

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NOKIA OF AMERICA CORPORATION AND
AT&T SERVICES, INC.,
Petitioners,

v.

IARNACH TECHNOLOGIES, INC.,
Patent Owner.

CASE IPR2024-00899
PATENT 9,806,892

PATENT OWNER'S SUR-REPLY
37 C.F.R. § 42.23

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No.	Brief Description
1001	U.S. Patent No. 9,806,892
1002	File History of U.S. Patent No. 9,806,892
1003	Declaration of Dr. Alexander V. Sergienko
1004	Curriculum Vitae of Dr. Alexander V. Sergienko
1005	Iarnach's Infringement Contentions for the '892 Patent in <i>Iarnach Techs. v. AT&T Corp., et al.</i> , Case No. 2:23-cv-0231-JRG (E.D. Tex.)
1006	M. Röger <i>et al.</i> , "Optically Powered Fiber Networks" Optics Express, Vol. 16, No. 26 (Dec. 22, 2008)
1007	ITU-T Standard G.987.3 (2010)
1008	ITU-T Standard G.988 (2010)
1009	International Publication No. WO2013014483 to Ghazisaidi
1010	ITU-T Standard G.9807.1 (2023)
1011	Shing-Wa Wong <i>et al.</i> , "Sleep Mode for Energy Saving PONs: Advantages and Drawbacks" 2009 IEEE Globecom Workshops (2009)
1012	Abhishek Dixit <i>et al.</i> , "ONU power saving modes in next generation optical access networks: progress, efficiency and challenges" Optics Express, Vol. 20, No. 26 (Dec. 10, 2012)
1013	U.S. Patent No. 9,209,897 to Amitai
1014	U.S. Patent No. 8,873,969 to Hood
1015	European Patent Specification EP 2 710 813 B1 to Hood
1016	European Patent Specification EP 2 692 080 B1 to Hood
1017	European Patent Specification EP 2 333 989 B1 to Schmuck
1018	Declaration of Dr. Sylvia D. Hall-Ellis
1019	Curriculum Vitae of Dr. Sylvia D. Hall-Ellis

¹ Relevant portions of Patent Owner's exhibits may be highlighted to help the Panel find cited sections.

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1020	Hall-Ellis Declaration Attachment 1A
1021	Hall-Ellis Declaration Attachment 2A
1022	Hall-Ellis Declaration Attachment 2B
1023	Hall-Ellis Declaration Attachment 2C
1024	Hall-Ellis Declaration Attachment 2D
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1026	Hall-Ellis Declaration Attachment 3B
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1028	Hall-Ellis Declaration Attachment 3D
1029	Doc. No. 50, Docket Control Order, Iarnach Technologies Ltd. v. AT&T Corp. et al., No. 2:23-cv-00231 (E.D. Tex.)
1030	Doc. No. 31, Order Granting Nokia's Motion to Intervene, Iarnach Technologies Ltd. v. AT&T Corp. et al., No. 2:23-cv-00231 (E.D. Tex.)
1031	U.S. District Courts – Judicial Caseload Profile (Dec. 2023)
1032	Doc. No. 45, Agreed Docket Control Order, Iarnach Technologies Ltd. v. Verizon Communications, Inc. et al., No. 2:23-cv-00631 (E.D. Tex)
1033	Doc. No. 1, Complaint, Iarnach Technologies Ltd. v. AT&T Corp. et al., No. 2:23-cv-00231 (E.D. Tex.)
1034	Doc. No. 1, Complaint, Iarnach Technologies Ltd. v. Verizon Communications, Inc. et al., No. 2:23-cv-00631 (E.D. Tex)
1035	Doc. No. 114, Order Dismissing U.S. Patent No. 9,806,892, 2.23-cv-231 (E.D. Tex)
1036	Deposition Transcript of Dr. Kerry Litvin
1037	ITU-T, SG15, Q2, Editorial Summary: XGPON Transmission Convergence layer specification / Clause 16, March 29, 2010
1038	ITU-T, SG15, Q2, Proposed Revisions for simplifying power saving modes in G.987.3, Meeting, date: May 23, 2013, Chengdu
1039	ITU-T Standard G.987.3 (2014)

No.	Brief Description
1040	“Two proposals in ChengDu and the path forward for ONU power management simplification” June 5, 2013
1041	ITU-T, SG15, Q2, Unified ONU power management, Meeting, date: May 23, 2013, Chengdu
1042	Screen Capture of Röger Fig. 2
1043	ITU-T, SG15, Q2, proposed modifications on updated power saving mechanism in G.987.3, Meeting Date: December 2, 2013, Geneva
2001	Declaration of Bruce Schofield in Support of Patent Owner’s Preliminary Response
2002	Defendant’s Invalidity Contentions, Iarnach Technologies Ltd. v. AT&T Services Inc. et al., Case No. 2:23-cv-00231 (E.D. Tex.) (served Dec. 7, 2023)
2003	Defendant’s Invalidity Contentions, Iarnach Technologies Ltd. v. Verizon Business Network Services LLC et al., Case No. 2:23-cv-00631 (E.D. Tex.) (served May 6, 2024)
2004	Executed Summons for AT&T Services Inc., Iarnach Technologies Ltd. v. AT&T Services Inc. et al., Case No. 2:23-cv-00231, Dkt. No. 11 (E.D. Tex.)
2005	Federal Court Management Statistics–Profiles, <i>available at</i> https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distp_rofile0630.2024.pdf
2006	Declaration in Support of Motion for <i>Pro Hac Vice</i> Admission of Justin Chen
2007	Declaration of Dr. Kerry I. Litvin in Support of Patent Owner’s Response
2008	PCT/CN2012/078649 (filed July 13, 2012)
2009	WO 2014/012109 A1 (filed July 15, 2013) (published Jan. 16, 2013)
2010	Consent, Webster’s New Universal Unabridged Dictionary (1983)

