suggestion for having Roberts '840's control system on the same card as a transceiver

In the Petition, Petitioner does not adequately explain why an ordinarily skilled artisan would have provided an energy level detector on the same card that includes a transmitter in its combination of Roberts '840 and Ade. Pet. 54–60. As discussed above, Petitioner maps Roberts '840's control system 5 to the recited energy level detector. *Id.* at 59. As Patent

Owner argues, Roberts '840 shows control system 5 is not a part of transmitter 2. PO Resp. 45–48; Ex. 1009, Figs. 1, 9, 10. Nor is it a part of receiver 4. PO Resp. 45–48; Ex. 1009, Figs. 1, 9, 10. And, as discussed above, Roberts '840 discloses that a purpose of its control system is to control its optical element 3 and/or the output of the transmitter 2 to avoid degradation and distortion due to attenuation of the signal over an optical link to the receiver 4. *Id.* at 1:4–29, 2:22–23, 3:12–16, 8:25–38, Figs. 1, 9, 10. Petitioner has not explained the relevance of such a control system controlling the degradation and attenuation that occurs between remotely located transmitters and receivers for a transmitter, a receiver, and a control system that are all on one card. Pet. 54–60. And no such relevance is apparent.

In its Reply, Petitioner does not provide any explanation why an ordinarily skilled artisan would have placed control system 5 on the same card with transmitter 2 and receiver 4. Pet. Reply 20–22. Instead, Petitioner argues that Roberts '840 discloses means for determining power located at the receiver. Pet. 58–59; Pet. Reply 22 (citing Ex. 1039 ¶¶ 36–37). Dr. Blumenthal testifies that this power measurement can be used to control a remote transmitter at another node. Ex. 1039 ¶ 38. Based on this testimony, Petitioner argues: "Thus, Roberts '840 discloses means for determining power at the receiver, which also includes a transmitter in combination with Ade." Pet. Reply 22. Petitioner concludes: "Accordingly, the Roberts '840 and Ade combination discloses an energy level detector at the receiver on a transceiver card." *Id.* Further, Petitioner asserts that an ordinarily skilled artisan would have been motivated to place an energy level detector at this location: "Additionally, a POSITA would be motivated to

make the threshold determinations on the same card near the receiver." *Id.* at 23.

Even if we were to agree with Petitioner that Roberts '840 suggests placing its control system on the same card with its receiver, claim 14 recites that the transceiver card comprises a transmitter, a receiver, and an energy level detector. Therefore, having just the receiver and the energy level detector would not be enough. And Petitioner has not identified a suggestion or motivation for placing the transmitter, receiver, and energy level detector in its proposed combination all on one card. Pet. 54–59; Pet. Reply 22–23.

We determine that Petitioner has not proved that claim 14 would have been obvious over Roberts '840 and Ade.

3. Analysis of Claims 15, 20–22, and 24

Nothing in Petitioner's showing regarding claims 15, 20–22, and 24 remedies the deficiencies set forth above for claim 14. Thus, we determine that Petitioner has not proved that any of claims 15, 20–22, and 24 would have been obvious over Roberts '840 and Ade.

K. Asserted Obviousness over Roberts '840, Ade, and Ikeda

Claim 16 depends from claim 14. Nothing in Petitioner's showing regarding claim 16 remedies the deficiencies set forth above for claim 14. Thus, we determine that Petitioner has not proved that claims 17 and 18 would have been obvious over Roberts '840, Ade, and Ikeda.

L. Asserted Obviousness over Roberts '840, Ade, and Hooijmans

Claims 17 and 18 each depend from claim 14. Nothing in Petitioner's showing regarding claims 17 and 18 remedies the deficiencies set forth above for claim 14. Thus, we determine that Petitioner has not proved that

claims 17 and 18 would have been obvious over Roberts ’840, Ade, and Hooijmans.

M. Asserted Obviousness over Roberts ’840, Ade, and Kobayashi

Claim 19 depends from claim 14. Nothing in Petitioner’s showing regarding claim 19 remedies the deficiencies set forth above for claim 14. Thus, we determine that Petitioner has not proved that claim 19 would have been obvious over Roberts ’840, Ade, and Kobayashi.

