

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 RESPONSE
37 C.F.R. § 42.120

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CURRENT EXHIBIT LIST¹

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 et al., "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 et al., "Sleep Mode for Energy Saving PONs: Advantages and Drawbacks" 2009 IEEE Globecom Workshops (2009)
1012	Abhishek Dixit et al., "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.

No.	Brief Description
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
1025	Hall-Ellis Declaration Attachment 3A
1026	Hall-Ellis Declaration Attachment 3B
1027	Hall-Ellis Declaration Attachment 3C
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)
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)

No.	Brief Description
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

Nokia of America Corporation and AT&T Services, Inc. (“Petitioners”) filed a request for *inter partes* review of Claims 1–5 and 10–15 (“Challenged Claims”) of Patent No. 9,806,892 (“’892 Patent” or “Patent-at-Issue”) under pre-AIA 35 U.S.C. §103(a) in light of combinations of references referred to as G.987.3, Röger, G.988, and Ghazisaidi (“References”). Paper 18, Corrected Petition (“Pet.”) at 1. The Board instituted a trial. Paper 19 (“Inst. Dec.”).

One major issue for the Board is whether the References render obvious Claims 1, 10, and 14³ and their dependents with limitations requiring “direct” transitions from the claimed first state (with the ONU’s transmitter off and receiver on) to the second state (with both transmitter and receiver off) and *vice versa*. Petitioners first say G.987.3 would do so alone because an ONU may give intermittent responses in low power states, but G.987.3 is clear that an ONU enters these states from the Active Free state (not asserted as either a first or second state), so there is no reason to believe intermittent responses mean there had to have been “direct transitions” between the claimed states.

³ Claim 14 does not use the word “direct” so the applicability of this argument depends upon whether “transition . . . to . . . from” should be construed to require direct transition.

Second, Petitioners argue the limitation would have been obvious because a POSITA would have modified G.987.3 in view of Röger to have the ONU make direct transitions from G.987.3's Asleep and Listen states. However, G.987.3 considered the very transition Petitioners advocate for and explicitly specified that an ONU is not permitted to do this. Indeed, G.987.3 makes clear that such a direct transition is antithetical to how the specification fundamentally operates, where the ONU cannot notify the OLT of such transitions, and the OLT relies upon the ONU not to slip in and out of the different low power states.

Petitioners put forth a lot of obfuscation, such as saying the teaching away only applies to the OLT rather than the ONU, that Patent Owner points to the same functionality for infringement as Petitioners do for invalidity, and that G.987.3's teaching not to make the suggested direct transitions was due to a practical "chip speed" limitation, but none of this is true.

Third, Petitioners simply point to Röger's ONUs making direct transitions between a wakeup/receive state and a snooze/sleep mode and say—voilà—the direct transitions claimed in 1D are unpatentable. But the aspects of Röger that allow these direct transitions are deeply incompatible with G.987.3's design. So, Petitioners' suggestion to simply copy Röger's direct transitions in low power states plainly would not work without a substantial redesign of the basic principles that G.987.3 was built upon, meaning a combination was not obvious.

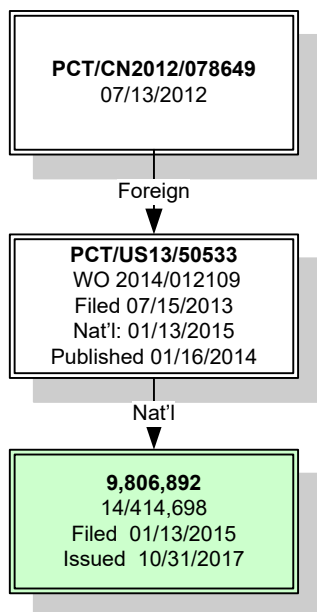
A second major question for the Board to address is whether the References render obvious Claim 12 and its dependents that require periodic consent messages to allow the ONU to remain in the low power states. The answer is no, because the single reference Petitioners rely upon, G.987.3, only teaches a message to enter—not remain in—a low power state, and, once in a low power state, all other messages are for *disallowing* the ONU to remain there.

Finally, the Board may have to address a couple of dependent claims if the Board finds the independent claims from which they depend obvious. The first dependent claim issue is whether G.987.3's ONU would send a message indicative of the transition between the first state and the second state (Claim 4). The answer is “no,” at least because both states require the ONU transmitter to be off, so to send such a message would mean the transition was not direct, and G.987.3's basic design is only concerned with notifying the OLT of transitions in and out of low power states. The second dependent claim issue is whether G.987.3's ONU teaches one control message's power management rule specifies two separate time periods, one for each of the low power states (Claim 15). Again, the answer is “no,” at least because Petitioners only point to a single time parameter, rather than the claimed two separate time periods in a single message, and rely upon an “aware state” that is not what Petitioners previously mapped to a low power state.

Patent Owner addresses these and other issues in more detail herein.

II. FAMILY AND EFFECTIVE FILING DATE

The '892 Patent is part of the following family.



As seen, the '892 Patent is a national entry of international application PCT/US13/50533 (“’533 PCT App.”) that designated the United States. Ex. 2009 at (81). The ’533 PCT App. is treated as a national application filed at the USPTO as of the ’533 PCT App.’s filing date, July 15, 2013. 35 U.S.C. § 363. The ’533 PCT App. was filed within 12 months of, and claims priority to, foreign application PCT/CN2012/078649 (“CN ’649 App.”) filed in a WTO member country. Ex. 2009 at (30); Ex. 2008. As such, the ’533 PCT App. is entitled to the CN ’649 App.’s filing date of July 13, 2012 (“Effective Filing Date”). 35 U.S.C. §§ 119(a), 363(b). This is also the Patent-at-Issue’s Effective Priority Date, as Petitioners have assumed. Pet. 3.

The Leahy-Smith America Invents Act (“AIA”) only applies to patents that “contains or contained at any time” a claim with an effective filing date on or after March 16, 2013. Pub. L. No. 112-29, 125 Stat. 284 §§ 6(f)(2)(A), 3(n)(1) (2011). As such, the Board should judge the ’892 Patent under the pre-AIA regime.⁴ Petitioners appear to agree, as the Petition references “pre-AIA” statutes. Pet. 1. Also, the USPTO appears to have previously made a similar determination, as the Examiner of the application that matured into the ’892 Patent also examined the Patent-at-Issue under pre-AIA statutes. Ex. 1002 *passim*.

III. LEVEL OF ORDINARY SKILL IN THE ART

As the Board noted, the Parties’ proposals of a person of ordinary skill in the art (“POSITA”) at the ’892 Patent’s Effective Priority Date are very similar, having a baseline of “at least a bachelor’s degree in electrical engineering, computer engineering, or similar discipline . . . and at least two years of experience with optical communications and networks.” Inst. Dec. 13–14. Patent Owner’s analysis would not change under either proposal.

Patent Owner proffers Dr. Kerry I. Litvin’s written testimony in support of this Response. Ex. 2007. Dr. Litvin has many years of experience regarding Optical Networks and holds many patents in the field. *Id.* ¶¶6–16. While

⁴ The Board referenced *AIA* statutes in the Institution Decision. Inst. Dec., at n.4.

Dr. Litvin's expertise surpasses that of a POSITA, he performed his analysis considering that of a POSITA at the Effective Priority Date using the provided legal standards. *Id.* ¶¶17–40.

IV. CLAIM CONSTRUCTION

A. Means-Plus-Function Terms

Patent Owner concurs with Petitioner that Limitation 10D and Claim 13 have terms presumed to be construed under pre-AIA 35 U.S.C. § 112(f)—“means for transitioning ” and “means for specifying.” However, Patent Owner's position is that these terms do not need an explicit construction to resolve any of the issues in this trial. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (explaining that the Board need not construe terms immaterial to the obviousness dispute).

B. “Transition . . . from . . . to” in Claim 14

Patent Owner clarifies and more narrowly tailors its previous position put forth in the Preliminary Response. Specifically, Patent Owner modifies the term that the Board should construe from “transition” to “transition . . . from . . . to,”

and re-urges that Claim 14 requires a direct transition from the first low power mode to the second low power mode and *vice versa* for the following reasons.⁵

First, the specification pervasively advocates that ***the invention*** is direct transitions between low power states. *See, e.g.*, Ex. 1001, 1:58–63; 12:31–32; 12:53–54; 13:1–4; 13:14–22; *see also GPNE Corp. v. Apple Inc.*, 830 F.3d 1365, 1370 (Fed. Cir. 2016) (“[R]ecogniz[ing] that when a patent ‘repeatedly and consistently’ characterizes a claim term in a particular way, it is proper to construe the claim term in accordance with that characterization.”); *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1341 (Fed. Cir. 2001) (explaining that when the preferred embodiment is described as the invention itself, the claims are not entitled to a broader scope than that embodiment).

Second, the patentee made clear from the abstract, meant to give a concise understanding of the invention, that the invention concerns “transitioning the ONU ***directly*** between the first state and the second state.” Ex. 1001, abstract (emphasis added); *see also SciMed Life*, 242 F.3d at 1342 (restricting limitation in

⁵ Claim 12 also does not use the word “direct”; however, Patent Owner’s view is that Limitation 12D regarding periodic consent messages allowing the ONU to remain in the low power states is dispositive, so the Board need not reach the “direct” issue for Claim 12. *See Nidec Motor Corp.*, 868 F.3d at 1017.

part in light of the abstract, because “from the outset the specification” characterized the limitation as having the restriction).

Third, the '892 Patent criticizes “conventional power management technique[s]” for not directly transitioning between the first and second power states. *See, e.g.*, Ex. 1001 at 4:32–40 & Figs. 2–3; *see also UltimatePointer, LLC v. Nintendo Co., Ltd.*, 816 F.3d 816, 823–24 (Fed. Cir. 2016) (finding extolling virtues of one feature, and criticism of its opposite, to limit the claims to the feature); *SciMed Life*, 242 F.3d at 1342–43 (same).

Fourth, the applicant argued during prosecution that the Pfeiffer reference did not render claim 14 obvious because it failed to disclose *direct* transitions. Ex. 1002, at 26–27 (distinguishing then-claim 16 because Pfeiffer’s end node “cannot enter the listen state ***directly*** from the sleep state”) (emphasis added); *see also Computer Docking Station Corp. v. Dell, Inc.*, 519 F.3d 1366, 1374–75 (Fed. Cir. 2008) (citations omitted) (explaining that a patentee may limit the meaning of a claim term by making a clear and unmistakable disavowal of scope during prosecution). By doing so, the Applicant made clear that the Applicant construed the group of claims “to be patentably distinguishable over the cited art for reasons applicable to both claims”; here, the direct transitions. *See In re McDaniel*, 293 F.3d 1379, 1383–84 (Fed. Cir. 2002).

As the Board noted, in the response to the office action, claim 16 had not been amended with the word “direct,” Inst. Dec. 18; however, claims 1 and 16 were amended in a similar fashion in another aspect. Claim 1 was amended to read “transitioning the ONU directly ~~between~~ from the first state ~~and~~ to the second state . . .” and Claim 16 was amended to read “wherein the ONU is configured to transition ~~between~~ from the first low power mode ~~and~~ to the second low power mode . . .” *Compare* Ex. 1002 at 30, 33 *with id.* at 64, 67. These amendments, in conjunction with the applicant’s arguments, suggest that the applicant meant the “from” and “to” in the limitation to signify direct transitions from the first and second power modes, while the previously recited “between” and “and,” without “direct,” language encompassed indirect transitions.

