

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NOKIA OF AMERICA CORPORATION,
Petitioner,

v.

ALEXANDER SOTO AND WALTER SOTO,
Patent Owner.

IPR2023-00960
Patent 8,238,754 B2

Before THU A. DANG, JOSIAH C. COCKS, and
KEVIN C. TROCK, *Administrative Patent Judges*.

TROCK, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314(a)

I. INTRODUCTION

Nokia of America Corporation (“Petitioner” or “Nokia”) filed a Petition, Paper 2 (“Pet.” or “Petition”), to institute an *inter partes* review of claims 1–16 and 18–30 (the “challenged claims”) of U.S. Patent No. 8,238,754 B2 (Ex. 1001, “the ’754 patent”). Alexander Soto and Walter Soto (collectively “Patent Owner”) timely filed a Preliminary Response, Paper 14 (“Prelim. Resp.”).

With our approval, Petitioner filed a Preliminary Reply, Paper 15 (“Prelim. Reply”), and Patent Owner filed a Preliminary Sur-reply, Paper 16 (“Prelim. Sur-reply”), to address issues related to the ’754 patent’s priority date and our discretion under 35 U.S.C. §§ 315(a), 325(d).

We have jurisdiction under 35 U.S.C. § 314 and 37 C.F.R. § 42.4. Under 35 U.S.C. § 314(a), we may not authorize an *inter partes* review unless the information in the petition and the preliminary response “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

For the reasons stated below, we determine that Petitioner has established a reasonable likelihood that it would prevail with respect to at least one claim. We therefore institute *inter partes* review as to all of the challenged claims and all of the asserted grounds of unpatentability in the Petition.

II. BACKGROUND

A. *Related Proceedings*

Petitioner identifies the “following pending lawsuits or related matters involving the ’754 Patent:”

1. *NextGen Innovations, LLC v. Nokia of America Corporation, et al.*, 2-22-cv-00309 (EDTX)
2. *NextGen Innovations, LLC v. Fujitsu Network Communications, Inc. et al.*, 2-22-cv-00307 (EDTX)
3. *NextGen Innovations, LLC v. II-VI, Inc. et al.*, 4-21-cv-07477 (NDCA)
4. *NextGen Innovations, LLC v. II-VI, Inc. et al.*, 4-20-cv-00854 (EDTX)

Pet. 88–89. Petitioner also identifies a prior petition for *inter partes* review of the ’754 patent, IPR2021-01495, as being “voluntarily dismissed by petitioner prior to a decision by the Board.” Pet. 89.

Patent Owner identifies the first and second of the above actions (1, 2) and also the following:

5. *NextGen Innovations, LLC v. Infinera Corporation*, 2:22-cv-00306 (EDTX)
6. *NextGen Innovations, LLC v. AT&T Services, Inc., et al.*, 2:22-cv-00308 (EDTX)
7. *II-VI Inc., v. Alexander Soto and Walter Soto*, IPR2021-01361 (Patent No. 10,771,181)
8. *II-VI Inc., v. Alexander Soto and Walter Soto*, IPR2021-01358 (Patent No. 9,887,795)
9. *II-VI Inc., v. Alexander Soto and Walter Soto*,

IPR2021-01359 (Patent No. 10,263,723)

10. *Nokia of America Corp., v. Alexander Soto and Walter Soto*, IPR2023-00680 (Patent No. 9,887,795)
11. *Nokia of America Corp., v. Alexander Soto and Walter Soto*, IPR2023-00681 (Patent No. 10,263,723)
12. *Nokia of America Corp., v. Alexander Soto and Walter Soto*, IPR2023-00682 (Patent No. 10,771,181)
13. *Infinera Corp. v. Alexander Soto and Walter Soto*, IPR2023-00834 (Patent No. 9,887,795)
14. *Infinera Corp. v. Alexander Soto and Walter Soto*, IPR2023-00835 (Patent No. 10,263,723)
15. *Infinera Corp. v. Alexander Soto and Walter Soto*, IPR2023-00838 (Patent No. 10,771,181)

Paper 11, 1–2.

B. Real Party in Interest

Petitioner identifies “Nokia of America Corporation, Nokia Corporation, and Nokia Solutions and Networks OY” as its real party in interest. Pet. 88. Patent Owner identifies “NextGen Innovations, LLC (exclusive licensee of U.S. Pat. No. 8,238,754)” as its real party in interest (Paper 11, 1) and also states that “AT&T is believed to be a real party-in-interest with Petitioner” (Paper 17, 1 (citing Paper 15, 9–10)).

C. The ’754 patent (Ex. 1001)

The ’754 patent is titled “SYSTEM AND METHOD FOR PLUGGABLE OPTICAL MODULES FOR PASSIVE OPTICAL NETWORKS.” *Id.* at code (54). The ’754 patent claims priority to

U.S. provisional application Nos. 60/485,072 filed on July 3, 2003 and 60/515,836 filed on Oct. 30, 2003. *Id.* at code (60).

The description of the invention's field states "[t]he present invention relates to optical fiber networks." *Id.* at 1:22. The disclosure of the invention's background, however, focuses on "[o]ptical modules . . . used in applications requiring digital optical transmission" (*id.* at 1:34–35) and "integrat[ing] components used in the transmission and reception of optical signals into a single packaged subsystem" (*id.* at 1:39–41).

Figure 11 of the '754 patent is reproduced below and described as illustrating a "typical optical module" of the prior art. *Id.* at 1:56, Fig. 11 (heading).

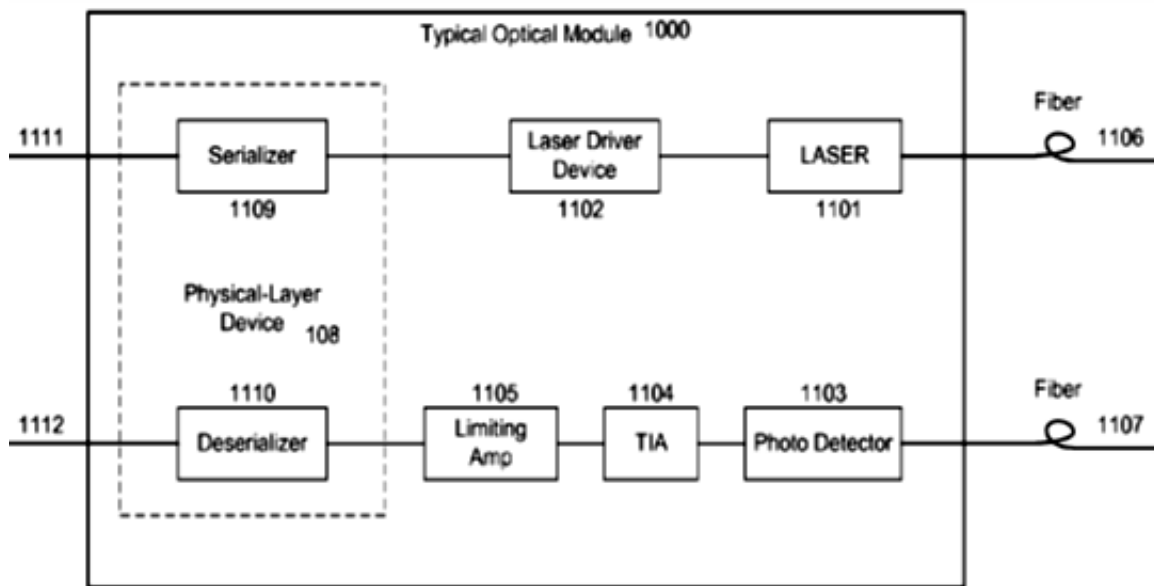


Figure 11 shows optical module 1100. Module 1100 includes laser 1101, laser driver (LD) 1102, photo detector (PD) 1103, transimpedance amplifier (TIA) 1104, limiting amplifier (LA) 1105, and physical-layer devices 1108 such as a mux/demux (with an associated clock multiplier unit (CMU) and clock data recovery (CDR) functions) in serializer 1109 and

deserializer 1110.¹ *Id.* at 1:56–62. Module 1100 has dual optical fibers for signal reception 1106 and transmission 1107 and pins for parallel input 1111 and output 1112. *Id.* at 1:62–65.

Figure 12 of the '754 patent is reproduced below and described as illustrating three levels of optical-module integration of the prior art.

Id. at 1:65–66, Fig. 12 (heading).

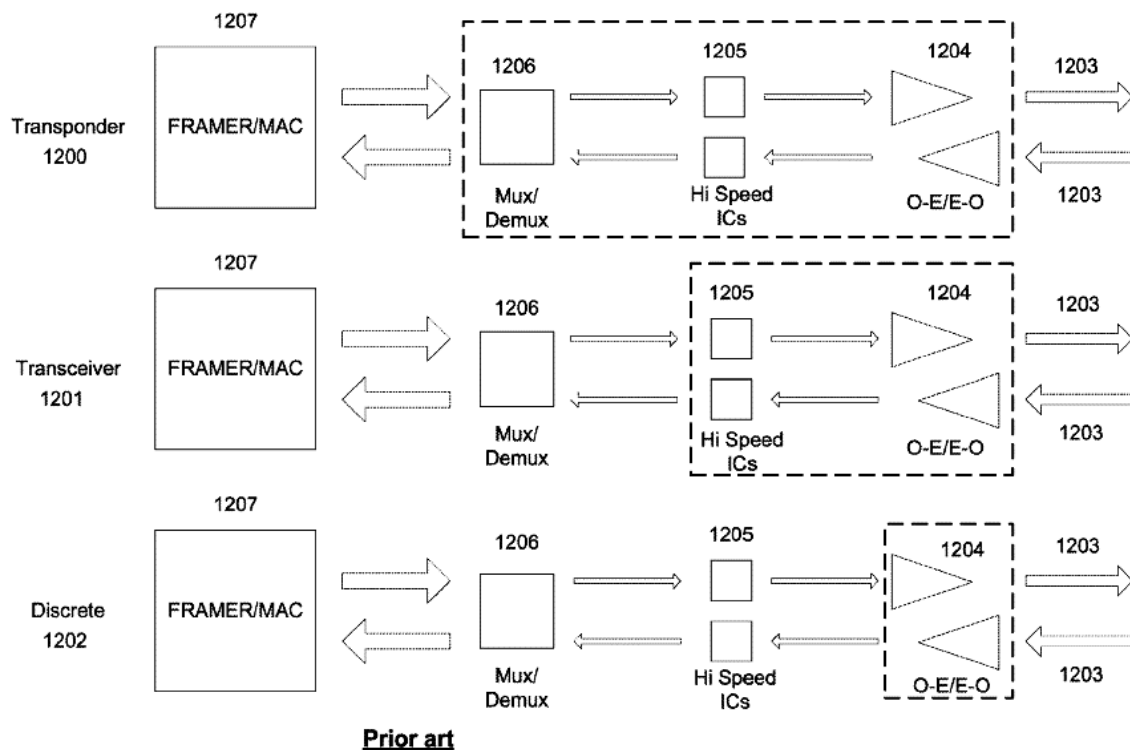


Figure 12 shows as illustrating three levels of optical module integration: “discrete” optical module 1202, “transceiver” optical module 1201, and “transponder” optical module 1200. “Discrete” optical module 1202 contains only the optical-electrical and electrical-optical (O-E/E-O) components 1204 such as a laser and photo detector. *Id.* at 1:66–2:2.

¹ The description and figure present different reference characters for the module (1100 and 1000) and physical layer device (1108 and 108).

“Transceiver” optical module 1201 contains O-E/E-O components 1204 and hi-speed integrated circuits 1205 such as LD, TIA and LA. *Id.* at 2:2–4.

“Transponder” optical module 1200 contains O-E/E-O components 1204, hi-speed integrated circuits 1205, and mux/demux devices 1206 containing CDR and CMUs. *Id.* at 2:5–7. Optical modules 1200, 1202, 1204 are connected with various interfaces to Framers and Media Access Control (MAC) devices 1207. *Id.* at 2:7–10.