III. CONCLUSION

Petitioner has not proved by a preponderance of the evidence that (i) claims 14–15, 20–22, and 24 would have been obvious over Corke and Ade; (ii) claim 16 would have been obvious over Corke, Ade, and Ikeda; (iii) claims 17 and 18 would have been obvious over Corke, Ade, and Hooijmans; (iv) claim 19 would have been obvious over Corke, Ade, and Kobayashi; (v) claims 14, 15, 20–22, and 24 would have been obvious over Roberts ’840 and Ade; (vi) claim 16 would have been obvious over Roberts ’840, Ade, and Ikeda; (vii) claims 17 and 18 would have been obvious over Roberts ’840, Ade, and Hooijmans; or (viii) claim 19 would have been obvious over Roberts ’840, Ade, and Kobayashi.

IV. ORDER

Accordingly, it is

ORDERED that claims 14–22 and 24 have not been proved to be unpatentable.

FURTHER ORDERED that, because this is a final written decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Paper ##
Entered: ## ##, 2019

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC. and OCLARO, INC.,
Petitioner,

v.

OYSTER OPTICS, LLC,
Patent Owner.

Case IPR2017-01881
Patent 8,913,898 B2

LEE, Administrative Patent Judge, concurring.

I agree with the conclusion of my colleagues in the majority opinion that Petitioner has not shown by a preponderance of the evidence that any challenged claim is unpatentable. However, with respect to all alleged grounds of unpatentability based in whole or in part on Corke and Ade, discussed in the majority opinion in Sections II.F, II.G, II.H, and II.I, I reach that conclusion through a different path. Therefore, I do not join those parts of the majority opinion. With respect to the remainder of the majority opinion, including the analysis of all alleged grounds of unpatentability based in whole or in part on Roberts '840 and Ade, I join the majority opinion in full.

I find (1) that the reasoning expressed in the Petition for combining Corke and Ade is ambiguous; (2) that Patent Owner's reading of Petitioner's reasoning is reasonable; and (3) that Petitioner has recast, subsequent to filing of the Patent Owner Response, its reasoning for combining Corke and Ade to exclude Patent Owner's reasonable reading of the Petition and to present a new rationale that it did not present in the Petition. Such recasting is highly prejudicial to Patent Owner. I would not analyze the new rationale. Also, I would not analyze arguments that Petitioner's counsel represented at oral hearing that Petitioner did not make. Counsel must be responsible for what they represent to the Board. Further, it would be prejudicial to Patent Owner "if" the result of the analysis of arguments Petitioner's counsel represents Petitioner did not make, were to favor Petitioner and lead to cancellation of any claim.

Petitioner begins by noting that Corke discloses an energy level detector to measure performance of a received optical signal. Pet. 23. Petitioner notes that Corke's Figure 2 illustrates an embodiment in which the detector is integrated into a receiver, and that Corke's Figure 4 illustrates an embodiment in which the detector is integrated into a device with both a transmitter and receiver. *Id.* at 24–25. Petitioner further notes that the embodiments of Corke's Figures 2 and 4 are implemented on a single "device." *Id.* at 25.

Petitioner then acknowledges that Corke does not expressly state that "device 6" of Corke's Figure 2 embodiment or "device 29" of Corke's Figure 4 embodiment is implemented on a single optical

card. *Id.* at 25. Immediately thereafter, Petitioner introduces Ade and the proposed combination as follows:

> In view of Ade's disclosure of a transceiver implemented on a single integrated circuit, it would have been obvious to a POSITA to implement Corke's transceiver on a single device, either as Ade's integrated chip on a printed circuit board of Corke's card to form a transceiver card or implementing Ade's transceiver as discrete components on a printed circuit board of Corke's card to form a transceiver card. Ex. 1003, 82.

