

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NOKIA OF AMERICA CORPORATION *et al.*,
Petitioners,

v.

IARNACH TECHNOLOGIES LIMITED,
Patent Owner.

Case IPR2024-00899
Patent 9,806,892

**PATENT OWNER'S PRELIMINARY RESPONSE UNDER 37
C.F.R. § 42.107 TO PETITION FOR *INTER PARTES* REVIEW**

Mail Stop "PATENT BOARD"
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

EXHIBIT LIST

Exhibit	Description
EX2001	Declaration of Bruce Schofield in Support of Patent Owner's Preliminary Response
EX2002	Defendant's Invalidity Contentions, <i>Iarnach Technologies Ltd. v. AT&T Services Inc. et al.</i> , Case No. 2:23-cv-00231 (E.D. Tex.) (served Dec. 7, 2023)
EX2003	Defendant's Invalidity Contentions, <i>Iarnach Technologies Ltd. v. Verizon Business Network Services LLC et al.</i> , Case No. 2:23-cv-00631 (E.D. Tex.) (served May 6, 2024)
EX2004	Executed Summons for AT&T Services Inc., <i>Iarnach Technologies Ltd. v. AT&T Services Inc. et al.</i> , Case No. 2:23-cv-00231, Dkt. No. 11 (E.D. Tex.)
EX2005	Federal Court Management Statistics–Profiles, available at https://www.uscourts.gov/sites/default/files/data_tables/fcms_na_distprofile0630.2024.pdf

TABLE OF CONTENTS

I.	Introduction.....	1
II.	Background.....	2
	A. PON Systems.....	2
	B. Power Management in Conventional Standard-Based PON Systems.....	4
	C. The '892 Patent	6
III.	The Asserted References	7
	A. G.987.3 [Ex1007]	7
	B. Röger [Ex1006]	9
	C. G.988 [Ex1008]	10
	D. Ghazisaidi [Ex1009].....	10
IV.	Legal Standards	10
V.	Level of Ordinary Skill in the Art	11
VI.	Claim Construction.....	11
	A. “Transition” in Claims 12 and 14 Must Be Direct.....	12
	B. Other Constructions.....	14
VII.	Argument	14
	A. Ground 1: G.987.3 in View of Röger Further in View of G.988 Fails to Render Any Claim Obvious.	16
	1. G.987.3 in View of Röger Further in View of G.988 Fails to Disclose Limitation 1[D]/14[B] Requiring Direct Transitions.....	16
	B. Ground 2: G.987.3 in View of Röger Further in View of G.988 Further in View of Ghazisaidi Fails to Render Any Claim Obvious.....	28
	1. G.987.3 in View of Röger Further in View of G.988 Further in View of Ghazisaidi Fails to Disclose Limitation 10[D]/12[B] Requiring Direct Transitions.	28
	2. G.987.3 in View of Röger Further in View of G.988 Further in View of Ghazisaidi Fails to Disclose	

Limitation 12[D] Requiring a Message to Allow the ONU to Remain in a State.	29
C. The Board should exercise its discretion to deny the Petition under <i>Fintiv</i>	32
1. Factor 1: whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted.....	35
2. Factor 2: proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision	35
3. Factor 3: investment in the parallel proceeding by the court and the parties	37
4. Factor 4: overlap between issues raised in the petition and in the parallel proceeding	37
5. Factor 5: whether the petitioner and the defendant in the parallel proceeding are the same party.....	38
6. Factor 6: other circumstances that impact the Board’s exercise of discretion, including the merits.	38
VIII. Conclusion	39

TABLE OF AUTHORITIES

Cases

<i>Apple Inc. v. Fintiv, Inc.</i> , IPR2020-00019, Paper 11 (P.T.A.B. Mar. 20, 2020)	33, 38
<i>Apple Inc. v. Fintiv, Inc.</i> , IPR2020-00019, Paper 15 (P.T.A.B. May 13, 2020)	33
<i>Cuozzo Speed Techs., LLC v. Lee</i> , 136 S. Ct. 2131 (2016)	33
<i>Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.</i> , 800 F.3d 1375 (Fed. Cir. 2015)	10
<i>Gen. Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha</i> , IPR2016-01357, Paper 19 (P.T.A.B. Sept. 6, 2017)	33, 39
<i>Google LLC v. Agis Software Dev., LLC</i> , IPR2020-00873-16 (PTAB Nov. 25, 2020)	38
<i>GPNE Corp. v. Apple Inc.</i> , 830 F.3d 1365 (Fed. Cir. 2016)	13
<i>Harmonic Inc. v. Avid Tech., Inc.</i> , 815 F.3d 1356 (Fed. Cir. 2016)	10
<i>In re Fine</i> , 837 F.2d 1071 (Fed. Cir. 1988)	27, 28, 32
<i>In re Magnum Oil Tools Int’l, Ltd.</i> , 829 F.3d 1364 (Fed. Cir. 2016)	10, 11
<i>NHK Spring Co. Ltd. v. Intri-Plex Techs. Inc.</i> , IPR2018-00752, Paper 8 (P.T.A.B. Sept. 12, 2018)	33, 39
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005)	11
<i>Sand Revolution II, LLC v. Continental Intermodal Group-Trucking LLC</i> , IPR2019-01393, Paper 24 (P.T.A.B. June 16, 2020)	35

Statutes

35 U.S.C. § 315(b)	32
35 U.S.C. § 316(a)(11)	36

Rules

35 U.S.C. § 314(a)	33
--------------------------	----

Regulations

37 C.F.R. § 42.100 (b)	11
------------------------------	----

I. Introduction

Patent Owner Iarnach Technologies Limited (“Iarnach” or “Patent Owner”) respectfully requests that the Board refuse to institute *inter partes* review of U.S. Patent No. 9,806,892 (the “’892 Patent”).

As an initial matter, Petitioners Nokia of America Corporation (“Nokia”) and AT&T Services, Inc. (“AT&T”) (collectively “Petitioners”) have not even challenged or requested cancellation of any claims of the ’892 Patent. Although Petitioners “request cancellation of the Challenged Claims,” Petitioners define “the Challenged Claims” as “Claims 1-11 . . . of U.S. Patent No. 8,934,359.” Pet. at 1, 70. Accordingly, for this reason alone, *inter partes* review should not be instituted.

To the extent the Board evaluates the ’892 Patent, it should not institute *inter partes* review because Petitioners have failed to show a reasonable likelihood of prevailing with respect to Claims 1–5 and 10–15.

Ground 1 fails because Petitioners have not shown that the prior art discloses direct transitions between low power states. G.987.3 alone fails to render direct transitions obvious because it explicitly disallows such transitions, and a POSA would have ensured compliance with the standard as described in G.987.3. The combination of G.987.3 and Röger also fails to render direct transitions obvious because Röger does not discuss transitions at a state machine level like the ’892 Patent, and a POSA would not understand Röger’s diagrams as disclosing direct

transitions. Even if Röger discloses direct transitions (and it does not), a POSA would not have combined G.987.3 or G.988 with Röger because G.987.3 expressly prohibits the proposed combination.

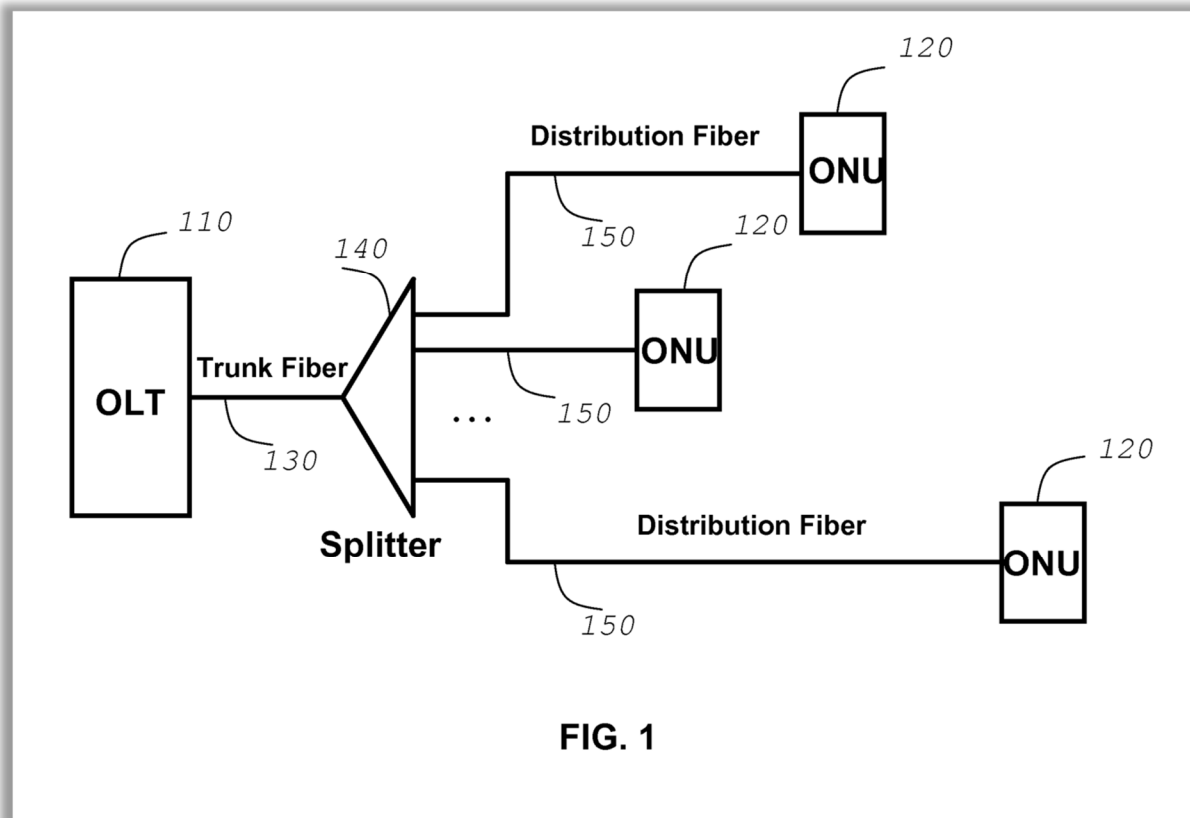
Ground 2 fails for the same reasons as Ground 1. Moreover, Petitioners' alleged "consent message" gives permission to enter a low power mode, not "remain" in a low power state as required by claim 12.