CLAIM LISTING²

No.	Limitation
1A	1. A method of optical communication in a passive optical network, comprising:
1B	operating an optical network unit (ONU) in a first state in which a transmitter of the ONU is turned off and a receiver of the ONU is turned on;
1C	operating the ONU in a second state in which both the transmitter and the receiver are turned off;
1D	transitioning the ONU directly from the first state to the second state and transitioning the ONU directly from the second state to the first state, based on a power management rule;
1E	ensuring the ONU is fully powered up, synchronized, and capable of responding to both upstream and downstream traffic and control before exiting the first state or the second state; and
1F	receiving, by the receiver, a power management message from an optical line terminal (OLT); and
1G	changing the power management rule based on the received power management message.
2	2. The method of claim 1 , further comprising: operating the ONU in a third state in which both the transmitter and the receiver are turned on.
3	3. The method of claim 1 , wherein the power management rule specifies a first time period for operation in the first state and a second time period for operation in the second state and wherein the transitioning is performed upon expiration of at least one of the first time period and the second time period.
4	4. The method of claim 1 , further comprising: transmitting, to an optical line terminal, a message indicative of the transitioning between the first state and the second state.

² For consistency Patent Owner follows Petitioners' numbering convention.

No.	Limitation
5	5. The method of claim 1 , further comprising: performing the transitioning responsive to the received power management message and a local decision to change an operational state.
10A	10. An optical communication apparatus, comprising:
10B	a memory that stores processor-executable instructions; and
10C	a processor that uses the stored instructions to implement a method, comprising operating an optical network unit (ONU) in a first state in which a transmitter of the ONU is turned off and a receiver of the ONU is turned on; and operating the ONU in a second state in which both the transmitter and the receiver are turned off; and
10D	wherein the processor includes means for transitioning the ONU directly from the first state to the second state and means for transitioning the ONU directly from the second state to the first state, based on a power management rule;
10E	wherein the processor uses stored instructions to ensure the ONU is fully powered up, synchronized, and capable of responding to both upstream and downstream traffic and control before exiting the first state or the second state; and
10F	wherein the processor further uses the stored instructions to implement the method by receiving, by the receiver, a power management message from an optical line terminal (OLT) and changing the power management rule based on the received power management message.
11	11. The apparatus as in claim 10 , wherein the power management rule specifies a first time period for operation in the first state and a second time period for operation in the second state and wherein the transitioning is performed upon expiration of at least one of the first time period and the second time period.
12A	12. An optical line terminal (OLT) for operation in a passive optical network (PON), the optical line terminal comprising:

No.	Limitation
12B	a processor configured to generate messages for controlling a transition of an optical network unit from a first low power state in which a receiver of the optical network unit is turned on but a transmitter of the optical network unit is turned off to a second low power state in which both the receiver and the transmitter of the optical network unit are turned off;
12C	a transmitter configured to transmit the generated messages to the optical network unit;
12D	wherein the generated messages comprises a periodic consent message to allow the optical network unit to remain in either the first low power state or the second low power state.
13	13. The optical line terminal as in claim 12 , wherein the processor includes means for specifying a first time period for operation in the first low power state and a second time period for operation in the second low power state and wherein the transition of the optical network unit from the first low power state to the second low power state is controlled to occur upon expiration of at least one of the first time period and the second time period.
14A	14. A passive optical network (PON) communications system, comprising:
14B	an optical network unit (ONU) operable in a first low power mode in which the ONU is able to receive but not transmit and a second low power mode in which the ONU is not able to either receive or transmit, wherein the ONU is configured to transition from the first low power mode to the second low power mode and to transition from the second low power mode to the first low power mode based on a power management rule, and wherein the ONU changes a power management rule based on a received power management message;
14C	an optical line terminal (OLT) communicably coupled to the ONU, the OLT configured to transmit a control message to the ONU to control at least one aspect of transition of the ONU between the first low power mode and the second low power mode; and
14D	the ONU configured to ensure that the ONU is fully powered up, synchronized, and capable of responding to both upstream and downstream traffic and control before exiting the first low power mode or the second low power mode.

No.	Limitation
15	15. The system as in claim 14, wherein: the OLT is configured to transmit the control message that includes the power management rule that specifies a first time period for operation in the first low power state and a second time period for operation in the second low power state and to control the ONU to transition from the first low power state to the second low power state upon expiration of at least one of the first time period and the second time period.

I. INTRODUCTION

Patent Owner will not recapitulate the multiple deficiencies in Petitioners' unpatentability theories, and hope it suffices to say that Petitioners are incorrect that Patent Owner "challenges *only* motivation to combine." Paper 28 ("Reply") at 1 (emphasis added).

Petitioners' strategy for the direct transition limitations is now to misdirect the Board by continually arguing in the Reply that G.9807.1 implemented "the claimed direct transitions," without acknowledging that Petitioners are referring to G.9807.1's new Watchful Sleep mode that *is not Petitioners' proposed modification*. Indeed, G.9807.1 *still prohibits* Petitioners' suggested modification to allow direct transitions from the Asleep to the Listen state and the other direction.

Petitioners now also propose a new obvious theory for the first time in their Reply by suggesting that a POSITA would also modify G.987.3 so that an OLT would not send downstream traffic to an ONU in a Listen state. While the Board should procedurally ignore this new argument, it still fails because this new theory would remove the advantage that G.987.3 contemplated was a good tradeoff for the *higher* power consumption of the Listen mode, so cuts against the Petitioners' proffered motivation to combine the references, to *lower* power consumption.

Patent Owner discusses these and other issues in further detail herein.