Id. at 25. The above-quoted reasoning refers to "Corke's card," although no such card of Corke was previously identified by Petitioner. It is not apparent what "Corke's card" is referred to by Petitioner. That uncertainty is inconsequential, however, because the gist of the reasoning, manifestly, is that in light of Ade's disclosure of a transceiver integrated on a single integrated circuit, one with ordinary skill in the art would have known to implement Corke's transceiver as either an integrated chip on a card or as discrete components on a card.

Petitioner then summarizes its proposed combination as follows:

> The proposed combination therefore includes a single card with Corke's optical power detectors and Ade's receiver, transmitter, and modulator with control circuitry. Ex. 1003, ¶ 83. A POSITA would have recognized that Corke's "device" would benefit from combination with Ade's integrated transceiver." *Id.*

Pet. 26. It is unclear how Ade's "modulator and control circuitry" fit into Petitioner's proposed combination, because the reasoning expressed prior to that summary does not accord a role to those components. The cited testimony of Dr. Blumenthal provides little clue. Dr. Blumenthal testifies:

> A POSITA would have recognized that Corke's optical network would similarly benefit from inclusion of Ade's integrated transceiver chip. Implementing transmitters and receivers on the same chip (rather than on separate cards) would reduce the total number of cards in a communications system, thereby reducing the cost and complexity of the system. As with the combination of Treyz and Ade, there is no energy (or interaction) between the transmitter and receiver. Accordingly, the proposed combination would have constituted an obvious combination of prior art elements according to known methods to yield only predictable results.

Ex. 1003 ¶ 83.

Thus, the Petition is ambiguous with regard to the combination of Corke and Ade. Although it is clear that Petitioner relies on the energy detector of Corke and the integrated transmitter and receiver of Ade, it is unclear how those components are put together. Each claim is directed to more than a collection of unrelated parts. It is necessary for Petitioner to present a "story" of how the teachings of the prior art are combined. For example, one approach would be to start with a system such as that according to Corke, and then integrating the transmitter and receiver together on a single chip as is taught by Ade, and another approach would be to take an energy level detector such as that disclosed in Corke and using it in a system such as that disclosed in Ade. Either approach must be supported by reasoning with rational underpinnings for combining teachings. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007).

Patent Owner has treated Petitioner's obviousness contention as starting with the embodiments of Corke and then, based on the teachings of Ade, modifying Corke's system to include Ade's integrated transceiver chip.

PO Resp. 21–22. Based on the above discussion of the language in the Petition, that reading by Patent Owner is reasonable. Petitioner, however, asserts that Patent Owner's reading of Petitioner's rationale is incorrect, and that Petitioner's proposed combination is formed by taking the energy level detector of Corke and using it in Ade's disclosed system. Specifically, at oral hearing, counsel for Petitioner stated:

> So because the entirety of Patent Owner's arguments related to the combination [of Corke and Ade] assumed that protection switching [of Corke's disclosed embodiments] must be included in the combination, and that's a faulty assumption, they basically have no argument as to the actual combination, which is that it's obvious to put an energy level detector associated with the receiver [of Corke] with the integrated transceiver components of Ade.

Hr'g Tr. 9:3–8. Also at oral hearing, there was the following exchange:

> JUDGE KAISER: I'm just going to say it sounds like really what your argument is, is that this argument about the separate fibers is attacking a different combination than what you are trying to make. So it sounds like really the combination that you're trying to make is that you take everything from Ade and really what you're putting into it is the monitoring feature of Corke and not really worried so much about what the fibers are in Corke because that's not what you are relying on Corke for. Is that a fair assessment?
>
> MR. OAKS: Right. yes.

Id. at 14:23–15:6.

Counsel for Petitioner indicated at oral hearing that this sentence in the Petition conveys its argument: "The proposed combination includes a single card with Corke's optical power detectors and Ade's receiver, transmitter, and modulator with control circuitry." Hr'g Tr. 26:11–17 (citing

Pet. 26). That sentence has been discussed above. It identifies components but does not explain the manner in which they are put together by Petitioner. Furthermore, Ade's modulator 10 and modulator control circuit 12 are both component parts on Ade's transceiver chip. Ex. 1024, 3:62–68. So, there is no clear "story" of the proposed combination, just that the proposed combination includes Corke's energy level detector and Ade's transceiver chip. I do not read the identified sentence in the Petition as conveying that Petitioner is proposing to take the energy level detector of Corke and using it within Ade's system. The sentence also is consistent with taking Ade's transceiver chip and using it in a Corke embodiment. The sentence is ambiguous with regard to how those parts are put together.