For at least these reasons, the Petition should be denied.

II. Background

A. PON Systems

The '892 Patent relates to improvements in passive optical network ("PON") systems. Ex1001 at 1:21–23; Ex2001 at ¶ 30. A passive optical network generally includes an "optical line terminal" ("OLT") connected to one or more "optical network unit(s)" ("ONU"). *See* Ex1001 at 1:21–34; Ex2001 at ¶ 31. An exemplary configuration is shown below:



Ex1001 at Fig. 1.

An OLT is a central node or headend and “can be located at the access provider's communication facility (e.g., central office).” *Id.* at 1:34–35; Ex2001 at ¶ 31. An ONU “can be located at or near the access user’s premises,” and it “typically draws electrical power from the user’s premises power supply network and may employ battery backup to support communication services in case of power outage.” Ex1001 at 1:35–39.

The ’892 Patent is directed to an improved power management technique that reduces the power consumption of an ONU. *See id.* at 1:40–47; Ex2001 at ¶ 32. Reduced power consumption “can allow an access provider to guarantee lifeline

services to customers by increasing the duration of operational time during power outages.” Ex1001 at 1:48–51. It can also “reduce the size and cost of the battery backup unit” and “reduce overall green-house gas emission and carbon footprint of” technologies based on passive optical networks. *Id.* at 1:51–55.

B. Power Management in Conventional Standard-Based PON Systems

At the time of the invention, standard-based PON systems employed “protocol-based power-saving techniques based on a signalling mechanism between the OLT and the ONU to function properly.” *Id.* at 4:8–12. These techniques involved “defining several power levels and specifying the cyclic behavior of an ONU which periodically switches between the full power level and one lower power level.” *Id.* at 4:12–15; Ex2001 at ¶ 32. For example, the XG-PON standard identified the “ONU Dozing power level, which is characterized by powering off of the ONU transmitter and the associated circuitry for substantial periods of time on the condition that the receiver remains continuously on, and the ONU Sleeping power level, which is characterized by both ONU transmitter and ONU receiver [being] turned off for substantial periods of time.” Ex1001 at 4:16–23; Ex2001 at ¶ 32. The Dozing mode can also be referred to as a “listen” mode while the Sleeping mode can also be called a “cyclic sleep” mode. Ex1001 at 4:46–52, 3:21–24; Ex2001 at ¶ 32; Ex1009 at [0008].

Figure 7A shows the state machine behavior of an ONU as specified in the XG-PON standard:

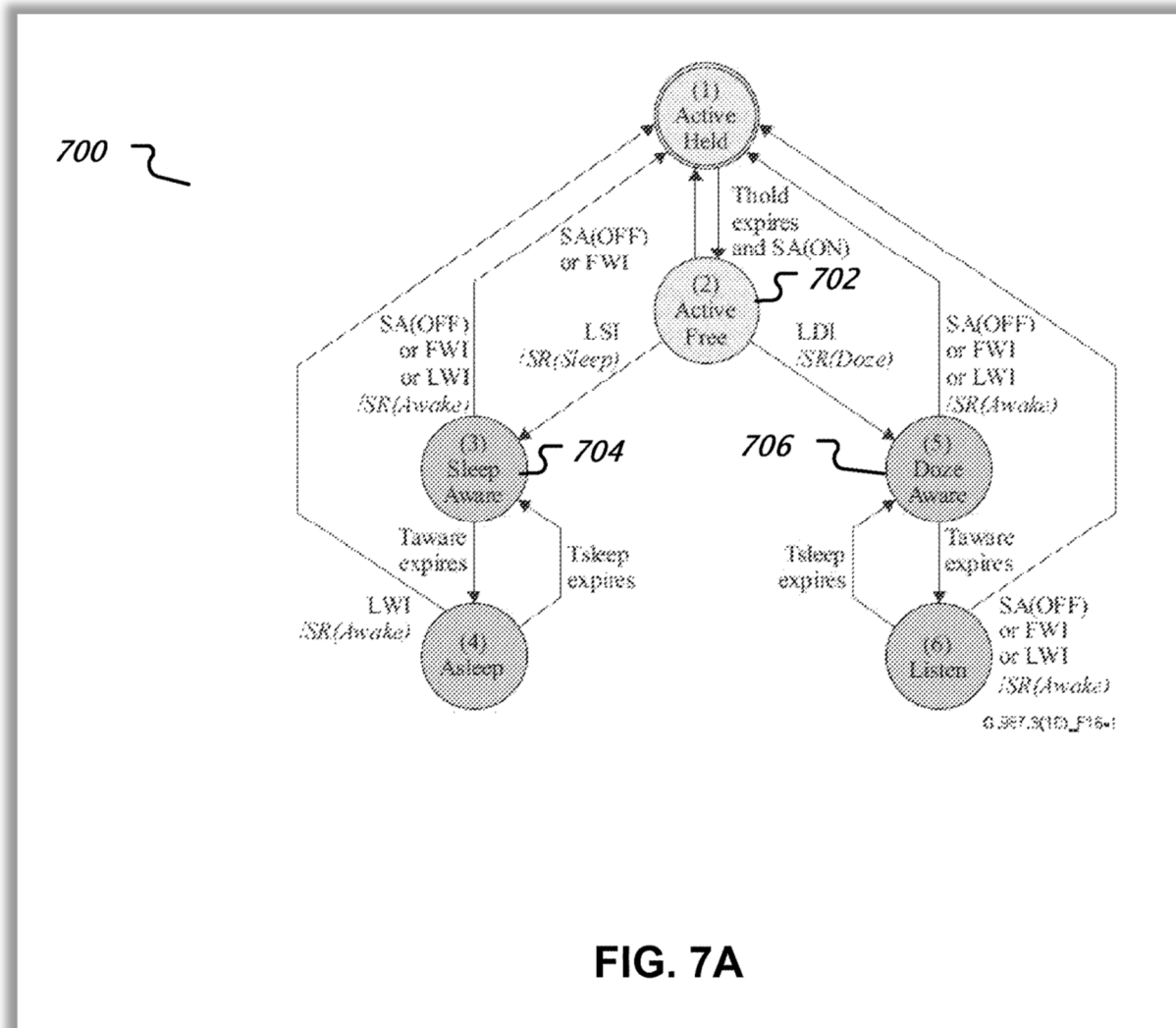


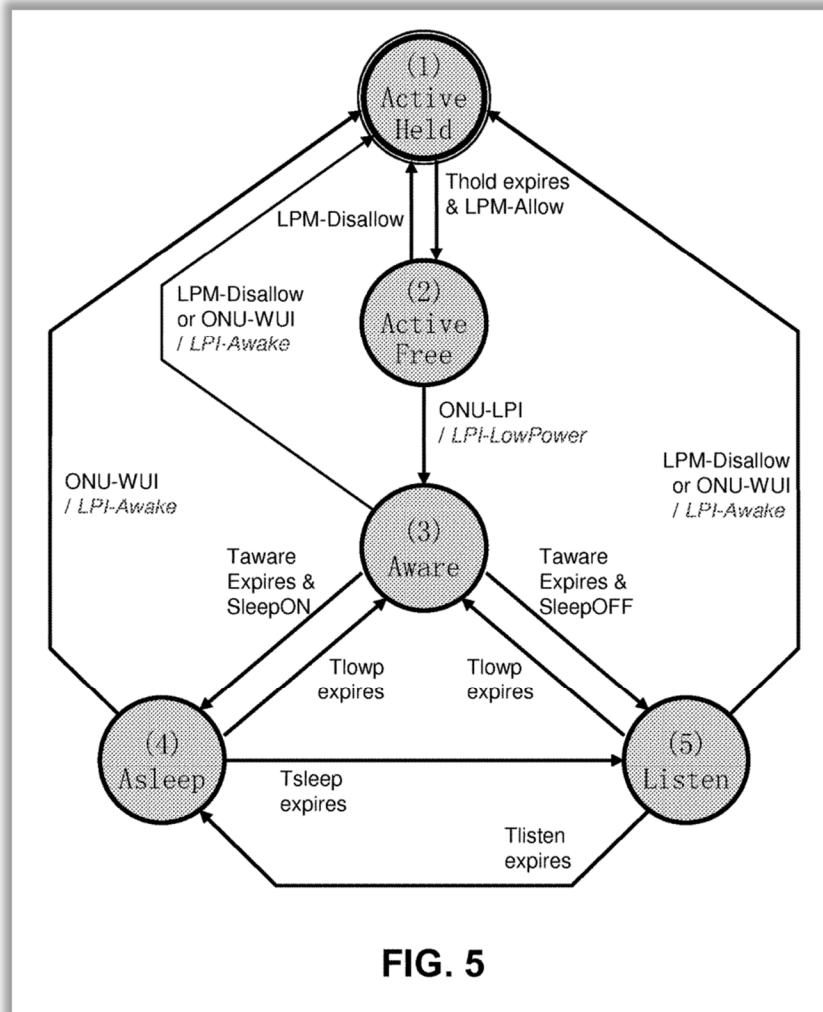
FIG. 7A

Ex1001 at Fig. 7A; Ex2001 at ¶ 32. As shown in the diagram above, the ONU can transition from the initial state Active Free (702) into either a Sleep Aware state (704) or a Doze Aware state (706). Ex1001 at 4:29–32. However, the state machine does not allow direct transitions between the Doze Aware and the Sleep Aware states. *Id.* at 4:32–34; Ex2001 at ¶ 32. Direct transitions between the Listen and

Asleep states are also prohibited. Ex2001 at ¶ 32. As explained by the '892 Patent, conventional ONUs lacked “the technology of directly transitioning between two low power consumption states without having to go through an active state (e.g., a full powered state).” Ex1001 at 4:34–37. Transitioning through an intermediate active state “may increase the power consumed by the ONU, thereby undesirably reducing batter[y] life.” *Id.* at 4:37–40.

C. The '892 Patent

The improved technique of the '892 Patent removes this additional power consumption by allowing direct transitions between low power states. Ex2001 at ¶ 33. Figure 5 illustrates a state machine that governs ONU behavior in an embodiment of the improved technique:



Ex1001 at Fig. 5; Ex2001 at ¶ 33. As shown in the diagram above, direct transitions between the Listen and Asleep states are now possible. Ex2001 at ¶ 33.

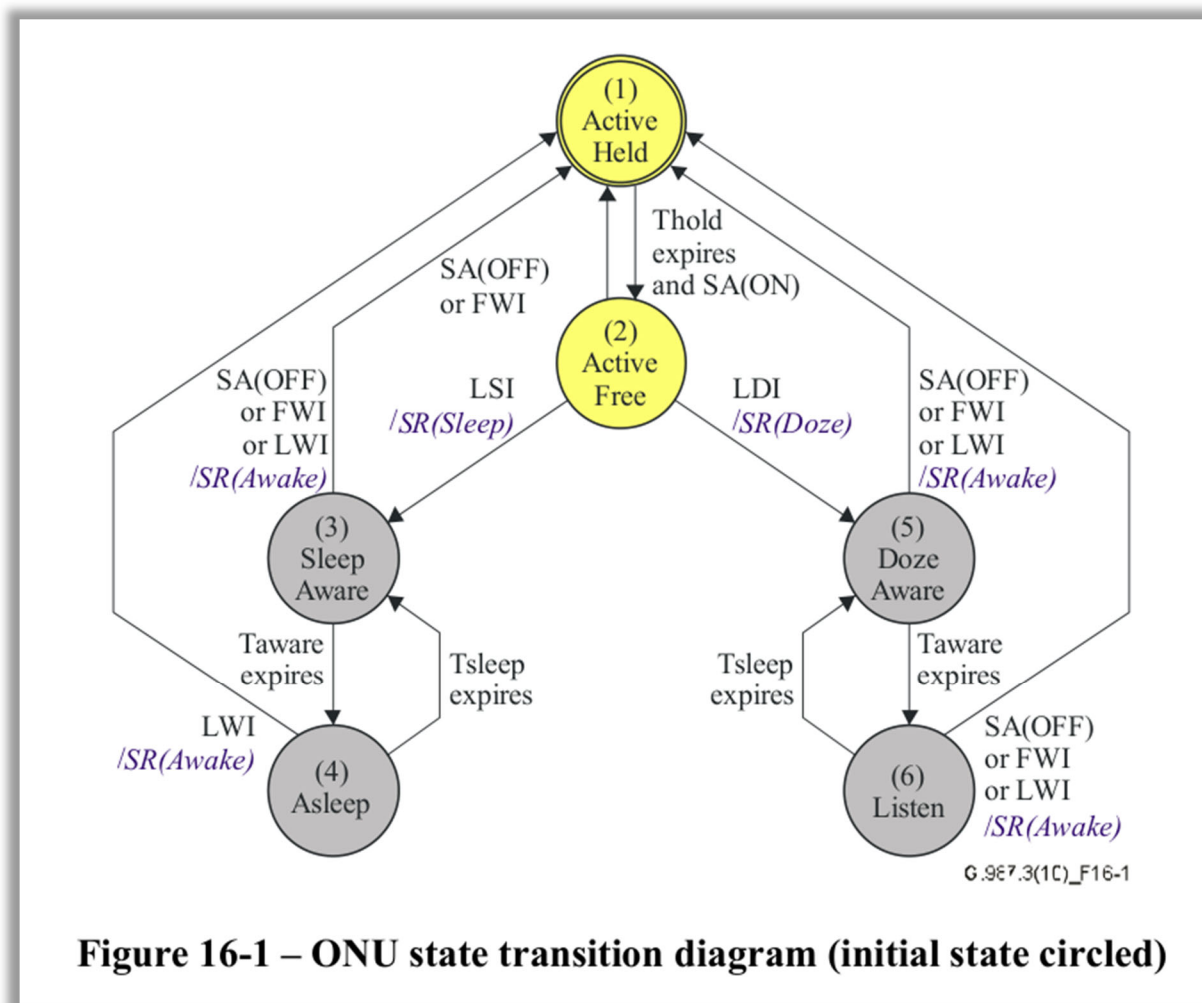
III. The Asserted References

A. G.987.3 [Ex1007]

G.987.3 is an ITU-T Recommendation dated October 2010 and titled “10-Gigabit-capable passive optical networks (XG-PON): Transmission convergence (TC) layer specification.” Ex1007 at 1. The document “describes the transmission convergence layer for 10-gigabit-capable passive optical network systems.” *Id.* at

3. In particular, the document describes ONU power management. *See id.* at 97–106; Ex2001 at ¶ 35.

Notably, the '892 Patent cited G.987.3 as an example of conventional ONUs lacking “the technology of directly transitioning between two low power consumption states without having to go through an active state (e.g., a full powered state).” Ex1001 at 4:25–37. Indeed, G.987.3 includes the state diagram that corresponds to Figure 7A of the '892 Patent:



Ex1007 at 101. G.987.3 provides two low power modes for the ONU: Doze mode and Cyclic Sleep mode. *Id.* at 97; Ex2001 at ¶ 36. The receiver is active in Doze mode but inactive in Cyclic Sleep mode. Ex1007 at 59; Ex2001 at ¶ 36. G.987.3 specifically states that “[d]irect transitions between Doze mode and Cyclic Sleep mode are disallowed.” Ex1007 at 105; Ex2001 at ¶ 36. It was not until after the ’892 Patent was filed that the standard allowed for direct transitions. *See* Ex1005 at 10–14; Ex2001 at ¶ 36.

G.987.3 was previously considered by the examiner during prosecution. *See* Ex1001 at References Cited (listing G.987.3).

B. Röger [Ex1006]

Röger is titled “Optically powered fiber networks.” Ex1006 at 1. Röger describes “power-efficient innovative hardware” and “a novel low-energy medium access control protocol.” *Id.* at 1. Röger was focused on minimizing subscriber power consumption associated with maintaining synchronization with the central office. Ex2001 at ¶ 37. To that end, it provided two new power modes: (1) a “snooze mode” where subscribers attempt to maintain synchronism with the central office by using a local quartz clock; and (2) a “sleep mode” where subscribers lose synchronism with the central office.” Ex1006 at 6, 8; Ex2001 at ¶ 37. Röger never mentions direct transitions between two low power consumption states and does not contain any state diagrams. Ex2001 at ¶ 37.

