

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 Owners.

Case No. IPR2023-00960

U.S. Patent No. 8,238,754

PETITIONER'S REPLY TO PATENT OWNER'S RESPONSE

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TABLE OF EXHIBITS

Exhibit	Short Name	Description
Ex. 1001	'754 Patent	U.S. Patent No. 8,238,754
Ex. 1002-1	'754 File History	File History of U.S. Patent No. 8,238,754
Ex. 1002-2	'514 File History	File History of U.S. Patent Application No. 60/886,514
Ex. 1003	Prucnal Declaration	Declaration of Dr. Paul Prucnal
Ex. 1004	Prucnal CV	<i>Curriculum Vitae</i> of Dr. Paul Prucnal
Ex. 1005	Shraga	U.S. Patent No. 6,697,374
Ex. 1006	Wood	U.S. Patent No. 7,088,921
Ex. 1007	Togami	U.S. Patent No. 6,439,918
Ex. 1008	Fujimori	U.S. Patent No. 7,206,366
Ex. 1009	Liu	U.S. Patent No. 6,005,694
Ex. 1010	Starr Declaration	Declaration of Thomas J. J. Starr
Ex. 1011-1	G.984.3 Draft Recommendation	ITU-T Study Group 15, Temporary Document 7, Draft new Recommendation G.984.3 – Transmission Convergence Layer for Gigabit Passive Optical Networks
Ex. 1011-2	Contribution 104	ITU-T Study Group 15, Contribution 104, Draft new Recommendation G.984.3 – Transmission Convergence Layer for Gigabit Passive Optical Networks
Ex. 1012	OKI Article	<i>SFF & SFP Optical Transceivers</i> , OKI Technical Review Issue 190, Vol. 69, No. 2 (April 2002)
Ex. 1013	Ramaswami	Rajiv Ramaswami & Kumar Sivarajan, <i>Optical Networks, A Practical Perspective</i> (2d ed. 2002)

Exhibit	Short Name	Description
Ex. 1014	Kramer IEEE	Glen Kramer & Gerry Pesavento, <i>Ethernet Passive Optical Network (EPON): Building a Next-Generation Optical Access Network</i> , IEEE Communications Magazine (February 2002)
Ex. 1015	Kazi	Khurram Kazi, <i>Optical Networking Standards, A Comprehensive Guide for Professionals</i> (2006)
Ex. 1016	SFP MSA	SFF Committee, INF-8074i Specification for SFP (Small Formfactor Pluggable) Transceiver, Rev. 1.0, May 12, 2001).
Ex. 1017	XFP MSA	10G small form factor pluggable, XFP Revision 4.5 (initial publication March 2002)
Ex. 1018	XENPAK MSA	INF-8474i Specification for Xenpak 10 Gigabit Ethernet Transceiver, Rev. 3.0, September 18, 2002 (publicly announced March 12, 2001)
Ex. 1019	Kramer OSA	Glen Kramer, et al., <i>Supporting differentiated classes of service in Ethernet passive optical networks</i> , Journal of Optical Networking, Vol. 1, Nos. 8 & 9 (August & September 2002)
Ex. 1020	EC&M Article	Small Form Factor Connector Basics by Paul Rosenberg, EC&M.com (Sept. 1, 2001).
Ex. 1021	Going Serial Article	Going Serial in Gigabit Ethernet Designs by Martin Lund, EDN.com (June 20, 2002).
Ex. 1022	G.984.2	ITU-T G.984.2 (03/2003) Gigabit-capable Passive Optical Networks (GPON): Physical Media Dependent (PMD) layer specification
Ex. 1023	G.984.1	ITU-T G.984.1 (03/2003) Gigabit-capable Passive Optical Networks (GPON): General Characteristics
Ex. 1024	ITU-T A.1	ITU-T A.1 (10/2000) Work methods for study groups of the ITU Telecommunication Standardization Sector (ITU-T)

Exhibit	Short Name	Description
Ex. 1025	SG15 Contributions List	List of contributions from Oct. 2003 Geneva, Switzerland Meeting
Ex. 1026	SG15 TD-PLEN List	List of Plenary temporary documents from the Oct. 2003 Geneva, Switzerland Meeting
Ex. 1027	WP1 TD List	List of WP1 temporary documents from Oct. 2003 Geneva, Switzerland Meeting
Ex. 1028	WP1 TD5	Report of Q.2/15 Rapporteur meeting, 13-14 August 2003, Santa Clara, USA
Ex. 1029	TD-58GEN	List of participants at the Oct. 2003 Geneva, Switzerland
Ex. 1030	TD-7PLEN HTML	Webpage printout of The G.984.3 Draft Recommendation page
Ex. 1031	Contribution 104 HTML	Webpage printout of Contribution 104
Ex. 1032	DCO	Doc. No. 58, Docket Control Order, <i>NextGen Innovations, LLC v. Fujitsu Network Communications, Inc. et al.</i> , No. 2:22-cv-00307-JRG-RSP (E.D. Tex.) (consolidated cases)
Ex. 1033	Caseload	U.S. District Court – Judicial Caseload Profile (Sept. 2022)
Ex. 1034	Agilent New Fiber Optic Transceiver	<i>Agilent Technologies' New Fiber Optic Transceivers Offer Industry's Lowest EMI Emissions</i> , Agilent Technologies Inc. (July 10, 2001)
Ex. 1035	Infringement Contentions	Plaintiff NextGen Innovations, LLC's Disclosure of Asserted Claims and Infringement Contentions to the Nokia Defendants, <i>NextGen Innovations, LLC v. Nokia Corp., et al.</i> , No. 2:22-cv-00309-JRG-RSP (E.D. Tex.)
Ex. 1036	Nokia's Motion to Intervene in the AT&T Litigation	Dkt. No. 27, Nokia of America Corporation's Motion to Intervene, <i>NextGen Innovations, LLC v. AT&T Services, Inc., et al.</i> , No. 2:23-cv-00263-JRG-RSP (E.D. Tex.)

