

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ACTIVISION BLIZZARD, INC.,
ELECTRONIC ARTS INC.,
TAKE-TWO INTERACTIVE SOFTWARE, INC.,
2K SPORTS, INC., and
ROCKSTAR GAMES, INC.,
Petitioner,

v.

ACCELERATION BAY, LLC,
Patent Owner.

Case No. IPR2016-00747
Patent 6,732,147 B1

PATENT OWNER'S RESPONSE

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37 C.F.R. § 42.2459

37 C.F.R. § 42.104(b)(4).....26

37 C.F.R. § 42.10760

PATENT OWNER'S EXHIBIT LIST

	Description
Exhibit-2001	Declaration of Michael Goodrich, Ph.D., dated June 26, 2016
Exhibit-2002	Andrew Tanenbaum, Computer Networks, Third Edition (1996)(Excerpts) – Pg. 292-293
Exhibit-2003	Declaration of Michael Goodrich, Ph.D. In Support Of Patent Owner Response
Exhibit-2004	Declaration of Dr. Harry Bims in Support of Patent Owner's Response with Appendix A (<i>Curriculum Vitae</i> of Dr. Harry Bims) [CONFIDENTIAL - PROTECTIVE ORDER MATERIAL]
Exhibit-2005	RESERVED
Exhibit-2006	Declaration of Virgil E. Bourassa in Support of Patent Owner's Response [CONFIDENTIAL - PROTECTIVE ORDER MATERIAL]
Exhibit-2007	Andrew Tanenbaum, Computer Networks, Third Edition (1996) – Pg. 17, 28-34, 275, 287-299, 345-354
Exhibit-2008	Boeing Invention Disclosure Form (19 pages) [CONFIDENTIAL - PROTECTIVE ORDER MATERIAL]
Exhibit-2009	Patent License Agreement between Boeing Management Company and Sony Computer Entertainment America Inc. [CONFIDENTIAL - PROTECTIVE ORDER MATERIAL]
Exhibit-2010	Deposition Transcript of Dr. David R. Karger, taken on November 29, 2016
Exhibit-2011	Deposition Transcript of Dr. David R. Karger for Case Nos. IPR2015-01964 and IPR2015-01996, taken on July 6, 2016

Exhibit-2012	Deposition Transcript of Dr. David R. Karger for Case Nos. IPR2015-01970 and IPR2015-01972, taken on July 7, 2016
Exhibit-2013	Vu and Risner, <i>Performance and Cost of Broadcast Routing Algorithms in the Strategic Defense System Terrestrial Network</i> , Military Communications Conference, 1991. MILCOM '91, IEEE, pages 29.2.1 to 29.2.5 (Nov. 4-7, 1991)
Exhibit-2014	IEEE 802.4 / ISO 8802-4 Standard
Exhibit-2015	RESERVED
Exhibit-2016	Claim chart created by Dr. Harry Bims regarding the '147 Patent and the technology in the Sony Computer Entertainment America Inc. 's ("Sony") products
Exhibit-2017	RESERVED
Exhibit-2018	RESERVED
Exhibit-2019	RESERVED
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Exhibit-2021	OSI model, available at https://www.tes.com/lessons/AMRvJVI32tmEEQ/osi-model
Exhibit-2022	Sony Kabushiki Kaisha ("Sony Corporation") Form 20-F filed with the U.S. Securities and Exchange Commission, for fiscal year ended March 31, 2008
Exhibit-2023	destiny.bungie.org webpage - "Bungie Weekly Update 04/25/2014" - available at http://destiny.bungie.org/bwu/26
Exhibit-2024	Bungie webpage - How to Join or Create a Fireteam - available at https://www.bungie.net/7_HowtoJoinorCreateaFireteam/en/Help/Article/13978
Exhibit-2025	Bungie webpage - Matchmaking Updates - available at https://www.bungie.net/en/News/Article/14278