C. G.988 [Ex1008]

G.988 is an ITU-T Recommendation titled “ONU management and control interface (OMCI) specification.” Ex1008 at 1. The document “specifies the optical network unit (ONU) management and control interface (OMCI) for optical access networks.” *Id.* at 3.

D. Ghazisaidi [Ex1009]

Ghazisaidi is a published international patent application (WO 2013/014483). It is focused on scheduling traffic exchanges in a PON. Ex1009 at 1; Ex2001 at ¶ 39.

IV. Legal Standards

An IPR should not be instituted unless the petitioner has shown a likelihood of success on the invalidity grounds *presented in the petition*. See *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016) (“[T]he Board must base its decision on arguments that were advanced by a party, and to which the opposing party was given a chance to respond.”).

“In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3)). This burden of persuasion never shifts to the patent owner. See *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l*, 829 F.3d at 1380.

V. Level of Ordinary Skill in the Art

As addressed by Patent Owner’s expert, a POSA at the time of the invention would have at least a bachelor’s degree in electrical engineering, computer science, or a similar degree plus at least two years of experience in optical networks. Ex2001 at ¶ 29. This description is approximate, and a higher level of education or skill might make up for less experience, and vice versa. *Id.*

VI. Claim Construction

Claims are construed according to *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100 (b).

A. “Transition” in Claims 12 and 14 Must Be Direct.

12[B] 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;

14[B] 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;

The term “transition” in claims 12 and 14 should be construed to require a direct transition. Specifically, “transition” in claim 12 should be construed to mean “direct transition,” and “transition” in claim 14 should be construed to mean “transition directly.”

As discussed earlier, the ’892 Patent is focused on reducing the power consumption of an ONU. *See supra* Section II. Indirect transitions between low power states are mentioned only when the specification criticizes the technological shortcomings of conventional ONUs. *See* Ex1001 at 4:32–40 (“Conventional ONUs therefore lack the technology of directly transitioning between two low power consumption states without having to go through an active state such a transition

through the active state may increase the power consumed by the ONU, thereby undesirably reducing batter[y] life.”).

Indeed, the specification repeatedly and consistently characterizes its transitions between low power states as direct transitions. *See* Ex1001 at Abstract (“Techniques for unified optical network unit power management in a passive optical network include . . . **transitioning** the ONU **directly** between the first state and the second state”); 1:58–63 (“The method includes . . . **transitioning** the ONU **directly** between the first state and the second state”); 12:31–32 (“At 806, method 800 **directly transitions** the ONU between the first state and the second state”); 12:53–54 (“The module 906 is for **transitioning** the ONU **directly** between the first state and the second state”); 13:1–4 (“At 1002, the process 1000 operates an OLT to generate a message that causes a **direct transition** of the ONU from a first low power mode . . . to a second low power mode”); (“The module 1102 is for operating an optical line terminal (OLT) to generate a message that causes a **direct transition** of the ONU from a first low power mode . . . to a second low power mode”) (emphases added). And the Federal Circuit has “recognized 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.” *GPNE Corp. v. Apple Inc.*, 830 F.3d 1365, 1370 (Fed. Cir. 2016).

Moreover, the Applicant overcame a rejection during prosecution by arguing that the Pfeiffer reference did not render claim 14 obvious because it failed to disclose direct transitions. *See* Ex1002 at 26 (distinguishing then-claim 16 because Pfeiffer’s end node “cannot enter the listen state directly from the sleep state”).

B. Other Constructions

Petitioners state that certain means-plus-function terms in claims 10 and 13 should be construed. Pet. at 4–5. For purposes of this Preliminary Response, Patent Owner does not propose any constructions for these terms because the Petition fails to present a reasonable likelihood of prevailing under the claim interpretations relied on by Petitioners.¹

VII. Argument

Ground 1 fails because Petitioners have not shown that the prior art discloses direct transitions between low power states. The G.987.3 standard fails to render direct transitions obvious because it explicitly disallows such transitions. *See* Ex1007 at 105 (“Direct transitions between Doze mode and Cyclic Sleep mode are disallowed.”). Thus, the G.987.3 standard does not provide a motivation to modify the standard as proposed by Petitioners. To the contrary, a POSA would have been

¹ Patent Owner reserves the right to propose its own constructions if the Petition is instituted.

motivated to remain compliant with the G.987.3 standard. The combination of G.987.3 and Röger also fails to render direct transitions obvious because Röger does not discuss transitions at a state machine level like the '892 Patent, and a POSA would not understand Röger's diagrams as disclosing direct transitions. Even if Röger discloses direct transitions (and it does not), a POSA looking at these references in combination would not have been motivated to combine G.987.3 or G.988 with Röger because G.987.3 expressly prohibits the proposed combination.

Ground 2 fails for the same reasons as Ground 1. Furthermore, Petitioners' alleged "consent message" gives permission to enter a low power mode, not "remain" in a low power state as required by claim 12.

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

1. G.987.3 in View of Röger Further in View of G.988 Fails to Disclose Limitation 1[D]/14[B] Requiring Direct Transitions.

1[D] 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;

14[B] 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;

The Petition cannot present a reasonable likelihood of prevailing on Ground 1 because it fails to show that the '892 Patent's direct transitions would have been obvious. Petitioners provide two arguments regarding direct transitions: (1) G.987.3 alone renders the limitation obvious; and (2) the combination of G.987.3 and Röger renders the limitation obvious. Pet. at 48. Neither argument has merit.

(a) G.987.3 Alone

G.987.3 alone fails to render the limitation obvious because a POSA would not have modified G.987.3 to implement direct transitions. Ex2001 at ¶ 40. Petitioners contend that a POSA would have been motivated to apply direct transitions between the "Listen" and "Asleep" states to G.987.3 "to save energy by

not powering on the transmitter when transitioning between the ‘Listen’ and ‘Asleep’ states.” Pet. at 19. But a POSA would not have been motivated to modify G.987.3 in this way because it would cause the modified ONU and OLT to no longer be compliant with the standard. Ex2001 at ¶ 40. G.987.3 explicitly disallows “[d]irect transitions between Doze mode and Cyclic Sleep mode,” which is exactly what Petitioners are proposing. Ex1007 at 105; Ex2001 at ¶ 40. Thus, Petitioner’s stated grounds fly in the face of the disclosure provided by G.987.3.

A POSA would have been focused on complying with the standard to ensure interoperability with other standard-compliant equipment. Ex2001 at ¶ 40. Petitioners recognize that “[t]he ITU-T documents, including G.987.3, define and coordinate standards for telecommunications technologies around the world including PONs.” Pet. at 8. The ITU-T recommendations “are essential for ensuring that all passive optical networks can function efficiently,” and “the standards defined in these recommendations allow passive optical networks from around the world to interconnect.” Ex1003 at ¶ 63. “While individual optical network units, optical line terminals, and passive optical networks may differ, *all must be within the boundaries defined by the ITU-T recommendations* in order to operate with other components.” *Id.* (emphasis added). For example, Petitioners admit that “the ONU of Röger would be standardized based on ITU-T recommendations.” Pet. at 14. Similarly, “the ONUs and OLTs of Ghazasaidi would have been standardized based

on ITU-T recommendations.” *Id.* at 55. Accordingly, Petitioners agree that POSAs such as Röger and Ghazasaidi would have been motivated to retain compliance with the standard.