Additionally, considering the entirety of Petitioner's reasoning in the Petition, as identified and discussed above, Patent Owner's reading of Petitioner's articulated reasoning is more reasonable than Petitioner's reading of the same. For instance, it is clear from paragraph 83 of Dr. Blumenthal's Declaration, reproduced above, that Dr. Blumenthal is discussing modification of an embodiment in Corke. Also, this statement of Petitioner also indicates that Petitioner is referring to a modification of Corke's embodiment: "A POSITA would have recognized that Corke's 'device' would benefit from combination with Ade's integrated transceiver." Pet. 26. By "device," Petitioner is referring to an entire embodiment of Corke. *Id.* at 25 ("Corke states that the embodiments described in Figures 2 and 4 are implemented on a single 'device.'").

Thus, the circumstance before us is this: (1) the Petition is ambiguous with regard to how the teachings of Corke and Ade are combined; (2) Patent

Owner has taken a more reasonable reading of the Petition than has Petitioner; and (3) Petitioner argues that Patent Owner's reading of the Petition does not reflect the actual arguments made by Petitioner. Because the Petition is ambiguous with regard to how the teachings of Corke and Ade are combined, Petitioner cannot recast its argument as something other than how Patent Owner reasonably has read it. To do otherwise would be highly prejudicial to Patent Owner. For example, if Patent Owner had assumed Petitioner's "story" is taking Corke's energy level detector and using it in the context of Ade, Patent Owner could then be faced with an assertion by Petitioner that that is not Petitioner's rationale and that Petitioner's rationale is based on modifying Corke's embodiment to include Ade's transceiver.

The Supreme Court has instructed, with regard to *inter partes* reviews, that "[i]n all these ways, the statute tells us that the petitioner's contentions, not the Director's discretion, define the scope of the litigation all the way from institution through conclusion." *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348, 1357 (2018). That does not mean, however, that Petitioner can benefit from an ambiguous petition by recasting it in whichever manner it desires after institution of *inter partes* review. Along with the power to define the scope of review, Petitioner has the responsibility and obligation to make clear its contentions in the Petition. Condoning the making of ambiguous positions in the Petition would give a substantial and unfair advantage to Petitioner. A petition containing ambiguous or incomplete reasoning also is against the rule governing the content of petitions. Specifically, a petition is required to include "[a] full statement of the reasons for the relief requested, including a detailed explanation of the significance of the evidence including

material facts, and the governing law, rules, and precedent." 37 C.F.R. § 42.22(a)(2).

The majority opinion addresses arguments that Petitioner's counsel represents Petitioner did not make, and also addresses arguments that it determines Petitioner actually did not make. Specifically, modifying one of Corke's embodiments to include Ade's transceiver chip is argument Petitioner's counsel represents Petitioner did not make in the Petition. Hr'g Tr. 9:3–8; 14:23–15:6. And taking Corke's energy level detector and applying it in Ade's system is an argument the majority determines Petitioner actually did not make. In the circumstances of this case, I see no reason to analyze either.

During the oral hearing, in response to the Board's inquiry, counsel for Petitioner agreed that the Board need only focus on what Petitioner's counsel represents as Petitioner's argument to determine whether that argument actually was made in the Petition, and need not address arguments that Petitioner's counsel represents are not Petitioner's arguments. Hr'g Tr. 26:2–23. For reasons discussed above, I find that Petitioner did not make, in the Petition, the argument that it would have been obvious to one with ordinary skill in the art to take an energy level detector such as that disclosed in Corke and include it in a system such as that disclosed by Ade.

For the foregoing reasons, Petitioner has not shown by a preponderance of the evidence that any challenged claim is unpatentable in whole or in part over Corke and Ade.

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