Fifth, there is not a single preferred embodiment that does not have direct transitions between a first and second state. And it is axiomatic that a claim interpretation that excludes all preferred embodiments from the scope of the claim is rarely, if ever, correct. *See, e.g., Accent Packaging, Inc. v. Leggett & Platt, Inc.*, 707 F.3d 1318, 1326 (Fed. Cir. 2013) (citation omitted).

The Board invoked another basic tenant of claim construction when preliminarily deciding the meaning of transition in Claim 14, that claim terms are ***presumed*** to have consistent meanings across claims, and, therefore, based on claim differentiation (i.e., comparison of Claim 14 with other claims), “transition”

must be different than “direct transition.” Inst. Dec. 17. However, as explained above, “the written description and prosecution history overcome any presumption arising from the doctrine of claim differentiation.” *Anderson Corp. v. Fiber Composites, LLC*, 474 F.3d 1361, 1370 (Fed. Cir. 2007) (citations omitted). Indeed, “the doctrine of claim differentiation cannot broaden claims beyond their correct scope, determined in light of the specification and the prosecution history and any relevant extrinsic evidence” and “claims that are written in different words may ultimately cover substantially the same subject matter.” *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1480 (Fed. Cir. 1998).

C. “Power Management Message”

Challenged Claims 1, 5, 10, and 14 contain the term “power management message.” Petitioners propose that a “‘power management message’ [is] a message that is usable to change a power management rule.” Pet. 26 (citations omitted).

Patent Owner’s view is that this term is not germane to the contested issues presented to this Court and therefore requires no express definition. *See Nidec Motor Corp.*, 868 F.3d at 1017.

D. All Other Terms

Patent Owner believes the Board should give all other terms their ordinary and customary meanings, as understood by a POSITA at the time of invention,

having taken into consideration the language of the claims, the specification, and the prosecution history of record. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (*en banc*). Patent Owner addresses the normal meaning of “consent” when discussing Limitation 12D.

V. PETITIONERS’ REFERENCES FAIL TO RENDER OBVIOUS THE FOLLOWING CHALLENGED CLAIMS

Patent Owner addresses the claims in the same order as Petitioners do, first considering the claims in Ground 1, concerning Claims 1–5 and 14–15, and then considering the claims in Ground 2, concerning Claims 10–13.

A. Claim 1: G.987.3 in View of Röger Further in View of G.988 Fails to Render Obvious Limitation 1D

[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;
--

Limitation 1D refers to the previously defined “first state” where the “transmitter of the ONU is turned off and a receiver of the ONU is turned on” and a “second state” where “the transmitter and the receiver are turned off.” The limitation requires (1) going directly from the first state to the second state and (2) going directly back from the second state to the first state.

1. Petitioners’ Motivation to Combine Arguments Are Flawed

For Limitation 1D, Petitioner first invokes G.987.3 and cites to Petitioners’ “Motivation to Combine” section. Pet. 19; *see also* Pet. § 8. Petitioners’ Motivation

to Combine section argues that Limitation 1D is obvious in view of G.987.3 alone and also obvious in light of G.987.3 in view of Röger. Pet. 7–15. As such, Patent Owner first addresses Petitioners’ Motivation to Combine arguments.

a. That G.987.3’s ONU May Respond Intermittently in a Sleep or Listen State Does Not Mean the ONU Transitioned Directly Between a Sleep and Listen State

Patent Owner first addresses Petitioners’ argument that G.987.3 alone renders Limitation 1D obvious. Specifically, Petitioners argue that because G.987.3 recognizes “the possibility that the ONU does not receive downstream traffic from the OLT and allow[s] for extra response delays if the ONU can’t respond in a normal time” the ONU *must be* “performing direct transitions.” Pet. 11 (citing Ex. 1007 at 106; Ex. 1003 ¶69). This is an unspoken inherency argument, but Petitioners’ conclusion does not logically follow from G.987.3’s disclosure. Ex. 2007 ¶¶66–78.

It is true that G.987.3’s ONU may not timely-respond if the ONU is in a Sleep or Doze State, because in the low power states the ONU’s transmitter and/or the receiver is off, as G.987.3 notes. Ex. 1007 Tbl. 16–5 at 103 (explaining that the OLT only “expects a response to every bandwidth grant” in the AwakeForced and AwakeFree states but “expects only intermittent responses” and missed “handshakes” in the LowPower states); *see also id.* at 106 (“The OLT must be prepared for the possibility that a sleeping ONU does not receive the transmission.”); *see also* Ex. 2007 ¶¶68–74. However, G.987.3 also makes it clear that an ONU gets

to one of these low power states by *entering from the ActiveFree state*, not by directly transitioning between low power states. *Id.* Fig. 16–1 at 101 (showing the ONU entering the LowPower states from the ActiveFree state); *see also* Ex. 2007 ¶75.

Indeed, G.987.3’s Table 16–4, shown below, specifically greys out any action based upon OLT Forced Wakeup Indication (“FWI”) and Sleep Allow (“SA”) inputs when the ONU is in the Asleep (4) state because the ONU cannot receive the inputs at this time.

Table 16-4 – ONU state transition and output table

Inputs	ONU power management states					
	(1) ActiveHeld	(2) ActiveFree <i>Start</i>	(3) SleepAware	(4) Asleep <i>End</i>	(5) DozeAware	(6) Listen
FWI	*	→ (1)	→ (3) /SR(Awake)		→ (1) /SR(Awake)	→ (1) /SR(Awake)
SA (OFF)	*	→ (1)	→ (1) /SR(Awake)		→ (1) /SR(Awake)	→ (1) /SR(Awake)
SA (ON)	→ (2) Upon Thold exp. (Note)	*	*		*	*
LWI	*	*	→ (1) /SR(Awake)	→ (1) /SR(Awake)	→ (1) /SR(Awake)	→ (1) /SR(Awake)
LSI		→ (3) /SR(Sleep)	*	*		
LDI		→ (5) /SR(Doze)			*	*
Tsleep exp.				→ (3)		→ (5)
Taware exp.			→ (4)		→ (6)	

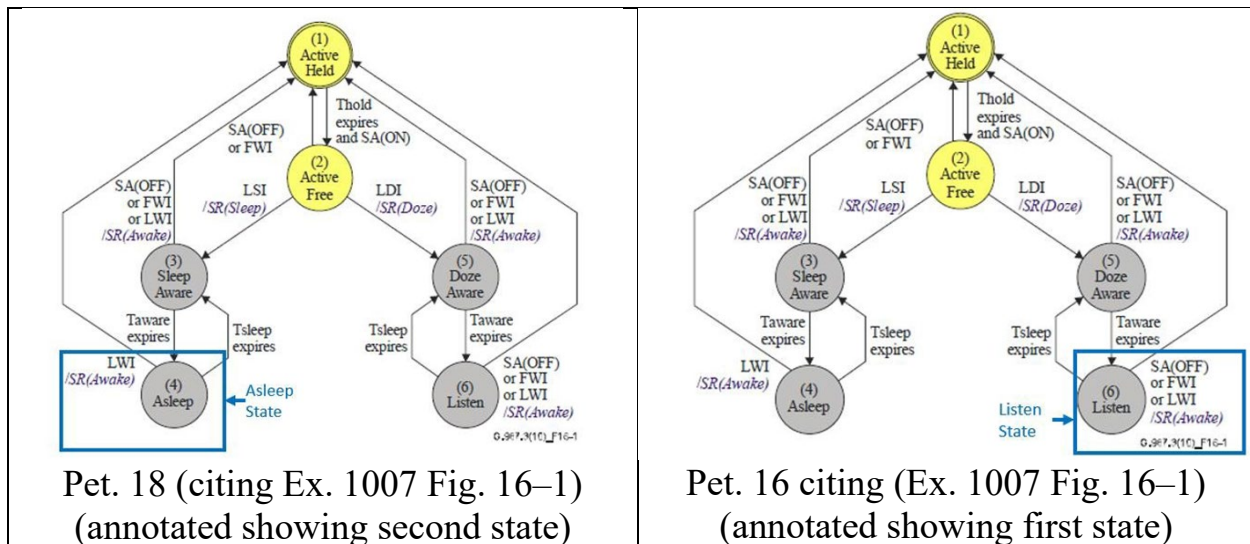
Ex. 1007 Tbl. 16–4, at 102 (shown in part and yellow highlighting and red

annotation added). More importantly, in light of Petitioners' argument, the table also shows that the ONU enters the Asleep State (ONU Power Management State 4) state *from the ActiveFree state (ONU Power Management State 2)* through the SleepAware state (ONU Power Management State 3). This is shown above beginning with the "start" state and the transition labeled "A," and finishing on "end" with the transition labeled "B." Therefore, just because an ONU has delayed responses in low power states is no basis for concluding that the ONU got into the Asleep state directly from the Listen state, or *vice versa*.

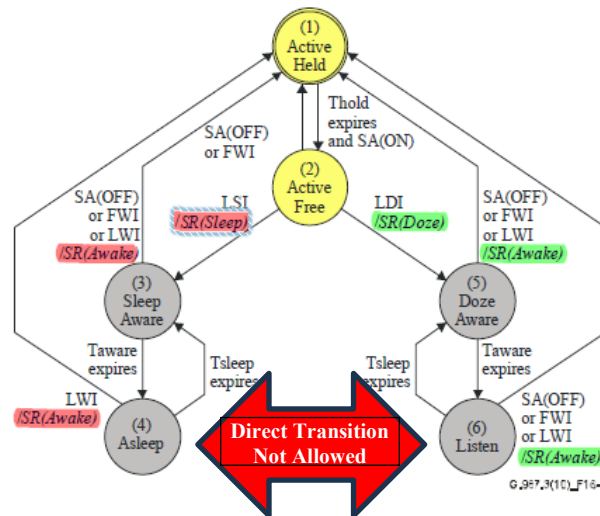
Indeed, as discussed next, the ONU cannot make such a direct transition, because this is "disallowed." Ex. 1007 Tbl. 16–7 n.2, at 105; *see also* Ex. 2007 ¶¶76–78.

b. G.987.3 Teaches Away from Petitioners' Suggested Modification of G.987.3 in View of Röger

Petitioners alternatively suggest that a POSITA would modify G.987.3 in light of Röger to allow direct transitions between G.987.3's Listen (6) and Asleep (4) state, the states that Petitioners map to the claimed first and second states, as shown below.



In support of this position, Petitioners argue that while G.987.3 does not “explicitly allow” direct transitions between the Listen (6) and Asleep (4) mode, Pet. 10, G.987.3 “in no way preclude[s] the ONU from alternating between a doze mode and a sleep mode” after the OLT sends a Sleep_Allow(ON) message, *Id.* 14. This is incorrect. G.987.3 does more than “not explicitly allow” such direct transitions. G.987.3 explicitly mandates that “[d]irect transitions between Doze mode and Cyclic Sleep mode **are disallowed.**” Ex. 1007 Tbl. 16–7 n.2, at 105 (emphasis added); *see also* Ex. 2007 ¶¶79–104. The disallowed transition is shown below.



Ex. 1007 Fig. 16–1, at 101 (red and green highlighting and red arrow with text added).