II. CLAIM CONSTRUCTION: “TRANSITION . . . FROM . . . TO” MEANS A DIRECT TRANSITION

For the term “transition . . . from . . . to,” Petitioners start by mischaracterizing Patent Owner’s position as abandoning that Claim 12 requires a direct transition. Paper 28, Petitioners’ Reply (“Reply”) at 1. Claim 12’s language, “transition . . . from . . . to” requires a direct transition like Claim 14, and Patent Owner only indicated that the Board need not decide this issue, because Claim 12 is clearly not anticipated or obvious based on the missing periodic consent messages of Limitation 12D. Paper 7, Patent Owner’s Response (“POR”) at n.5.

Petitioners then cite to three portions of the specification for the proposition that “transition” is different than “direct transition.” Reply at 1–3 (citing Ex. 1001 at 4:29–39; 5:61–63; and 11:66–67). First, Petitioners’ argument misses the pertinent issue of whether the ’892 Patent uses transition “*between*” to include *indirect* transitions and transition “*from/to*” to reference *direct* transitions.

Second, the cited sections are irrelevant or supportive of Patent Owner’s positions. In column 4, lines 29–32, the specification (1) uses the terminology “[f]rom . . . transition into” to describe the *direct* transitions from “Active Free” 702 to “Sleep Aware” 704 or “Doze Aware” 706 (see Fig. 7A), like Claim 14, indicating that the ’892 Patent uses transition “from . . . to” to mean direct transition; and (2) disparages not allowing the direct transitions from “Sleep Aware” from/to “Doze Aware,” supporting that the invention is limited to this feature. Column 5,

lines 61–63, do not contain the word “transition” and appear immaterial. Lines 66–67 of column 11 uses “transition *between*” (emphasis added) to describe an *indirect* transition in the prior art, and “between” is the exact language removed from now Claim 14 during prosecution when the Patentee argued that direct transitions was the distinguishing feature, reinforcing that the change from “between” to “from/to” was meant to exclude indirect transitions. Ex. 1002 at 27, 33.

Finally, Petitioners argue that the Board should not follow the maxim that “a claim interpretation that excludes all preferred embodiments from the scope of the claim is rarely, if ever, correct,” for Claim 14, because other claims capture direct transitions. Reply 3. While it is true that different claims can capture different embodiments, a finding that Claim 14 captures indirect transitions would mean this claim includes *no* embodiment, while encompassing a feature that the specification disparaged and the applicant said differentiated the prior art during prosecution. This *is* rarely, if ever, correct. *See, e.g., SciMed Life Sys., Inc. v. Adv. Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1344 (Fed. Cir. 2001) (rejecting a construction that “flies in the face of the many statements in the written description that define ‘the invention’ as . . . distinguish[ed] [from] the prior art”); *see also* Ex. 1001 3:15–29 (explaining how direct transition is superior to prior art); 4:32–37 (contrasting non-direct transition of prior art); 11:65–67 (same).

III. ALL CLAIMS: PETITIONERS FAIL TO SHOW A POSITA WOULD MODIFY G.987.3 IN VIEW OF RÖGER IN THE WAY PETITIONERS CONTEND, SO DO NOT SHOW ANY CHALLENGED CLAIM REQUIRING THE DIRECT TRANSITION LIMITATIONS OBVIOUS

Petitioners' obviousness position is still based upon a mis-portraying of G.987.3's *express prohibition* against *the ONU* making direct transitions from/to the Asleep (4) state to/from the Listen (6) state as G.987.3 merely "choos[ing] not to adopt them" and "lack[ing] express support for those transitions." Reply 4, 7. Indeed, the best Petitioners can do is repeat their argument that Note 2 must be directed to the OLT state machine rather than the ONU state machine, because "Note 2 appears in Table 16-7 of G.987.3" for the OLT rather than Table 16-4 for the ONU. *Id.* 6.

But Patent Owner described in detail why, even though Note 2 is found in the OLT Table 16-7, Note 2 is clearly applicable to *the ONU*. Among other evidence: (1) the entire G.987.3 section regards *the ONU's* power management, (2) the OLT only supports *the ONU's* low power states, (3) Note 2 specifies that *the ONU* should never send an SR(sleep) when *the ONU* is in the Doze state or SR(Doze) when *the ONU* is in a Sleep State, and (4) Table 16-4 and Figure 16-1 concerning *the ONU* shows that *the ONU* always enters the Asleep State from Listen State, and the reverse, through Active Free, never directly. POR 11–19. Petitioners do not address *any* of this argument and evidence. Reply at 6.

And the last point (4) is why Note 2 is not found in the ONU state table: because there is no way for an ONU to accidentally enter the Asleep State from Listen State, or the reverse, while the OLT may become “unsynchronized” by, for example, missing ONU transitions, and therefore possibly receive a prohibited ONU sequence of inputs. Ex. 1007 at 105 (noting that if the OLT sees a disallowed ONU transition the OLT should attempt to “regain state machine synchronization”).

Petitioners then argue that even if Note 2 restricts the ONU, the prohibition still supports obviousness, because direct transitions “*were known and contemplated.*” Reply 6. But G.987.3 actually “contemplated and *disallowed*” the direct transitions Petitioners’ suggest, as Dr. Litvin explained. Ex. 1007 at 105 (“Direct transitions . . . are *disallowed*”) (emphasis added); Ex. 2007 ¶108 (“[T]he *prohibition* was a conscious and reasoned design choice.”) (emphasis added); Ex. 1036 at 47:14–20 (“A[.] It acknowledges direct transitions? It *prohibits* direct transitions.”) (emphasis added). So, G.987.3 teaches Petitioners’ suggested direct transitions *do not happen*.

Petitioners then make the interesting argument that G.987.3’s teaching that an ONU is “disallowed” from making a direct transition request means that such a request is allowed, because “Note 2 provides guidance for how the OLT should react to an ONU that is performing a direct transition.” Reply 7. But what G.987.3 really teaches is that if the OLT sees such a request, it means that the two state machines

must have become unsynchronized—e.g., the OLT has missed one or more ONU transitions or received a corrupted message—because, per the specification, an ONU *cannot* make such a request. Ex. 1007 at 105 (noting that if the OLT sees a disallowed transition the OLT should attempt to “*regain* state machine synchronization”) (emphasis added).