Exhibit-2026	Playstation webpage - Port Numbers, which do I need to open for the PlayStation and how do I do it? - available at http://community.eu.playstation.com/t5/PSN-Support/Port-Numbers-which-do-I-need-to-open-for-the-PlayStation-and-how/td-p/13390392
Exhibit-2027	PlayStation webpage - Test Internet Connection, PlayStation 4 User's Guide - available at http://manuals.playstation.net/document/en/ps4/settings/nw_test.html
Exhibit-2028	Game Informer webpage - The Matchmaking Technology of Destiny- available at http://www.gameinformer.com/b/features/archive/2013/12/06/the-matchmaking-technology-of-destiny.aspx?PostPageIndex=1
Exhibit-2029	Bungie presentation - Shared World Shooter - Destiny's Networked Mission Architecture
Exhibit-2030	Excerpt of Destiny full size box cover
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Exhibit-2032	Bungie webpage - Voice Chat [Beta] in Destiny - available at https://www.bungie.net/en/News/Article/12376/7_voice-chat-beta-in-destiny
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Exhibit-2035	YouTube Screenshot - Destiny: Connection Based Matchmaking? - available at https://www.youtube.com/watch?v=YG7IhxdsciA
Exhibit-2036	YouTube Screenshot - Destiny Gameplay Walkthrough - available at https://www.youtube.com/watch?v=mfzIDQQLCqk

Exhibit-2037	YouTube Screenshot - Destiny Gameplay Walkthrough – available at https://www.youtube.com/watch?v=nIDyPPxKotM&feature=iv&src_vid=XKQfiwPzjmc&annotation_id=annotation_2453463955
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On March 11, 2016, Activision Blizzard, Inc., Electronic Arts, Inc., Take-Two Interactive Software, Inc., 2K Sports, Inc., and Rockstar Games, Inc., (“Petitioner”) filed a Petition for *Inter Partes* Review, challenging claims 1–16 of U.S. Patent No. 6,732,147 (Ex. 1001, the “‘147 Patent”). Based on a limited record, the Board instituted *inter partes* review (“IPR”) of claims 6–10 (“the instituted claims”) of the ‘147 Patent on September 12, 2016. Decision Instituting *Inter Partes* Review, IPR2016-00747, Paper No. 12 at 25. (“Institution Decision”). Patent Owner, Acceleration Bay, LLC, (“AB” or “Patent Owner”) respectfully submits that, based on the full record for the Board should find that Petitioner has not met its burden to demonstrate that the challenged claims are unpatentable over the sole ground at issue in this case.

I. INTRODUCTION

The claims subject to IPR in this case solve a problem that arises when a computer involuntarily leaves a broadcast channel. In particular, the claims under review are directed to a “method for healing a disconnection of a first computer from a second computer, the computers connected to a broadcast channel.” ‘147 Patent, claim 6. The claims further require that this healing method occurs in the context of the broadcast channel “being an m -regular graph where m is at least 3” and that the method “maintain[s] an m -regular graph.” *Id.* Petitioner has failed to meet its burden of proof that the challenged claims are unpatentable because the

Petition fails to demonstrate that the four references in the instituted ground, alone or in combination, disclose the elements of the invention claimed or that a POSITA would have been motivated in July 2000 to combine the references in the manner advanced by Petitioner.

As a threshold matter, none of the references relied on by Petitioner disclose or suggest the claimed broadcast channel, which “overlays a point-to-point communications network.” ‘147 Patent at 4:5–7. The references relied on by the Petitioner—(1) Peter J. Shoubridge et al., *Hybrid Routing in Dynamic Networks*, IEEE International Conference on Communications (Ex. 1005, “Shoubridge”); (2) Tamás Denes, *The “Evolution” of Regular Graphs of Even Order by their Vertices*, *Matematikai Lapok*, 27, 3–4 (Ex. 1017, “Denes”);¹ (3) Jose Rufino et al., *A Study on the Inaccessibility Characteristics of ISO 8802/4 Token-Bus LANs*, IEEE INFOCOM ’92: The Conference on Computer Communications (Ex. 1011, “Rufino”); and (4) T. Todd, *The Token Grid Network*, IEEE/ACM Transactions on Networking, 2.3, 279–287 (Ex. 1019, “Todd”) —are devoid of any description or suggestion of such a broadcast channel. Petitioner’s failure to address this fundamental aspect of the claims is fatal.