Petitioners acknowledge G.987.3’s restriction but argue that the constraint “is only applicable to the OLT.” Pet. 10. This is simply wrong, as Note 2 itself makes clear. Ex. 2001 ¶41. The following sentence says “[w]hen the OLT receives a request to execute such a transition, [the OLT] attempts to regain state machine synchronization *by waking up the ONU.*” Ex. 1007 Tbl. 16–7 n.2, at 105 (emphasis added). Hence, Note 2 is unambiguous that the OLT should never see this transition *by the ONU* because *the ONU is not allowed* to make such a transition. *Id.* That is, Note 2 says that if the ONU sends a request to execute such a transition, it means things have gone wrong, the OLT state machine is not correctly reflecting the state of the ONU (i.e., has become unsynchronized), and the OLT should take corrective action by immediately forcing the ONU into the Forced Awake state. *Id.*; see also Ex. 2007 ¶¶82–86.

Other portions of G.987.3's Table 16–7 further confirm the restriction *is on the ONU*.

Inputs	OLT power management states					
	(1) AwakeForced	(2) AwakeFree	(3) LowPower Sleep	(4) Alerted Sleep / FWI	(5) LowPower Doze	(6) Alerted Doze / FWI
SR (Awake)	*	*	→ (2)	→ (1)	→ (2)	→ (1)
SR (Sleep)	* /SA(OFF) (Note 1)	→ (3)	*	*	→ (1) /SA(OFF) (Note 2)	→ (1) /SA(OFF) (Note 2)
SR (Doze)	* /SA(OFF) (Note 1)	→ (5)	→ (1) /SA(OFF) (Note 2)	→ (1) /SA(OFF) (Note 2)	*	*

Ex. 1007 Tbl. 16–7, at 105 (shown in part) (yellow highlighting and green and red annotations added). As seen, the initiating action is controlled by the “Inputs” of the first column, Sleep_Request (“SR”) messages *from the ONU*. As further illustrated, the action taken in response to the input from the ONU depends upon what state the OLT thinks *the ONU is in* as shown in the header row. And barring an aberrant event, the OLT’s tracking of the ONU state is correct. See Ex. 1007 at 98 (explaining the OLT and ONU state machines are in partial alignment); see also *id.* Tbl. 16–7 n.2, at 105 (noting synchronized state machines); see also Ex. 2007 ¶¶87–92.

With this understanding, Note 2 in the table above (shown in red text in original) indicates that the OLT should not receive an SR(sleep) shown in the row circled in green *from the ONU* if the OLT understands the ONU is in the “LowPower Doze” or “Alerted Doze” states shown in the columns circled in red, because *the ONU* is not allowed to transition from the Sleep states to the Doze state. That is, cells in this union, highlighted yellow, are invalid *ONU transitions*. Likewise, Note 2 indicates that the OLT should not receive an SR(Doze) shown in the row circled in red *from the ONU* if the OLT believes the ONU is in the “LowPower Sleep” or “Alerted Sleep” states shown in the columns circled in green, because *the ONU* is also not allowed to transition from the Doze state to Sleep states. Therefore, Note 2 is applicable to the cells where these red and green rectangles overlap (highlighted yellow), because these cells are invalid *ONU transitions*.

There really should not be any doubt that the restriction is on the ONU, as the *nothing in this section allows the OLT to go into low power, doze, or sleep states*. The OLT only “supports *the ONU* in a low power state,” i.e., LowPowerDoze and LowPowerSleep. Ex. 1007 Tbl. 16–5, at 103 (emphasis added); *see also id.* at 98 (noting that the OLT “discover[s] *the ONU’s power management capabilities*”) (emphasis added). The OLT “leaves *the selection of doze or cyclic sleep mode to the ONU’s discretion*.” Tbl. 16–3, at 100 (emphasis added). Indeed, almost all, if not all, of Petitioners’ citations are to Chapter 16 of G.987.3, and Chapter 16 is titled

“**ONU** power management.” (emphasis added). Ex. 1007 at 89; *see also* Ex. 2007 at 86, 93.

In short, G.987.3 is unambiguous: the ONU may not make direct transitions between Doze mode and Cyclic Sleep modes. Such direct transitions are “disallowed.”

Further in support of Petitioners’ view that G.987.3’s restriction between Doze and Cyclic sleep mode is not applicable to the ONU, Petitioners’ say the newer G.9807.1 specification allows the OLT to support ONUs in a new LowPower watchful sleep state but continues to disallow direct transitions between Doze and Cyclic sleep mode, indicating that these transitions are a responsibility of internal ONU management.” Pet. 10–11. Patent Owner agrees that G.9807.1 has a similar direct transition restriction, again in “Note 2” as shown below.

Inputs	OLT power management states					
	(1) AwakeForced	(2) AwakeFree	(3) LowPower Sleep/Watch	(4) Alerted Sleep/Watch/ FWI	(5) LowPowerDoze	(6) AlertedDoze/ FWI
SR (Awake)	*	*	→ (2)	→ (1)	→ (2)	→ (1)
SR (Sleep/WSleep)	* /SA(OFF) (Note 1)	→ (3)	*	*	→ (1) /SA(OFF) (Note 2)	→ (1) /SA(OFF) (Note 2)
SR (Doze)	* /SA(OFF) (Note 1)	→ (5)	→ (1) /SA(OFF) (Note 2)	→ (1) /SA(OFF) (Note 2)	*	*

Ex. 1010 Tbl. 16.7, at 238 (shown in part) (yellow highlighting and green and

red annotations added). But G.9807.1's Table 16.7 is read the same way as G.987.3's Table 16-7, and also describes how *the ONU* may not send an SR(Doze) (row circled in red) from any of the LowPowerSleep/LowPowerWatch states (3) or AlteredSleep/AlteredWatch states (4) (columns circled in green). Likewise, *the ONU* may not send an SR (Sleep) or SR(WSleep) message (row circled in green) from either the LowPowerDoze (5) or AlteredDoze (6) states (columns circled in red).

G.9807.1's OLT state machine showing *the ONU's* SR requests (indicated by pink rectangles) further illustrates this restriction:

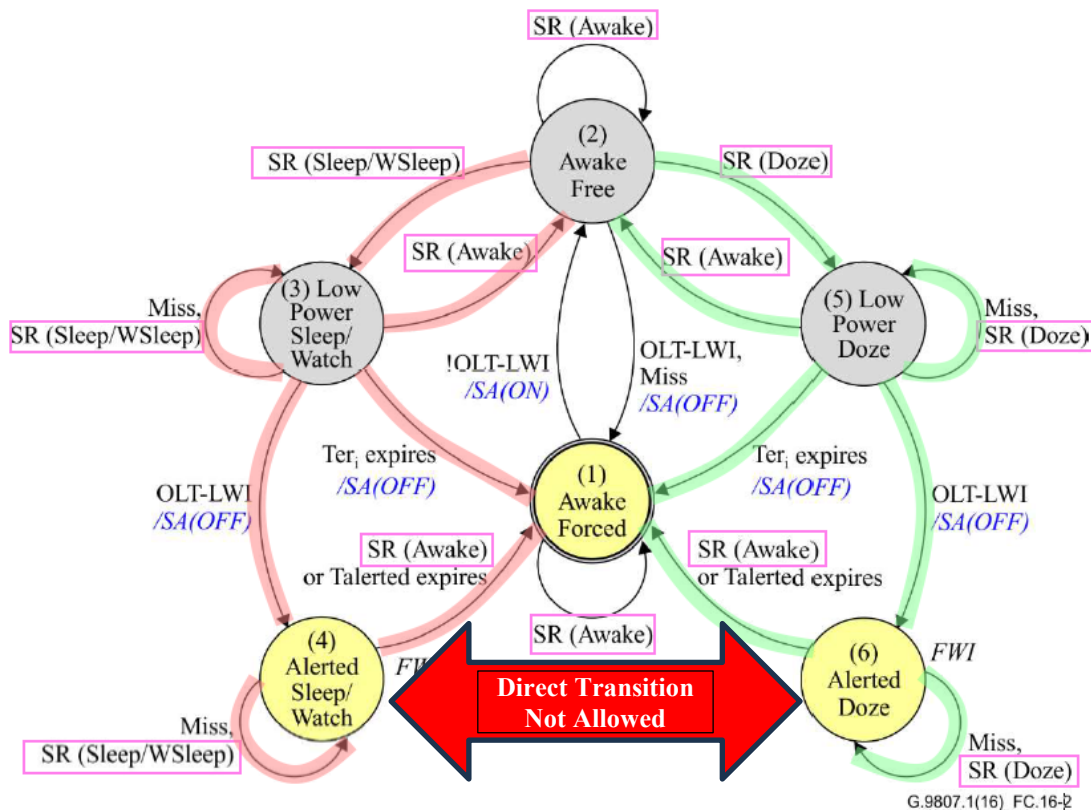


Figure C.16.2 – OLT state transition diagram (initial state circled)

Ex. 1010 Fig. C.16.2, at 229 (red and green highlighting, pink rectangles, and red arrow with text added). As seen, there is still no direct path between the Doze states (5)–(6) on the right (transitions in green) and the Sleep states (3)–(4)—*including the new ONU LowPowerWatch and AlertedWatch states*—on the left (transitions in red) *based upon ONU inputs (SR requests)* as reflected in G.9807.1’s Table 16.7. Because, as Note 2 in the new specification makes clear, these are still not valid direct *ONU transitions*. Ex. 2007 ¶¶101–04.

Indeed, G.9807.1’s Table 16.7 below illustrates how the new ONU Watchful Sleep state (3) exists side-by-side with the older ONU LowPowerDoze state (5).

Inputs	OLT power management states					
	(1) AwakeForced	(2) AwakeFree	(3) LowPower Sleep/Watch	(4) Alerted Sleep/Watch/ FWI	(5) LowPowerDoze	(6) AlertedDoze/ FWI
SR (Awake)	*	*	→ (2)	→ (1)	→ (2)	→ (1)
SR (Sleep/WSleep)	*	→ (3)	*	*	→ (1)	→ (1)
	/SA(OFF) (Note 1)				/SA(OFF) (Note 2)	/SA(OFF) (Note 2)
SR (Doze)	*	→ (5)	→ (1)	→ (1)	*	*
	/SA(OFF) (Note 1)		/SA(OFF) (Note 2)	/SA(OFF) (Note 2)		

Ex. 1010 Tbl. 16.7, at 238 (red, green, and pink annotations added). Specifically, if the OLT believes the ONU is in the AwakeFree state (2) (shown in pink), and the OLT receives the new *SR(WSleep)* “input” *from the ONU*

(circled in red), the OLT shifts to the LowPowerWatch state (3) (highlighted in red) *to reflect that the ONU is in this state*. In contrast, if the OLT believes the ONU is in the AwakeFree state (2) (shown in pink), and the OLT receives an *SR(Doze)* input from the ONU (circled in green), the OLT knows the ONU transitioned to the LowPowerDoze state (5) (highlighted in green). Therefore, that G.9807.1 has a new watchful sleep request and LowPowerWatch state—in addition to supporting the original Doze states (5)–(6)—does not change that G.987.3’s Note 2 restriction is applicable to an ONU, and Petitioners’ citation to G.9807.1’s new “watchful sleep” functionality only serves to obfuscate. *See* Pet. 10–11.

In sum, to the extent that direct transitions between G.987.3’s Asleep (4) and Listen (6) states are—as Petitioners contend—“a responsibility of internal ONU management,” the ONU’s responsibility *is to ensure that these transitions do not occur* in accordance with G.987.3’s mandate.