Petitioners then rehash the argument that Note 2 cannot prevent direct state transitions because the note is also found “in G.9807.1, which formed the basis for Iarnach’s infringement contentions.” Reply at 7 (citations omitted). But Patent Owner already explained that the infringement contentions do not rely upon a direct transition from the states in G.987.3 *that Petitioners point to*, and that Note 2 in G.9807.1 *continues to prohibit* the direct transitions to which Petitioners do point. POR 19–22 & 29–32. Petitioners again do not address *any* of Patent Owner’s argument and evidence that this is true. *See generally* Reply.

Petitioners put forth many documents purporting to be a presentation and notes regarding change proposals to XG-PON power management, *see* Exs. 1037–38, 1040–41 and 1043 (“Interim Documents”), to try and rebut Dr. Litvin’s expert testimony that G.987.3’s prohibition on direct transitions from/to the Sleep state to/from the Doze state is an architectural limitation. Reply 7–15.

As a reminder, Dr. Litvin explained that the mutual exclusivity of the two lower power states stems from the fact that “[t]he OLT needs to know which of the

low power modes the ONU is intending to enter, if given permission, because the particular low power state will determine if the OLT can still continue to send downstream data (Doze mode) or not (Cyclic Sleep mode) to the ONU in the low power mode.” Ex. 2007 ¶96; Ex. 1036 at 114:8–22.

Ignoring hearsay issues, these Interim Documents *confirm* Dr. Litvin’s explanation by discussing the separate “cyclic sleep” and “dozing modes,” whereby the cyclic sleep mode “specification SHALL leave an operator a possibility to specify in the future an OLT that is *capable of selectively buffering downstream data* destined to each ONU *in the sleep period* and transmitting the data downstream when the respective ONU enters the active period” Ex. 1037 at 2 (emphasis added), where, by contrast, in the dozing mode the ONU may continue to receive downstream data with doze because the ONU’s “Tx, but NOT Rx, can be turned off,” *id.*; *see also* Ex. 1041 at 1 (“In a system supporting both doze mode and cyclic sleep mode, each low-power cycle is nevertheless characterized by either doze or sleep behaviour, *but not both*. At the start of each cycle, the parties negotiate whether the ONU will doze *or* sleep.”) (emphasis added).

Petitioners say Patent Owner and its expert did not base their conclusion on “any evidence.” Reply 8, 15. But both cited Petitioners’ primary reference—which Patent Owner considers “evidence”—that explains that in sleep state the OLT may “buffer downstream traffic” where in the doze state the OLT may “forward”

downstream traffic, so the two low power states are mutually exclusive, and, as just discussed, Petitioners newly-presented Interim Documents confirm the same. *See, e.g.*, POR 27–28; Ex. 2007 ¶¶50, 52, 116–20; Ex. 1037 at 2; Ex. 1041 at 1.

Petitioners put forth the misleading proposition that “as seen in G.9807.1 . . . G.987.3 does in fact allow for the claimed direct transitions,” *id.* at 8 (citing Ex. 1036 at 36:8–37:14, 39:10–40:8, 45:9–46:22), and “that POSITAs *did in fact* modify G.987.3 to implement the direct transitions disclosed in Röger,” *id.* at 12 (additionally citing Ex. 1039 at 102–12 and Ex. 1010 at 230–39). Yes, G.9807.1 evolved to support the new “Watchful Sleep” mode that Patent Owner contends is within the scope of the claims. Ex. 1036 at 35:11–22; Ex. 1010 at 31. ***However, Petitioners’ obviousness theory does not argue that it would be obvious to modify G.987.3 to add “Watchful Sleep” like G.9807.1.***

Petitioners instead argue that a POSITA would have modified G.987.3 in light of Röger to allow direct transitions between G.987.3’s Listen (6) and Asleep (4) states, ***which is not the same.*** Compare Paper 18 (“Pet.”) at 16 & 18 (annotating Ex. 1007 Fig. 16–1 to show Petitioners’ alleged first and second states in G.987.3) with G.9807.1, Ex. 1010, Fig. C.16.2, at 229 and Tbl. 16.7, at 238 (showing the Watchful Sleep functionality separate from the still-supported Listen/Doze Mode); *see also* G.987.3 (01/2014), Ex. 1039 at Fig. 16–2 (showing no transition between States 4 and 6) and Tbl. 16–7 (continuing to warn in Note 2 an ONU is not allowed

to directly transition from the Doze and Cyclic Sleep). And ***not one*** of Petitioners' newly presented Interim Documents show Petitioners' proposed modification. *See generally* Exs. 1037–38, 1040–41, & 1043.

Indeed, Petitioners citation to Dr. Litvin's testimony for the proposition that a "limited addition of a handful of parameters confirms that the architecture of G.987.3 does in fact allow for the claimed direct transitions" is a gross mischaracterization. Reply at 8 (citing Ex. 1036 at 36:8–37:14, 39:10–40:8, and 45:9–46:22). First, G.9807.1 characterized the addition of "watchful sleep modes" as a "major change[]." *See* Ex. 1010 at 31. Second, Dr. Litvin merely said that XGS-PON came after XG-PON and relied upon XG-PON to evolve XGS-PON. Ex. 1036 at 36:8–37:14. He testified that both documents have power parameters with "similar names," *id.* 39:10–40:8, such as T_{hold} , T_{lowpower} , T_{sleep} expiration, etc., *id.* 45:9–46:22, but that he would have "to read the detailed descriptions to tell you if the definition of each evolved from one to the next, from XG-PON to XGS-PON," *id.* 40:5–18. In truth, Dr. Litvin explicitly opined that with G.9807.1 "direct (ONU) transitions between Doze and Cyclic sleep are still prohibited," Ex. 2007 ¶101, and that this was still his opinion at his deposition, Ex. 1036 at 101:2–9.