¹ English language translation of Ex. 1016 is provided as Ex. 1017 (“Denes”).

Petitioner's reliance on Rufino as allegedly teaching the messaging features recited in the instituted claims is misplaced. Rufino's messaging techniques are peculiar to the context of a token bus network, in which a logical ring is established over a physical bus, and are not extensible to the point-to-point network underlying the claimed broadcast channel. Rufino's deficiency in this regard may be clearly understood with reference to the claim feature of "having a third computer not already connected to said first computer respond to said connection port search message." That is, because Rufino's underlying network is a physical bus in which all computers are directly connected to one another, there exists no "third computer not already connected to said first computer," as recited in independent claim 6. Nor are Rufino's messaging techniques extensible to m-regular networks in which m is at least 3.

Moreover, Petitioner fundamentally misunderstands or misleadingly mischaracterizes the disclosures of Shoubridge, Denes, Rufino, and Todd in its attempt to cobble together its Frankenstein's Monster obviousness ground. For example, Denes would not have been chosen to modify Shoubridge because, contrary to Petitioner's assertion and as admitted by Petitioner's expert, Shoubridge does not disclose a network "where nodes are being added and dropped." See Petition at 31; *see also* Ex. 2010, 11/29/16 Karger Tr. at 51:7-52:14. In another example, Denes specifically identifies in Theorem 2 that its equation

ET⁻¹ (which Petitioner cites for teaching the repair of disconnecting of a node from an m-regular network) applies only if that node and all m of its edges are in the graph; hence, the Denes equation ET⁻¹ **does not apply** to the type of involuntary disconnections at issue in claim 6, which is directed at healing a disconnection of a first computer from a second computer. Denes at 13. In still another example, Rufino's messaging technique is only valid in the m=2 scenario of a token bus network, so its assertion that a POSITA would have modified the combination of Shoubridge and Denes with Rufino's messaging technique is both unfounded and incorrect. See Petition at 33. In yet another example, Petitioner's reliance on Todd to "expand the messaging techniques from a 2-regular topology to a 4-regular topology" fails because Todd's modified token ring network is (1) fundamentally incompatible with Rufino's token bus network and (2) does not use messaging of any sort—let alone Rufino's messaging techniques—to deal with the issue of failed nodes. See Petition at 59–60.

Finally, Petitioner did not address the abundant secondary considerations that demonstrate that the challenged claims are not obvious. This is another basis for finding at least challenged claims, patentable because Petitioner provides an incomplete obviousness analysis. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966); *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

For these reasons, and those stated below, Petitioner's obviousness challenges to the claims of the '147 Patent should be denied and all claims confirmed patentable.

II. FACTS

A. SWAN Development

The idea to create the patented invention described in the '147 Patent first arose in 1996 as Boeing was acquiring airplane companies outside of the Puget Sound region of Washington. Ex. 2006, ("Bourassa Decl.") at ¶ 4. The systems that Boeing used at that time only allowed for a two-person collaboration with a one-to-one connection. Bourassa Decl. at ¶¶ 3, 4. Accordingly, Virgil Bourassa and Fred Holt—employees working in the Mathematics & Engineering Analysis Department at Boeing and eventual co-inventors of the SWAN Patents—were asked to create a system that would allow peer-to-peer communications for at least three participants across the country. Bourassa Decl. at ¶¶ 3, 4, 7. However, they saw a need to create a more comprehensive system that would allow for the reliable communication between a significantly higher number of participants. *Id.*

Although the inventors initially believed this would be a task that would take no more than three weeks, this project unexpectedly turned into a three-year effort. Bourassa Decl. at ¶¶ 8-39. Throughout those three years, the inventors had nearly thirty different epiphanies that led to the creation of a successful system that was

able to provide peer-to-peer communications among computer processes across the world, all while maintaining high reliability and low latency. *Id.* After extensive testing and realizations, the inventors had built a working model of SWAN by August 30, 1999, and had fully implemented SWAN into [REDACTED] an internal CAD program at Boeing, by September 16, 1999. *Id.*

SWAN's success and usefulness were made apparent when Boeing launched an initiative in 1999 to search for the best internal technologies that had commercial potential. Bourassa Decl. at ¶ 40. SWAN was selected as one of these technologies with commercial potential and quickly rose to the top of the portfolio. *Id.* The SWAN system yielded the SWAN Patents which were filed on the same day, but are unrelated and directed to distinct aspects.