Petitioners’ motivation to combine begins with the premise that G.987.3 merely does not “explicitly allow,” but does “not preclude,” the ONU from making direct transitions between a Doze mode and Cyclic sleep mode; however, as shown, G.987.3 explicitly does preclude the ONU from making such direct transitions. That is G.987.3 unequivocally teaches away from Petitioners’ proposed solution. Rarely is there such a scenario as here where “the prior art foresaw the specific invention

that was later made, and warned against taking that path.” *Spectralytics, Inc. v. Cordis Corp.*, 649 F.3d 1336, 1343 (Fed. Cir. 2011); *see also In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) (explaining that teaching away occurs when a POSITA would merely “be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant”).

c. G.987.3 Already Desired Reduction of Power and Already Considered Direct Transitions between Asleep and Listen States, Yet G.987.3 Still Taught Not to Allow These Direct Transitions

Petitioners argue that “[t]his modification to direct transitions would have been driven by a well-known problem in the field, reducing power consumption.” Pet. 12 (citing Ex. 1003 ¶70). But, as Petitioners concede, G.987.3 *already noted* that “it is desirable to reduce the power consumed by an ONU as much as possible.” *Id.* (citing Ex. 1007 at 97). Yet G.987.3 *still taught that an ONU was not permitted to make direct transitions from the Sleep to Doze states*. Ex. 1007 Tbl. 16–7 n.2, at 105. *See also* Ex. 2007 ¶¶45–53, 105–07 (explain that sleep and doze were consciously chosen as mutually exclusive compromises for power consumption and performance).

Likewise, Petitioners argue that direct transitions were obvious because of the “limited numbers of power states and scenarios for an ONU to transition between them,” Pet. 11–12. However, the limited number of power states and transitions actually cuts against Petitioners’ argument, because with so few permutations the

specification designers must have considered Petitioner’s proposal, but did not adopt it. Ex. 2007 ¶¶108–10. Indeed, this is not speculation: G.987.3 *explicitly considered* the very direct transitions that Petitioners say would be used, but G.987.3 *still taught that direct ONU transitions from the Sleep to Doze states were not allowed*. Ex. 1007 Tbl. 16–7 n.2, at 105.

Petitioners rely upon the teachings of G.987.3 for a POSITA’s motivations and potential state transitions, yet Petitioners ignore or misconstrue the other portions of the same reference that considered the very transitions for which Petitioners advocate *and rejected them*. The Federal Circuit said that a court must consider G.987.3 “for all it taught, [including] disclosures that diverged and taught away from the invention at hand.” *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1069 (Fed. Cir. 2018) (citation and quotation omitted). Therefore, considering G.987.3 “for all it taught,” shows G.987.3 *teaches away* from Petitioners’ proposed modifications.

d. Petitioners’ Exhortation that Chip Speed Was G.987.3’s Concern Is a Strawman

Petitioners additionally argue that G.987.3 would implement their advocated direct transition in view of Röger because “[a]dvancements in chip speed . . . made it more practical to periodically turn on and off a receiver while a transmitter remained off in an ONU.” Pet. 12–13. Implicit in Petitioners’ argument is that the reason G.987.3 disallowed transitions from the Asleep to Listen states was that

G.987.3 viewed the time it took to turn on a receiver as unacceptable. Petitioners set up this argument because they cannot defeat the real reason G.987.3 prohibited direct transitions explained in the next sub-section (e), but chip speed was not G.987.3's concern. Ex. 2007 ¶¶111–15.

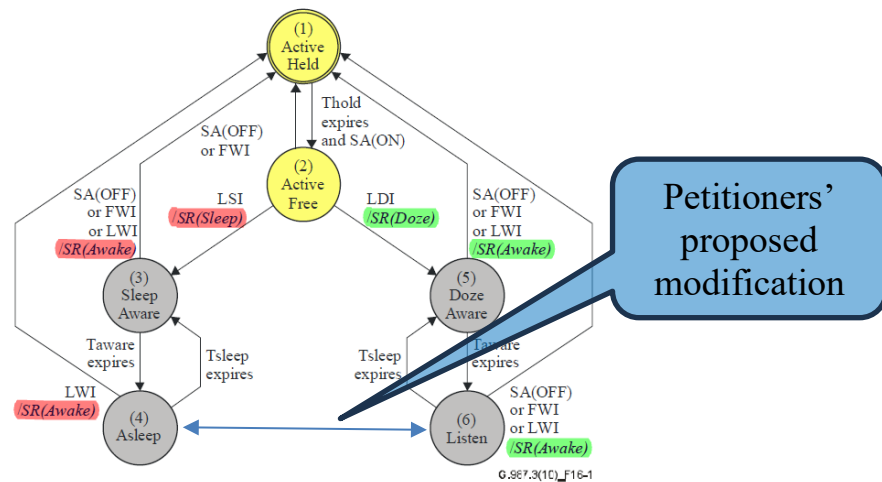
G.987.3's ONU design *already implements* transitions from Asleep (4) to SleepAware (3), where the ONU periodically *turns on and off a receiver* every time T_{sleep} expires. *See, e.g.*, Ex. 1007 Fig. 16–1, at 101. Indeed, the ONU periodically turns on its transmitter as well as the receiver. *Id.* at 100. Moreover, G.987.3 contemplates that there are designs where “the sleeping ONU can respond to a bandwidth grant *without delay*” “when leaving the Asleep state.” *Id.* Tbl. 16–1 (I_{transmit} row), at 98 (emphasis added).

G.987.3's ONU design also already shows that it has no problem activating and deactivating only half of the Tx/Rx pair, because the ONU only turns on the transmitter when transitioning from Listen (6) to DozeAware (5) states. And, again, G.987.3 provides for an initialization time for the dozing ONU where the ONU can respond to a bandwidth grant “without delay.” *Id.* (I_{txinit} row) at 99.

As such, increased speed in “periodically turn[ing] on and off a receiver” is no basis to modify G.987.3's design to implement direct transitions as G.987.3's current design showed there was *already no practical problem doing this*. Ex. 2007 ¶¶111–15.

e. Petitioners' Suggestion of Having an ONU Perform Direct Transitions between Asleep and Listen in G.987.3 in View of Röger Would Not Work, and to Get It to Work Would Require a Substantial Redesign of the Elements Shown in G.987.3 as Well as a Change in the Basic Principles under Which G.987.3's Drafters Designed the Specification to Operate

Petitioners argue that a POSITA would look at Röger and simply implement direct transitions between Asleep (4) and Listen (6) states in G.987.3 as shown.



Ex. 1007 Fig. 16–1 at 101 (annotated). But such a change is fundamentally incompatible with G.987.3's design.⁶

⁶ Indeed, beyond using ONUs and OLTs, Röger that is concerned with ultralow power optically powered devices is fundamentally addressing a different field than G.987.3 that concerns locally powered ONUs in large and dispersed residential and small business locations requiring high speed data services. Ex. 2007 ¶¶54–57; *see also In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992) (explaining that just because two references concern oil does not make them in the same field of endeavor when one concerns extreme conditions and the other does not).

G.987.3 is designed to operate where an ONU sends SR messages to an OLT, toggling from awake to/from doze, or awake to/from sleep, *but never from doze to sleep or the reverse*, as shown below. See also Ex. 2007 ¶¶115–16.

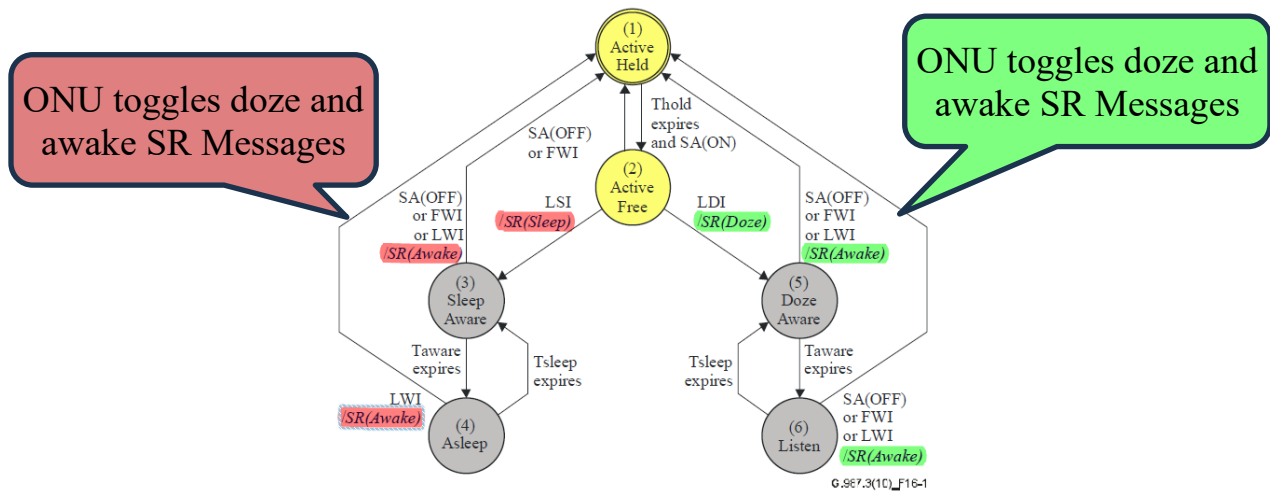


Figure 16-1 – ONU state transition diagram (initial state circled)

Ex. 1007 Fig. 16–1 at 101 (annotated). This operation and restriction are necessary because (1) a G.987.3 OLT behaves differently when the ONU is Asleep versus Listening, and (2) an OLT relies upon the ONU SR(Doze) and SR(Sleep) messages to know which of the mutually exclusive states the ONU is in, but an ONU cannot send a notification of direct transitions between Asleep (4) and Listen (6) states. Ex. 2007 ¶¶46–52.

Specifically, “[i]n the low power doze state, the OLT forwards downstream traffic” to the ONU because the OLT knows the ONU’s receiver is on and can receive such data. Ex. 1007 Tbl. 16–5 (LowPowerDoze/LowPowerSleep row) at 103. While “in the low power sleep state, the OLT may buffer downstream traffic,”

because if the OLT sent data when the ONU's receiver is off the data would be lost. *Id.*; *see also id.* (AlertedDoze/AlertedSleep row) ("The OLT forwards, discards or buffers downstream traffic for the ONU, just as it did during the immediately preceding LowPowerDoze or LowPowerSleep state."); *see also* Ex. 2007 ¶¶116–20.

And the ONU would have to turn on its transmitter to send the OLT a notification of a transition from/to the Asleep/Listen states, but, if this happened, the OLT would no longer make a *direct* transition, because both states require the transmitter to be off. *See* Ex. 2007 ¶107.

Therefore, allowing the ONU to make direct transitions between Asleep and Doze states would render G.987.3 inoperable for its intended design where the OLT relies upon the fact that a dozing ONU cannot slip into the Asleep state. *Id.*; *see also* Ex. 1007 Tbl. 16–7 n.2, at 105. Thus, G.987.3 "teaches away" from the proposed change. *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984) (explaining a proposed modification for obviousness cannot change a reference's fundamental operation); *In re Ratti*, 270 F.2d 810, 813 (CCPA 1959) (explaining a modification cannot change a reference's principle of operation); *see also* Ex. 2001 ¶40 (explaining that the *raison d'être* of a specification is to allow disparate parts to work together by following the specification's mandates); *see also* Ex. 2007 ¶¶121–28 (explaining that "Röger can transition directly between the Wake Up state and either the Snooze or Sleep states because Röger's design is not like G.987.3's that has a Doze mode that

can receive downstream data” and “[t]he two fundamental designs are incompatible”).