There is simply nothing incompatible with Patent Owner's position that a POSITA would not and could not implement the "direct transitions" Petitioners advocate for and the fact that Patent Owner relied upon G.9807.1's new and separate

Watchful Sleep in its infringement contentions in District Court. A POSITA would not make Petitioners' suggested modification, because (1) an ONU that slipped out of the Listen State would "lose data and induce errors," Ex. 2007 ¶81, and (2) an ONU that moved directly from Sleep to Listen would increase power consumption for no reason, *id.* ¶53. The Watchful Sleep state exists in parallel with the older mutually exclusive Listen and Asleep states and does not affect this reasoning. *See, e.g.*, Ex. 1010 at 31; *see also* Ex. 1043 ("This proposal achieves the goal to include updates for Watchful sleep mode while maintaining backward compatibility with current power saving modes contained in the standard.").

Petitioners take a quote from Dr. Litvin's expert report out of context to imply that Patent Owner believed drafters never considered turn-on times when designing the PON specifications. Reply 8 (citing Ex. 2007 ¶112). However, in context it is clear that Dr. Litvin was explaining why turn-on times were not a concerning "reason G.987.3 disallowed transitions from the Asleep to Listen states," Ex. 2007 ¶111, and G.987.3's actual concern was "maintaining a distinct Doze mode which provides a compromise between service delivery and energy efficiency vs a Cyclic Sleep mode which emphasizes energy efficiency [and] the driving force in keeping these modes separate without ONU autonomous direct transitions," *id.* ¶114.

Petitioners also put forth a new document that indicates the availability of chips with "very fast enable/disable times" showing a date about eleven months after

the Effective Priority Date . Reply at 8–9 (citing Ex. 1038 at 1). However, assuming the truth of the matter asserted therein, the same document does not then conclude that ONU direct transitions from/to the Asleep mode to/from the Doze mode should be allowed, but, instead, suggests removing the Doze mode altogether. Ex. 1038 at 1 (“For this reason, we aim to deprecate dozing as stand-alone mode or feature.”) and 2 (“Doze mode should be eliminated.”). Therefore, Ex. 1038 is again consistent with Dr. Litvin’s observation, because the document noted that “[f]rom the point of view of the OLT, the ONU will only be engaging in Sleeping,” *id.* at 2, so the OLT will not rely upon the ONU being able to receive downstream traffic, Ex. 2007 ¶116. Ex. 1038’s markup recognizes this fact:

~~LowPowerDoze~~ LowPowerSleep	The OLT supports the ONU in a low power state. The OLT provides normal allocations to the ONU but expects only intermittent responses from the ONU to bandwidth grants, as defined by various timers. ~~In the low power doze state, the OLT forwards downstream traffic;~~ in the low power sleep state, the OLT may buffer downstream traffic.
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5	Activity_level	0- Sleep_Request (awake). 1- Sleep_Request (doze). ~~Doze request, ONU receiver active— During low-power periods of doze mode, the ONU can receive downstream traffic.~~ Deprecated. 2- Sleep_Request (sleep). Cyclic sleep request, ONU receiver inactive— During low-power periods of cyclic sleep mode, the ONU cannot receive downstream traffic.
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Ex. 1038, Tbl. 16–5 at 13 and Sleep_Request table on pp. 3–4 (both shown in part).

Petitioners criticize Patent Owner's point that Petitioners' proposed modification cannot be fixed by Petitioners' suggestion that ONUs notify the OLT of a transition directly from Asleep to Listen or *vice versa*, because "these signaling mechanics are not found in the challenged claims." Reply 10–11. But, of course, they are: the requirement that the ONU directly transition from/to the first state (with transmitter off) to/from the second state (also with transmitter off) mandates that the ONU's "signaling mechanics" cannot turn on its transmitter to notify the OLT of the transition or the transition would not be direct. *See, e.g.*, Limitations 1B–D.

Petitioners now improperly propose a new obvious theory for the first time in their Reply, whereby a POSITA would also modify G.987.3 to stop an OLT from sending downstream traffic to an ONU after the OLT allowed the ONU to transition to a Doze/Listen state. Reply 11; *see also Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (agreeing that petitioners are held to the "grounds of invalidity [petitioners chose] to assert in its petition," which is fair because "petitioners are aware [of this restriction] when they seek to institute an IPR"). Ignoring its impropriety, this new theory would take away the advantage of allowing an OLT to send downstream traffic to the ONU in the Doze/Listen state that G.987.3 contemplated was a good tradeoff for ***higher power consumption*** compared to the Asleep mode. *See, e.g.*, Ex. 2007 ¶114. So, Petitioners' new

proposed modification cuts against the Petitioners' proffered motivation to combine the references, to *decrease* power usage, by putting the ONU in the *higher* power Doze Mode without even gaining the corresponding benefit. *See id.* ¶53.

In fact, when considering power, Petitioners' new proposed modification to disallow downstream traffic to a dozing ONU, actually counsels for removing the Listen state altogether, not keeping the Listen state and allowing the ONU to directly transition back and forth to/from the Asleep state as Petitioners suggest. *See, e.g.*, Ex. 1040 at 5, 10, & 12 (noting that with “[n]o signaling within the Power Saving phase” “only one branch is left,” referring to the Sleep and Doze branches); *see also* Ex. 1038 at 1–4 (noting no ability to forward downstream traffic means “Doze mode should be eliminated”).

Petitioners cite caselaw that prior art references need not be “physically combinable to render obvious the invention,” Reply 11–12, but Patent Owner has not argued some “physical” incompatibility.