Figure 17 of the ’754 patent is reproduced below and described as illustrating an optical module with MAC, TC-Layer, and PHY-Layer components according to an exemplary embodiment of the invention. *Id.* at 5:34–36, 14:65–67.

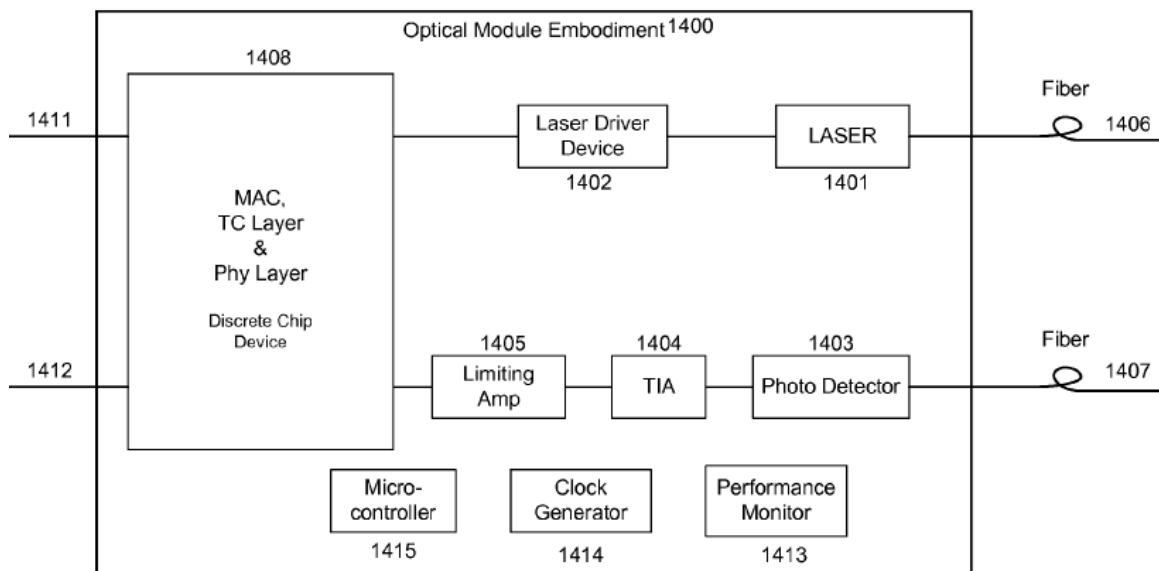


Figure 17 shows optical module 1400 with MAC, TC Layer, and PHY Layer components. The form factor of optical module 1400 preferably complies with a multi-source agreement (MSA). *Id.* at 15:2–4. Optical module 1400 contains O-E/E-O components 1401, 1403 (such as laser 1401 and photo detector 1403), hi-speed devices 1402, 1404, 1405 (such as laser driver 1402, TIA 1404, and limiting amp 1405), MAC, TC-Layer and

PHY-Layer functionality component(s) 1408, performance monitor 1413 (to correct the laser), clock generator 1414 (for the digital components), and micro-controller 1415 (for communications with “external intelligence”). *Id.* at 15:5–10, 15:38–51. “The invention is envisioned” as follows:

The MAC, TC-Layer and PHY-Layer functionality component(s) 1408 inside the optical module are the basis of the invention and are not to be confused with replacing the traditional MAC, TC-Layer and PHY-Layer devices that reside outside of optical modules. The MAC and TC-Layer comprise of functionality needed to generate and receive transmission frames and are responsible for the entire overhead associated with the transmission frame for a point-to-multipoint network. The invention is envisioned to enable point-to-multipoint connections in previously point-to-point only connections via passive optical network (PON) implementation. This implies a headend or Optical Line Terminal (OLT) MAC and TC-Layer, which must emulate the functionality of a point-to-point link and is the master of the point-to-multipoint link, with a complementary client or Optical Network Terminal (ONT) MAC and TC-Layer operating in a slave like relationship to the headend MAC & TC-Layer counterpart. The MAC performs the efficient arbitrating of downstream and upstream data by determining bandwidth allocation and packet destination on the point-to-multipoint network. The term TC-Layer originated with ATM protocol but has become and is used here to describe a specification that: bundles and unbundles sent and received data into packets or frames; manages the transmission of packets or frames on a network via medium access and bandwidth allocation; provides necessary messaging and end point behavior, and checks and corrects for errors. The PHY-Layer comprises the functionality of clock data recovery, analog to digital and digital to analog conversion.

Id. at 15:9–37.

D. Challenged Claims

Petitioner challenges claims 1–16 and 1–30 of the '754 patent. Pet. 1. Challenged claims 1 and 18 are independent. Independent claims 1 and 18 each recite a “network client optical transceiver module for a passive optical network,” with claim 1 written as an apparatus claim and claim 18 written as a method claim. Claim 1 is exemplary.

- [1.Pre] A network client optical transceiver module for a passive optical network, the passive optical network having one or more passive optical splitters for coupling the network client optical transceiver module over one or more optical fibers to the head end of the passive optical network and the network client optical transceiver module having a pluggable form-factor and configured to removably couple to an optical module port of a switch or router, the network client optical transceiver comprising:
 - [1.A] an optical port configured to optically couple to one or more optical fibers of the passive optical network having one or more passive optical splitters;
 - [1.B] a bi-directional optical interface block optically coupled to the optical port and configured to perform optical-to-electrical and electrical-to-optical signal conversion;
 - [1.C] a control module electrically coupled to the bi-directional optical interface block and configured to receive from the head end of the passive optical network data communications representing one or more start times for transmitting data communications to the head end of the passive optical network and configured to transmit the data communications to the head end of the passive optical network responsive to the start times; and
 - [1.D] an electrical network interface port electrically coupled to the control module and for electrically coupling into the optical module port of the switch or router and for communicating with the switch or router; whereby
 - [1.E] the network client optical transceiver module is configured to optically communicate with the head end of the passive optical

network responsive to start times for transmitting data communications to the head end of the passive optical network and the network client optical transceiver module is configured to removably couple to the optical module port of the switch or router and electrically communicate with the switch or router.

Ex. 1001, 16:47–14 (numbering and formatting designated by Petitioner; *see* Pet. 91).

E. Evidence

Petitioner relies upon the following evidence:

- (1) U.S. Patent No. 6,697,374 B2, issued February 24, 2004 (“Shraga”) (Ex. 1005);
- (2) U.S. Patent No. 6,439,918, issued August 27, 2002 (“Togami”) (Ex. 1007);
- (3) ITU-T Study Group 15, Temporary Recommendation 7, (“The G.984.3 Draft Recommendation”) and ITU-T Study Group 15, Contribution 104 (collectively “G.984.3 Draft Recommendation/Contribution 104”) (respectively Exs. 1011-1, 1011-2);²
- (6) Declaration of Dr. Paul Prucnal. Ex. 1003.

² Petitioner states: “Both the G.984.3 Draft Recommendation and Contribution 104 are virtually identical and contain the same substantive material and thus will be referred to collectively throughout the grounds of this Petition as ‘the G.984.3 Draft Recommendation/Contribution 104.’” Pet. 14 n.3. For consistency, we will collectively reference these two documents as “G.984.3 Draft Recommendation/Contribution 104.”

F. Asserted Grounds of Unpatentability

Claims Challenged	35 U.S.C. § ³	References
1–16, 18–30	103(a)	Shraga/Togami
1–16, 18–30	103(a)	Shraga/Togami/G.984.3 Draft Recommendation/Contribution 104

III. ANALYSIS

A. Principles of Law

A claim is unpatentable as obvious under 35 U.S.C. § 103(a) “if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a) (2006). 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 skill in the art; and (4) so-called “secondary considerations,” including commercial success, long-felt but unsolved needs, failure of others, and unexpected results. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended various provisions of Title 35 of the U.S. Code. The application from which the ’754 patent issued was filed before March 16, 2013, the relevant effective date of the AIA. *See* Ex. 1001, code (22). Accordingly, citations to 35 U.S.C. § 103 are to the pre-AIA version.

At this stage, neither party has presented any evidence on the fourth *Graham* factor.

The Supreme Court has made clear that we apply “an expansive and flexible approach” to the question of obviousness. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415 (2007). Whether a patent claiming a combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *KSR*, 550 U.S. at 417. Reaching this conclusion, however, requires more than a mere showing that the prior art includes separate references covering each separate limitation in a claim under examination. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention. *Id.*

B. Level of Ordinary Skill

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. “The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991).

Petitioner describes a person of ordinary skill in the art (“POSITA”) as a person having at least “(1) an undergraduate degree in electrical engineering, computer engineering, computer science, or a comparable field of study and (2) at least two years of experience with optical data

communications or a comparable field of work.” Pet. 15 (citing Ex. 1003 ¶¶ 30–31). Petitioner’s declarant, Dr. Paul Prucnal, testifies to substantially the same level of ordinary skill in the art (Ex. 1003 ¶ 30) but adds that a person of ordinary skill in the art “would have been familiar with MSA optical modules, including SFP, XFP, and XENPAK, . . . networking protocols such as Ethernet, and the technologies that enable it, as well as the miniaturization of those technologies into what are commonly known as Small Form-Factor Pluggable (SFP) module” (Ex. 1003 ¶ 31).

In its Preliminary Response, Patent Owner does not dispute the Petitioner’s description of a person of ordinary skill in the art. *See generally* Prelim. Resp.

Petitioner’s description of a person of ordinary skill appears to be consistent with the subject matter of the ’754 patent. This is supported by the testimony of Petitioner’s declarant, Dr. Prucnal. *See* Ex. 1003 ¶¶ 30–31. We agree Petitioner’s assessment of a person of ordinary skill for purposes of this Decision, with the exception of the qualifier “at least,” to keep the description from being vague and extending to a level reflecting that of an expert. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995).

C. *Claim Construction*

In an *inter partes* review based on a petition filed on or after November 13, 2018, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2020); 83 Fed. Reg. 51,340, 51,340–41, 51,343 (Oct. 11, 2018).

In applying such standard, claim terms are generally given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). Usually, the specification is dispositive, and it is the single best guide to the meaning of a disputed term. *Id.* at 1315.

Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Matal*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); *see Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (applying *Vivid Techs.* in the context of an *inter partes* review).

Here, Petitioner asserts: “Unless otherwise specified, the terms should receive their respective plain and ordinary meaning as understood by a person of ordinary skill in the art under *Phillips v. AWH Corp.*” Pet. 10. Patent Owner does not dispute that assertion. *See generally*, Prelim. Resp. On this record and for purposes of this Decision, we determine that no claim terms require express construction.

D. Prosecution History

The '754 patent issued on August 7, 2012, from U.S. Patent Application No. 12/982,872 (“the '872 application”), filed on December 30, 2010. Ex. 1001, codes (10), (21), (22), (45). The '754 patent indicates that the '872 application is a continuation of U.S. Patent Application No. 10/886,514 (“the '514 application” or “the '514 parent application”), filed on July 6, 2004, which issued as U.S. Patent No. 7,925,162 (“the '162 patent”). *Id.* at code (63); *see also* Ex. 2015. The '754 patent claims priority to Provisional Application No. 60/485,072, filed on July 3, 2003, and Provisional Application No. 60/515,836, filed on October 30, 2003. Ex. 1001, code (60).

Petitioner asserts that the '754 patent “was granted as a first action allowance,” where the “Examiner made no prior art rejections and stated in the Notice of Allowability that the subject application was allowable over U.S. Patent Publication No. 2002/0163921 to Ethridge et al. because of the application’s ‘electrical network interface port electrically coupled to the control module and for coupling into the optical module port of the switch or router.’” Pet 7–8 (citing Ex. 1002-2, 18–19). “In other words,” Patent Owner asserts, “allowance was based on the fact that the PON data communication control functionalities were placed in a pluggable form-factor.” Pet. 8. Petitioner, however, acknowledges that “[m]uch of the prosecution history of the '754 Patent lies in the history of its parent application,” i.e., the '514 application. *Id.* (citing Ex. 1002-2).