Exhibit	Short Name	Description
Ex. 1037	AT&T Litigation DCO	Dkt. No. 23, Docket Control Order, <i>NextGen Innovations, LLC v. AT&T Services, Inc., et al.</i> , No. 2:23-cv-00263- JRG-RSP (E.D. Tex.)
Ex. 1038	AT&T Litigation Infringement Contentions	Plaintiff NextGen Innovations, LLC's Disclosure of Asserted Claims and Infringement Contentions to AT&T, <i>NextGen Innovations, LLC v. AT&T Services, Inc., et al.</i> , No. 2:23-cv-00263- JRG-RSP (E.D. Tex.) (Sept. 13, 2023)
Ex. 1039	RESERVED	RESERVED
Ex. 1040	Willner Deposition Transcript	Deposition Transcript of Dr. Alan Willner, (Sept. 17, 2024)
Ex. 1041	Prucnal Supplemental Declaration	Supplemental Declaration of Dr. Paul Prucnal

I. INTRODUCTION

Petitioners' Petition to institute inter partes review ("IPR") of U.S. 8,238,754 ("754 Patent") (Ex. 1001) set forth compelling grounds sufficient to establish that the Challenged Claims were rendered obvious under 35 U.S.C. §103 by the combination of prior art references Shrags (Ex. 1005) and Togami (Ex. 1006). Petitioner further established that Shrags and Togami in combination with the G.984.3 Draft Recommendation/Contribution 104 (Exs. 1011-1, 1011-2) rendered the Challenged Claims obvious under 35 U.S.C. §103.

Patent Owners' ("POs") arguments fail to rebut Petitioner's evidence that the challenged claims were obvious to a POSITA. As an initial matter, POs' Response (POR) misrepresents Petitioner's combination. POs dedicate nearly half of their Response to addressing a particular detail of Shrags and Togami that was *not* proposed in the Petition and, instead, was contrived by POs during the deposition of Petitioner's expert, Dr. Prucnal. *See generally* Paper 34 ("POR"). Additionally, POs mischaracterize Petitioner's combination by suggesting Petitioner proposes placing an entire ONT device containing a 24-port switch into a pluggable in an effort to argue that a POSITA would not have been motivated to combine Shrags and Togami. *Id.*, 24-25. Petitioner does not and has never advanced that argument, and thus POs' criticism fails. A POSITA would have been motivated to combine Shrags and Togami, rendering obvious the pluggable optical module of the '754 Patent.

Moreover, the Board should disregard POs' expert's declaration and testimony. As an initial matter, Dr. Willner failed to include an oath or attestation of truthfulness in his declaration and thus did not comply with the requirements of the Board. But more importantly, Dr. Willner's blatant evasiveness, contradictions to the opinions offered in his declaration, and evident refusal to answer even basic questions about his background and his declaration's supporting materials calls into question his reliability and legitimacy as an expert witness.

Thus, for the reasons set forth in the Petition, and as supported herein, the Board should determine all Challenged Claims are unpatentable.

II. ARGUMENT

A. Petitioner's combination does not propose putting Shrags's switch inside Togami's pluggable.

POs argue "[i]t is important for the Board to understand what the final proposed combination *actually is*." POR, 10. Petitioner agrees—but what it *actually is* comports with what is shown in the Petition, not POs' attempted strawman argument.

For avoidance of doubt, Petitioner's combination of Shrags with Togami involves the inclusion of PON communication functionalities present in the Shrags ONT onto the Togami pluggable optical transceiver module. *See, e.g.* Paper 2 ("Petition"), 18-19 ("A POSITA 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 PON . . .”). Indeed, the Board has recognized Petitioner’s combination in its Institution Decision. *See* Paper 19 (“ID”), 48 (“[] 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.”).