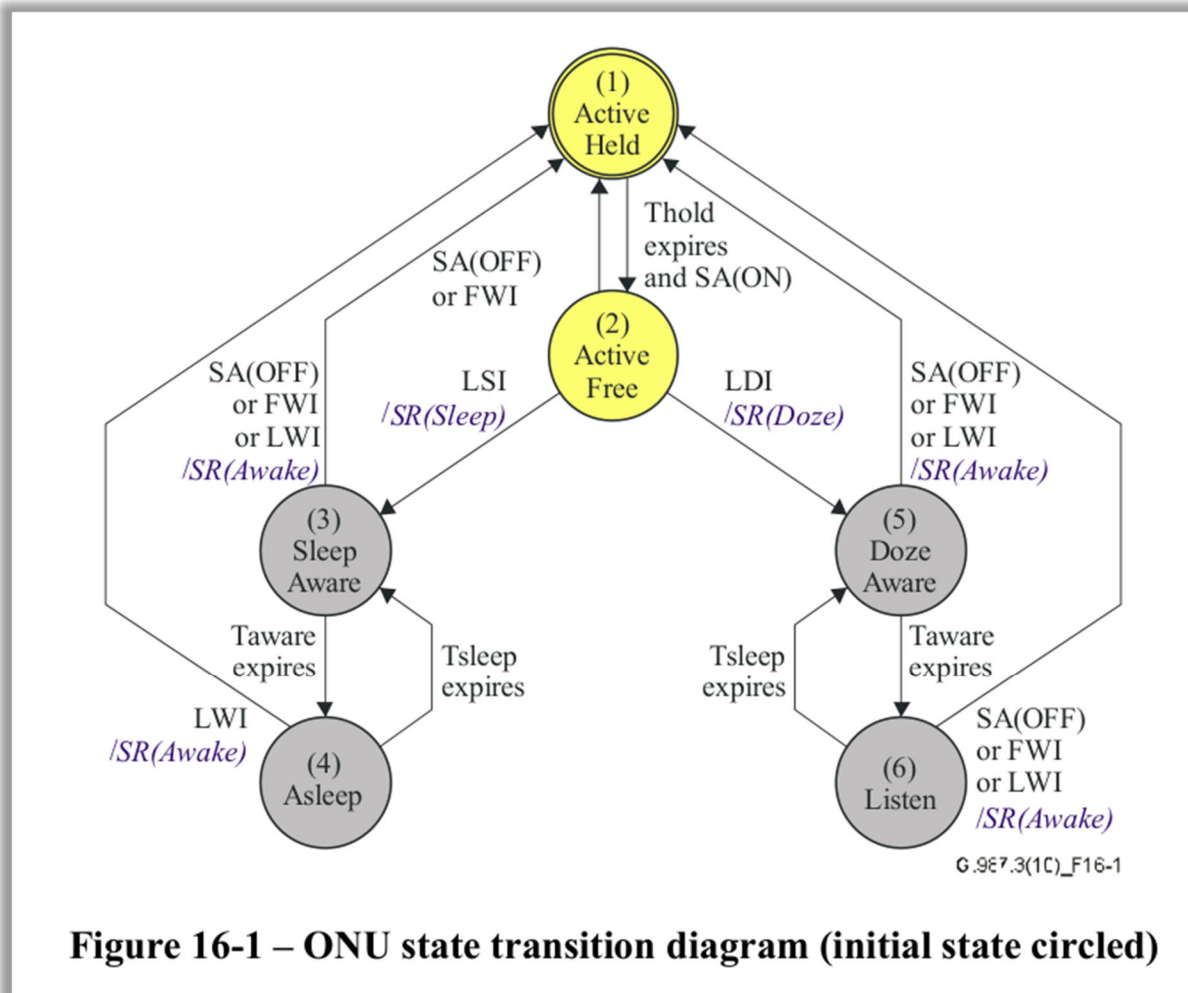
Petitioners argue that the statement in G.987.3 prohibiting direct transitions does not apply to ONUs. Specifically, Petitioners assert that the statement “is only applicable to the OLT, and there is no similar restriction or note in the ONU state transition and output table.” Pet. at 10. This is incorrect. Ex2001 at ¶ 41. The language prohibiting direct transitions between Doze mode and Cyclic Sleep mode applies to ONUs because those modes are ONU power saving modes:

11.3.4.5 Sleep_Request message

An ONU sends Sleep_Request to signal its intention to change power saving modes. Clause 16 defines the use and function of this message in detail.

Octet	Content	Description
1-2	ONU-ID	
3	0x10	Message type ID "Sleep_Request".
4	SeqNo	Always 0.
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. 2- Sleep_Request (sleep). Cyclic sleep request, ONU receiver inactive – During low-power periods of cyclic sleep mode, the ONU cannot receive downstream traffic. Other values reserved.
6-40	Padding	Set to 0x00 by the transmitter; treated as "don't care" by the receiver.
41-48	MIC	Message integrity check

Ex1007 at 59 (emphasis added).



Id. at 101; Ex2001 at ¶ 41. The statement prohibiting direct transitions was made when discussing OLT state transitions because the OLT is involved in controlling ONU power states, not because the statement applies to only the OLT. *See* Ex1007 at 99 (“The power management behaviour of a given ONU is controlled by a pair of state machines residing at the OLT and the ONU.”); Ex2001 at ¶ 41.

Petitioners contend that their interpretation of the statement is correct because it also appears in G.9807.1, which allows direct transitions in Watchful Sleep mode. *See* Pet. at 10–11. But the existence of direct transitions in Watchful Sleep mode is

not contradictory because that mode is distinct from the Doze and Cyclic Sleep modes. *See* Ex1010 at 230 (“This clause addresses three additional means of power management One is called Doze mode; another is referred to as Cyclic sleep mode; the third is known as Watchful sleep mode.”); Ex2001 at ¶ 42. Notably, Watchful Sleep mode was not standardized until after the ’892 Patent was filed. Ex2001 at ¶ 42. One can use direct transitions and comply with G.9807.1, but the same is not true for G.987.3. *Id.*

Petitioners argue that their proposed modification would have been “driven by a well-known problem in the field, reducing power consumption.” Pet. at 11. But a POSA would not have been driven solely by reducing power consumption, as Petitioners suggest. Ex2001 at ¶ 43. Instead, a POSA would have been focused on standard compliance. *Id.* Moreover, Petitioners’ proposed modification would add complexity to the ONU state machine, which would discourage a POSA from making it. *Id.*

Petitioners suggest that the invention is obvious because “there are a finite number of solutions to reduce power consumption in optical networks.” Pet. at 11. But there are numerous potential solutions to reduce power consumption in optical networks. Ex2001 at ¶ 44. This includes power shedding, which itself takes into account numerous shedding classes. Ex1008 at 71; Ex2001 at ¶ 44. It would not have been obvious to use the ’892 Patent’s approach to transition mechanics between

two specific low power states in the ONU (as opposed to looking for power savings in, for example, another network component). Ex2001 at ¶ 44.

(b) G.987.3 and Röger Combined

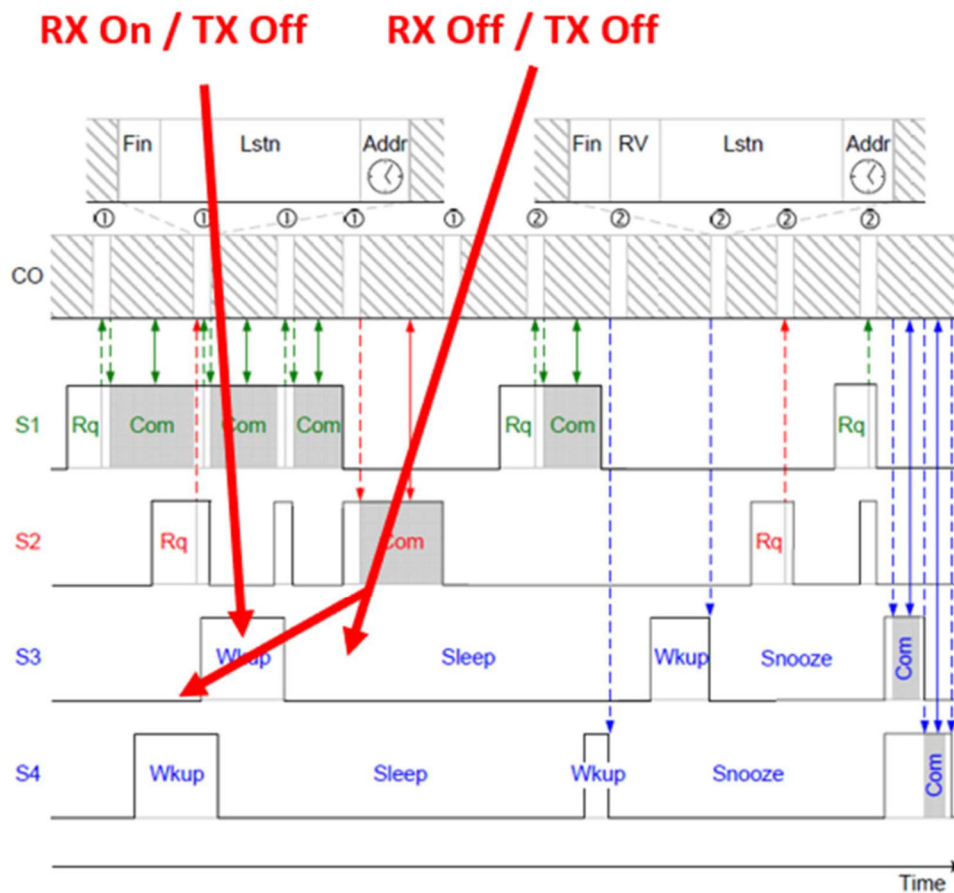
The combination of G.987.3 and Röger fails to render the limitation obvious because Röger does not disclose direct transitions between low power states. *Id.* at 45. Unlike the '892 Patent, Röger is not concerned with transitions at a state machine level and does not discuss them. *See, e.g.*, Ex1001 at Fig. 5; Ex2001 at ¶ 45. Indeed, Röger does not contain a single state diagram. Ex2001 at ¶ 45.