Indeed, Röger has no need for this ability to forward downstream data as explained in more detail below in § V.A.2.b, so may operate in a fundamentally different manner that allows for direct transitions from the Wakeup/Listen and Snooze/Sleep states, but Röger’s behavior cannot be simply be plopped in G.987.3 to allow direct transitions between Asleep and Doze. Ex. 2007 ¶¶118–128.

2. Petitioners Limitation 1D Arguments Do Not an Obvious Case Make

Patent Owner now turns to the Petition’s Section 8(a) arguments regarding Limitation 1D. *See* Pet. 19–23.

a. Petitioners Mischaracterize Patent Owner’s Infringement Position

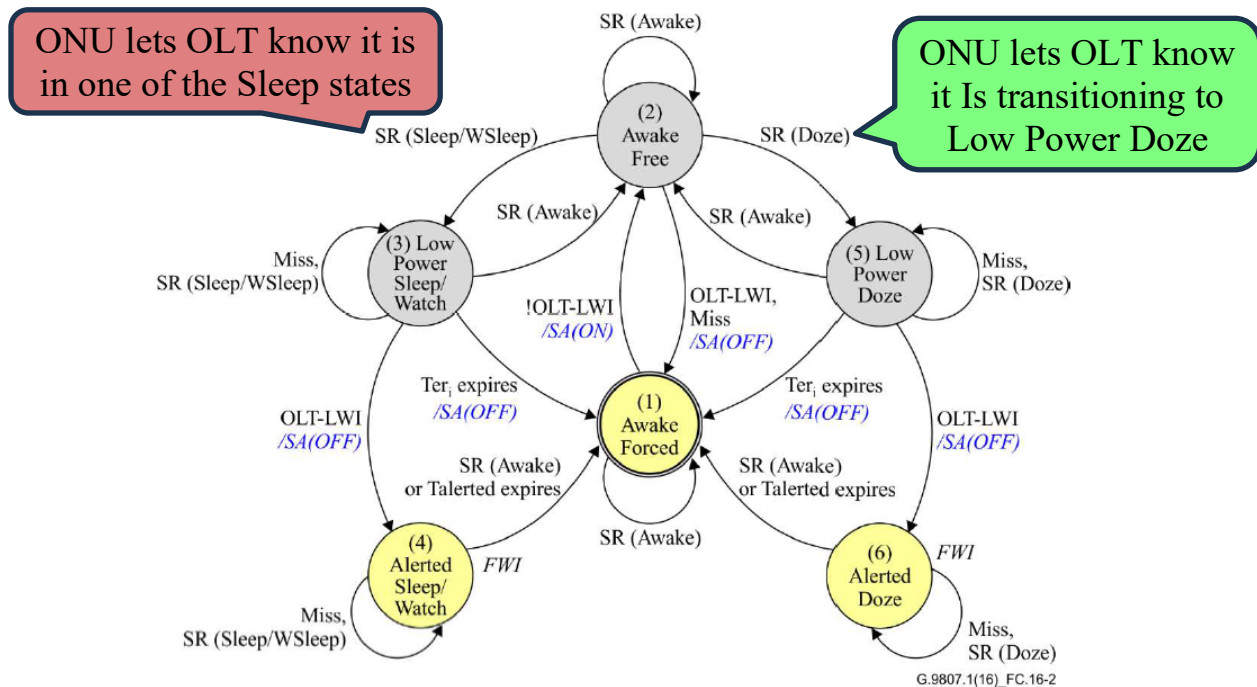
Petitioners state that “Patent Owner’s position in its related infringement contentions . . . contend that 1[D] is met by a ‘maximum sleep interval’ ($I_{\text{sleep}}/I_{\text{lowpower}}$) in a later version of G.988,” implying that Patent Owner has mapped the same items for infringement as present in the prior art. Pet. 19 (added subscripts). This characterization is simply incorrect. Patent Owner’s infringement contentions do not argue Limitation 1D is met simply due to a maximum sleep interval.

The contentions map transitions based on G.9807.1’s *Trxoff*, where the “ONU uses this timer in the *Watch state* of the Watchful sleep mode while checking the

downstream signal for the remote wake-up indications.” Ex. 1005 at 13 (citing Ex. 1010 Tbl. C.16.1 at 232) (emphasis added). In the same vein, Patent Owner explicitly maps “transitions from the ‘*Watch*’ state” to Limitation 1D’s transition from a “first power state,” *id.* (emphasis added), which is different than *the Listen state* *Petitioners map to the first power state.*

Indeed, G.987.3 does not have the T_{rxoff} parameter or Watch state because this is new functionality *not present in the older specification.* See Ex. 1010 at 31 (explaining that one of the new specification’s “major changes” is support for “watchful sleep modes”).

In fact, the new specification still supports a Listen Mode (sometimes referred to as LowPowerDoze) that is separate from the more recent Watch state. See, e.g., Ex. 1010 Tbl. C.16.1 (Power Management Parameters) at 231 (“Upon entry to a LowPower state (i.e., Asleep, *Listen or Watch* state) . . .”) (emphasis added); see also *id.* Tbl. 16.7, at 238 (showing OLT support for the ONU’s LowPowerDoze state (5) *and the separate* LowPowerWatch state (3)); Ex. 2007 ¶101. And G.9807.1 shows that an ONU enters the two modes differently.



Ex. 1010 Tbl. C.16.2, at 237 (annotated). As seen above, in G.9807.1, an OLT recognizes an ONU entering the LowPowerDoze (a.k.a. Listen) state (5) when the ONU sends an SR(Doze) message (shown on the right in green) similar to what was done under G.987.3. *Compare id.* Fig. C.16.2, at 237 with Ex. 1007 Fig. 16–1, at 101. In contrast, with G.9807.1, an ONU enters the separate LowPowerWatch state (3) by sending a new SR(WSleep) message (shown on the left in red) not available under G.987.3. Ex. 1010 Fig. C.16.2

Patent Owner does not point to a transition from/to the LowPowerDoze/Listen state states in G.9807.1 like Petitioner does, because Patent Owner *could not*. As described above, the newer specification still forbids the ONU from transitioning directly between a Doze state and any of the LowPowerSleep, LowPowerWatch, AlteredSleep, or AlteredWatch states or from transitioning directly from Sleep or

Watchful Sleep states to the LowPowerDoze or AlertedDoze states. *See* § V.A.1.b beginning on page 19 (explaining Ex. 1010 Tbl. 16.7 n.2, at 238).

In short, Plaintiff’s contentions that transitions in G.9807.1’s *new Watch state*—not present in G.987.3—meets 1D’s limitations is not the same as Petitioners’ contention that a POSITA would modify G.987.3 so that an ONU transitions *from/to the ‘Listen’ state (6)*—still separately present and supported in G.9807.1—to arrive at Limitation 1D.

b. Petitioners Argument for Limitation 1D Proper Does No More than Show the Existence of Elements in Röger

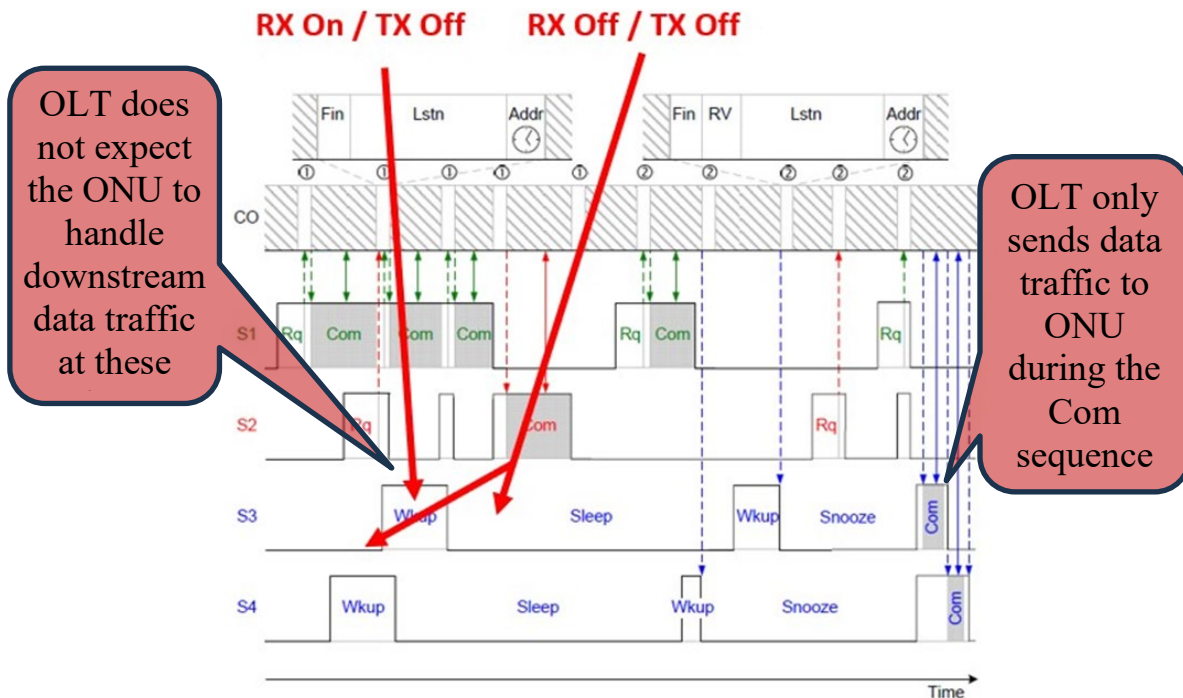
Even a cursory reading of Petitioners’ analysis for Röger vis-à-vis Limitation 1D (i.e., the argument outside the Petition’s Motivation to Combine section) shows that Petitioners merely point out where Röger’s ONUs directly transitions between a wakeup/receive state (that Petitioners map to a “first state”) and a snooze/sleep mode (that Petitioners map to a “second state”) and then leap to the conclusion that, therefore, “the combination of G.987.3 and Röger demonstrate that the direct transitions claimed [in] 1[D] are unpatentable.” Pet. 20–22. But the mere existence of Limitation 1D’s elements in Röger is not sufficient to render the claimed invention obvious. *Virtek Vision Int’l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 887 (Fed. Cir. 2024).

For obviousness, Petitioners must provide a clear reason for a person of ordinary skill in the art to combine Röger’s elements with G.987.3 *in the claimed*

manner, *Personal Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993–994 (Fed. Cir. 2017), which Petitioners say is allowing direct transitions in G.987.3 between the Asleep and Doze states. While Röger may have direct transitions, as already laid out, Petitioners’ motivations to modify G.987.3 to have an ONU alternate between the Listen and Asleep States are specious and fundamentally incompatible with G.987.3’s basic principles of operation . *See* § V.A.1 *supra*.

And although it is Petitioners burden to show how Röger’s teaching would lead a POSITA to make Petitioners’ proposed modifications by a preponderance of the evidence, 35 U.S.C. § 316(e); *see also In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1375 (Fed. Cir. 2016), Patent Owner nonetheless now explains why Röger would not lead a POSITA in this direction.