The Petition, supported by the testimony of Dr. Prucnal, relies on Shraga’s functional diagram (Figure 1) for two key purposes. First, it shows how and where a POSITA would arrange the components within Petitioner’s proposed combination of a pluggable optical transceiver module for use in transmitting data communications over a PON. And second, it shows how a POSITA would easily understand that these components align with the components and ports of Togami’s pluggable, evidencing the simplicity of Petitioner’s combination. *See, e.g.*, Petition, 24, 26-28, 31-34; *see also* Ex. 2021, 76:15-77:10; Ex. 1041 ¶12. As confirmed by Dr. Prucnal in his deposition, the ONT functional components within the pluggable optical module of the combination primarily consist of Shraga’s ONT’s optical interface, framer blocks, PON/ONT functions of the CLU, and ingress and egress FIFO. *See, e.g.*, Ex. 2021, 51:18-52:4, 87:8-88:4, 96:23-97:2; Ex. 1041 ¶13. These components do not include a switch or switching functionality—which itself is *not*

a component or functionality within a PON system. A switch's purpose is merely to "switch" or route traffic, agnostic of the network used to deliver that traffic to the actual end user (in this case, a PON).

Section IV.B of POs' Response is titled "The Second Proposed Combination (Switch in SFP)." *Id.*, 13. But Petitioner does not propose a "second" combination of Shraga and Togami where Shraga's switch is located on a pluggable optical module. At no point in the Petition, or in Dr. Prucnal's declaration, do Petitioner or Dr. Prucnal state that the combination proposes placing a switch inside a pluggable optical transceiver module. Petitioner proposed something quite different. *See, e.g.*, Petition, 31-34 (confirming that the proposed combination pluggable would *plug into* a switch, such as the switch shown in Shraga, not comprise a switch). During his deposition, Dr. Prucnal confirmed multiple times that in *his* combination—the combination considered in the Petition—the switch is *not* included in the pluggable optical transceiver module capable of transmitting data communications over the PON. *See, e.g.*, Ex. 2021, 61:15-22, 65:15-23 ("the functionality in Shraga that's inside the ONT, *with the exception of the switch*, would be [what's] going into the Togami pluggable device.") (emphasis added), 96:16-97:2; Ex. 1041 ¶13. POs' positions regarding their "second proposed combination" are irrelevant as they are responsive discussion in a combination not proposed by Petitioner and not at issue

in this proceeding.¹ *See, e.g.*, POR, 13-16, 20-24, 36-37, 44-47.

B. A POSITA would have been motivated to “separate” Shraga’s PON or ONT functionality from Shraga’s switch.

POs present a number of arguments as to why a POSITA would not have been motivated to implement certain functional components of Shraga in the pluggable optical module of Togami. In particular, POs state a POSITA would not have implemented the functionality of Shraga’s ONT in a pluggable optical transceiver module, such as that of Togami, because doing so would “separate” said components from Shraga’s switch 64—but separating the PON- or ONT-related components from the remaining non-PON-related components poses no impediment.

- i. *“Separating” Shraga’s switch from the PON-specific functions would have no effect on its operation or the operation of Shraga’s PON system.*

As Dr. Prucnal made clear in both his original declaration and in his deposition testimony, Shraga’s inclusion of the switch 64 *within* the same box as the ONT functionality is merely a design choice employed by the inventors of Shraga—a

¹ POs’ Response also contains Section IV.C, “Combinations Not In The Petition.”

As the title suggests, in this section POs discuss two additional “combinations” not proposed by the Petition, one of which the Board already clarified was *not* proposed by Petitioner. ID at 47-48. Petitioner relies on its combination in the Petition and, thus, these sections of the POR are not responsive and should be disregarded.

POSITA would have understood that switch 64 could be its own freestanding device, separate from Shraga's ONT, and still perform all of the same functions had it been included within the "boundary" of Shraga's box. *See* Petition, 31-33; Ex. 1003 ¶141; *see also* Ex. 2021, 66:12-17, 68:17-22 ("whether the switch be included on the inside of [Shraga's] ONT module or on the outside is a design choice, which is to say that one could just have that switch outside equally well as inside"), 69:13-25; Ex. 1041 ¶¶15-16. This is supported by the fact that switch 64 is merely connected to the ingress and egress FIFO blocks of Shraga's ONT for the transfer of various data and signals. *See* Ex. 1005, Fig. 1; Ex. 1041 ¶15. Whether or not switch 64 is contained within the same physical "device" or "boundary" or "box" as the other functional components is inconsequential from a functionality standpoint; switch 64 would still electrically communicate with the other components of Shraga's ONT. *See* Ex. 1003 ¶141; *see also* Ex. 2021, 66:12-17, 68:17-22, 69:13-25; Ex. 1041 ¶16. In fact, it was well known in the art at the time of the '754 Patent's filing that ONTs and switches, such as Shraga's switch 64, came in the form of separately packaged devices and could communicate electrically via, for example, an ethernet cable. Ex. 1041 ¶16. Dr. Prucnal describes his personal familiarity with these devices in his supplemental Declaration. *Id.* It was also well known, as he describes, that these switches included their own discrete controllers or CLUs and thus, it would not have been required for a switch to be controlled by an external controller or CLU. *Id.*, ¶¶17, 23.