Petitioners say that the pertinent question is whether a POSITA “would have readily recognized that direct transitions could be combined into G.987.3,” Reply 12, but this is not correct. The pertinent question here is whether a POSITA at the effective priority date would have specifically modified G.987.3 to allow the Asleep (4)/Listen (6) state direct transitions for which Petitioners advocate, not “direct transitions” in the abstract. *Sirona Dental Sys. v. Institut Straumann AG*,

892 F.3d 1349, 1356 (Fed. Cir. 2018) (explaining that an IPR must proceed “in accordance with or in conformance to the petition” “all the way from institution through to conclusion”) (citing *SAS Inst., Inc. v. Iancu*, 138 S.Ct. 1348, 1356–57 (2018)). And a POSITA would have “readily recognized” and understood why G.987.3 literally says that Petitioners’ suggestion is “disallowed,” and followed this teaching away from Petitioners’ proposal. Ex. 1007 Tbl. 16–7 n.2, at 105; Ex. 2007 ¶81.

When Petitioners finally address their secondary reference, they say “the only remaining question is whether 1[D] is obvious in view of Röger.” Reply 15. In a general sense this is true, but the real question is whether at the Effective Priority Date, and without knowledge of the ’892 Patent’s teachings, would a POSITA modify G.987.3 in view of Röger *to allow direct transitions from/to the Sleep/Listen states as set forth in the Petition*. *Sirona Dental*, 892 F.3d at 1356. In answer to this question, Petitioners only say that “Röger teaches the claimed direct transitions.” *Id.* 18. But the existence of the limitation in Röger is insufficient to support the “thorough and searching” specific explanation regarding whether, why, and how in view of Röger a POSITA would have modified G.987.3 as Petitioners contend. *Palo Alto Networks, Inc. v. Centripetal Networks, LLC*, 122 F.4th 1378, 1384–85 (Fed. Cir. 2024).

Petitioners call “irrelevant” Patent Owner’s explanation of why Röger’s fundamentally different design means Röger’s transitions are no motivation or basis to modify G.987.3 as Petitioners suggest, because Röger’s “signaling mechanisms”—such as how Röger’s “rendezvous signals of Röger are different from [G.987.3’s] Sleep Request messages” and “times when the OLT transmits data to the ONUs”—are not claimed. Reply 15–16. But there is no requirement that the reason there is no basis or motivation to combine two references must be a claimed feature, and Petitioners cite no authority that this is true. Indeed, if this were the case, Petitioners’ proffered motivation to combine, “to reduce the power consumed by an ONU,” Reply at 5, would be improper, because the claims do not require a reduction of power consumed by an ONU, *see* Claim Listing on p. vii.

In truth, Patent Owner’s discussion is “unnecessary,” but not “irrelevant,” because Patent Owner need say nothing, where, as here, Petitioners have not explained why Röger would override G.987.3’s explicit instruction not to allow the ONU Sleep/Listen state direct transitions, Pet. 20–22; Reply 15–16, and Dr. Litvin’s explanation why a POSITA understands this prohibition exists, Ex. 2007 ¶¶116–20. Still, Petitioners have not put forth any disagreement with Patent Owner’s “irrelevant” explanation of how Röger works or addressed the merits of Patent Owner’s argument. Reply 15–16.

Instead, in a footnote, Petitioners suggest that the Board should disregard Dr. Litvin's opinions because Dr. Litvin testified that he spent up to 200 hours evaluating 30 to 50 patents for Patent Owner over the last three or four years to select the ones that he thought had the most likelihood of being implemented. Reply at 16 n.4; *see also* Ex. 1036 at 24:7–11; 26:1–16. However, Petitioners cite no authority that the Board should discount an expert's testimony for having previously acted in a consulting capacity. Federal Rule of Evidence 702 sets forth the qualifications for an expert to testify, and the rule does not list "not having been a consulting expert." Consultants routinely end up testifying for many reasons. *See, e.g., Curtis v. Lever Up Inc.*, No. 20-cv-01873, 2021 WL 5014497, at *4 (D. Colo. Oct. 28, 2021) (finding expert's role shifted from consulting to testifying expert after an attorney asked the expert to produce a report).

Likewise, Petitioners insinuate that the Board should fault Dr. Litvin for not considering the Preliminary Response or its accompanying declaration by a different expert. Reply at 16 n.4. But, again, Petitioners cite no authority that a Patent Owner's expert should not make a completely independent and unbiased assessment for a patent owner's response. To the contrary, after institution a patent owner may address items not raised in the preliminary response, *Apple Inc. v. DSS Tech. Mgmt.*, IPR2015-00369-14, at 4 (PTAB Aug. 12, 2015), including providing "additional" expert opinions, 35 U.S.C. § 316(a)(8), and need not re-make

or adopt every argument put forth in a preliminary response, *3G Licensing v. Honeywell Int'l*, No. 2023-1557, 2024 WL 5054806, at *4 (Fed. Cir. Dec. 10, 2024).

Finally, Petitioners suggest the Board disregard Dr. Litvin's opinions because Dr. Litvin supposedly "based his opinions regarding the relevance of Röger on an understanding that Claim 1 *is limited to telecommunication networks* for high bandwidth because [of] the preamble of Claim 1." Reply 16–17 (citing Ex. 1036 at 88:8–98:7) (emphasis added). This is untrue. Ex. 1036 at 95:22–96:18 ("I just said that *I didn't limit myself to the telecommunications passive optical network*, but it's my understanding that this is where it is primarily applicable") (emphasis added); *Id.* 98:1–7 (explaining Dr. Litvin also did *not* limit his analysis based upon "the type of subscriber, the speed of the subscriber, [or] the geography of the deployment.").³

³ Petitioners' counsel did get Dr. Litvin to discuss Claim 1's preamble, *id.* 92:17–100:1, which he did not address in his report, *id.* 103:19–104:6, over Patent Owner's scope objections, *id.* 92:19, 92:13, 95:6–8, 95:16–19. Indeed, Petitioners' counsel tried to teach Dr. Litvin what it meant for a preamble to be limiting. *Id.* 93:8–95:19. Nonetheless, Dr. Litvin's testimony is correct: "the ['892 Patent's] specification is certainly geared toward a telecommunications PON" and Röger's method of powering is "not really in the realm of telecommunications practicality." *Id.* 89:8–92:05. Still, to be clear, Patent Owner is not arguing that the '892 Patent is patentable over the References due to the preambles.