Petitioners point to direct transitions from Röger “Wakeup” to/from its “Snooze/Sleep” as being the first and second states, respectively, as shown below.



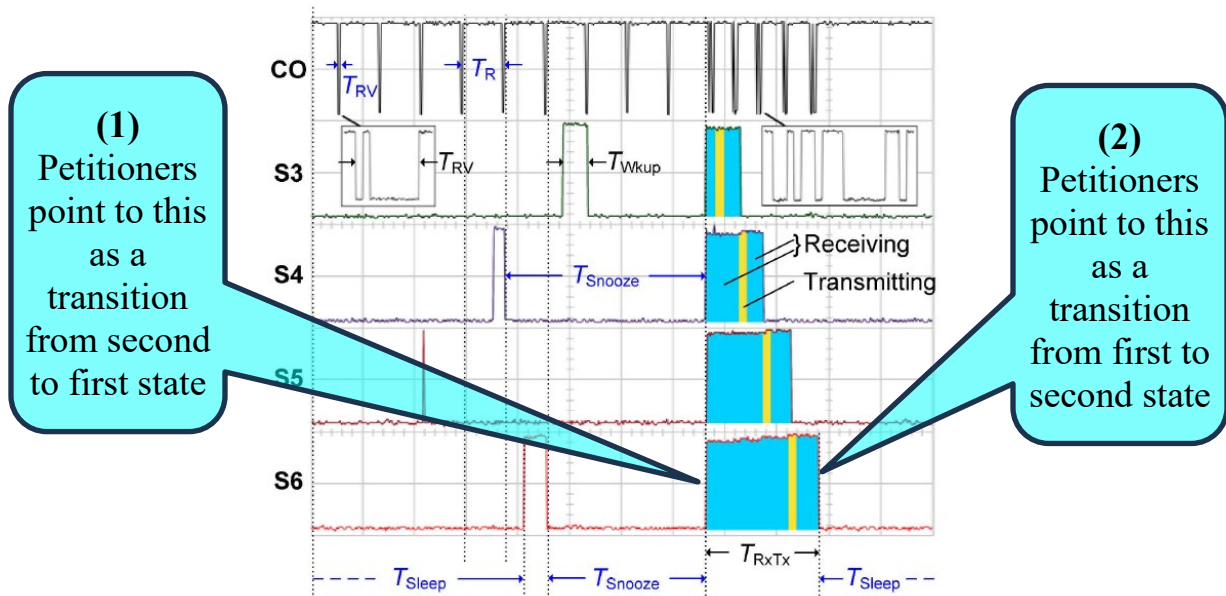
Pet. 21 (citing Ex. 1006 Fig. 2) (Red lines and accompanying text added by Petitioner; balloon annotation added by Patent Owner). However, the reason that Röger can make direct transitions from its “Wakeup” to its “Snooze/Sleep” modes is because Röger’s OLT *does not expect the ONU to receive data traffic at anytime in these states*. Ex. 2007 ¶¶117–19.

In the Snooze/Sleep modes, Röger’s ONU does not receive data because in these states the ONU’s receiver is off. *See* Ex. 1005 Tbl. 2. And an ONU in Röger’s Wakeup mode does not receive downstream traffic given Röger’s ONU uses its low quality clock in this state. *Id.* at 6 (noting that with an “inaccurate but ultra-low power clock . . . [t]hese devices cannot be scheduled accurately over a longer period”).

Rather, as Röger explains, its ONU operates in Wakeup mode only to receive a “precise rendezvous [RV] time” when the ONU will *then wait* to be “addressed and *exchange data* with CO [the Central Office].” *Id.* at 12 (emphasis added); *see also id.* at 6.

That is, despite Petitioners’ attempt at equating the two, *see* Pet. 16 & 21, G.987.3’s Listen State (6) is fundamentally different from Röger’s Wakeup mode, because G.987.3’s ONU’s Listen State (6) *is for receiving data traffic*, Ex. 1007 Tbl. 16–2 at 106 (describing how in the Listen State “[t]he ONU listens to the downstream signal and forwards downstream traffic”); *id.* Tbl. 16–5 at 103 (“In the low power doze state, the OLT forwards downstream traffic.”). As such, as explained above, G.987.3’s ONU cannot directly transition from the Listen state (receiving data) to Asleep state (with no ability to receive data) like Röger can transition from its Wakeup mode to Sleep/Snooze modes (where the OLT will not send data traffic). *See* § V.A.1.e *supra*.

Likewise, in a footnote, Petitioners contend Röger directly transitions between a first and second state during the “Com sequences,” without any explanation why a POSITA would look to Röger’s functionality described here and arrive at the invention as claimed. Pet. 22 n.4 (referencing Röger’s Figure 6 transitions in and out of the Com sequences). Patent Owner reproduces Röger’s Figure 6 below.



Ex. 1006 Fig. 6 (balloons added).

In truth, these transitions are in keeping with Röger’s functionality but not compatible with Petitioners’ proposed G.987.3 modification. Looking at the second transition (2) of Subscriber 6 (“S6”) in Fig. 6, for instance, shows that the OLT puts S6 to sleep by sending an End command, as Petitioners describe. Pet. 22 n.4 (citing Ex. 1006 12–13). However, G.987.3 is not designed for the OLT to command an ONU to go to sleep like Röger is.

Rather, the fundamental operation of G.987.3 is that an OLT only ever grants the ONU *permission* to go into a low power state via a Sleep_*Allow*(ON) message. Ex. 1007 Tbl. 16–3, at 100 (“The OLT grants permission to the ONU *to exercise any power management mode and leaves the selection of doze or cyclic sleep mode to the ONU’s discretion.*”). The ONU may (1) request to enter an Asleep state, *id.*;

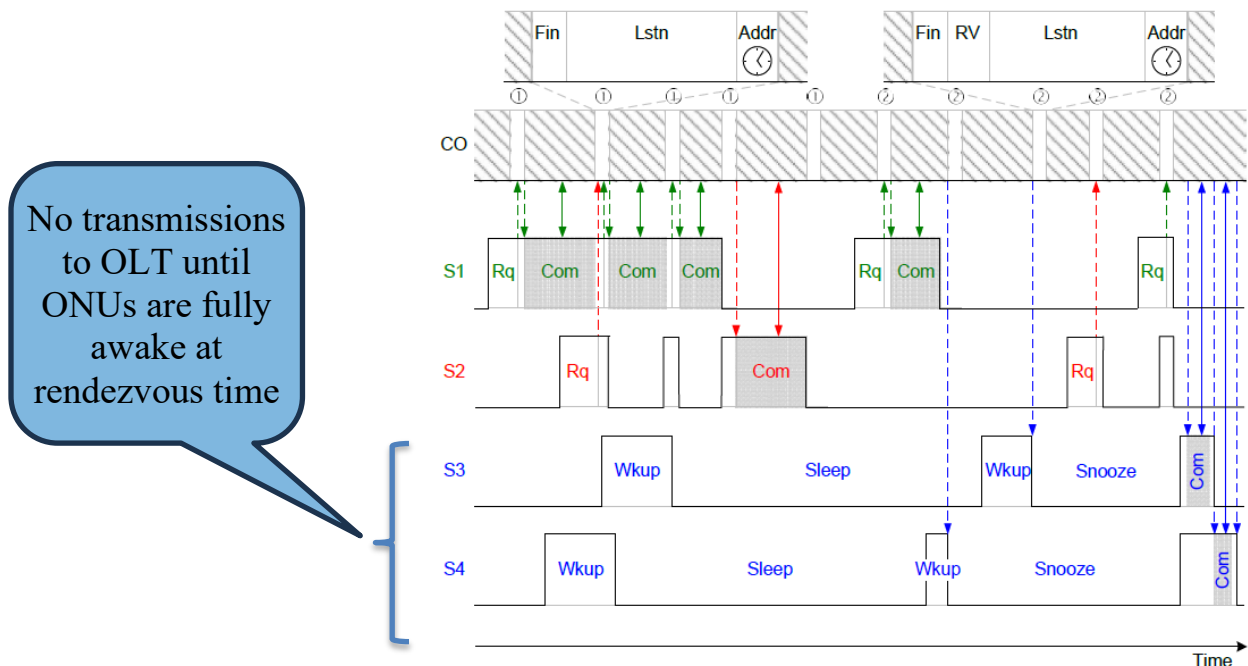
(2) request to enter a Doze State, *id.*; or (3) decide not to enter a low power state at all, *id.* at 57 (explaining, for example, that if an ONU “supports no form of sleep mode . . . the ONU silently discards this [Sleep Allow] message”). And, with G.987.3, it is up to ***the ONU to tell the OLT*** what the ONU would like to do with SR messages, ***and the OLT relies upon such ONU messages to change the OLT’s mode of operation.*** See § V.A.1.e *supra*. G.987.3’s design, unlike Röger, does not have the OLT “micromanage” the low power states. Ex. 2007 ¶¶120–28.

Therefore, Petitioners have not suggested that a POSITA would or could modify G.987.3 so that an OLT commands the ONU to sleep from a receive/listen state like Röger. And Petitioners have not explained how Röger’s fundamentally different operations where ***no*** data traffic is being sent would lead a POSITA to let a G.987.3 ONU transition from the Listen (6) state, where data traffic ***is*** being sent, to the Asleep (4) state, where Patent Owner showed this behavior is incompatible with G.987.3’s basic design. *Id.*

As for the first transition (1), Fig. 6 is illustrating that the S6 ONU transitions from Snooze to the Receive mode at the “precise rendezvous time” Röger’s ONU previously received in the Wakeup mode. Ex. 1006 at 12. But just like G.987.3 does not support Röger’s End command, G.987.3 also has no provision for precision timing that relies upon exact synchronization between the OLT and ONU. Rather,

in G.987.3, “lock-step state tracking is *not* an objective of the protocol.” Ex. 1007 at 99 (emphasis added).

As such, G.987.3’s “primary signalling mechanism used to coordinate the ONU and OLT state machines is based on the PLOAM messages,” *Id.* 98, but Röger’s sleeping/snoozing/waking up/receiving ONUs do not send such state messages. Instead, Röger’s OLT simply assumes an ONU in a Wakeup state will receive a polling(1) and RV(2) message and the ONU will “activate[] itself precisely at the scheduled rendezvous [RV] time,” as shown below. Ex. 1006 at 12; *see also id.* at 8 (“Snoozing subscribers (S3 and S4) maintain a precise quartz clock, *awake exactly at rendezvous time and wait for being addressed by the CO.*”) (emphasis added).



Ex. 1006 Fig. 2 at 7 (annotated).

Yet, again, Petitioners have not suggested that a POSITA would or could modify G.987.3 so the OLT and ONU would agree upon a “precise rendezvous time” like Röger, or explained how Röger’s fundamentally different rendezvous operation would lead a POSITA to let a G.987.3 ONU transition from the Listen (6) state (where the ONU is receiving data) to Asleep (4) state (where the ONU cannot receive data), against G.987.3’s fundamental design. *See* § V.A.1.e *supra*.