Patent Owner agrees with Petitioner, stating that “the substantive examination occurred during examination of the Parent Application.” Prelim. Resp. 29. Patent Owner also notes that “Examiner Li examined both

the Parent Application and the application for the '754 Patent.” *Id.* at 30. Patent Owner asserts that “Examiner Li found that the prior art lacked, in a pluggable optical transceiver module, the claimed control module coupled to the electrical network interface port that is for coupling into the optical module port of the switch or router.” *Id.* at 35 (citing Ex. 1002-1, 18) (emphasis omitted).

E. Relevant Prior Art

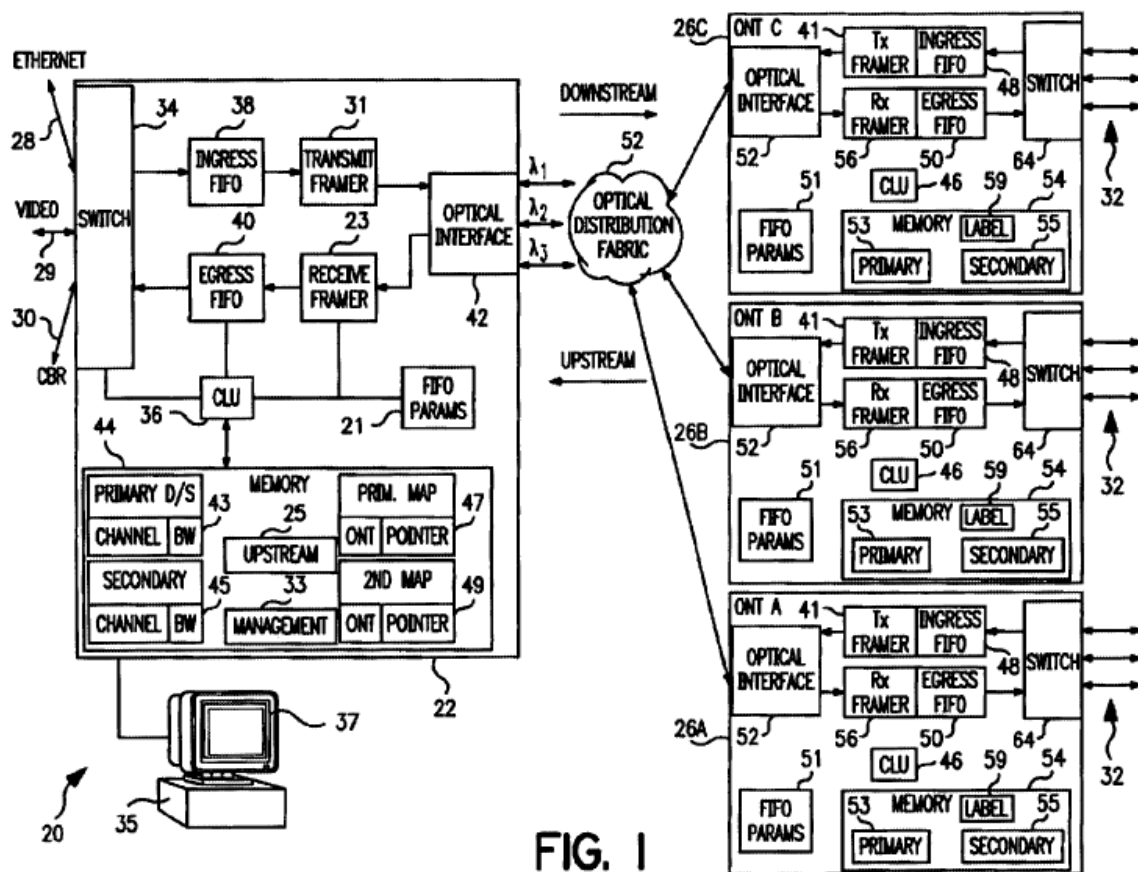
1. Shraga (Ex. 1005)

Shraga is titled “OPTICAL NETWORK COMMUNICATION SYSTEM.” *Id.* at code (54). The description of the invention’s field states “[t]he present invention relates to optical fiber networks.” *Id.* at 1:22. The description of the invention’s background summarizes a “point-to-multi-point passive optical network (PON)” as follows:

A point-to-multi-point passive optical network (PON) operates as a communication system by broadcasting optical signals downstream from a central unit, herein termed an optical line termination (OLT), to optical network terminations (ONTs). The signals are transferred from the OLT to the ONTS via fibre optic cables and passive optical splitters, which comprise the physical fabric of the network. For upstream communication, each ONT must be able to transmit signals which are not interfered with by other ONTs. One of the methods known in the art for performing such upstream and downstream transmissions is by using time domain multiple access (TDMA), wherein each ONT is allocated a window when only it can transmit, and where the OLT also has windows for transmission to specific ONTs.

Id. at 1:15–28.

Figure 1 is reproduced below and illustrates a schematic diagram of a PON 20. *Id.* at 7:17–18.



Shraga's Figure 1 is a schematic diagram of passive optical network (PON) 20 that includes passive optical distribution fabric connecting optical line terminal (OLT) 22 at the head end with optical network terminations (ONTs) 26A, 26B, 26C acting as respective receiving end points. *Id.* at 7:19–30. PON 20 transfers data between OLT 22 and ONTs 26 as downstream frames (from OLT 22) and upstream “virtual” frames (from ONT 26). *Id.* at 7:35–37. The optical distribution fabric passively splits downstream transmission so that all ONTs 26 receive the frames in a generally broadcast manner. *Id.* at 7:48–50.

OLT 22 is coupled at its upstream side to industry-standard data transfer services (e.g., Ethernet line 28). *Id.* at 7:30–32. ONTs 26 are

coupled at their respective downstream sides to data lines 32 providing lower-rate services to downstream clients. *Id.* at 7:33–35.

Control and logic unit (CLU) 36 of OLT 22 controls the overall operation of PON 20 by controlling elements of OLT 22. *Id.* at 7:60–63. CLU 36 controls operation of data ingress (from the upstream direction) First-In First-Out FIFO logical memory 38, data egress (to the upstream direction) FIFO logical memory 40, transmit framer 31, receive framer 23, and FIFO parameter table 21. *Id.* at 8:2–7. CLU 36 also controls operation of optical interface 42 that converts data of transmit framer 31 to optical signals of fabric 24 (e.g., modulating and transmitting a laser) and converts optical signals of fabric 24 to data of receive framer 23. *Id.* at 8:10–16. Each ONT 26 also includes CLU 46, ingress FIFO 48, egress FIFO 50, transmit framer 41, receive framer 56, FIFO parameter table 51, and optical interface 52 that operate in similar manners to those above. *Id.* at 8:37–40.

Frames are transmitted in a fully duplex manner (e.g., using different wavelengths). *Id.* at 7:35–41. OLT 22 transmits downstream frames in a substantially continuous sequence of constant period frames. *Id.* at 7:43–45. ONTS 26 transmit upstream frames in respective windows (i.e., that do not collide). *Id.* at 7:51–54. The upstream frames have, collectively, the same period as the downstream frames. *Id.* at 7:54–58. Communications are categorized into channels, such that each channel constitutes a one-to-one mapping the between OLT 22 and a specific ONT 26 (or set of ONTs) via allocated channel parameters (e.g., allocated bandwidths). *Id.* at 8:49–59. OLT 22 includes tables for tracking and updating window parameters of ONTs 26 and for mapping channels to ONTs 26. *Id.* at 8:60–63. Each ONT

26 also includes tables for mapping to the respective allocated channels (e.g., upstream bandwidth). *Id.* at 8:66–9:6.

Figure 2 is reproduced below and illustrates a schematic timing diagram of downstream and virtual upstream frames. *Id.* at 9:66–10:1.

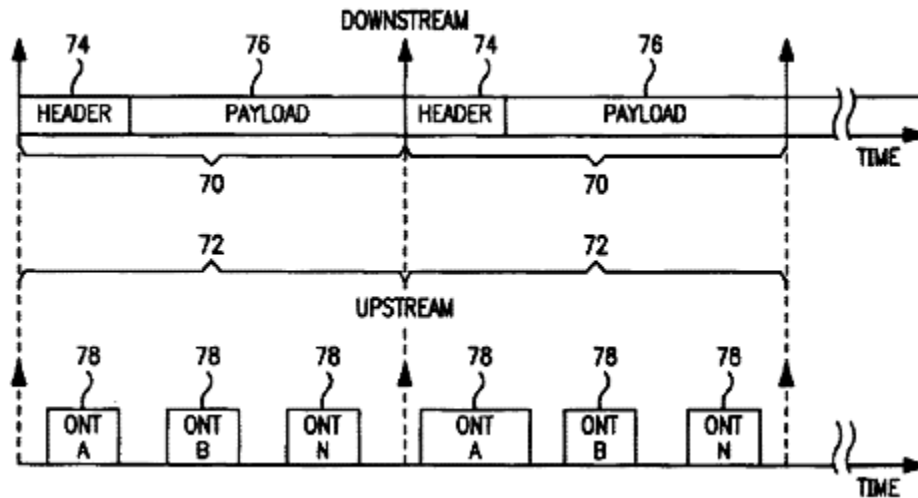


Figure 2 shows timing diagram of downstream frame 70 and virtual upstream frame 72. Each downstream frame 70 is transmitted from OLT22 with a substantially equal “network period” and includes header 74 permitting ONTs to identify the beginning of frame 70 and providing a marker for frame timing throughout PON 20. *Id.* at 10:2–8. During each network period, each ONT 26 is able to send upstream data within respective allocated respective window 78. *Id.* at 10:14–17. Window start times and lengths are allocated within each virtual frame 72 such that windows 78 do not overlap. *Id.* at 10:24–26.

Figure 3 is reproduced below and illustrates a schematic diagram of a downstream frame header. *Id.* at 10:38–39.

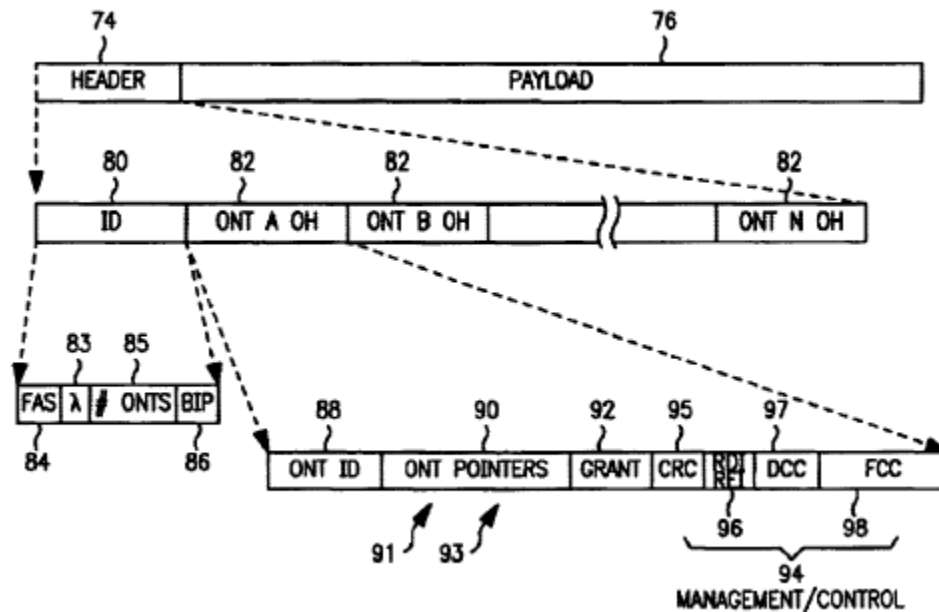


Figure 3 shows downstream frame header 74 which includes frame identification section 80 consisting of frame alignment signal (FAS) section 84, wavelength identification section 83, ONTs section 85, and bit interleaved parity (BIP) section 86. *Id.* at 10:40–44. FAS section 84 is used by ONTs as a start-of-frame identifier. *Id.* at 10:44–46. Wavelength identification section 83 identifies the wavelength group used by the frame. *Id.* at 10:46–47. The number of ONTs section 85 indicates the number of ONTs operating in the wavelength group. *Id.* at 10:49–50.