POs argue that, because Shraga states its CLU sends controlling signals to switch 64, Shraga's switch 64 cannot be a "separate" component. POR, 17. This is not true. *See id.*, ¶17. First, the Petition does not suggest removing the switch-specific control functions from the Shraga device. Ex. 2021, 87:8-88:4 ("So I'm not just taking the CLU out of Shraga"). The switch's controller would stay with the switch. *Id.* And second, Shraga describes and shows switch 64 as being connected to the actual ONT functional components only at the ingress and egress FIFO blocks. *See* Ex. 1005, Fig. 1. Therefore, because Shraga states that its switch operates "according to controlling signals received from CLU," a POSITA would have understood that these controlling signals can be communicated to the switch using the connection point at the ingress/egress block, *i.e.*, the CLU is coupled to the switch via the ingress/egress FIFO. *Id.*, 7:67-8:2, 8:36-42; Petition, 31-32; Ex. 1041 ¶17. It would therefore have been obvious to a POSITA that, regardless of whether or not the switch 64 is located within of Shraga's ONT box, switch 64 would nonetheless remain electrically coupled to the ingress and egress FIFO blocks of Shraga's ONT. *See* Petition, 31-34; Ex. 1041 ¶17.

ii. Whether the switch is operable when the pluggable optical module is unplugged is irrelevant to Petitioner's combination.

POs misguidedly argue that if the Petitioner's pluggable optical module is not plugged into the switch "there is no electrical connection from the CLU to the switch,

rendering the switch inoperable.” POR, 17-18. But such a scenario is both wrong and inconsequential to a POSITA’s motivation to combine the references. Ex. 1041 ¶18. As mentioned above, the switch would maintain its own controller or CLU.

In the actual combination proposed by Petitioner, where the pluggable optical module plugs into a host device such as the switch, the CLU remains capable of transmitting electrical signals to the switch. *See* Petition, 31-34; Ex. 1003 ¶140-46; Ex. 1041 ¶17-18. If the proposed pluggable optical module were *not* plugged into its host device, such as a switch, then the entire data communications system contemplated in Shruga would logically fail to operate as described, not just the host switch. *Id.*, ¶¶18-19. This is because Petitioner’s proposed pluggable optical module functions as a conduit to receive data communications transmitted by the head-end of the network and pass them to downstream devices connected via the switch, as taught in Shruga. *Id.*; *see also generally* Petition § VII.A. Thus, the pluggable optical module *must be* plugged into its host device for data communications to occur and for the switch to have any purpose at all. Petition, 32-33; Ex. 1041 ¶ 19.

The scenario contemplated in POs’ Response—wherein the pluggable module of Petitioner’s combination is not plugged into a host device, such as a switch—is akin to arguing that if the switch is not plugged into a power source it is rendered inoperable. Indeed, without said connection, neither the switch nor pluggable optical module are capable of performing, or have a purpose to perform, their distinct

functionalities. Ex. 1041 ¶19. Therefore, POs' proposition that the switch would be "inoperable" is not a legitimate or valid criticism of Petitioner's combination. Moreover, such a scenario is not claimed or contemplated in the '754 Patent, which *requires* the pluggable network client optical transceiver module be "coupled to" the switch (Ex. 1001, Claim 1).

iii. Petitioner's pluggable optical module would not change the operation of Shraga's switch.

POs further argue that, if Shraga's ONT functionality is placed in Togami's pluggable, it would be "impossible" for the specific CLU component to provide controlling signals to the switch, as described in Shraga. POR, 18. In particular, POs misguidedly state that the electrical interface of Togami's described SFP pluggable does not allow for passage of "control signals." *Id.*, 18-19. Thus, POs wrongly argue, "the CLU-switch control connection" will be severed and "Shraga's switch 64 can no longer be used for its intended purpose." *Id.* This argument is disproved on the face of the SFP MSA (Ex. 1016), as Dr. Willner recognized in his deposition.

First, POs again mischaracterize the Petition's combination. Petitioner is not suggesting that the switch must be left with no controller or CLU in its own box. The specific control logic that performs the PON communications functionality of the ONT would instead be implemented by the logic within the pluggable of Togami. Dr. Prucnal explained that, "I'm not just take the CLU out of Shraga and putting it into Togami. . . . but [Togami] would be carrying out the duties of the CLU." Ex.

2021, 87:8-88:4. Both Togami and Shruga already have control logic, the presented combination merely shows that a POSITA would be motivated to move certain PON-specific functionality from one control logic (in Shruga's box) to the other (Togami's pluggable), creating the pluggable optical module proposed by Petitioner's combination.

Putting that aside, Ex. 1016 describes the technical specification for a small-form-factor pluggable transceiver, such as the SFP described in Togami. Ex. 1016, 1016.002; Petition, 5-6, 33-34. Appendix B of the SFP MSA describes the device's "Electrical Interface," including its connector pins and input/outputs. *See* Ex. 1016, 1016.021-39. The "electrical interface" portion of the SFP is the portion that removably couples to the host device, such as a switch. *See* Petition, 31-34.