In the end, G.987.3 has an OLT that relies upon the ONU to be in a *mutually exclusive* Doze Listen state (*where the OLT sends data traffic*) or Sleep state (where the OLT will buffer or discard data traffic). And in G.987.3, the OLT and ONU coordinate *loosely* synchronized state machines via the ONU’s SR messages. *See, e.g.*, Ex. 1007, Tbl. 16–4, at 102. In contrast, Röger operates in a very different manner where the ONU (1) gets a rendezvous time in a Wakeup State operating with a low quality clock *where the OLT will not send data traffic*, (2) “*precisely*” coordinates a transition to a listen mode at the rendezvous time, and then (3) is ordered to sleep by the OLT (*that will again not send data traffic until the next rendezvous time*). Petitioner nowhere clearly explains how or why Röger’s disparate functionality could be incorporated into G.987.3 or would lead a POSITA to implement Petitioners’ suggested direct transitions from G.987.3’s Asleep (4) and Listen (6) states against G.987.3’s central design that relies upon the mandate not to make this transition. Ex. 1007 Tbl. 16–7 n.2, at 105.

B. Claims 2–5: G.987.3 in View of Röger Further in View of G.988 Fails to Render Claims Dependent from Claims 1 Obvious

Because Petitioner failed to show independent Claim 1 is obvious, as set forth in Section V.A, Petitioner has also failed to meet its burden to show a reasonable likelihood that claims that depend from Claim 1 are unpatentable. *In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) (“Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious.”).

C. Claim 4: G.987.3 in View of Röger Further in View of G.988 Independently Fails to Render Obvious Dependent Claim 4

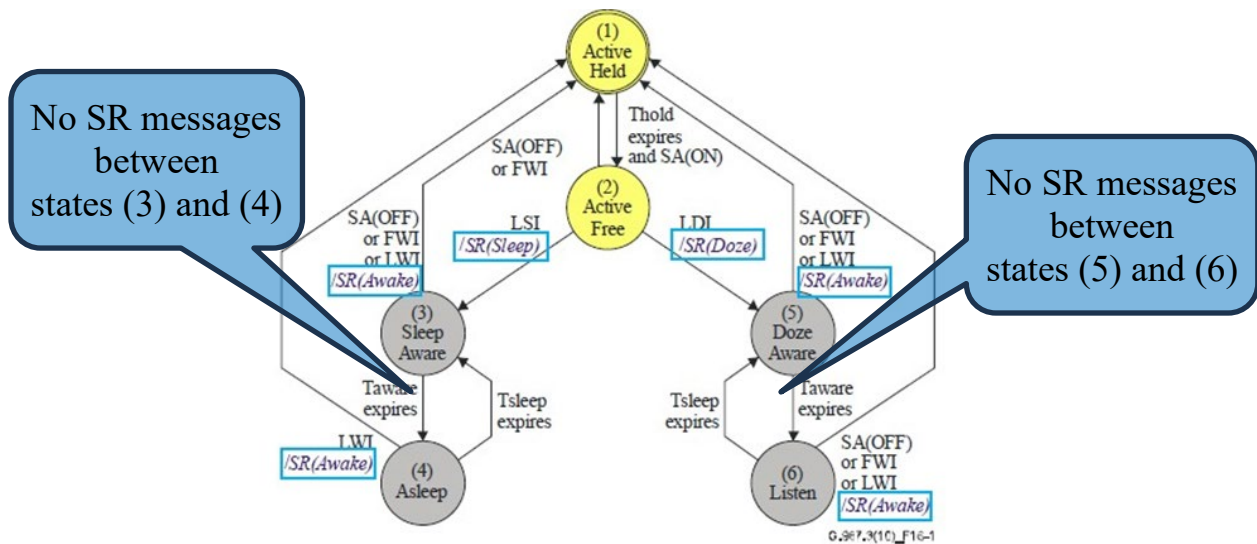
4. The method of claim 1, further comprising: transmitting, to an optical line terminal, a message indicative of the transitioning between the first state and the second state.

For Claim 4, Petitioners’ argument is that because G.987.3 teaches that the ONU sends a Sleep_Request (“SR”) message when going to a low power state (Sleep or Doze) from the full power state, and *vice versa*, if G.987.3 were modified as Petitioners suggest to allow direct transitions from/to the ASleep and Listen states *the ONU* would transmit a SR message during the latter transitions as well. Pet. 42–43. First, Petitioners undercut their own argument by admitting that in the first or second state, that Petitioners map to Listen and Asleep states, the ONU’s transmitter

would be turned off, so the ONU could not “transmit the message indicative of transitioning.”⁷ Pet. 42.

Second, ignoring that the ONU cannot transmit to the OLT with the OLT transmitter disabled, G.987.3 contradicts that an SR message would be sent, saying “[o]nly the state transitions *between the full power and low power state subsets generate an output PLOAM message.*” Ex. 1007 at 98 (emphasis added). That is, the OLT is only interested in transitions from/to the “mutually exclusive subsets: the full power states and the low power states.” *Id.* As Petitioners’ own annotated diagram shows, there are no SR messages when transitioning directly between Listen and Doze Aware or directly between Sleep Aware and Asleep, despite the fact that the ONU could send an SR message as the ONU’s transmitter is on in the Aware states, Ex. 1007 at 100, *because these are transitions wholly within the low power states.*

⁷ Petitioner’s query of “[w]hether Claim 4 . . . contradict[s] 1[D]” is an indefiniteness issue beyond the scope of this proceeding. 35 U.S.C. § 311(b).



Pet. 43 (showing Ex. 1007 Fig. 16–1 annotated by Petitioners with blue rectangles) (balloon annotations added by Patent Owner). Therefore, G.987.3 contradicts Petitioners’ assertion that the ONU would send an SR message on a transition wholly within the low power states.

For either or both reasons, Petitioners have failed to show Claim 4 is obvious.

D. Claim 14: G.987.3 in View of Röger Further in View of G.988 Fails to Render Obvious Limitation 14B

[14B] . . . 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 . . .

Patent Owner’s argument for Limitation 14B is contingent upon the Board adopting Patent Owner’s definition for “transition . . . from . . . to” as meaning a direct transition as set forth in the Claim Construction section. *See* § IV.B *supra*. If the Board adopts this construction, Claim 14 is not obvious for the same reasons set out for Limitation 1D. *See* § V.A *supra*.

E. Claim 15: G.987.3 in View of Röger Further in View of G.988 Fails to Render Claim 15 Dependent from Claims 14 Obvious

Because Petitioner failed to show independent Claim 14 would be obvious, as just set forth, Petitioner has also failed to meet its burden to show a reasonable likelihood that claims that depend from Claim 14 are unpatentable. *In re Fine*, 837 F.2d at 1076.

F. Claim 15: Petitioner Independently Fails to Show Dependent Claim 15 Is Obvious

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.

For Claim 15, Petitioners rely upon their previous arguments, Pet. 53; however, such reliance is misplaced because Claim 15 is not the equivalent of the previously addressed claims, including Claim 3 that has the most similar structure. While Limitation 1F recites a “power management message” that might be akin Claim 15’s “control message,” Claim 3 does *not* further limit the Limitation 1F’s “power management message,” unlike Claim 15 that further operates on Claim 14’s “*control message*.” Rather, Claim 3 puts further limitations on the separately recited “*power management rule*” of *Limitation 1D*.

Specifically, Claim 15 further requires, among other limitations, the previously recited control message transmitted by the OLT “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” (emphasis added). That is, **one** control message’s power management rule must specify **two separate** time periods, one for operation in the first low power state (where the ONU is able to receive but not transmit) and a second time period for operation in the second low power state (where the ONU is not able to either receive or transmit). *See Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1373 (Fed. Cir. 2005) (“The terms ‘first, second, and third’ are terms to distinguish different elements of the claim.”); *3M Innovative Props. Co. v. Avery Dennison Corp.*, 350 F.3d 1365, 1371 (Fed. Cir. 2003) (“[T]he use of the terms ‘first ... pattern’ and ‘second . . . pattern’ is equivalent to a reference to ‘pattern A’ and ‘pattern B.’”).

Note that while use of the definite article in the phrase “**the** control message” presumably does not restrict the scope of the claims to only one control message—i.e., that “the” in comprising claims generally means “one or more”—does not negate that **a single** control message’s power management rule must specify what is required by the following claim language: the **two** specified time periods. *See In re Varma*, 816 F.3d 1352, 1362–63 (Fed. Cir. 2016) (“For a dog owner to have ‘a dog

that rolls over and fetches sticks,’ it does not suffice that he have two dogs, each able to perform just one of the tasks.”). And Petitioners previous arguments for Claims 1 and 3 do not address Claim 15’s requirements.

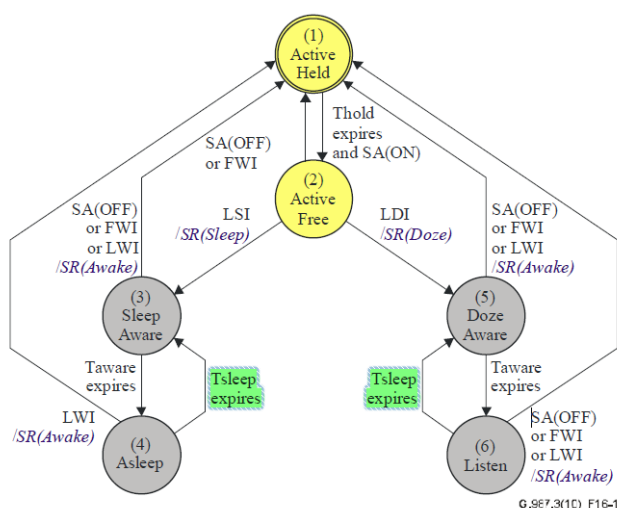
Indeed, Petitioners say that because “[a]s discussed further above with respect to 1[F]-1[G], the ‘power management *rule*’ for the ONU is switching back and forth between low power and *aware* states” and “[s]ince I_{sleep} and I_{aware} control how much time the ONU spends *in these states*, the OMCI message defines the ‘power management rule.’”⁸ Pet. 53–54 (citations omitted; emphasis added; subscript added). First, Limitation 15 concerns a *message*, rather than the referenced *rule*. Second, pointing to the time spent *in the “aware state”* further does not meet the claim language, because in the aware state “[b]oth ONU receiver and transmitter remain on,” Ex. 1007 at 100, so does not specify the “time period for operation in” either of the first (Rx on, Tx off) or second (Rx and Tx off) previously recited states.⁹

⁸ G.988’s I_{sleep} is similar to G.987.3’s I_{sleep} . Compare Ex. 1007, Tbl. 16–1, at at 98 (first row) (“ I_{sleep} is the maximum time the ONU spends in its Asleep or Listen states, as a count of 125 microsecond frames.”) with Ex. 1008, at 82 (“The I_{sleep} attribute specifies the maximum time the ONU spends in its asleep or listen states, as a count of 125-microsecond frames.”) (subscripts added).

⁹ Secondly, that “[t]he OMCI messages (‘control message[s]’)”—plural—may define the sleep and aware states, see Pet. 53, also does not meet the limitations because this is not *one* control message specifying the two claimed periods.

Therefore, even if everything Petitioners says is correct, Petitioners' theory regarding a *rule* and time in an *aware state with the transmitter on* do not meet Claim 15's limitations regarding a *message* and time in a first state *with the transmitter off*.

Petitioners proffer an alternative theory whereby "the maximum time the ONU spends in the *Asleep* and *Listen* [rather than Sleep and *Aware*] states teaches the 'second time period' and the 'first time period' respectively." Pet. 54 (citations omitted). However, I_{sleep} is "a count of 125-microsecond frames" and the singular value specifies "the maximum time the ONU spends in its Asleep **or** Listen states." Ex. 1007, at 98 (emphasis added); Ex. 1008, at 82 (same). T_{sleep} is set based on I_{sleep} , Ex. 1007 Tbl. 16-1, at 106, and this single time period is applied to both Asleep and Listen states as shown highlighted in green in the ONU state transition diagram below.