Petitioners contend that Röger discloses a direct transition from a sleep mode to a receive mode because it states that subscribers “activate their basic receiver circuitry.” Pet. at 20. But this statement says nothing about whether the transition from sleep mode to receive mode was direct. Ex2001 at ¶ 46. As explained by the '892 Patent, “[d]irect transition refers to changing the operational state of the ONU between the first and the second states *without having to go through an intermediate third state.*” Ex1001 at 12:33–36 (emphasis added). Notably, G.987.3-compliant ONUs would also “activate their basic receiver circuitry” when transitioning from the “Asleep” state to the “Listen” state, but even Petitioners admit that such a transition would be indirect. *See* Pet. at 19; Ex1007 at 101; Ex2001 at ¶ 46.

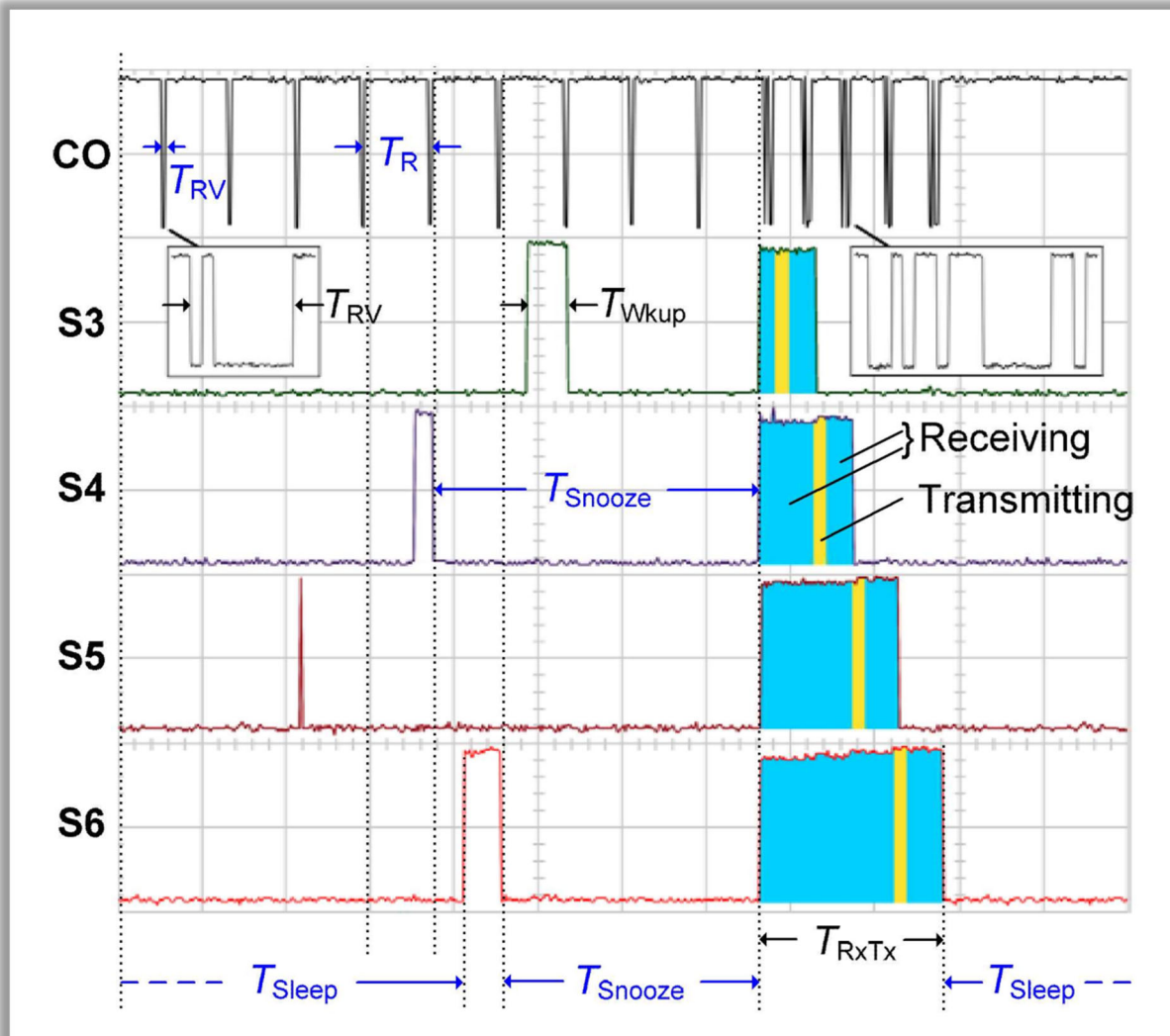
Petitioners similarly argue that Röger discloses a direct transition from a receive mode to a sleep mode because it states that “the subscribers go back to sleep.” Pet. at 20. But this statement also says nothing about whether the transition was direct, and Petitioners admit that G.987.3-compliant ONUs would undergo an indirect transition when they “go back to sleep.” *See* Pet. at 19; Ex1007 at 101; Ex2001 at ¶ 47.

Next, Petitioners point to “low portion[s]” and “high portion[s]” of a line in their annotated version of Figure 2 to allege direct transitions:

Ex. 1006, Fig. 2 (annotated)



Pet. at 21. However, Figure 2 does not describe transitions between sleep mode and receive mode at a state machine level. Ex2001 at ¶ 48. A POSA would understand that there is an intermediate state that is simply not illustrated in the diagram. *Id.* For example, using Petitioners' logic, one could interpret Figure 6 as showing that the "receive" mode (shown in blue) and "transceive" mode (shown in yellow) have the same power consumption because they both correspond to high portions of a line:



Ex1006 at 12; Ex2001 at ¶ 48. But the supply current for transceive mode is almost double the supply current for receive mode:

Subscriber modes		Attributes	μC current $I_{\mu C}$	Supply current I_b	Total I_b
Sleep	μC low-power modes	Low-Q clock	0.5 μA	I_{Sleep}	0.5 μA
Snooze		High-Q clock	1 μA	I_{Snooze}	1 μA
Receive	μC active mode	Receiver on	3.5 mA	I_{Rx}	6 mA
Transceive		Transceiver on		I_{RxTx}	11 mA

Ex1006 at 11; Ex2001 at ¶ 48. Just as Figure 6 fails to show power consumption details, Figure 2 fails to show state transition details. Ex2001 at ¶ 48.

Moreover, Röger explains that the high levels in Figure 6 indicate “receive *or* transceive” modes, so a single high portion of a line in Röger’s diagrams can indicate multiple different states. Ex1006 at 12 (emphasis added); Ex2001 at ¶ 48. Indeed, each color-coded high level in Figure 6 shows at least three separate states. Ex1006 at 11–12 (“At rendezvous time all subscribers *switch to receive mode* When for instance subscriber S4 recognizes its address (transition from the dark (blue) to the light (yellow) region in Fig. 6), it *activates its transmitter*, sends to CO whatever information was required, and *deactivates its transmitter* again (transition from the light (yellow) to the dark (blue) region in Fig. 6).”) (emphasis added); Ex2001 at ¶ 48. And based on Figure 6, the corresponding high level labeled “Com” in Figure 2 also corresponds to multiple states. Ex2001 at ¶ 48. Accordingly, a POSA would not interpret Figure 2 as disclosing direct transitions. *Id.*

Petitioners’ own description of Röger confirms this conclusion. *Id.* at ¶ 49. Figure 6 shows that an ONU exiting snooze mode transitions to receive mode. *Id.* But according to Petitioners, “[a] POSITA would have known that the ONUs would have had to be fully powered up and capable of responding to upstream and downstream traffic (i.e., capable of receiving and transmitting messages between the ONU and OLT) before exiting the snooze mode (‘second state’) . . . in order to

communicate with the OLT.” Pet. at 25. Therefore, Petitioners agree that Röger’s ONU enters an intermediate “fully powered up” state capable of transmitting messages between snooze mode and receive mode. Ex2001 at ¶ 49. The intermediate state is just not shown in the diagram. *Id.* Petitioners effectively contend that the Röger reference meets this limitation, when in fact it is silent on the ability to perform direct transitions. *Id.*

Even if Röger somehow discloses direct transitions (and it does not), a POSA would not have combined G.987.3 or G.988 with Röger because G.987.3 explicitly prohibits the proposed combination. *Id.* at ¶ 50. The ONU of Petitioners’ proposed combination would directly “alternate between sleep and doze modes,” but G.987.3 disallows “[d]irect transitions between Doze mode and Cyclic Sleep mode.” Pet. at 14; Ex1007 at 105; Ex2001 at ¶ 50. And as explained earlier, a POSA would have been focused on complying with the standard to ensure interoperability with other standard-compliant equipment. *See supra* Section VII.A.1(a). When viewing G.987.3 and Röger in combination, a person skilled in the art would not have been motivated to vary from the teachings of the standard and to adopt direct transitioning, especially when the Röger reference was silent on direct transitioning between low power states. Ex2001 at ¶ 50.