Section B4 of Appendix B is titled "Timing Requirements of Control and Status I/O," where I/O stands for "input/output." Ex. 1016, 1016.025; Ex. 1040, 111:3-16; Ex. 1041 ¶21. This section further describes the "control and status lines" contained at the electrical interface of the SFP. Ex. 1016.025; Ex. 1040, 112:3-7; Ex. 1041 ¶21. Ex. 1017, the technical specification for 10-gigabit small-form-factor pluggables, describes that the electrical interface of an XFP pluggable similarly contains "low speed pins for control and status." Ex. 1017, 1017.30; Ex. 1040, 122:2-123:5; Ex. 1041 ¶21. Thus, a POSITA already knew that the electrical interface of a known prior art SFP or XFP pluggable module, such as that of Togami,

contains an input and output portion for transmitting control and status information back and forth between it and the host switch or router.² Ex. 1041 ¶¶21-22; *see also* Petition, 33-34.

Despite stating in his declaration that “there [is] nothing in the SFP MSA that standardize[s] how an internal CLU should control an external switch” and that the “SFP MSA does not define . . . how a CLU in a removable pluggable optical transceiver module is supposed to control the operations of a switch through the interface of a pluggable optical transceiver module,” Dr. Willner recognized during deposition that both the SFP and XFP MSA *do* describe the transmission of control and status information at the pluggable modules’ electrical interface. *See* Ex. 2030 ¶76; *see also* Ex. 1040, 111:3-112:7, 122:2-132:5; Ex. 1041 ¶22. Therefore, it is not true, as POs and Dr. Willner claim, that the pluggable optical module formed by the combination of Shraga and Togami is incapable of communicating control information across its electrical interface to its host device—the very specification

² For clarity, nothing in the challenged claims requires the “control module” on the pluggable to send *controlling* signals to actually *control* the operation of the switch. Instead, the Challenged Claims merely require an electrical coupling of the pluggable module into the “port of the switch or router and for communicating with the switch or router” *See* Ex. 1001 at Claim 1.

of an SFP describes control input/output communications at the electrical interface.

A POSITA would, therefore, not be dissuaded from implementing such a combination. Ex. 1041 ¶22.

Regardless, as discussed in depth above, a POSITA at the time of the '754 Patent's filing date would have understood that Shraga's inclusion of switch 64 within its ONT box was a design choice, and that switch 64 could equally be located outside Shraga's ONT box. *See* Ex. 1003 ¶141; Ex. 2021, 66:12-17, 68:17-22, 69:13-25; Ex. 1041 ¶23; Petition, 31-33. Similarly, the decision to have Shraga's CLU perform control functionality on behalf of switch 64, rather than the switch performing such functionality on its own integrated CLU, is also a design choice—either would work. *See* Ex. 1041 ¶23; Petition, 31-33. A POSITA would have been familiar with a number of switches at the time of filing of the '754 Patent that *did not* require control information to be sent from some external control module or CLU in order to function. *Id.* Therefore, nothing about POs misplaced argument would have prevented, or even dissuaded, a POSITA from being motivated to combine Shraga and Togami in the way outlined in the Petition. *Id.*

C. A POSITA could have, and would have been motivated to, place Shraga's ONT functionality in a pluggable.

A POSITA would have been motivated to combine Shraga's data communication system and functionality with the pluggable optical transceiver module described in Togami. *See* Petition, 18-21. Despite POs' protestations to the

contrary, Petitioner's enumerated motivations (ease of install, repair, and/or replacement; compact footprint; and cost-effective nature) would not have encouraged a POSITA to maintain the *status quo*. Ex. 1041 ¶25. Rather, these motivations would have encouraged a POSITA to implement these common and useful form factors in order to achieve the well-known and desired benefits of a smaller, easily removable device. *Id.*; *see also, e.g.*, Petition, 19-21.

For example, ONTs in the prior art often consisted of hardware that was physically and irremovably fixed to the walls of clients or users. Ex. 1041 ¶26 (confirming that Dr. Prucnal personally had one such ONT in his house). A POSITA thus would have found it advantageous to instead implement the functionality of an ONT in the format of a removable SFP to allow for seamless and uncomplicated replacement of the device in instances such as device failure or upgrade to higher data rates. *Id.*, ¶¶26-27 (describing the more complicated, costly, and time-consuming process of replacing a hardwired ONT versus a pluggable ONT); *see also* Petition, 20-21. Moreover, a POSITA with the knowledge of pluggable optical transceiver modules, such as that of Togami, would have been motivated to implement the functionalities of ONTs, such as those described in Shraga, in a form factor footprint in order to conform with industry standard which would, in turn, cut down on manufacturing costs, ensure interoperability with other devices, and increase marketability to consumers. Ex. 1041 ¶28; *see also* Petition, 20-21.

Moreover, POs have failed to address Petitioner’s compelling evidence that POSITAs were, prior to the filing of the ’754 Patent, already aware of the concept of pluggable optical modules that “may be configured to communicate . . . data between computer system and optical network,” in a manner such as the combination proposed by Petitioner. *See* Petition, 20; Ex. 1003 ¶109; Ex. 1008, 1:38-40, 2:11-42 (specifically 2:36-42: “An optical-based transceiver, for example, may include various functional components which may implement tasks such as . . . media access control (MAC), controlling . . .”), 5:65-6:2. Therefore, a POSITA would have been motivated to combine Shraga and Togami in order to create a pluggable optical module capable of performing functionalities for the communication of data in a passive optical network.

i. A POSITA would have had a reasonable expectation of success in combining Shraga and Togami.