In sum, Petitioners fail to show a POSITA would modify G.987.3 in view of Röger in the way Petitioners contend, so do not show any challenged claim requiring the direct transition limitations obvious.

IV. CLAIM 12 AND ITS DEPENDENTS: PETITIONERS HAVE NOT SHOWN OLT GENERATED MESSAGES COMPRISE A PERIODIC “CONSENT MESSAGE” TO ALLOW THE ONU TO REMAIN IN EITHER THE FIRST OR SECOND LOW POWER STATE

Patent Owner disagrees that there is no requirement in Limitation 12D “that the ONU already be in a low power state when it receives the claimed consent message.” Reply 24. Limitation 12D expressly requires that the message allows the ONU “to remain” in the power mode, meaning the ONU must be *in* the power mode to “remain” there. Therefore, even if Petitioners’ contention that an ONU can receive periodic Sleep_Alow(ON) messages when the ONU is in the Active Held state is true, *see* Reply 26, Active Held is not a low power state, so does not (1) allow the ONU to *remain* in a low power state—just *enter* a low power state, Ex. 1007 at 95, or (2) meet Limitation 12D.

Petitioners do not contest that the specification teaches the claim explicitly. Reply 23–24; *see also* Ex. 1001, Tbl. 6, at cols. 10–11 (“Upon transition to and *periodically during* the sojourn *in* this [low power] state, the OLT sends an *LPM-Allow* message to the ONU”) (emphasis added). Instead, Petitioners argue the construction must be wrong because some figures do not explicitly show the functionality described in the text. *Id.* First, a patent does not have to “include a

drawing of [an embodiment] to cover that particular embodiment.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1367 (Fed. Cir. 2002); *see also* 35 U.S.C. § 113 & 37 C.F.R. §1.81(a) (noting drawings are optional when not “necessary for the understanding of the subject matter sought to be patented” like is the case here with such a clear textual description). Second, “[w]hen drawings and specifications conflict, then it is the language of the latter which controls.” *Shaffer Tool Works v. Joy Mfg. Co.*, 424 F. Supp. 1269, 1275 (S.D. Tex 1976) (citing *Johnson v. Riener*, 302 F.2d 757, 761 (1962)).

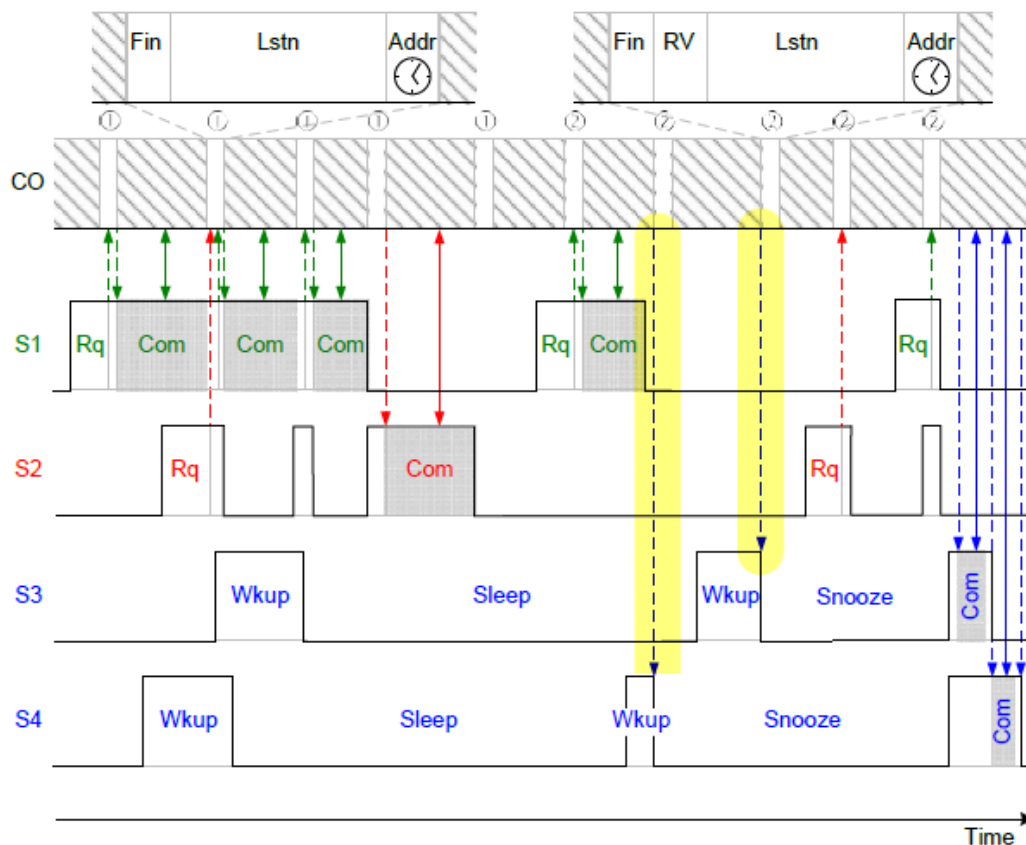
Petitioners then argue that Patent Owner’s “interpretation is nonsensical” if the relied upon text is compared to some figures. Reply 24–25. First, this appears to be a § 112 issue beyond the scope of this proceeding. 35 U.S.C. § 311(b). Second, there is no “contradict[ion],” because, as just explained, there does not have to be a corresponding figure that matches every embodiment described in the text. *CCS Fitness*, 288 F.3d at 1367.