B. The '147 Patent

The '147 Patent is one of several patents obtained by Boeing directed to its novel computer network technology. More particularly, the '147 Patent describes methods for disconnecting a node (either in a planned or unplanned manner) from a broadcast channel that overlays a point-to-point network where each node, or participant, is connected to some—but not all—neighboring participants. For example, Fig. 2 of the '147 Patent, reproduced below, shows a network of twenty participants, where each participant is connected to four other participants:

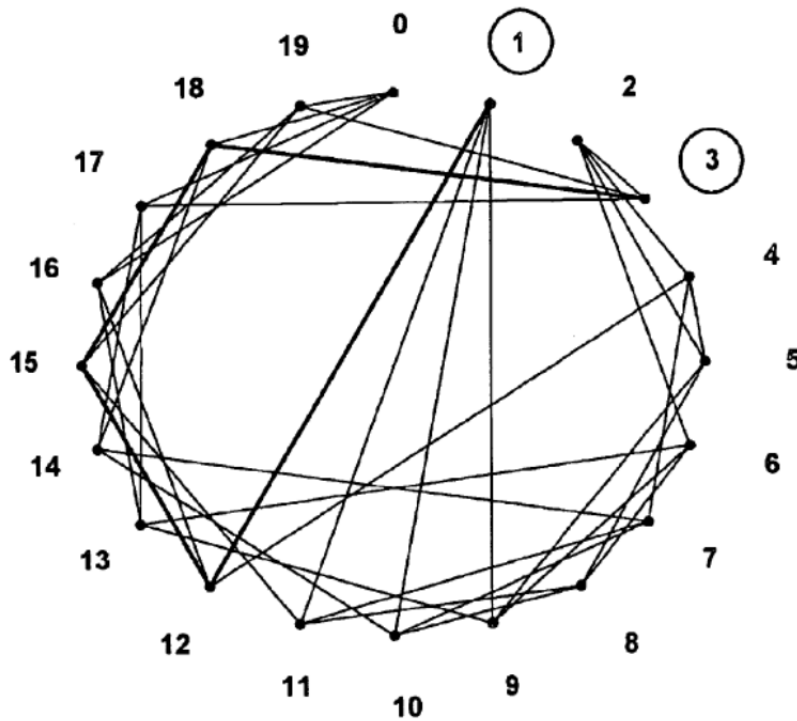


Fig. 2

Id. at Fig. 2. Such a network arrangement, where each node in the network, is connected to the same number of other nodes, is known as an ***m-regular network***.

Id. at 4:40-41. That is, a network is *m*-regular when each node is connected to *m* other nodes in a steady state, and a computer would become disconnected from the broadcast channel only if all *m* of the connections to its neighbouring nodes fail.

Id. at 4:41-44. In Fig. 2 above, $m=4$ because each node is connected to four other nodes of the network. A network is said to be ***m-connected*** when it would take a failure of *m* computers to divide the graph into disjoint sub-graphs, i.e., separate broadcast channels. *Id.* at 4:44-47. The '147 Patent also describes a computer

network in which the number of network participants, N , (in Fig. 2, this is twenty) is greater than the number of connections m to each participant (in Fig. 2, this is four). *Id.* at Fig. 2. This network topology, where no node is connected to every other node, is known as an ***incomplete graph***.

The incomplete graph topology relies on participants to disseminate information to other participants. *See id.* at 1:60-2:15. As described in the '147 Patent, to broadcast a message, the originating computer sends the message to each of its neighbors using the overlay network. *Id.* at 7:30-35. Each computer that receives the message then sends the message to its neighbors using the network. *Id.* at 7:36-48. In this way, the message is propagated to each computer of the overlay network using the underlying network, thus broadcasting the message to each computer over a logical broadcast channel.