POs also attempt to show that a POSITA could not have implemented certain functionalities described in Shraga’s ONT in a pluggable form factor because they would have “faced significant challenges in reducing the size, power consumption, and heat generation” of such a device. POR, 24. To argue this point, POs present an “example” ONT, the Motorola ONT6000GVT, described as a “GPON ONT for Multi-Dwelling Unit.” *See id.*; *see also* Ex. 2025. POs’ position this ONT next to Togami’s SFP module in an apparent effort to argue that a POSITA could not have placed a 425x305mm device inside a 56x14mm pluggable. *See* POR, 24. But this is

not the standard. *See Intel Corp. v. Pact XPP Schweiz AG*, No. 2022-1038, 2023 U.S. App. LEXIS 4436, at *6-9 (Fed. Cir. Feb. 24, 2023) (reversing holding that a petitioner show the prior art references could be “bodily incorporated”); *see also Allied Erecting v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016).

Instead, Petitioner’s combination confirms that a POSITA would have found it obvious to place discrete components capable of carrying out data communications functionalities of a PON in a pluggable module. *See* Petition, 18-19, 24, 26-28, 31-34; *see also* Ex. 2021, 76:15-77:10. And while such functionalities and components were traditionally found within ONTs, such as that described in Shraga, and further, could have been found in ONTs such as the ONT6000GVT, Petitioner’s combination does not suggest shrinking an entire device (with many additional functionalities and components) inside a pluggable.

Even assuming the ONT6000GVT was what Petitioner relied on, which it is not, the ONT6000GVT contains a number of bulky components that would *not* have been implemented on Petitioner’s proposed pluggable optical module and that a POSITA would not have considered implementing on a pluggable optical module. Ex. 1041 ¶¶30-31. For example, the data sheet of the ONT6000GVT states that it “provides 24 lines of Class 5 or soft-switch VoIP quality voice service.” Ex. 2025, 1. As confirmed by Dr. Willner and Dr. Prucnal, VoIP or “voice over IP” relates to the process of using a packet-switched network to transmit voice calls using

broadband internet. Ex. 1040, 132:17-134:4; Ex. 1041 ¶30. A POSITA would understand that, given the description that it provides 24 lines of the switched service, the ONT6000GVT device would contain a switch with 24 output ports to service up to 24 downstream devices (i.e., “lines”). *See* Ex. 2025, 1; Ex. 1041 ¶30. A 24-port switch would take up considerable space in the ONT6000GVT, contributing significantly to its large size. *Id.* As discussed in detail above, Petitioner’s combination does not propose placing any switch, let alone a 24-port switch, onto a pluggable optical module.

As another example, the ONT6000GVT data sheet additionally states that it “provides 12 lines of Ultra-Broadband data via VDSL2.” Ex. 2025, 1. As a POSITA would have understood, this description indicates that the ONT6000GVT provides DSL capabilities and access to at least 12 downstream users or devices through the inclusion of, for example, a DSL modem. Ex. 2025, 1; Ex. 1041 ¶31. Petitioner’s combination does not propose placing DSL distribution functionalities or ports, such as those found on a modem, on a pluggable optical module. In fact, neither of the prior art references discussed in the Petition even mention or contemplate DSL, let alone a 12-port DSL modem. Ex. 1041 ¶31.

Moreover, there were a number of ONTs available concurrently with the ONT6000GVT, such as the Motorola ONT1000GJ4, that had a smaller footprints and were capable of performing the PON functionality described in Shrager. Ex. 1041

¶32. In his supplemental Declaration, Dr. Prucnal discusses the fact that he had one of these ONTs in his house. *Id.* Dr. Prucnal breaks down the components within the ONT1000GJ4, evidenced by images of his personal device, to conclude that the ONT functionality and associated circuitry in these ONT boxes is no larger than 120x40mm. *Id.*, ¶¶32-36. Dr. Prucnal concludes that a POSITA would have found success in condensing such components and circuitry onto a pluggable optical module without much difficulty. *Id.*, ¶36.

In the same vein, POs argue that a POSITA would have not been motivated to combine Shraga and Togami as proposed by Petitioner because “a commercially available ONT . . . received a 48V or 120V power supply,” more power than a pluggable optical module is able to support. POR, 25. But POs then contradict their own argument and admit that implementing the data communications functionalities associated with Shraga’s CLU in a pluggable optical module, as proposed by Petitioner’s combination, “does not require a 48V or 120V power supply or a switch.” POR, 26. Moreover, as discussed, the ONT6000GVT contains many more functionalities and services than those contemplated in Petitioner’s combination or discussed in Petitioner’s prior art references and would thus draw more power than Petitioner’s proposed pluggable optical module. Ex. 1041 ¶35 The pluggable optical module proposed by Petitioner would not require a 48V or 120V power supply and, thus, would not need the bulky power supply to support such components. *Id.*

Therefore, in addition to the reasons discussed above, a POSITA could have combined Shraga and Togami to create the pluggable optical module proposed in the Petition and would have had a reasonable expectation of success in doing so.