Header 74 also includes one or more ONT header sections 82 each directed to a specific ONT 26 and collectively directed to ONTs 26 that will process the frame (i.e., intended users). *Id.* at 10:56–58. ONT header section 82 includes ONT identification section 88 and window pointer section 90 (among other sections). *Id.* at 10:60–61. Pointer section 90 is used by a specific ONT 52 (identified by section 88) to transmit upstream

and, specifically, consists of start window transmission time 91 (measured from receipt of FAS section 84) instructing when the specific ONT 26 will begin to transmit upstream in a respective upstream window 78 (shown below) and maximum length 93 of window 78 the ONT is permitted to transmit. *Id.* at 10:62–11:2.

Figure 7 is reproduced below and illustrates a schematic diagram of an upstream window. *Id.* at 14:43–44.

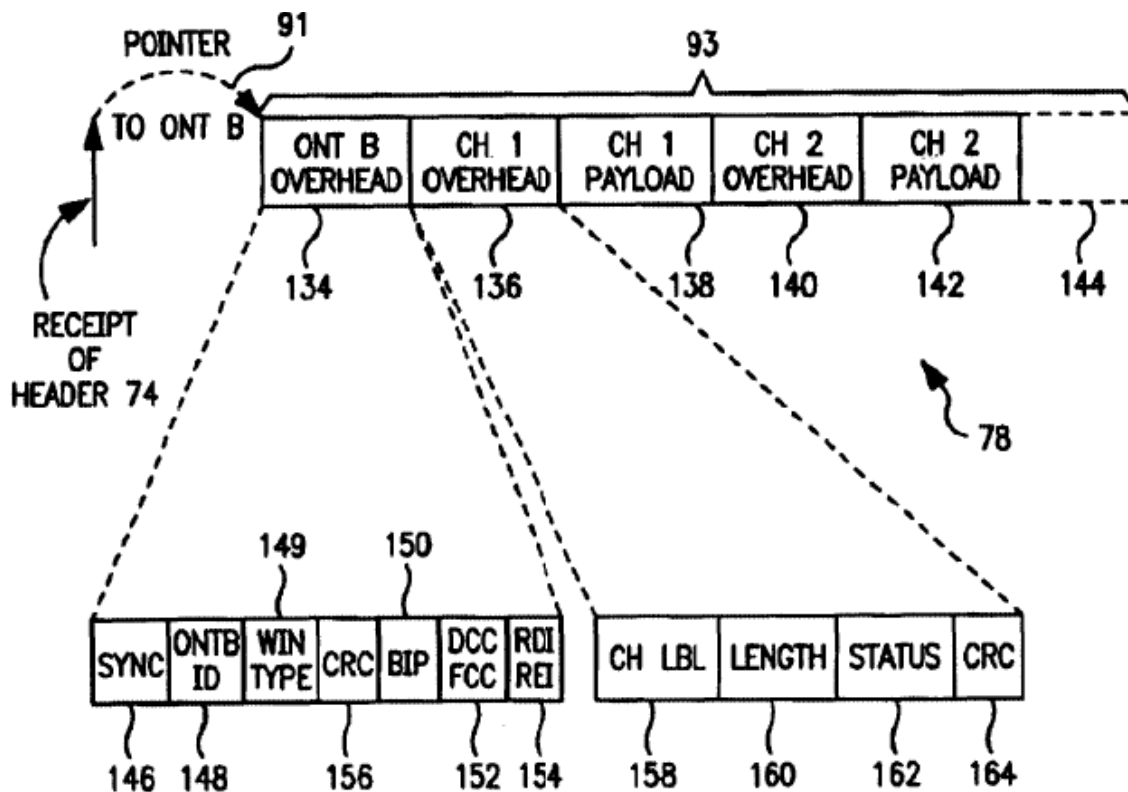


Figure 7 shows upstream window 78. Data in upstream window 78 is generated and transmitted by the above-described specific ONT 26. *Id.* at 14:45–46. The window does not overlap with any other windows 78 transmitted by other ONTS 26. *Id.* at 14:51–52. Window 78 is only transmitted from the specific ONT 26 after its receipt of above-described section 82 and particularly included pointer section 90 providing start

window transmission time 91 and maximum window length 93. *Id.* at 14:53–57.

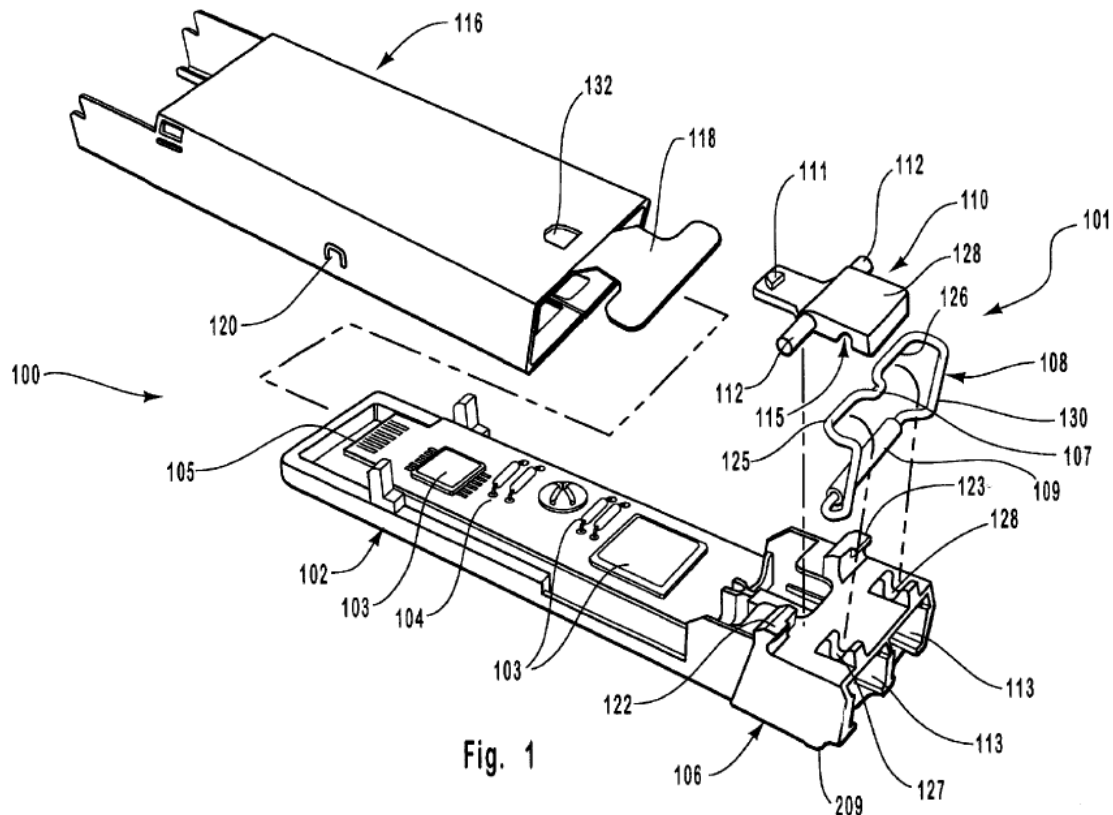
2. *Togami (Ex. 1007)*

Togami is titled “ELECTRONIC MODULE HAVING AN INTEGRATED LATCHING MECHANISM.” *Id.* at code (54). Togami is directed to “[a]n integrated latching mechanism for use with a user pluggable electronic module, such as an opto-electronic transceiver module. *Id.* at code (57). The description of the invention’s background summarizes an optical “transceiver module” as follows:

In [optical communications], the data carried by light signal must be converted to an electrical format when received by a device Conversely, when data is transmitted to the optical network, it must be converted from an electronic signal to a light signal. A number of protocols define the conversion of electrical signals to optical signals and transmission of those optical [T]he ANSI Fibre Channel (FC) protocol . . . is typically implemented using a transceiver module at both ends of a fiber optic cable. Each transceiver module typically contains a laser transmitter circuit capable of converting electrical signals to optical signals, and an optical receiver capable of converting received optical signals back into electrical signals.

Id. at 1:32–45. The description of the background also lists typical objectives for optical transceiver modules including compatibility with standard connection-port shapes and sizes, miniaturization, hot-pluggable connectivity (i.e., without removing electrical power), and omitting special tools for connectivity. *Id.* at 1:46–2:26. Togami describes a resulting need for an optical transceiver module with a latching scheme that permits a small form factor, complies with existing standards, permits easy insertion and extraction of the module without a special extraction tool or disturbing other communications links. *Id.* at 2:27–40.

Figure 1 is reproduced below and illustrates a perspective view of Togami's optical transceiver module. *Id.* at 5:5–8.



Togami's Figure 1 shows optical transceiver module 100. Module 100 includes base portion 102 configured to seat printed circuit board 104 for transceiver electronics 103 and optics (not shown). *Id.* at 5:8–13. On the rear edge of the printed circuit board 104 is exposed edge connector 105 compatible with an electrical connector (not shown) within the port of a host device. *Id.* at 5:15–19. At the other end of the base portion 102 is connector portion 106 forming receptacle 113 for a modular connector of an optical fiber cable. *Id.* at 5:21–25.

Figure 2 is reproduced below and also illustrates a perspective view of Togami's optical transceiver module as paired with the modular connector of an optical fiber cable. *Id.* at 5:25–27.

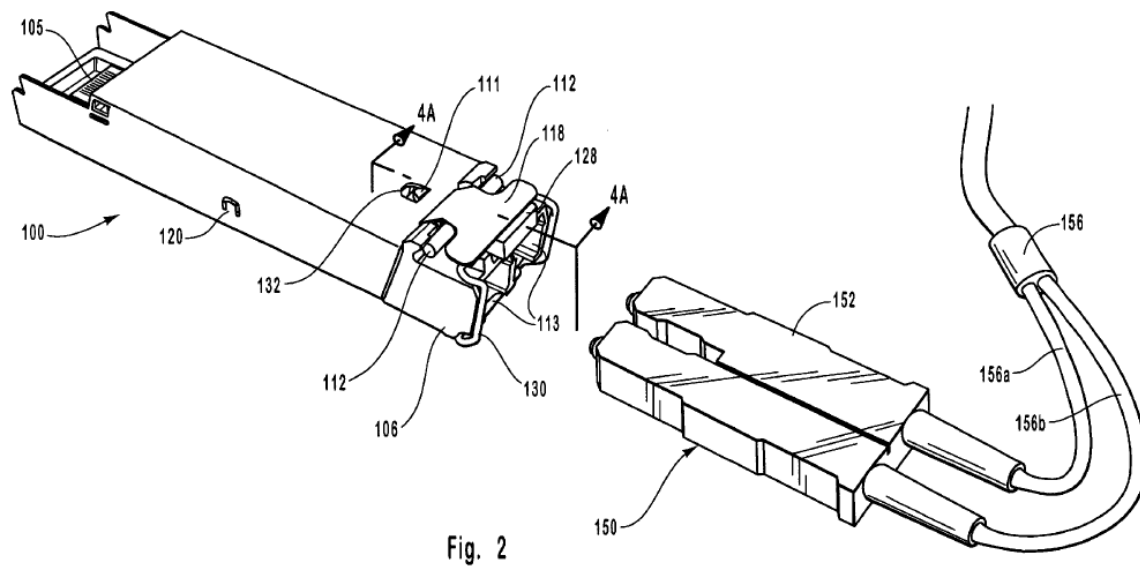


Fig. 2

Togami's Figure 2 shows optical transceiver module 100 as paired with modular connector 150 of optical fiber cable 156. Modular connector 150 of optical fiber cable 156 is received within receptacle 113 of connector portion 106. *Id.* at 7:38–41. Generally speaking, and per Togami's objectives, the remaining description of optical transceiver module 100 and modular connector 150 concerns structure for latching these components. *Id.* at 5:32–7:26.