The invention claimed in the '147 Patent focuses on processes for removing nodes, or participants, from an existing network or healing disconnections between pairs of nodes. A computer connected to the network can leave in either a planned or unplanned manner. *Id.* at 8:66–67. The challenged claims at issue relate to unplanned disconnections. *See* Preliminary Patent Owner Response at 6-7 for discussion of planned disconnection. For example when a computer leaves the network in an unplanned manner—such as in the event of a power failure—its neighbors discover the computer's absence when each unsuccessfully attempts to

send a message to the disconnected computer. *Id.* at 9:27–31. When a computer detects that one of its neighbors is disconnected, it broadcasts a port connection request over the broadcast channel indicating that it has an open port that needs a connection and identifying the call-in number for the port. *Id.* at 9:33–38. When the port connection request is received at another computer connected to the broadcast channel that has an open port, the other computer contacts the requesting computer to establish a connection. *Id.* at 9:38–42.

Fig. 5B of the '147 Patent, reproduced below, illustrates the procedure for healing a disconnection of a computer in an unplanned manner. In particular, Fig. 5B shows an exemplary procedure for computer **H**'s neighboring computers to establish new connections when they discover that computer **H** has disconnected in an unplanned manner (*e.g.* without sending a list of its neighboring computers). *Id.* at 9:42–45. When each of computer **H**'s neighbors discovers that **H** has disconnected, it broadcasts a port connection request indicating that it needs to fill an empty port. *Id.* at 9:45–48. In the example shown in Fig. 5B, the dashed lines indicate that computers **F** and **I** respond to each other's request and form a connection, and computers **A** and **E** respond to each other's request and form a connection. *Id.* at 9:48–51.

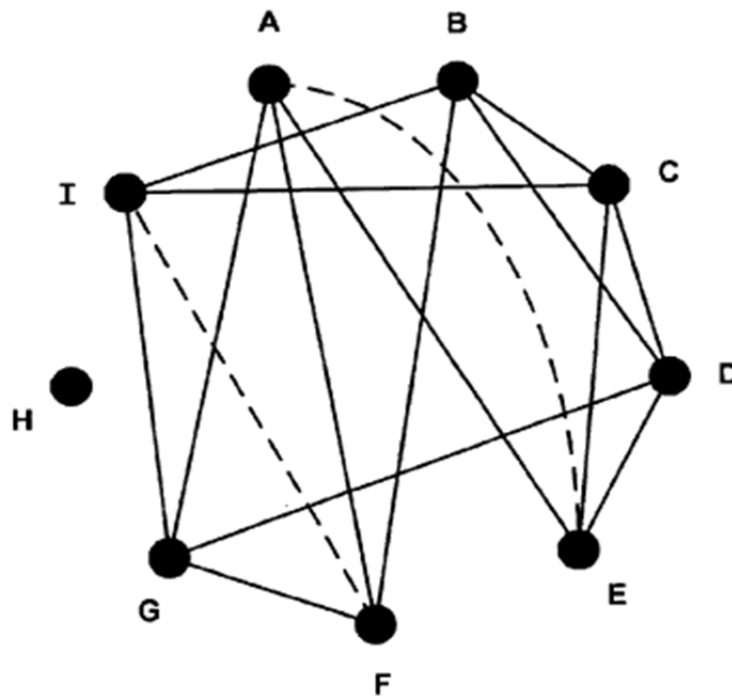


Fig. 5B

‘147 Patent, Fig. 5B.

III. CLAIMS AT ISSUE

C. Claim 6

6. [6a:] A method for healing a disconnection of a first computer from a second computer, the computers being connected to a broadcast channel, said broadcast channel being an m-regular graph where m is at least 3, the method comprising:

[6b:] attempting to send a message from the first computer to the second computer; and

[6c:] when the attempt to send the message is unsuccessful, broadcasting from the first computer a connection port search message indicating that the first computer needs a connection; and

[6d:] having a third computer not already connected to said first computer respond to said connection port search message in a manner as to maintain an m-regular graph.