Finally, Petitioners now implicitly concede that G.987.3 does not teach this claim, by trying to invoke Röger where the Petition and accompanying expert report solely relied upon G.987.3. *See* Pet. 62–63; Ex. 1003 ¶¶162–63. And Petitioners also attempt the new argument that having “an OLT send a [sic] Sleep_Allow(ON) messages to an ONU in the Listen state before the Isleep timer expired [would mean] that the ONU would not have to exit the Listen state to a Doze Aware state,”

Reply 26, where, before, Petitioners and their expert merely said sending such messages would generally “be beneficial by regularly keeping the ONU informed of its permissions,” without naming this alleged benefit, Pet. 63 (citing Ex. 1003 ¶159 (that said the same)). The Board should again procedurally ignore these new arguments. *Intelligent Bio-Sys.*, 821 F.3d at 1369.

Nonetheless, Petitioners’ new theories do not work. First, an ONU must transition from the Listen State to the Doze Aware state regardless of whether the ONU received additional SA(ON) messages, so that the ONU can handle other events, not related to OLT sleep permissions. *See, e.g.*, Ex. 1007 16-1 (explaining that during DozeAware ***local events may independently*** cause the ONU to enter the ActiveHeld state rather than returning to a low power state) (emphasis added) and Tbl. 16–2 (explaining that during DozeAware the ONU responds to all grant allocations).

Second, regarding obviousness in view of Röger, Petitioners point to the transitions of subscribers S3 and S4, and during the polling periods ② for these subscribers the central office only sends time stamps ***to wake up*** subscribers at the rendezvous time. Ex. 1006 at 7.



Id. Fig. 2 (highlighting added). Röger does not teach sending any consent signal that allows the subscribers “to remain” in a low power mode. The subscribers will remain in a low power mode *without the rendezvous time stamps* as seen in the first “Wkup” states for S3 and S4 above. *Id.*

V. **CLAIM 4: PETITIONERS DO NOT SHOW HOW OR WHY AN ONU COULD AND SHOULD SEND A MESSAGE FOR THE DISALLOWED TRANSITIONS**

Petitioners try to improperly reverse the burden, arguing that Patent Owner has not shown “how the ONU could transmit” or “in the event of a direct transition from Asleep to Listen, there would *not* be a message sent.” Reply 19 (emphasis added). But it is *Petitioners’ burden* to show how and why an ONU

would send a message. *See In re Magnum Oil Tools Int'l, Ltd*, 829 F.3d 1364, 1377–78 (Fed. Cir. 2016).

As to how, Petitioners now concede this is impossible. Reply 18–19.

As to why, Petitioners again rely upon an understanding that Note 2 means the ONU should send a “message indicative” of the disallowed transitions. Reply 19. But, as already explained, G.987.3 really teaches that such a message is not allowed, so, if the OLT does see such a request, it means that the OLT must have missed messages, received a corrupted message, etc., and the two state machines must have become unsynchronized, not that the transitions are allowed and the ONU should send a message while making the disallowed transition. *See* Section III *supra*; Ex. 1007 at 105.

VI. CLAIM 15: PETITIONERS’ ARGUMENT RELIES UPON THE INCORRECT ASSUMPTION THAT CLAIMS 1 AND 3 HAVE THE SAME SCOPE AND IS MET WITH MULTIPLE MESSAGES

Petitioners’ argument relies upon the incorrect assumptions that (1) Claims 1 and 3 have the same scope as Claim 15, and (2) multiple messages setting two time periods meet Claim 15’s requirements. Reply 20–24.

As to (1), Claim 15 is materially different than Claims 1 and 3. Claim 1 specifies a power management (not control) message *changes (not includes)* a power management rule, and Claim 3 specifies that the rule, *that need not be included in the message*, specifies two time periods. In contrast, Claim 15 requires

a control (not power management) message *includes* a power management rule, and that the rule *in the message* specifies *two* time periods. Because Petitioners' view of Claim 15's scope is incorrect, so is their obvious argument.

As to (2), the Claim 15 requires “*the* power management rule that specifies *a first time period . . . and a second time period*” (emphasis added) which, in context, is at least a one-to-two relationship,⁴ and “the power management” rule does not mean “*any one of the* one or more power management rules” as Petitioners try to read the claim. *See Salazar v. AT&T Mobility LLC*, 64 F.4th 1311, 1318 (Fed. Cir. 2023).

VII. CONCLUSION

For all claims, G.987.3 does not teach that an ONU makes direct transitions to/from G.987.3's Asleep state from/to G.987.3's Listen state, and, in fact, explicitly teaches away from Petitioners' proposed modification to do so, because such a modification would destroy G.987.2's fundamental design.

For Claim 12 and its dependents, G.987.3 does not teach or suggests periodic consent messages allowing an ONU *to remain* in low power states.

For dependent Claim 4, an ONU would not and could not send a message indicative of the transition between Petitioners' identified first state and second state.

⁴ As comprising claims, the message could also specify more than two time periods.

For dependent Claim 15 the References do not teach or suggest a control message power management rule that specifies two times for the low power states.

For these reasons, Petitioners have failed to meet their burden to show any of the claims are unpatentable as obvious and Patent Owner respectfully submits that the Board should find the same.

Dated: July 10, 2025 Respectfully submitted,

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CERTIFICATE OF WORD COUNT

Per 37 C.F.R. § 42.24, the undersigned certifies that the number of words in
PATENT OWNER'S SUR-REPLY is:

5,446

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Dated: July 10, 2025

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CERTIFICATE OF SERVICE

The undersigned certifies that on the tenth day of July, 2025, a complete and entire copy of the foregoing “PATENT OWNER’S SUR-REPLY,” including exhibits, if any, was served on the following counsel of record via email per Petitioners’ consent to electronic service. *See* Paper 18 at 73.

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