Petitioners contend that a POSA would have been motivated to apply Röger’s allegedly direct transitions “to the ONUs of G.987.3 in view of the known

advancements in technology at the time.” Pet. at 12. Specifically, they assert that “a POSITA would have been motivated to apply the direct transitions of Röger in light of advancements in how fast a receiver could be switched on” due to the decreased clock and data recovery (CDR) time disclosed in Wong. *Id.* Petitioners are incorrect. Ex2001 at ¶ 51. The classic device for recovering a clock signal from the data transitions is utilizing a Phase Lock Loop (“PLL”). *Id.* The technology always evolves but not substantially enough during the relevant period to drive the selection of power saving modes of the ONU. *Id.* There is an application-dependent design tradeoff that always needs to be made for any PLL. *Id.* The closed loop bandwidth of the PLL dictates two major competing design goals: the incoming signal always has jitter (noise) on it, but the recovered clock should be as stable (jitter free) as possible. *Id.* Thus, to reduce the jitter on the clock, it is best to have a very low closed loop bandwidth. *Id.* However, the lower the closed loop bandwidth, the slower the acquisition time. *Id.* As result, it is not ideal to have a superfast locking time, at the cost of having excessive noise on the recovered clock. *Id.* Therefore, the PLL properties are a design consideration, not a technology limitation for ONUs. *Id.* And the CDR advancements that Petitioners point to would not have motivated a POSA to apply Röger to G.987.3. *Id.*

For these reasons, Petitioners have not shown that independent claims 1 and 14, and therefore dependent claims 2–5 and 15, are unpatentable. *See 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.”).

B. Ground 2: G.987.3 in View of Röger Further in View of G.988 Further in View of Ghazisaidi Fails to Render Any Claim Obvious.

1. G.987.3 in View of Röger Further in View of G.988 Further in View of Ghazisaidi Fails to Disclose Limitation 10[D]/12[B] Requiring Direct Transitions.

10[D] 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;

12[B] 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;

As discussed earlier in Section VII.A.1, G.987.3 in view of Röger further in view of G.988 fails to disclose direct transitions. Petitioners do not rely on Ghazisaidi to show direct transitions. *See* Pet. at 58, 59–61. Accordingly, G.987.3 in view of Röger further in view of G.988 further in view of Ghazisaidi also fails to disclose direct transitions.

For this reason, Petitioners have not shown that independent claims 10 and 12, and therefore dependent claims 11 and 13, are unpatentable. *See 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.”).

2. **G.987.3 in View of Röger Further in View of G.988 Further in View of Ghazisaidi Fails to Disclose Limitation 12[D] Requiring a Message to Allow the ONU to Remain in a State.**

12[D] 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.

Claim element 12[D] requires “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.” Ex. 1001 at 16:50–53 (emphasis added). As such, the message applies to an ONU that is already in one of the low power states. Ex2001 at ¶ 54. Petitioners point to the Sleep_Allow(ON) event as the claimed consent message. Pet. at 62. But according to Petitioners’ own argument, Sleep_Allow(ON) “gives permission to the ONU to **transition into** a low power mode.” *Id.* (emphasis added); Ex2001 at ¶ 54. Accordingly, Petitioners’ consent message gives permission to **enter** a low power mode, not **remain** in a low power state as required by the claim. Ex2001 at ¶ 54.

This is confirmed by G.987.3’s ONU state diagram and table, which show that Sleep_Allow(ON), or SA(ON), applies only when the ONU is in the ActiveHeld state:

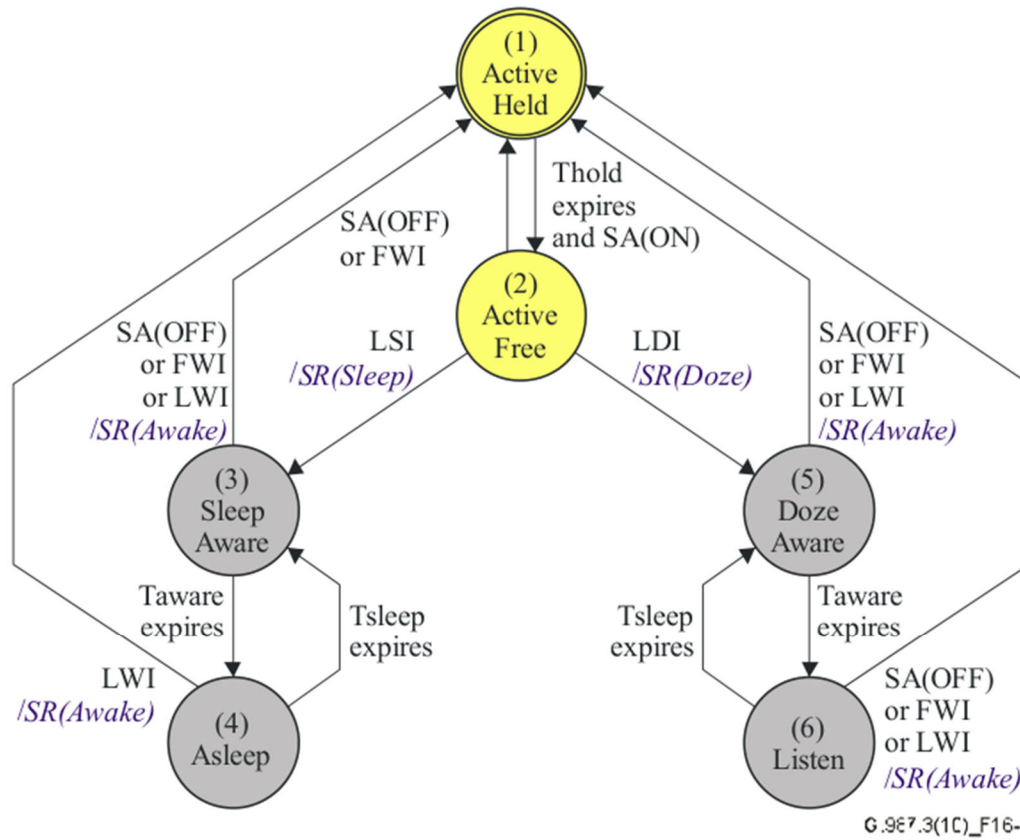


Figure 16-1 – ONU state transition diagram (initial state circled)

Ex1007 at 101.

Table 16-4 – ONU state transition and output table

Inputs	ONU power management states					
	(1) ActiveHeld	(2) ActiveFree	(3) SleepAware	(4) Asleep	(5) DozeAware	(6) Listen
FWI	*	→ (1)	→ (1) /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)	
* Indicates a self-transition.  A shaded cell means that the input is not applicable in the given state. NOTE – An ONU remains in the ActiveHeld state for at least Ihold upon entry into that state regardless of the SA message parameter value indicated by the OLT. The minimum sojourn in the ActiveHeld state is controlled by timer Thold that is initiated to Ihold upon ONU's entry into the ActiveHeld state. When Thold expires, the ONU executes a transition into to the ActiveFree state if the latched value of SA message parameter is ON or as soon as SA (ON) message is received.						

Id. at 102; Ex2001 at ¶ 55.

For these reasons, Petitioners have not shown that independent claim 12, and therefore dependent claim 13, are unpatentable. *See 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. The Board should exercise its discretion to deny the Petition under *Fintiv*

The Board should exercise its discretion to deny the Petition under *Fintiv*. Patent Owner sued Petitioner AT&T Services Inc. (“AT&T”) for infringement of the ’892 Patent on May 26, 2023 in *Iarnach Technologies Ltd. v. AT&T Services Inc., et al.*, Case No. 2:23-cv-00231 (E.D. Tex.) (the “AT&T Proceeding”). See Ex1033 at 3–4. AT&T was served with the complaint no later than May 30, 2023. Ex2004 at 2. Yet, AT&T delayed filing its IPR challenge until May 30, 2024—the last possible day under the statute. See Pet. at 74; 35 U.S.C. § 315(b). AT&T’s lack of diligence is further highlighted by the fact that it identified the same invalidity grounds based on G.987.3, Röger, G.988, and Ghazisaidi as part of its invalidity contentions in the district court case on December 7, 2023—more than five months before it filed its Petition. Ex2002 at 502, 504. Petitioner’s lack of diligence in filing its Petition demonstrates that its actions are purely meant to “increase, rather than limit, litigation costs,” and thus the Petition should be denied under *Fintiv*. See Director’s *Fintiv* Guidance at 1 (June 21, 2022), available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.

The Director has discretion to deny institution under 35 U.S.C. § 314(a). *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (2016). The Board should exercise such discretion here and deny the Petition because the same invalidity arguments will be addressed, and resolved, in the co-pending district court proceedings before the Board would issue a final written decision in this proceeding.