D. Claim 7

7. The method of claim 6 including:

when a third computer receives the connection port search message and the third computer also needs a connection, sending a message from the third computer to the first computer proposing that the first computer and third computer connect.

E. Claim 8

8. The method of claim 7 including:

when the first computer receives the message proposing that the first computer and third computer connect, sending from the first computer to the third computer a message indicating that the first computer accepts the proposal to connect the first computer to the third computer.

F. Claim 9

9. The method of claim 6 wherein each computer connected to the broadcast channel is connected to at least three other computers.

G. Claim 10

10. The method of claim 6 wherein the broadcasting includes sending the message to each computer to which the first computer is connected.

IV. CLAIM CONSTRUCTION

The specification and claims of the '147 Patent utilize a number of terms that serve to reinforce the operational context claimed invention. Petitioner improperly ignores the context provided by the '147 Patent and to read the claims in general, and certain claim terms in particular, over broadly in order to read its proffered references against the patent claims. *See Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015). For the foregoing reasons, Patent Owner respectfully requests that the Board adopt Patent Owner's proposed construction of the following claim terms, which place the claims in their proper context "in light of the specifications and teachings in the underlying patent." *In re Suitco Surface, Inc.*, 603 F.3d 1255, 1259–60 (Fed. Cir. 2010) (citation omitted).

A. "healing a disconnection of a first computer from a second computer" (All Challenged Claims)

The term "healing a disconnection of a first computer from a second computer" is properly construed as "connecting a first computer to another computer in order to maintain an m-regular network after the second computer has involuntarily been disconnected." In the context of the '147 Patent, the term "healing a disconnection" refers to the situation where a computer has been disconnected involuntarily, or in an unplanned manner, from an m-regular network. *See, e.g.*, Ex. 1002 (Vol. 3) at p.690, '147 Patent File History ("Claims [6-10] relate to the situation where a computer is involuntarily disconnected from

the M-regular graph computer network. Claim [6] has been amended to indicate that the healing process of the computer network is performed in a way such as to maintain the M-regular graph nature of the computer network.”); Ex. 2003, (“Goodrich Decl.”) ¶¶ 47-49.

B. “broadcast channel” (All Challenged Claims)

The term “broadcast channel” is properly construed as a “logical channel that overlays an underlying point-to-point communications network.” ‘147 Patent at 4:17-21 (defining a “broadcast channel” as a logical network “implemented using an underlying network system that sends messages on a point-to-point basis”); Goodrich Decl. ¶¶ 50-52.

C. “connected/connection” (All Challenged Claims)

The term “connection” is properly construed as “an edge between two application programs connected to a logical broadcast channel that overlays an underlying network” and “connected” as “having a connection.” In the context of the ‘147 Patent, the term “connected/connection” refers to the edges connecting the participants, or “application programs.” See, e.g., ‘147 Patent 4:51-55 (“[E]ach of the edges represents an “edge” connection between two computers of the broadcast channel.”); Goodrich Decl. ¶¶ 53-56.

V. PETITIONER'S EXPERT DID NOT PROVIDE A PROPER OBVIOUSNESS ANALYSIS OPINION

Dr. Karger failed to provide a proper validity analysis because he did not consider any secondary considerations. Dr. Karger failed to consider any secondary considerations in forming his obviousness analysis. Secondary considerations are a part of obviousness analysis not an afterthought to be thrown in later as Dr. Karger apparently intends to do. Ex. 1003 ("Karger Decl.") at ¶ 359 ("I may be asked to review such evidence and to formulate an opinion."); *Intri-Plex Techs., Inc. v. Saint-Gobain Performance Plastics Rencol Ltd.*, IPR2014-00309, Paper No. 83 at 35 (P.T.A.B. Mar. 23 2014) (citing *Leo Pharm. Prods., Ltd. v. Rea*, 726 F.3d 1346, 1358 (Fed. Cir. 2013)). Nothing prevented Petitioner from discussing secondary considerations as Petitioner had knowledge of the development of the '147 Patent and its license in the same field as Petitioner as the result of the co-pending litigation. As such, Petitioner's expert failed to provide a complete obviousness analysis as required by black letter law.