D. Dr. Prucnal’s district court opinions do not contradict his opinions in this proceeding.

POs cite to Dr. Prucnal’s expert report served in the corresponding district court litigation suggesting (erroneously) that Dr. Prucnal’s obviousness opinions are “contradictory.” POR, 25-26. In making this argument, however, POs fail to understand the distinction between Dr. Prucnal’s opinions on enablement and written description of the ’754 Patent’s specification and Petitioner’s arguments of obviousness considering the prior art references in this proceeding.

Dr. Prucnal’s opinions on enablement and written description were born out of deposition testimony by POs/inventors Alexander and Walter Soto (the “Soto Brothers”). Specifically, the Soto Brothers admitted that they were not able to personally develop a physical embodiment or prototype of the alleged invention. Ex. 2023, 321-22. Their testimony showed that they *themselves*—the Soto Brothers—did not adequately possess the alleged invention.

Despite the Soto Brothers’ admissions and the following lack of specific teachings *in the ’754 Patent* describing to a POSITA how to do so, a POSITA with knowledge and understanding of the prior art references presented in this Petition would have found that the combination of Shraga and Togami rendered obvious a

pluggable optical module for use in a PON.³ Dr. Prucnal pointed out that the prior art references at issue in this Petition contain engineering drawings and descriptions of the physical packaging of the pluggable optical module that would have enabled a POSITA in possession of Shraga and Togami to make the alleged invention. *Id.*, 157:5-158:15. The '754 Patent, on the other hand, contains no such diagrams and describes the invention only in terms of vague functional blocks. *Id.*

Thus, Dr. Prucnal's opinions on enablement and written description as they relate to the specification of the '754 Patent and the Soto Brothers' testimony regarding what ideas they actually possessed and those that they did not, do not contradict the compelling evidence of obviousness as presented in connection with this proceeding.

E. The Petition's Grounds render obvious all elements of the Challenged Claims.

Despite POs' incorrect claims that the "proposed combinations are missing many claim elements" and that Petitioner points "to disparate parts" of the art (POR, 32), the Petition is clear in the presented combination and provided analysis for each

³ POs cannot require a showing of a "specialized" teaching to support reasonable expectation of success when the patent itself lacks any detail regarding how to implement its pluggable (*e.g.*, details such as the size, power consumption, and heat generation). *Smith & Nephew, Inc. v. Rea*, 721 F.3d 1371, 1381 (Fed. Cir. 2013).

of the claim elements based on the teachings of both prior art references. *See* Petition, 18-19; ID, 48.

POs appear to ignore Petitioner's actual evidence and combination and argue, for several claim elements, that only one of the two prior art references used in Ground 1 discloses the requirements of the claim. But Petitioner does not need to show that both prior art references *independently* disclose all of the claim elements. For example, POs criticize Petitioner's analysis of [1.pre] because "*only* Togami, not Shraga, discloses an optical transceiver module having a pluggable form factor." POR, 36. Petitioner's combination, as discussed at length, proposes implementing certain PON data communications functionalities in Shraga within the pluggable of Togami, therefore Petitioner's proposed combination has a pluggable form factor and discloses claim element [1.pre]. *See* Petition, 18-19, 24-25.

POs argue that Shraga does not disclose [1.D]. POR, 42-51. But the combination renders obvious both the claimed "electrical network interface port" and the "optical module port of a switch or router." *See generally* Petition, 31-34. Specifically, Togami's pluggable module contains an electrical interface port for coupling to the corresponding port (the optical module port) of a host device, such as a switch. *Id.* Because Petitioner's combination proposes implementing PON data communications functionalities and components in Shraga within Togami's pluggable module, Petitioner's pluggable optical module discloses these elements.

POs' statement that Petitioner does not "adequately demonstrate that the ONT ID is assigned 'from the head-end' as recited in the claim" is equally false. POR, 54. Shruga makes clear that the "ONT ID" is assigned by the head-end: Shruga states that the head-end constructs header 74 that "comprises a one-byte ONT identification section 88," among other things, for transmission to the ONT with its upstream bandwidth allocation. *See* Ex. 1005, 10:56-11:6; Petition, 42-43; Ex. 1003 ¶184 ("a POSITA would have understood that this ONT ID section . . . is an assignment by the OLT at the head-end"). Therefore, the Grounds asserted in the Petition show that the combination of Shruga and Togami renders obvious all Challenged Claims.