The Board considers the presence and status of parallel district court litigation in determining whether to deny institution. *See NHK Spring Co. Ltd. v. Intri-Plex Techs. Inc.*, IPR2018-00752, Paper 8, at 20 (P.T.A.B. Sept. 12, 2018) (precedential); *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 15, at 17 (P.T.A.B. May 13, 2020) (informative) [hereinafter “*Fintiv*”]; *see also Gen. Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19, at 16-17 (P.T.A.B. Sept. 6, 2017) (“[W]e recognize that an objective of the AIA is to provide an effective and efficient alternative to district court litigation”). *Fintiv* “sets forth factors that balance considerations of system efficiency, fairness, and patent quality when a patent owner raises an argument for discretionary denial due to the advanced state of a parallel proceeding.” *Fintiv*, Paper 15, at 7-8 (citing *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, at 5-6 (P.T.A.B. Mar. 20, 2020) (precedential)).

The factors are:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;

2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board’s exercise of discretion, including the merits.

Id. “[T]he Board examines these factors, which relate to whether efficiency, fairness, and the merits support the exercise of authority to deny institution. In evaluating the factors, the Board takes a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Id.* (internal citations omitted). Additionally, on June 21, 2022, USPTO Director Vidal issued interim guidance for discretionary denial analysis (hereinafter the “Director’s Guidance”).² As detailed below, these factors favor discretionary denial under §314(a).

As noted above, the AT&T Proceeding is ongoing in the Eastern District of Texas. Although the ’892 Patent has since been dropped from the AT&T

² Available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.

Proceeding, the '892 Patent is still currently asserted in *Iarnach Technologies Ltd. v. Verizon Business Network Services LLC, et al.*, Case No. 2:23-cv-00631 (E.D. Tex.) (Filed Dec. 28, 2023) (the “Verizon Proceeding”). See Ex1034 at 4. The *Fintiv* factors support denial of the Petition based on these ongoing proceedings as discussed below.

1. Factor 1: whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted

Both the AT&T Proceeding and the Verizon Proceeding are ongoing in the Eastern District of Texas. No party in either proceeding has moved for a stay, nor is there evidence that one may be granted if the Petition is instituted. Thus, this factor is neutral. See *Sand Revolution II, LLC v. Continental Intermodal Group-Trucking LLC*, IPR2019-01393, Paper 24 at 7 (P.T.A.B. June 16, 2020) (informative).

2. Factor 2: proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision

Trial in the Verizon Proceeding is scheduled for September 22, 2025. Ex1032 at 1. In addition to the district court’s schedule, the Director’s Guidance has suggested that parties refer to the median time to trial for a district as well when evaluating the *Fintiv* factors. Director’s Guidance at 8–9. The Verizon Proceeding was filed December 28, 2023, Ex1034 at 1. The statistics for EDTX submitted by Petitioner show a median time to trial of 21.4 months, and more recent statistics show a similar median time to trial of 21.6 months. Ex1031 at 35; Ex2005 at 35.

Scheduled and projected dates for the Verizon Proceeding are shown in the table below:

Proceeding	Complaint Filed	Scheduled Trial Date	Projected Trial Date
Verizon	Dec. 28, 2023	Sept. 22, 2025	Oct., 2025 ³

Patent Owner is filing this Preliminary Response on September 13, 2024. If the Board reaches its institution decision within three months of receiving the preliminary response, 35 U.S.C. §314(b), and issues a final written decision within 1 year of institution, 35 U.S.C. §316(a)(11), a final written decision would likely not issue until around December 2025. Thus, the scheduled and projected trial dates for the Verizon Proceeding occur 2–3 months before an expected final written decision. Thus, this factor weighs strongly in favor of denial.

Petitioner suggests this factor does not support denial because it speculates that events beyond the trial date might not be complete before the final written decision in this IPR. Pet. at 68. Petitioner cites no support for the proposition that a

³ Petitioners suggest a projected trial date of December 2025 for the Verizon Proceeding. Pet. at 68. It is not clear how they arrived at that result, given that 21.4 months after the Dec. 28, 2023 filing date falls in early to mid-October.

nebulous milestone beyond the trial date should be considered instead of the trial date.

3. Factor 3: investment in the parallel proceeding by the court and the parties

The investment in the parallel proceedings is significant. The Verizon Proceeding will be in the middle of the Markman process by the institution decision deadline, with all preliminary claim construction statements served. Ex1032 at 4–5. Thus, the investment in the Verizon Proceeding weighs in favor of denial.

4. Factor 4: overlap between issues raised in the petition and in the parallel proceeding

The same G.987.3, Röger, G.988, and Ghazisaidi references are asserted against the '892 Patent in the Verizon Proceeding. Ex2003 at 502, 504. Petitioners suggest this near complete overlap does not support denial because the “Petition covers a number of claims that are not asserted in the AT&T case.” Pet. at 69. However, the validity of '892 Patent claims 1–3 and 5 are being challenged in the Verizon Proceeding, Ex2003 at 500, while here Petitioners have only added claims 4 and 10–15, Pet. at 1. The addition of these claims does nothing to counter the tremendous overlap that exists. For example, the Petition only includes 2 pages of non-duplicative substantive analysis addressing claims 10, 11, and 13. Pet. at 56–59, 63. Thus, Petitioners' inclusion of the additional claims does little (if anything) to counter the near total overlap between the proceedings.

Moreover, even though the Petition “challenges claims in addition to those that are challenged in the district court, it may still be inefficient to proceed because the district court may resolve validity of enough overlapping claims to resolve key issues in the petition.” *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 13 (P.T.A.B. Mar. 20, 2020) (precedential). This is especially true where, as here, Petitioners do not offer analysis of material differences of the claims at issue in the IPR in relation to the “grounds, arguments, and/or evidence . . . presented in the district court.” *Google LLC v. Agis Software Dev., LLC*, IPR2020-00873, Paper 16 at 13 (P.T.A.B. Nov. 25, 2020).

Thus, this factor favors denial of institution.

5. Factor 5: whether the petitioner and the defendant in the parallel proceeding are the same party

Although Petitioners AT&T and Nokia are not parties to the Verizon Proceeding, Patent Owner Iarnach is.

6. Factor 6: other circumstances that impact the Board’s exercise of discretion, including the merits.

As discussed above, the merits of this Petition are weak. *See supra* Section VII. G.987.3 fails to disclose and explicitly disallows direct transitions between low power states, and Röger does not disclose them either.

The circumstances created by Petitioners’ delay in filing its IPR Petition further supports discretionary denial. As discussed above, Petitioners waited until

the last possible day under statute to file their challenge despite identifying the same invalidity grounds in their district court invalidity contentions five months prior. Ex2002 at 500, 502, 504. As a result, there is little chance that this proceeding will be completed before the Verizon Proceeding. Petitioners' delay means that instituting an IPR at this stage would likely only duplicate work in the district court proceeding, rather than "provide an effective and efficient *alternative* to district court litigation." See *NHK Spring* at 20 (quoting *Gen. Plastic* at 16-17) (emphasis added).

On balance, the *Fintiv* factors favor discretionary denial.

VIII. Conclusion

Patent Owner respectfully requests that the Board refuse to institute *inter partes* review for the reasons stated herein.

Dated: Sept. 13, 2024

Respectfully submitted,

By: / Blaine A. Larson /
Blaine A. Larson (Reg. No. 69,132)
Attorney for Patent Owner
Iarnach Technologies Ltd.

CERTIFICATE OF SERVICE

The undersigned certifies that pursuant to 37 C.F.R. § 42.6(e), a copy of the foregoing was served via email to lead and backup counsel of record for Petitioners as follows:

Lead Counsel for Petitioner
Christopher TL Douglas Reg. No. 56,950 ALSTON & BIRD LLP Vantage South End 1120 S. Tryon Street, Suite 300 Charlotte, NC 28203 Phone: 704.444.1000 Fax: 704.444.1111 Email: christopher.douglas@alston.com
Back-Up Counsel for Petitioner
M. Scott Stevens Reg. No. 54,762 Karlee N. Wroblewski Reg. No. 76,805 Matthew M. Welch Reg. No. 75,429 Bennett M. Hardyman Reg. No. 80,838 ALSTON & BIRD LLP Vantage South End 1120 S. Tryon Street, Suite 300 Charlotte, NC 28203 Phone: 704.444.1000 Fax: 704.444.1111 Email: scott.stevens@alston.com Email: karlee.wroblewski@alston.com Email: matt.welch@alston.com Email: bennett.hardyman@alston.com

Dated: Sept. 13, 2024

Respectfully submitted,

By: /Blaine A. Larson /
Blaine A. Larson (Reg. No. 69,132)
Attorney for Patent Owner
Iarnach Technologies Ltd.

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that this brief complies with the type-volume limitation of 37 C.F.R. § 42.24 because this brief contains 6,910 words.

Dated: Sept. 13, 2024

Respectfully submitted,

By: / Blaine A. Larson /
Blaine A. Larson (Reg. No. 69,132)
Attorney for Patent Owner
Iarnach Technologies Ltd.