VI. SHOUBRIDGE IN VIEW OF DENES, RUFINIO AND TODD DO NOT RENDER OBVIOUS THE CHALLENGED CLAIMS UNDER 35 U.S.C. §103(A)

On September 12, 2016, based on the record before it, the Board instituted *inter partes* review of the '147 Patent finding that Petitioner has raised a reasonable likelihood that Claims 6-10 are unpatentable over Shoubridge in view of Denes, Rufino, and Todd under 35 U.S.C. § 103(a). For at least the following

reasons, Patent Owner respectfully requests that the Board find the challenged claims not rendered obvious over Shoubridge in view of Denes, Rufino, and Todd.

A. Shoubridge in view of Denes, Rufino, and Todd does not disclose Claim Element 6(a)(1): “A method for healing a disconnection of a first computer from a second computer, the computers being connected to a broadcast channel, said broadcast channel being an m-regular graph where m is at least 3, the method comprising”

For this claim element, Petitioner relies solely on Shoubridge and Denes. Petition at 29-30; Ex. 1003 at ¶161 (relying only on Shoubridge and Denes). In particular, Petitioner makes two arguments: (1) Shoubridge teaches involuntary disconnection by a computer connected to a broadcast channel on an m-regular graph network; and (2) Denes teaches disconnecting a node from a m-regular graph network, when a node is removed. Petition at 29-30; Ex. 1003 at ¶¶128-131, 161-162. However, neither Shoubridge nor Denes, nor their combination teach the claimed element at least because nodes are never dropped or added in Shoubridge's fixed-node simulated network, and Denes' algorithm does not apply to situations in which a node leaves a graph abruptly.

1. The Preamble is Limiting

As a preliminary matter, the term “a method for healing a disconnection of a first computer from a second computer, the computers being connected to a broadcast channel, said broadcast channel being an m-regular graph where m is at least 3” is limiting. See Decision to Institute at 9 (determining the preamble of

claim 6 is limiting). Given that the Board determined that the preamble of claim 6 is limiting in its Decision on Institution, it cannot now change course. See *SAS Institute, Inc. v. Complementsoft, LLC*, 825 F.3d 1341, 1351 (Fed. Cir. 2016) (holding that an agency may not change theories in midstream without giving reasonable notice of the change and the opportunity to present argument under the new theory). Indeed, as demonstrated below, the Preamble of independent claim 6 is limiting.

The question of “[w]hether to treat a preamble as a claim limitation is determined on the facts of each case in light of the claim as a whole and the invention described in the patent.” *Storage Tech. Corp. v. Cisco Sys., Inc.*, 329 F.3d 823, 831 (Fed. Cir. 2003). The Federal Circuit further dictates that a preamble limits the invention if it recites essential structure or steps, or if it is necessary to give life, meaning, and vitality to the claim. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305-06 (Fed. Cir. 1999) (citations omitted). A determining factor as to whether the preamble breathes life into the meaning of the claims is whether the preamble is referred to in the body of the claim. *Id.* at 1306.

In the context of the ‘147 Patent, the term “a method for healing a disconnection of a first computer from a second computer, the computers being connected to a broadcast channel, said broadcast channel being an m-regular graph

where m is at least 3” is limiting because it “breathes life and meaning to the claim” as the terms “first computer,” “second computer,” and “ m -regular graph” are all referred to in the body of the claim. *In re Wertheim*, 541 F.2d 257, 269-70 (C.C.P.A. 1976). The fact that the preamble provides antecedent basis for these terms indicates a reliance on both the preamble and claim body to define the claimed invention. *Bell Commc'ns Research, Inc. v. Vitalink Commc'ns Corp.*, 55 F.3d 615, 620 (Fed. Cir. 1995) (“[W]hen the claim drafter chooses to use both the preamble and the body to define the subject matter of the claimed invention, the invention so defined, and not some other, is the one the patent protects.”) (citations omitted).