Ex. 1007 Tbl. 16–1 at 101 (green highlighting added). So, Petitioners alternate

theory regarding *a single time* also does not meet the claim limitations requiring one control message including a power management rule specifying a first *and second time* period. *See Gillette*, 405 F.3d at 1373; *3M*, 350 F.3d at 1371.

Finally, Petitioner tries to bridge the gap between the references’ teachings and the required claim limitations, saying “[a] POSITA would have known that timing parameters configured by the control messages would *have also been applicable* to all transitions to include direct transitions from the ‘first low power state’ to the ‘second low power state’ in G.987 modified by Röger.” Pet. 54. First, even assuming what Petitioners say here is correct, that timing parameters “are applicable” is no argument that G.987.3 would specify two separate periods for G.987.3’s Listen and Asleep states, much less that it would have been obvious for a single control message to include a power management rule with two periods, whether making direct transitions or not. Second, Petitioners again merely reference control messages—plural—and do not address the one-to-two relationship of limitation in Claim 15.

In light of the above, Petitioners have independently failed to show the proffered references teach or suggest dependent Claim 15’s limitations.

G. Claim 10: G.987.3 in View of Röger Further in View of G.988 Further in View of Ghazisaidi Fails to Render Obvious Limitation 10D

[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;

For Limitation 10D, Petitioners only recite Ghazisaidi for its “processor,” and wholly rely upon their previous argument for Limitation 1D. Pet. 58. However, Petitioners are incorrect regarding Limitation 1D as Patent Owner previously set out, *see* § V.A *supra*, so have likewise failed to show Limitation 10D is obvious for the same reasons

H. Claim 11: G.987.3 in View of Röger Further in View of G.988 Further in View of Ghazisaidi Fails to Render Claim 11 Dependent from Claims 10 Obvious

Because Petitioners have failed to show independent Claim 10 would obvious, as just set forth, Petitioners have also failed to meet their burden to show a reasonable likelihood that claims that depend from Claim 10 are unpatentable. *In re Fine*, 837 F.2d at 1076.

I. Claim 12: G.987.3 in View of Röger Further in View of G.988 Further in View of Ghazisaidi Fails to Render Obvious Limitation 12D

[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.

Limitation 12D requires the OLT generated messages comprise a periodic “consent message” to allow the ONU *to remain* in either the first low power state (Rx only on) or the second low power state (neither Rx or Tx on).

For this limitation Petitioners only cite to G.987.3’s functionality. Pet. 62–63. *See also* Ex. 2007 ¶¶129–30. As to this analysis, Patent Owner agrees with Petitioners that G.987.3’s OLT sending the PLOAM message Sleep_Allow(**ON**) is a “consent message,” Pet. 62 (citing Ex. 1007 at 100), because the Sleep_Allow(ON) input “*grants permission* to the ONU to exercise any power management mode,” including “doze or cyclic sleep mode,” Ex. 1007 at 100 (emphasis added); *see also* Ex. 2007 ¶¶63–65 (explaining the plain and ordinary meaning of “consent”). Patent Owner also agrees with Petitioners that Sleep_Allow(ON) is like the “consent message” in the ’892 Patent’s embodiment, “LPM-Allow,” Pet. 62, because with the embodiment in the ’892 Patent the “OLT grants *consent* to ONU’s transition into a low power mode,” Ex. 1001 Tbl. 1, at 7 (emphasis added).

However, Patent Owner disagrees that G.987.3 teaches the OLT sends Sleep_Allow(ON) messages *periodically to allow the ONU to remain* in one of the

two lower power states. The difference can be seen by comparing the Patent-at-Issue teachings with G.897.3 functionality.

The '892 Patent teaches that in the LowPower state the “OLT is aware that the ONU is in a low power mode”—e.g., doze or sleep—and “[u]pon transition to and *periodically during* the sojourn in this state, the OLT sends an *LPM-Allow* message to the ONU.” Ex. 1001, Tbl. 6, at cols. 10–11 (emphasis added). That is, once the OLT knows that the ONU is in a lower power state from the ONU’s SR(Sleep/Doze) messages the OLT *continues to periodically send LPM-Allow* messages, “periodic consent messages,” while the ONU to is in a low power state so that the ONU may “remain” in the low power state. *Id.*

Further, a “consent message” is not an industry standard term, and the '892 Patent’s use is consistent with the colloquial understanding of “consent” as meaning “allowance”/“permission.” Ex. 2007 ¶65 (citing Ex. 2010). This further reinforces that the '892 Patent is using “consent” in the plain and ordinary way.

G.987.3, in contrast, only teaches that in the “Awake forced” state the OLT may “send[] a Sleep_Allow (ON) PLOAM message, thus granting the ONU a permission *to enter* a low power state at its own discretion” (i.e., to go to the Awake free” state). Ex. 1007 at 95 (emphasis added). Petitioners agree, saying Sleep_Allow(ON) “gives permission to the ONU to *transition into* a low power mode.” Pet. at 62 (emphasis added). But G.987.3 does not teach the OLT sending

any other SA(ON) messages, either in the OLT power management states table, *id.* Fig. 16–5 (last two rows), or in the OLT state machine, *id.* Fig 16–2.

Instead, Petitioners argue that G.987.3’s teaching that “Sleep_Alow PLOAM messages” may be sent “at any time,” includes being sent “periodically” to the ONU in the low power states because it is “beneficial [to] regularly keep[] the ONU informed of its permissions.” Pet. 62–63 (citing Ex. 1007 at 106 and Ex. 1003 ¶163). However, considering the entire context of the reference, the section that Petitioners cite teaches that the OLT may send the Sleep_Alow(OFF) PLOAM message “at any time.” Ex. 1007 § 16.4. As shown in Figure 16–2 below, the OLT only sends the SA(ON) command (shown in blue) from the transition from Awake forced (1) to Awake free (2).

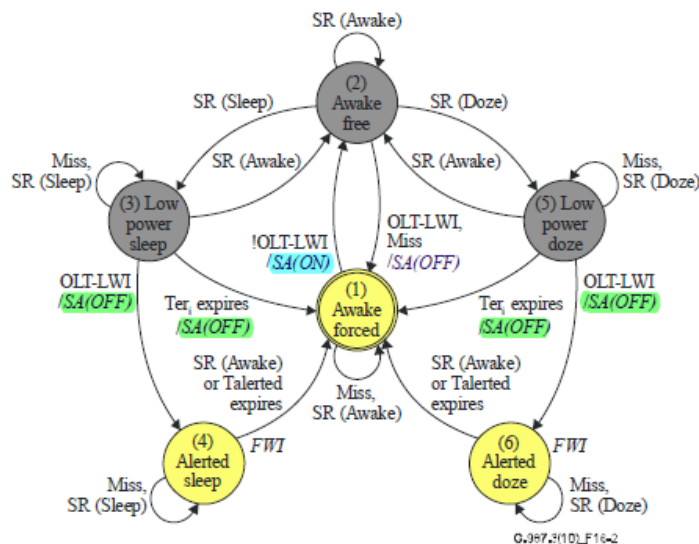


Figure 16-2 – OLT state transition diagram (initial state circled)

Id. Fig. 16–2 (green and blue highlighting added). Once the ONU is in a low

power state (Low Power sleep (3) or Low power doze (5)), the OLT only sends SA(**OFF**) commands (highlighted in green) to the ONU. And the G.987.3's SA(**OFF**) message is analogous to the '897 Patent's "LPM-*Disallow*" message where the OLT *withdraws* consent for the ONU to be in a low power mode, Ex. 1001 Fig. 5 (emphasis added) (transition from 5 to 1), not *remain in* a low power mode. Ex. 2007 *see also* Ex. 2007 ¶¶129–35.

Indeed, even if an ONU in G.987.3 was allowed to make direct transitions between Listen and Asleep modes against Note 2 of Table 16–7—it would not—G.987.3 still only shows sending SA(**OFF**) messages in low power modes. So, there is no basis to think the OLT would send an SA(**ON**) message in either mode.

In sum, G.987.3 only teaches that the OLT may send messages telling the ONU to *exit the low power mode*, SA(OFF), at any time “during low power mode,” *id.* at 98, not “periodic consent message[s] to allow the optical network unit *to remain* in either the first low power state or the second low power state,” as claimed.

Therefore, Petitioners have failed to show the proffered reference teaches or suggests limitation 12D.

J. Claim 13: G.987.3 in View of Röger Further in View of G.988 Further in View of Ghazisaidi Fails to Render Claim 13 Dependent from Claim 12 Obvious

Because Petitioners failed to show independent Claim 12 would be obvious as just set forth, Petitioners have also failed to meet their burden to show a reasonable

likelihood that dependent Claim 13, which depends from Claim 12, is unpatentable.

In re Fine, 837 F.2d at 1076.

VI. CONCLUSION

Petitioners preliminarily convinced the Board of things that are not true, like G.987.3's prohibition on transitions from Asleep to the Listen state are only applicable to the OLT. However, Patent Owner has now meticulously debunked this assertion. Petitioners' other incorrect contentions include: (1) G.987.3's ONU intermittent responses in low power states means the ONU must have made direct transitions from the Listen to Asleep state or *vice versa*; (2) G.9801.7's new watchful sleep state changes G.987.3's clear teaching that the prohibition is on the ONU; (3) that "Chip Speed" was the limiting factor that caused G.987.3 to teach away from Petitioners' proposed modification; (4) that Patent Owner pointed to the same elements for infringement that Petitioner points to for unpatentability of limitations like Limitation 1D; and (5) that Röger's functionality and operation that allow direct transitions between a wakeup/receive state and a snooze/sleep mode would somehow allow direct transitions between G.987.3 Asleep and Listen states. Indeed, Patent Owner has laid out why Petitioners' proposal would *not* work without an entire redesign of G.987.3's fundamental operation.

Patent Owner has now also laid out in more detail why G.987.3 does not teach periodically sending consent messages to the ONU to remain in a low power state

for Claim 12. And Patent Owner has further explained why the ONU would not and/or could not send a message to the OLT to let the OLT know the ONU is directly transitioning between Listen and Asleep States for Claim 4. Finally, Patent Owner described why Petitioners have shown no teaching or suggestion that there would be one message with a power management rule for two time periods as required by Claim 15.

Patent Owner therefore requests that the Board issue a final written decision finding Petitioner has failed to show any claim obvious by a preponderance of the evidence.

Dated: March 6, 2025

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

Per § 42.24(a)–(b) the undersigned certifies that the number of words in the paper, PATENT OWNER’S RESPONSE, is:

10,978

The word count does not include the table of contents, table of authorities, certificate of service, word count, exhibits list, or claim listing. To arrive at this count, the undersigned has relied upon the word count feature of the word-processing system used to prepare the paper.

Dated: March 6, 2025

/Blaine A. Larson/
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CERTIFICATE OF SERVICE

The undersigned certifies that on the sixth day of March, 2025, a complete and entire copy of the foregoing “PATENT OWNER’S RESPONSE,” including exhibits, if any, was served on the following counsel of record via email per Petitioner’ consent to electronic service. *See* Paper 1 at 3.

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