F. 35 U.S.C. § 314(a) Discretion - Fintiv

Patent Owner contends that we should exercise our discretion to deny institution under 35 U.S.C. § 314(a), citing *Apple v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 13-14 (PTAB Mar. 20, 2020) (precedential) ("*Fintiv*"). Prelim. Resp. 70–76. Petitioner contends that we should not deny institution under *Fintiv*. Pet. 83–86. We allowed the parties additional briefing to more fully address this issue. *See* Papers 15, 16.

Based on the District Court for the Eastern District of Texas dockets in *NextGen Innovations, LLC v. Fujitsu Network Communications, Inc. et al.*, 2-22-cv-00307 (EDTX) ("*Fujitsu*") (Ex. 3003), *NextGen Innovations,*

LLC v. Nokia of America Corporation, et al., 2-22-cv-00309 (EDTX) (“*Nokia I*”) (Ex. 3004), and *NextGen Innovations, LLC v. Nokia of America Corporation, et al.*, 2-23-cv-00637 (“*Nokia II*”) (EDTX) (Ex. 3005), it appears that a number of events have transpired in the District Court since the parties briefed their *Fintiv* arguments that are material to the Board’s consideration of this issue, in particular to the issue of a pending District Court trial date. Notably, it appears that the parties have not apprised the Board of any of these developments except for Patent Owner listing the *Nokia II* case in its Supplemental Mandatory Notices pursuant to 37 C.F.R. § 42.8(a)(2). *See* Paper 17.

In its *Fintiv* briefing, Patent Owner expressly argues that “[t]he Board should not waste its limited resources when, under the *Fintiv* factors, the Board’s decision will likely have no effect—not against anyone, ever [because] [t]rial is scheduled for May 6, 2024 [and] [t]he final written decision is not expected until January 20, 2025.” Prelim. Resp. 70–71.

Petitioner also makes an argument concerning the trial date in District Court, arguing that “[t]he earliest estimated trial date for the four currently pending consolidated cases is far in the future as jury selection is not set to begin until at least May 6, 2024.” Petition 84.

The parties continued to address the trial date issue in their supplemental briefing on *Fintiv*. *See* Prelim. Reply 9–10; Prelim. Sur-reply 8.

The problem with the parties’ briefing on the trial date issue is that it appears that in the District Court: 1) a stay (Ex. 3006) has been issued in the *Fujitsu* case (the “pending” May trial date (*See* Ex. 1032)); 2) NextGen Innovations has filed another patent in infringement suit against Nokia (*Nokia*

II) (Paper 17, 2); and 3) Nokia has jointly moved (Ex. 3007) to deconsolidate *Nokia I* from the *Fujitsu* case and to consolidate *Nokia I* with *Nokia II*, which the District Court has granted (Ex. 3008). Based upon our review of these documents, none of which were provided to the Board by the parties, it appears that there no longer is a pending District Court trial date in May 2004 involving Nokia. Given the lack of notice of these developments by the parties to the Board on an issue that is material to the Board's *Fintiv* analysis and the decision in this case, the Board no longer has confidence that the parties have provided the Board with accurate, timely factual information that the Board needs in order to render a fair, just determination of the *Fintiv* issue and this case.

Accordingly, pursuant to 37 C.F.R. § 42.11 (d)(3), the parties are Ordered to Show Cause why they should not be sanctioned under 37 C.F.R. § 42.12 (a) (2), (3) and to file briefs addressing this issue, not to exceed 10 pages, within 10 days of this Decision.

G. 35 U.S.C. § 325(d) Discretion⁴

“In determining whether to institute or order [an *inter partes* review], the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.” 35 U.S.C. § 325(d). The Director has delegated this discretion to the Board. 37 C.F.R. § 42.4(a).

Patent Owner asserts, *inter alia*, that we should deny the Petition under 35 U.S.C. § 325(d) because the Petition presents substantially the

⁴ The Panel recognizes that three other IPR proceedings between the parties involving the application of 35 U.S.C. § 325(d), namely IPR2023-00680, IPR2023-00681, and IPR2023-00682, are currently under Director Review.

same art and arguments that the Office previously analyzed and Petitioner fails to show that the Office erred during prosecution. *See* Prelim. Resp. 35–70; Prelim. Sur-reply 3–7. Petitioner disagrees, and argues that the asserted prior art references were not previously considered. *See* Pet. 81–83; Prelim. Reply 6–9.

1. Framework

In evaluating the exercise of discretion to deny institution under Section 325(d), the Board uses the following two-part framework: (1) determining whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of the first part of the framework is satisfied, determining whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. *Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential) (“*Advanced Bionics*”).

Within this two-part framework, the Board considers a number of non-exclusive factors in evaluating whether to exercise its discretion under § 325(d). *See Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first para.) (“*Becton, Dickinson*”); *see also Advanced Bionics*, Paper 6 at 9–11. The factors set forth in *Becton, Dickinson* are as follows:

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;

(b) the cumulative nature of the asserted art and the prior art evaluated during examination;

(c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;

(d) the extent of the overlap between the arguments made during examination and the manner in which petitioner relies on the prior art or patent owner distinguishes the prior art;

(e) whether petitioner has pointed out sufficiently how the examiner erred in its evaluation of the asserted prior art; and

(f) the extent to which additional evidence and facts presented in the petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson, Paper 8 at 17–18. *Becton, Dickinson* factors (a), (b), and (d) relate to whether the art or arguments presented in the Petition are the same or substantially the same as those previously presented to the Office. *Advanced Bionics*, Paper 6 at 10. Factors (c), (e), and (f) “relate to whether the petitioner has demonstrated a material error by the Office” in its prior consideration of that art or arguments. *Id.* Only if the same or substantially the same art or arguments were previously presented to the Office do we consider whether petitioner has demonstrated a material error by the Office. *Id.* “At bottom, this framework reflects a commitment to defer to previous Office evaluations of the evidence of record unless material error is shown.” *Id.* at 9.

2. Analysis

Petitioner argues that “[t]he Board should not deny institution under §325(d).” Pet. 81. Petitioner asserts that the “Petition does not include any prior art references that were cited during the original prosecution and are not cumulative of the art considered by the Examiner during prosecution.” *Id.* at 82 (citing Ex. 1003 ¶¶ 88–92); *see also* Prelim. Reply 6. Petitioner argues that “the combination of references used in this petition cannot be cumulative of the art and/or arguments raised during prosecution as there are material differences between the grounds herein and what was previously presented.” Pet. 83; *see also* Prelim. Reply 6.

Petitioner asserts, for example, that “the primary prior art reference used in this Petition is not merely limited to a WAN [wide-area network], as in the primary reference cited by the Examiner, but applies more broadly to PONs [passive optical networks] as a whole and can be implemented in LANs [local-area networks] and WANs.” Pet. 82. Petitioner asserts that while the ’514 parent application and the ’754 patent “possess[] the same specification and priority date, the two are quite different—the ’514 application specifically states throughout the claims that the PON is a LAN, whereas the PON described in the specification and claims of the ’754 Patent discloses more than just a LAN.” *Id.* at 82–83 (citing Ex. 1003 ¶ 91); *see also* Prelim. Reply 7–8.

In contrast, Patent Owner argues that we should deny institution under 35 U.S.C. § 325(d) “because the USPTO already carefully examined the type of combination that Petitioner proposes: a first reference cited for . . . signal processing components in an ONT [Optical Network Termination] /ONU [Optical Network Unit] in an optical network combined with a second

referenced cited for the pluggable optical transceiver form factor.” Prelim. Resp. 35–36. Patent Owner argues that “Examiner Li cited Medina for teaching an MSA-compliant SFP optical transceiver, just like how the Petition relies on Togami. Also, Examiner Li explicitly cited multiple references that have the same teachings as Shraga about 1) a PON, 2) the components in an ONT/ONU, and/or 3) scheduling.” Prelim. Resp. 37.

There is no dispute here that the asserted art, Shraga and Togami, was not previously presented to the Office, and Petitioner correctly notes that “Shraga or Togami were never used as the basis for any rejection.” Prelim. Reply 6. The issue then is whether substantially the same art or arguments previously were presented to the Office. *Advanced Bionics*, Paper 6 at 9–11. Patent Owner contends that Shraga and Togami are nothing more than another combination of a first reference (Shraga) cited for signal processing components in a passive optical network (PON) combined with a second reference (Togami) cited for a pluggable optical transceiver form factor. Prelim. Resp. 35–36. Patent Owner argues that the Office previously considered such a combination when it considered a number of references disclosing a passive optical network with electrical signal processing components in an ONT/ONU with scheduling, such as Akita, Yokomoto, Choi, Hale, Medina, Wang, Kuo, Abdelhamid, and Masucci in combination with Medina, which discloses a pluggable transceiver module. *See* Prelim. Resp. 37–64.

Petitioner argues, however, that “there are key differences between the references used in this Petition and the art cited by the Examiner,” as “the ’162 Patent and the ’754 Patent are directed to materially different subject matter: the ’162 Patent’s claims apply to a LAN and no other access

networks and therefore contrast with the claims of the '754 Patent, which apply instead to broadband access networks.” Prelim. Reply 7 (citing Pet. 82–83). “As such,” Petitioner contends, “the cited references were addressed only in the context of the claims of the '162 Patent, directed to LANs, and not the '754 Patent, directed to other access networks.” Prelim. Reply 8. Petitioner argues that “the combination of references used in this petition cannot be cumulative of the art and/or arguments raised during prosecution as there are material differences between the grounds herein and what was previously presented.” Pet. 83; *see also* Prelim. Reply 6.

We agree with Petitioner and find that the art asserted in the Petition is not substantially the same art previously presented to the Office. Here, Dr. Prucnal testifies, and we agree, that the '754 patent is directed to a device that operates on a passive optical network (PON), as opposed to a device that operate on a Local-Area Network (LAN) Ex. 1003 ¶ 87. The '754 patent explains that Figures 6A–6C, 7A–7C, and 8 “are illustrations of implementation of the optical local area network [LAN] 50.” Ex. 1001, 11: 36–37. Figure 8, however, shown below, illustrates a number of LANS connected to a WAN (wide-area network).