F. The Board should disregard Dr. Willner's declaration and testimony.

The testimony offered by Dr. Willner in this proceeding should be given little, if any, weight—for either procedural or substantive reasons. First, Dr. Willner's declaration (Ex. 2030) does not comply with 37 C.F.R. §1.68. Any un compelled direct testimony submitted in an IPR, "must be submitted in the form of an affidavit." 37 C.F.R. §42.53(a). "Affidavit means affidavit or declaration under §1.68 of this chapter." 37 C.F.R. §42.2. Accordingly, a declaration can be used in lieu of an affidavit only if it complies with §1.68. The "if, and only if" language of §1.68 makes clear that this is a mandatory requirement. These warnings provide necessary safeguards to ensure credibility. *See Fedex v. Katz*, CBM2015-00053, Paper 9 at 7-

8 (PTAB June 29, 2015). Indeed, the Board has repeatedly given “no weight” to purported declarations that fail to meet these basic requirements for sworn testimony. *See id.* (giving “no weight” to declaration where declarant “was not warned that willful false statements are punishable by fine or imprisonment, or sworn under penalty of perjury.”); *Bumble Bee Foods v. Kowalski*, IPR2014- 00224, Paper 18 at 14-15 (PTAB June 5, 2014) (same); *IBM Corporation v Intellectual Ventures II LLC*, IPR2015-01323, Paper 38 at 10-12 (PTAB September 27, 2016).

Here, Dr. Willner failed to comply with the requirements of §1.68 and attest that he had been “warned that willful false statements and the like are punishable by fine or imprisonment” and failed to set forth in his declaration’s body that “all statements made of the declarant’s own knowledge are true and that all statements made on information and belief are believed to be true.” Because of this failure to comply with mandatory requirements, the Board should not consider his opinions.

Moreover, Dr. Willner’s testimony is not credible and is littered with gamesmanship. During deposition, Dr. Willner exhibited evasive behavior and testified that he “could not remember” answers responsive to basic questions related to his background and declaration. *See, e.g.*, Ex. 1040, 16:6-16, 17:2-19, 18:19-19:15, 20:6-15, 35:2-9, 37:14-17, 38:6-8, 39:12-21, 45:17-46:18, 59:18-60:5, 89:3-90:4, 92:15-94:11, 96:17-97:1, 99:22-100:11, 113:6-11, 114:12-20, 125:12-126:9, 136:15-137:10. Dr. Willner’s answers to questioning regarding basic concepts that

make up the foundation of the '754 Patent were equally as evasive. *See, e.g., id.*, 42:5-43:13, 44:2-21, 44:22-46:13, 51:9-52:17, 53:2-14, 54:19-56:2, 59:1-60:5, 61:4-19, 62:20-64:6, 71:7-72:21, 74:20-76:19, 77:11-16, 80:22-82:4, 88:7-90:14, 92:1-7, 92:22-94:11, 98:11-102:4, 104:8-105:11, 111:8-112:2, 114:21-115:13, 117:9-120:2, 122:10-21, 127:1-128:7, 129:4-130:14, 137:3-139:15. For example, despite representing himself as an expert with over 40 years of experience, Dr. Willner testified that PONs could use devices other than splitters to passively split an optical signal, but that he seemingly did not “remember what other things were used.” *Id.*, 45:3-46:13. Dr. Willner also testified that he could not recall a single ONT, other than the Motorola ONT6000GVT, despite testifying that he has been involved with optical networking devices “for a very long time.” *Id.*, 20:22-22:22, 26:12-28:14, 136:15-137:10. Given Dr. Willner’s alleged knowledge and experience, Petitioner respectfully suggests that these obfuscations are indicative of the lack of credibility of his testimony.

Additionally, Dr. Willner attempted to caveat all of his answers related to the state of the prior art with the phrase “outside the context of the '754.” *See, e.g., id.*, 42:5-43:13, 44:2-21, 44:22-46:13, 51:9-52:17, 53:2-14, 54:19-56:2, 59:1-60:5, 61:4-19, 62:20-64:6, 71:7-72:21, 74:20-76:19, 77:11-16, 80:22-82:4, 88:7-90:14, 92:1-7, 98:11-102:4, 104:8-105:11, 111:8-112:2, 114:21-115:13, 117:9-120:2, 122:10-21, 127:1-128:7, 129:4-130:14. But, as the Board is well aware, the claims of the '754

Patent and the prior art cannot be read “outside the context” of one another; the state of the prior art is what it is. Given the evasive nature of Dr. Willner’s testimony, coupled with his failure to attest to the truthfulness of the opinions contained in his declaration, Dr. Willner’s opinions should not be given significant weight.

III. CONCLUSION

Therefore, for the reasons set forth in the Petition and further supported herein, Petitioner respectfully requests cancellation of the Challenged Claims.

Dated: October 11, 2024

Respectfully submitted,

/M. Scott Stevens/

M. Scott Stevens, Reg. No. 54,762

CERTIFICATION UNDER 37 C.F.R. §42.24

Under the provisions of 37 CFR §42.24, the undersigned hereby certifies that the word count for the foregoing Petition for inter partes review totals 5,357 words (Sections I-III), which is less than the 5,600 allowed under 37 CFR §42.24(c)(1).

Date: October 11, 2024

By: / M. Scott Stevens /

M. Scott Stevens

CERTIFICATE OF SERVICE

The undersigned certifies service that Petitioner served a copy of the foregoing REPLY TO PATENT OWNERS' RESPONSE by filing this document through the P-TACTS Filing System as well as sending a copy via electronic service (as agreed by counsel for POs) on the following:

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