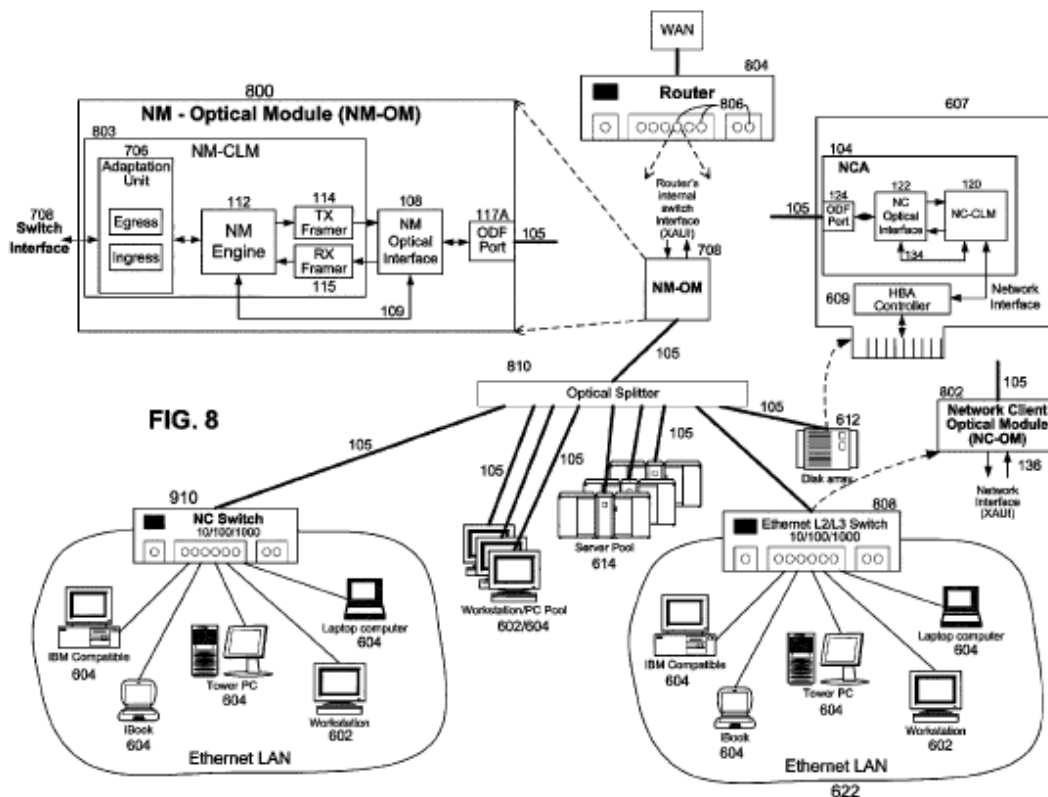


Figure 8 from the '754 patent shows Ethernet LAN 622 connected through optical splitter 810 to optical module 800, which is connected to router 804 that is connected to a WAN (wide-area network). Dr. Prucnal testifies, and we agree, that “the '754 Patent contemplates that ‘one LAN can be connected to other LANs over any distance often spanning an area greater than either LAN. . . . A system of LANs connected in this way is commonly referred to as a wide-area network (WAN).” Ex. 1003 ¶ 87 (citing Ex. 1001, 1:28–33). Thus, the '754 patent is directed to passive optical networks that comprise more than just a LAN.

Dr. Prucnal testifies that Shraga, the primary reference asserted by Petitioner here, is directed to an optical network communication system that “teaches a method for communication over a passive optical network from a

central point to end points by time division multiplexing of a sequence of frames divided into multiple timeslots.” Ex. 1003 ¶ 95. Dr. Prucnal also testifies that Shraga’s “methods are not limited to passive optical networks generally and, particularly, are not limited simply to wide area networks (WANs) or local area networks (LANs).” *Id.* ¶ 98.

In contrast, with respect to the primary reference (Wang) that was previously considered by the Office, the Board has already determined that it could find “no supportive evidence . . . that Wang teaches or suggests an optical LAN,” and that “Wang does not disclose an optical LAN, but instead what is most likely an optical WAN.” Ex. 1002-2, 29.

Similarly, we find that the arguments presented here are not the same, or substantially the same, as the arguments previously presented to the Office. For example, Petitioner’s annotated Figure 3 from Shraga is shown below.

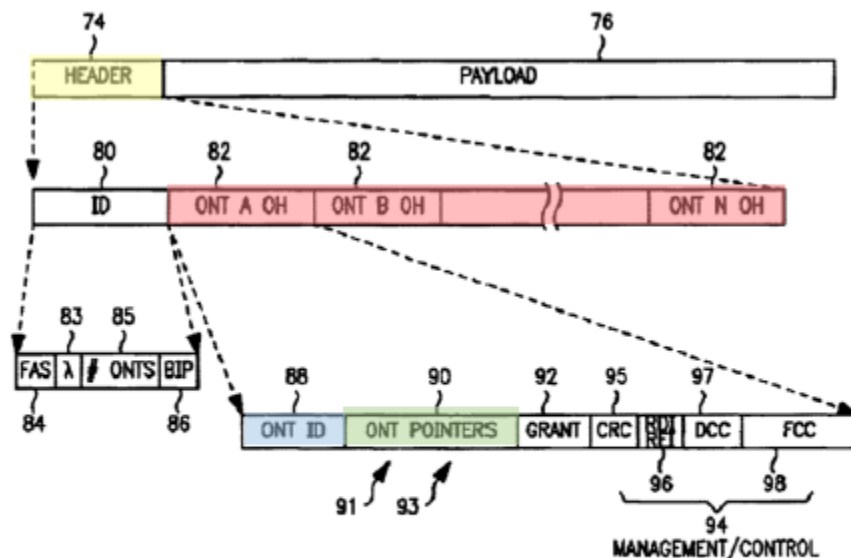


FIG. 3

Ex. 1005, Fig. 3 (annotated).

Petitioner's annotated Figure 3 from Shruga is a schematic diagram showing the structure of a downstream frame header. Pet. 30. Petitioner explains that

Each ONT/ONU overhead section includes an ONT identifier (in blue above) and an ONT pointers section (in green above). [Ex. 1005] 10:56-11:6. Shruga teaches that each ONT pointers section includes a start transmission time (91 above) measured from the frame alignment signal, indicating when the ONT/ONU is to begin transmitting data within its window upstream, back to the head-end. *Id.*

Once an ONT/ONU has received its start time from the OLT (in yellow below), the CLU uses this assignment to construct the transmission window, beginning with an overhead section (in red below) in accordance with the start time (in blue below) provided by the pointer of the downstream transmission. *Id.* at 14:42- 57, Fig. 7. After the window is fully constructed by the CLU, the ONT/ONU transmits the window upstream at the start time allocated to it. *Id.*; *Id.* at 9:56-65.

Pet. 30. Based on this teaching, Petitioner argues that a person of ordinary skill in the art “would have understood that Shruga teaches a transceiver module ‘configured to transmit the data communications to the head-end of the PON responsive to the start times’ provided by the head-end OLT.” *Id.* at 31 (citing Ex. 1003 ¶ 138).

This argument, that the disclosure in the primary reference of the structure and operation of a downstream frame header acts to inform a person of ordinary skill in the art that that the reference teaches a *transceiver module*, is not the same, or substantially the same, as an argument previously considered by the Office. Patent Owner argues that “Yokomoto teaches ‘supervisory control information regarding which time slots are used for transmitting the STM signals, in sending out the PON upstream transmission frame,’” but this does not contemplate or present an argument whereby the

description of the downstream frame header acts to inform a person of ordinary skill in the art that Yokomoto is teaching a *transceiver module*. Prelim. Sur-reply, 4–5 (citing Ex. 2005 ¶ 109; *see also id.* at ¶¶ 107, 110, 113–120 (further describing “time slots”)).

Based on the record before us, we determine that the arguments presented by the Petition are not the same, or substantially the same, as the arguments previously presented to the Office. Having determined that Part 1 of the Advanced Bionics framework has not been met, we do not reach Part 2 of the framework.

We therefore determine that the circumstances of this case do not warrant the exercise of our discretion under 35 U.S.C. § 325(d).

H. Priority Date

Patent Owner asserts that “[t]he ’754 Patent claims priority to provisional application 60/485,072, filed on June 3, 2003 and also to provisional application 60/515,836 filed on October 30, 2003.” Prelim. Resp. 8 (citing Ex. 1001, cover). Patent Owner contends that “Petitioner has admitted that the ’754 Patent is entitled its earliest 2003 priority date: June 3, 2003.” Prelim. Resp. 8. Because of this, Patent Owner asserts that “the G.984.3 Draft Recommendation and/or Contribution 104 relied on in Ground II no longer qualify as prior art.” *Id.* at 9.

Petitioner contends that “[t]he ’754 Patent is not entitled to a priority date of June 3, 2003.” Prelim. Reply 1. Petitioner asserts that Patent Owner admitted in District Court in its Infringement Contentions that the ’754 Patent is entitled to a priority date of October 30, 2003. *Id.* at 1–2 (citing Ex. 1035, 6). Petitioner also contends that Patent Owner has not established that the ’754 patent is entitled to a July 3, 2003, priority date because

“[p]atent claims ‘are not entitled to an earlier priority date merely because the patentee claims priority.’” Prelim. Reply 4 (citing *Nat. Alts. Int’l, Inc. v. Iancu*, 904 F.3d 1375, 1380 (Fed. Cir. 2018) (quoting *In re NTP, Inc.*, 654 F.3d 1268, 1276 (Fed. Cir. 2011)). Petitioner points out that “for a patent’s claims to be entitled to an earlier priority date, the patentee *must demonstrate* that the claims meet the requirements of 35 U.S.C. §120.”

Prelim. Reply 4–5 (citing *Nat. Alts.*, 904 F.3d at 1380). Petitioner contends that “Patent Owners failed to make the requisite showing because they cannot demonstrate written description [support] for the claims of the ’754 Patent are found in the July Provisional.” Prelim. Reply 5.

In its Sur-reply, Patent Owner asserts that Petitioner “waived its priority argument.” Prelim. Sur-reply, 1. Patent Owner asserts that “Patent Owners did not have the opportunity to address Petitioner’s new argument regarding an October 30, 2003 priority date and its impact on other arguments in the Preliminary Response, including with respect to Ground II,” and that “Patent Owners cannot do so in this sur-reply that is limited to 10 pages and for which no expert reports may be submitted.” *Id.* at 3.

Because this Decision does not rely on the prior art challenged by Patent Owner, we do not need to decide this issue at this point in the proceeding. Instead, we encourage the parties to further address this issue in their upcoming briefs, during discovery, and at trial in this matter so that a final decision on this issue can be made on a more fully developed record.

I. Obviousness based on Shraga and Togami (Ground 1)

Petitioner contends that claims 1–16 and 18–30 would have been rendered obvious by the combined teachings of Shraga and Togami. Pet. 18–59. Petitioner provides a detailed claim analysis, supported by the

testimony of Dr. Prucnal. *Id.*; Ex. 1003 ¶¶ 105–257. Patent Owner challenges some of Petitioner’s evidence and arguments. Prelim. Resp. 9–26. We discuss the evidence and the arguments provided by the parties with respect to independent claim 1, beginning with Petitioner’s rationale to combine the asserted art.

1. Rationale to Combine

Petitioner contends that a person of ordinary skill in the art “would have been motivated to combine the optical transceiver module of Togami with the optical network data communications system of Shruga to create a pluggable optical transceiver module for use in transmitting data communications over a PON for several reasons.” Pet. 18–19 (citing Ex. 1003 ¶¶ 106–07).

“First,” Petitioner asserts, “utilizing the pluggable optical module having a small form-factor in accordance with existing standards disclosed in Togami for data communications in a PON, as taught in Shruga, was already well-known and implemented in the art.” Pet. 19 (citing Ex. 1003 ¶ 107; Ex. 1008; Ex. 1012; *see also* Ex. 1034 (announcing “hot-pluggable” SFP fiber optic transceivers, which “allows greater flexibility in system configurations, and eliminates system downtime during upgrades and maintenance”)). Petitioner points to “an article published in the OKI Technical Review in April 2002 [that] shows the use of small form-factor pluggables in connection with PONs such as GPON, EPON, and LANs.” Pet. 19 (citing Ex. 1003 ¶ 107; Ex. 1012, Fig. 1, 95). Figure 1 from the OKI Technical Review article is shown below.

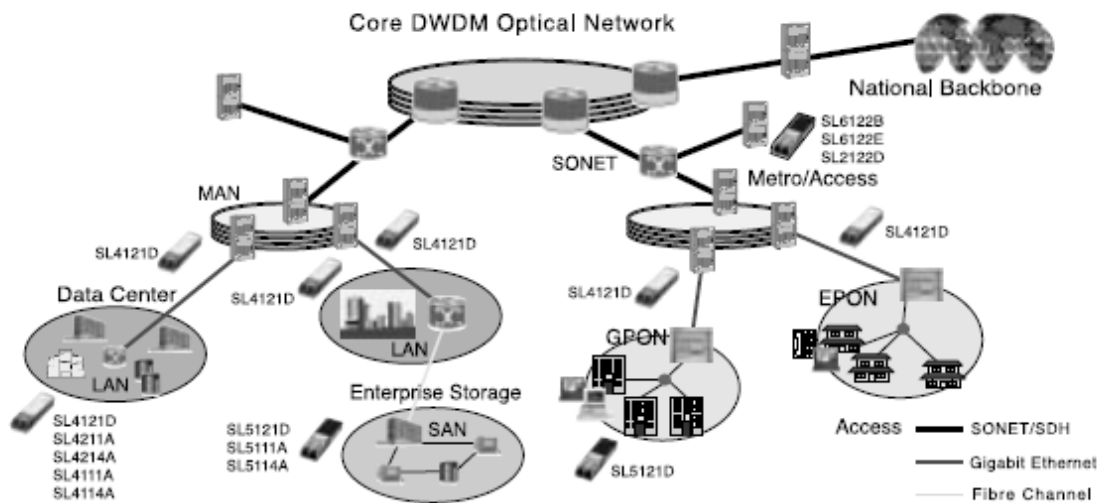


Fig. 1 Optical communications network for the broadband era

Figure 1, shown above, illustrates an optical communications network showing a number of possible utilizations of Small Form Factor (SFF) short wave optical transceivers, e.g. SL4211A, SL4111A, SL5111A, etc. Ex. 1012, Fig. 1.

Second, Petitioner asserts that a person of ordinary skill in the art “would have been motivated to combine Shraga and Togami because, as disclosed by the MSAs [Multi Service Agreements] that had already standardized certain pluggable form-factors, a pluggable optical module was easier to install, repair, and/or replace than a traditional mounted transceiver, decreasing the chances of improper installation and the likelihood that other components near the transceiver could be damaged during service.” Pet. 20 (citing Ex. 1003 ¶ 110; Ex. 1007, 2:1–8). Petitioner also asserts that “a pluggable optical transceiver module took less time to install, repair, and/or replace because of its removable nature, meaning less down time for the fiber-optic system during maintenance.” Pet. 20 (citing Ex. 1003 ¶ 111; Ex. 1007, 1:49–60).

Third, Petitioner asserts that a person of ordinary skill in the art “would have been motivated to combine Shruga and Togami because a pluggable optical transceiver module is more compact, taking up less room than traditional transceivers.” Pet. 20–21 (citing Ex. 1003 ¶ 112). Petitioner asserts that “[d]ecreasing the transceiver size was a goal of a [person of ordinary skill in the art] in the early 2000s, as stated in the ’754 Patent.” Pet. 21 (citing Ex. 1001, 2:14–16).

Fourth, Petitioner asserts that a person of ordinary skill in the art “would have been motivated to combine Shruga and Togami to create a pluggable optical transceiver module for transmitting data communications over a PON because a pluggable optical transceiver is more cost effective, a goal of a POSITA in the early 2000s.” Pet. 21 (citing Ex. 1003 ¶ 113; Ex. 1008, 2:42–47). Petitioner explains that “[u]tilizing the already-standardized small form-factor pluggable optical modules allowed for system manufacturers to save costs by utilizing a large number of ports for data communications; providing for easier installation, repair and replacement; decreasing manufacturing costs; and allowing for upgrades to the optical system by simply replacing the module.” Pet. 21 (citing Ex. 1003 ¶ 113; Ex. 1008, 1:39–55, 2:42–47).

Petitioner contends that a person of ordinary skill in the art “would have had a reasonable expectation of success in combining the PON data communications system in Shruga with the pluggable optical transceiver module in Togami because many of the expected results of the combination were stated goals and benefits in the references and, more generally, goals of POSITAs during the early 2000s.” Pet. 21 (citing Ex. 1003 ¶¶ 114–115).

Patent Owner challenges Petitioner’s arguments and evidence directed to its rationale to combine. *See* Prelim. Resp. 19–23. Patent Owner argues that Petitioner’s motivations “would not have caused a POSITA to move Shraga’s CLU [control logic unit] into Togami’s pluggable module.” *Id.* at 19. Patent Owner also argues that a person of ordinary skill in the art “would not [have] been motivated to add a CLU into a pluggable optical transceiver module because whenever a pluggable optical transceiver module needs to be replaced as a result of damage or physical wear, the replacement cost would be further increased by the cost of replacing a CLU that would not have otherwise needed replacement.” *Id.* at 22.

Patent Owner’s challenges to Petitioner’s evidence of a rationale to combine are unsupported attorney arguments, and are not evidence. *Icon Health & Fitness, Inc. v. Strava Inc.*, 849 F.3d 1034, 1046 (Fed. Cir. 2017) (“Attorney argument is not evidence or explanation in support of a conclusion.”); *Invitrogen Corp. v. Clontech Lab., Inc.*, 429 F.3d 1052, 1068 (Fed. Cir. 2005) (“Unsubstantiated attorney argument regarding the meaning of technical evidence is no substitute for competent, substantiated expert testimony.”).

At this stage of the proceeding, Patent Owner has not provided declaration testimony to support its assertions. As a result, Patent Owner’s assertions are founded mostly on attorney argument, and the opinions of Petitioner’s declarant, Dr. Prucnal, presently stand unrebutted. On the evidentiary record presently before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that one of ordinary skill in the art would have sufficient reason to combine Shraga and Togami

to create a pluggable optical transceiver module for use in transmitting data communications over a passive optical network in the manner described.

Based on the preliminary record before us, we find that Petitioner has shown sufficiently for purposes of institution that a person of ordinary skill in the art at the time of the claimed invention would have had reason to combine the teachings of Shraga and Togami in the manner described, and would have had a reasonable expectation of success in so doing.

2. Independent Claim 1

Claim 1 generally recites a network client optical transceiver module for a passive optical network having a passive optical splitter for coupling the transceiver module over optical fibers to the head end of the passive optical network, where the optical transceiver module has a pluggable form-factor and is configured to removably couple to an optical module port of a switch or router. Ex. 1001, 16:48–55. The transceiver module generally comprises an optical port, a bi-directional optical interface block configured to perform optical-to-electrical and electrical-to-optical signal conversion, a control module electrically coupled to the interface block and configured to receive start times for transmitting data communications to the head end of the optical network, and an electrical network interface port coupled to the control module for electrically coupling into the optical module port of the switch or router. *Id.* at 16:56–17:1–14.

With respect to the limitations of claim 1, Patent Owner disputes Petitioner's evidence and arguments with respect to limitation [1.C] reciting a control module. Prelim. Resp. 14–19. At this point in the proceeding, Patent Owner does not challenge Petitioner's showing with respect to the other limitations of claim 1. *See* Prelim. Resp. 19–23.

a. [1.C] a control module electrically coupled to the bi-directional optical interface block . . .

With respect to limitation [1.C] Petitioner asserts that “Shraga discloses that each OLT and ONT/ONU contains a control and logic unit (CLU) (shown below in yellow) coupled to the optical interface which controls, via management software, the overall operation of the PON. Pet. 27–28 (citing Ex. 1005, 7:60–8:9, 8:36–43). Petitioner asserts that a person of ordinary skill in the art “would have understood that, for the ONT/ONU to process signals from the head-end, the CLU would necessarily be “electrically coupled” to the optical interface, as the internal components of the ONT/ONU communicate via electrical signals.” Pet. 28 (citing Ex. 1003 ¶ 134; Ex. 1005, 8:10–18, 8:36–43, 10:56–11:15). Petitioner’s annotated version of Shraga’s Figure 1 is shown below. Pet. 28.

Shraga teaches that the CLU controls the operation of data communications in the PON, including data ingress/egress, as well as the transmit and receive framers, which in conjunction allow the ONT/ONU to transmit and receive optical data communications. Ex. 1003, ¶134; Ex. 1005, 7:50-8:9, 8:36-47. Shraga also discloses that downstream frames transmitted from the OLT headend are comprised of a header (in yellow below) that begins with a frame alignment signal (identified as 84 below) which is used by the ONTs/ONUs as a reference point for syncing upstream transmissions, and further contains a series of overhead sections directed to specific ONTs/ONUs (in red below) is received by the ONTs/ONUs to identify a beginning of the frame, acting as a starting marker for frame timing throughout the PON. *Id.* at 9:66-10:13, 10:38-55, Fig. 2, Fig. 3.

Pet. 29. Shraga's Figures 2 and 3, annotated by Petitioner, are shown below.

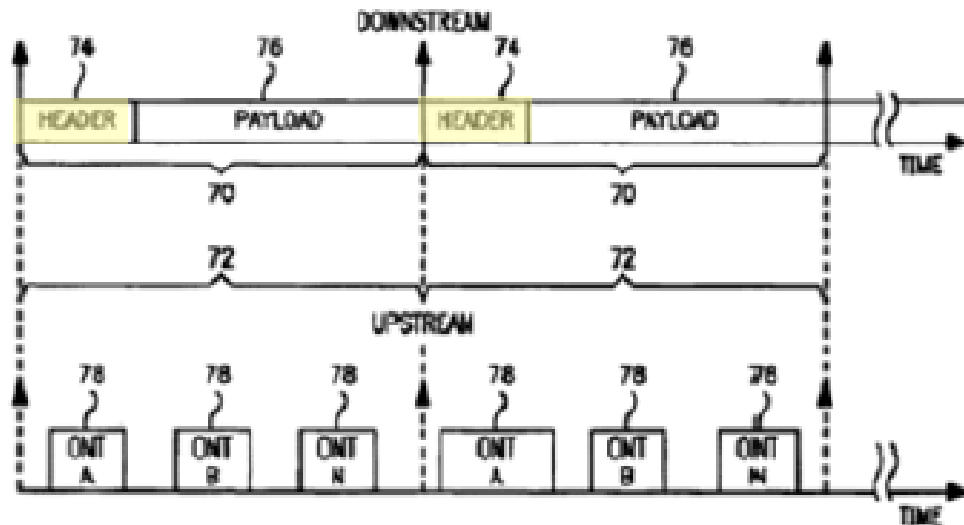


FIG. 2

Ex. 1005, Fig. 2 (annotated).

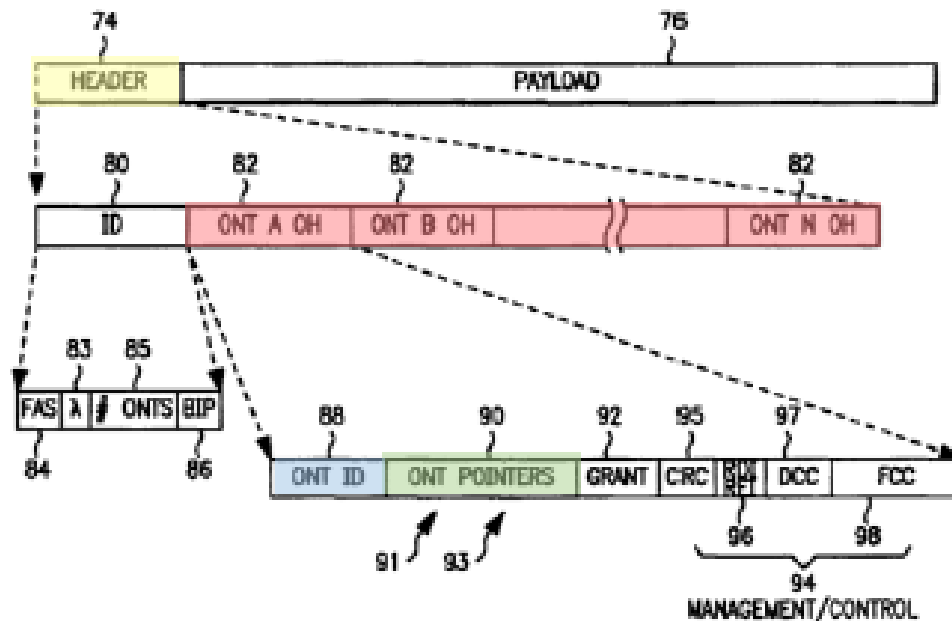


FIG. 3

Ex. 1005, Fig. 3 (annotated).

Shraga's annotated Figure 2 is a schematic timing diagram showing the overall structure of downstream frame 70 and virtual upstream frame 72 transmitted in the network of Figure 1. Each downstream frame 70 is transmitted from OLT 22 with a substantially equal period. Each downstream frame 70 comprises header 74, at least part of which serves, inter alia, as a means for receiving ONTS to identify a beginning of the frame, and thus acts as a starting marker for frame timing throughout PON 20. Ex. 1005 9:66–10:8.

Shraga's Annotated Figure 3 is a schematic diagram showing the structure of downstream frame header 74. Header 74 comprises frame identification section 80, which in turn consists of frame alignment signal (FAS) section 84, wavelength identification section 83, ONTS section 85, and bit interleaved parity (BIP) section 86. *Id.* at 10:38–44.

According to Petitioner,

Each ONT/ONU overhead section includes an ONT identifier (in blue above) and an ONT pointers section (in green above). *Id.*; *Id.* at 10:56-11:6. Shruga teaches that each ONT pointers section includes a start transmission time (91 above) measured from the frame alignment signal, indicating when the ONT/ONU is to begin transmitting data within its window upstream, back to the head-end. *Id.*

Once an ONT/ONU has received its start time from the OLT (in yellow below), the CLU uses this assignment to construct the transmission window, beginning with an overhead section (in red below) in accordance with the start time (in blue below) provided by the pointer of the downstream transmission. *Id.* at 14:42- 57, Fig. 7. After the window is fully constructed by the CLU, the ONT/ONU transmits the window upstream at the start time allocated to it. *Id.*; *Id.* at 9:56-65.

Pet. 30. Shruga's Figure 7, annotated by Petitioner, is shown below.

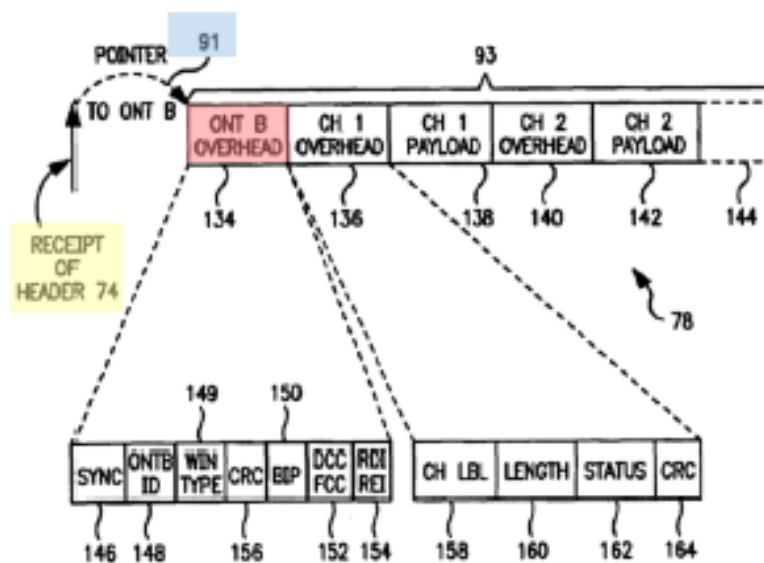


FIG. 7

Ex. 1005, Fig. 7 (annotated).

Shraga's Figure 7 is a schematic diagram showing details of upstream window 78 of ONT26B. Data in upstream window 78 is generated and transmitted by ONT 26B. Window 78 is implemented by ONT 26B so that on reception of the window at OLT 22, the window does not overlap with any other windows 78 transmitted by other ONTS 26. Ex. 1005, 14:42–53.

Petitioner asserts that a person of ordinary skill in the art “would have understood that Shraga teaches a transceiver module “configured to transmit the data communications to the head-end of the PON responsive to the start times” provided by the head-end OLT.” Pet. 31(citing Ex. 1003 ¶ 138).

Patent Owner argues that in the full context of claim 1, limitation [1.C] “requires the claimed pluggable network client optical transceiver module to include the claimed control module.” Prelim. Resp. 14. Patent Owner argues that “[t]he Petition overlooks this requirement and does not therefore establish a likelihood of success in demonstrating that the combination of Shraga and Togami disclose this element.” *Id.* Patent Owner argues that “Shraga’s CLU is not comprised within the ‘Optical Interface’ block and not comprised within a pluggable optical transceiver module.” *Id.* Patent Owner faults the Petition, because it “does not argue that Togami’s pluggable optical transceiver module has the claimed controller.” *Id.*

Patent Owner also argues that “Petitioner has not explained why the combination of Shraga and Togami . . . would result in the CLU being installed on a pluggable transceiver module as opposed to remaining in Shraga’s ONT/ONU.” *Id.* at 15. Patent Owner asserts that “[n]either the Petition nor Dr. Prucnal make any argument for moving Shraga’s CLU into Togami’s optical transceiver module.” Prelim. Resp. 17. Patent Owner

contends that “Dr. Prucnal argued that it would have been obvious for a POSITA to replace Shraga’s ‘optical interface’ in the ONT/ONU with Togami’s pluggable optical transceiver module.” Petition at 18 (citing Ex. 1003 ¶ 106).

We disagree with Patent Owner. Dr. Prucnal did not argue, as Patent Owner contends, that “it would have been obvious for a POSITA to replace Shraga’s ‘optical interface’ in the ONT/ONU with Togami’s pluggable optical transceiver module.” Rather, Dr. Prucnal testified that a person of ordinary skill in the art “would have been motivated to combine the optical transceiver module of Togami with the optical network data communications system of Shraga to create a pluggable optical transceiver module for use in transmitting data communications over a passive optical network.” Ex. 1003 ¶ 106.

With respect to the recited control module, Dr. Prucnal testifies that “Shraga discloses that each OLT and ONT/ONU contains a control and logic unit (CLU) . . . which controls, via management software comprised in a memory, the overall operation of the individual elements of the ONT/ONU,” and that “the CLU is [electrically] coupled to the optical interface.” *Id.* ¶ 134 (citing Ex. 1005, 7:60–8:9, 8:36–43). Dr. Prucnal testifies that “[o]nce an ONT/ONU has received its start time from the OLT . . . the CLU of the ONT/ONU uses this information to construct the transmission window. Ex. 1003 ¶ 136 (citing Ex. 1005, 14:42–57, Fig. 7). Dr. Prucnal also testifies that “[a]fter the window is fully constructed by the CLU, the ONT/ONU transmits the window upstream at the start time allocated to it.” Ex. 1003 ¶ 137 (citing Ex. 1005, 9:56–65). “Therefore,” Dr. Prucnal testifies, a person of ordinary skill in the art “*would have understood that Shraga*

teaches a transceiver module ‘configured to transmit the data communications to the head-end of the passive optical network responsive to the start times’ provided by the headend OLT.” Ex. 1003 ¶ 137 (emphasis added). “Thus,” Dr. Prucnal concludes, “it is my opinion that a [person of ordinary skill in the art] would have found the combination of Shraga and Togami discloses” the recited control module of claim 1. *Id.* ¶ 138.

b. Conclusion as to Independent Claim 1

We have considered all of the evidence and arguments presented by the parties with respect to independent claim 1. Based on the preliminary record before us, we are persuaded that Petitioner has demonstrated sufficiently for purposes of institution that the combined teachings of Shraga and Togami meet all the limitations of independent claim 1 and that a person of ordinary skill in the art at the time of the claimed invention would have had reason to combine the teachings of Shraga and Togami in the manner described in the Petition, and would have had a reasonable expectation of success in so doing.

3. Dependent Claims

Petitioner contends that dependent claims 2–16 and 19–30 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combined teachings of Shraga and Togami. Pet. 34–59. Petitioner provides a detailed claim analysis, supported by the testimony of Dr. Prucnal. *See Id.*; Ex. 1003 ¶¶ 148–257. Petitioner also provides an explanation of a rationale to combine the teachings of these references in the manner described in the Petition, which is also supported by the testimony of Dr. Prucnal. Pet. 18–21 (citing Ex. 1003 ¶¶ 105–115).

Patent Owner challenges Petitioner's arguments and evidence by arguing that "[n]one of Petitioner's arguments regarding dependent claims 2–16 cure the deficiencies discussed for Claim 1. Because these dependent claims are nonobvious for at least the reasons discussed for independent claim 1, the Petition's arguments are unlikely to succeed on the merits." Prelim. Resp. 24–25. Patent Owner makes a similar argument with respect to dependent claims 19–30. *Id.* at 26.

With respect to dependent claims 10 and 16, Patent Owner also argues that Petitioner "relies on the G.984.3 Draft Recommendation and/or Contribution 104 references in its arguments for claim 10 and claim 16," and "[b]ecause neither of these references has been established as prior art, Petitioner has not shown a likelihood of success in Ground I regarding claims 10 and 16 of the '754 Patent." Prelim. Resp. 23 (citing Pet. 44–45 (claim 10), 51 (claim 16)). Also, with respect to dependent claim 16, Patent Owner argues that "Petitioner's discussion of this dependent claim lacks any evidence for arguing that Shruga teaches an optical transceiver module." Prelim. Resp. 24.

We have considered all of the evidence and the arguments provided by the parties with respect to dependent claims 2–16 and 19–30. Because we determine that Petitioner demonstrates a reasonable likelihood of prevailing in its challenge to independent claim 1 as obvious over Shruga and Togami, we are instituting an *inter partes* review on that challenge and we also institute *inter partes* review as to all challenges in the Petition, including Petitioner's challenges to dependent claims 2–16 and 19–30. *See PGS Geophysical* 891 F.3d at 1360 (Fed. Cir. 2018).

J. Obviousness based on Shruga/Togami and G.984.3 Draft Recommendation/Contribution 104 (Ground 2)

Petitioner contends that claims 1–16 and 18–30 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combined teachings of Shruga, Togami, and the G.984.3 Draft Recommendation/Contribution 104. Pet. 60–81. Petitioner provides a detailed claim analysis, supported by the testimony of Dr. Prucnal. *See Id.*; Ex. 1003 ¶¶ 258–402. Petitioner also provides an explanation of a rationale to combine the teachings of these references in the manner described in the Petition that is supported by the testimony of Dr. Prucnal. Pet. 60–62 (citing Ex. 1003 ¶¶ 258–266).

Patent Owner challenges Petitioner’s arguments and evidence, arguing that “Petitioner waived its right to challenge the July 3, 2003 earliest priority date of the ’754 Patent,” and that “Ground II does not provide any independent argument about why it would have been obvious for a pluggable optical transceiver module to have a control module as recited in the claims.” Prelim. Resp. 27–29.

We have considered all of the evidence and the arguments presented by the parties with respect to claims 1–16 and 18–30 on this ground. Because we determine that Petitioner demonstrates a reasonable likelihood of prevailing in its challenge to independent claim 1 under 35 U.S.C. § 103(a) as obvious over Shruga and Togami, we are instituting an *inter partes* review on that challenge and we also institute *inter partes* review as to all challenges in the Petition, including Petitioner’s challenges under Ground 2. *See PGS Geophysical* 891 F.3d at 1360 (Fed. Cir. 2018).

IV. CONCLUSION

For the foregoing reasons, we determine that there is a reasonable likelihood that Petitioner would prevail with respect to at least one of the challenged claims in the Petition. We therefore institute trial as to all challenged claims on all grounds asserted in the Petition.

V. ORDER

Accordingly, it is

ORDERED that *inter partes* review of claims 1–16 and 18–30 of the '754 patent is instituted on all grounds in the Petition;

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this decision; and

FURTHER ORDERED that pursuant to 37 C.F.R. § 42.11 (d)(3), the parties shall file briefs within 10 days of this Decision to Show Cause why they should not be sanctioned under 37 C.F.R. § 42.12 (a) (2) (3), said briefs not to exceed 10 pages in length.

PETITIONER:

Scott Stevens
Scott.stevens@alston.com
Karlee Wroblewski
Karlee.wroblewski@alston.com
Matthew Welch
Matt.welch@alston.com
Daniel O'Connor
Dan.occonor@alston.com

PATENT OWNER:

Qi Tong
ptong@raklaw.com
Irene Lee
ilee@raklaw.com