Moreover, the phrases “healing a disconnection” and “said broadcast channel being an m -regular graph where m is at least 3” were added during prosecution to clarify the distinctions of the ‘147 Patent over the prior art. *See Ex. 1025* at 5 (amending claim 16 (now claim 6) to include these features); 11–12 (distinguishing the cited references on the basis that they do not teach a broadcast channel forming an m -regular graph with $m=3$); and 13 (distinguishing over the cited references by adding the “healing a disconnection” feature). The Federal Circuit dictates that such amendments indicate that the added claim language is material and, therefore, limiting. *See Bass Pro Trademarks, LLC v. Cabela's, Inc.*, 485 F. 3d 1364, 1368–69 (Fed. Cir. 2007) (finding that amending the preamble to

include a claim term and stressing the importance of the claim term during prosecution indicates that the term is a material limitation of the claim).

Accordingly, the phrase “a method for healing a disconnection of a first computer from a second computer, the computers being connected to a broadcast channel, said broadcast channel being an m -regular graph where m is at least 3” as recited in independent claim 6 is limiting.

2. Shoubridge and Denes fail to disclose a “a method for healing a disconnection of a first computer from a second computer”

As discussed, above, the term “healing a disconnection of a first computer from a second computer” is properly construed as “connecting a first computer to a third computer in order to maintain an m -regular network after the second computer has involuntarily been disconnected.” See § IV.A, *supra* (citing ‘147 Patent File History (“Claims [6-10] relate to the situation where a computer is involuntarily disconnected from the M -regular graph computer network. Claim [6] has been amended to indicate that the healing process of the computer network is performed in a way such as to maintain the M -regular graph nature of the computer network.”)).

Contrary to Petitioner's assertion, Shoubridge does not disclose “a dynamic network in which... computers... enter and leave a non-complete m -regular

network.” Petition at 29.² In the Shoubridge system, new nodes are never added, and existing nodes are never removed. *Id.* at 1382 (“*G* has essentially fixed topology with links always existing between nodes and their respective neighbors.”). The only values that change are link costs. *Id.* Notably, Dr. Karger cites to Shoubridge’s general statements regarding links failing or being congested, but cites no evidence that Shoubridge actually discloses a computer (or node) leaving the network in either voluntary or involuntary fashion. See Ex. 1003 at ¶¶128-131, 162. That is because Shoubridge’s simulation was designed not to allow disconnections because Dr. Shoubridge wanted to simplify the simulation to require no topology control. Shoubridge at 1382 (“This simplified approach requires no topology control **as a particular node’s at any given time always belong to the same subset of nodes as originally defined in *G*.**”) (emphasis added).

² Shoubridge teaches a simulation model with an adaptive routing algorithm at the network level. Shoubridge at 1382–83. As explained in Shoubridge, there are no computers other than the one performing the simulation. *Id.* While not explicitly identified in Petition, Petitioner presumably identifies the simulated nodes as computers, despite the fact that they are not actual computers.

In regards to Denes, Petitioner only argues that Denes discloses “a general method of maintaining an m-regular graph when a node is removed from the network.” Petition at 29–32. In particular, Petitioner identifies that p_1 would be “first computer” and p would be “second computer.” Petition at 31. Denes, however, does not address the situation where a node abruptly leaves the network, and presents a situation in which there is no node p or edges to any neighbors (*e.g.* p_1). Indeed, the formula cited by Petitioner represents a transformation for dropping a node where the leaving node is currently present in the network, not “healing a disconnection” where a node or edge has left the network abruptly. See Denes at 366 (“ ET^{-1} ” denotes the removal of a node from the graph.”); Goodrich Decl. ¶¶65-75. By the definition, Denes specifically requires “ p ” and all k (which Petitioner maps to m) of its edges to be a member of graph $\Gamma_{n,k}$ prior to application of the transformation algorithm. See Denes at 366 (“The ET^{-1} transformation can be applied to a graph $\Gamma_{n,k} = (P, K) \in PR_k$ **if and only if** there exists a T -characterized vertex $p \in \Gamma_{n,k}$.”) (emphasis added); Goodrich Decl. ¶¶66-73.

In other words, Denes does not contemplate a situation where “healing a disconnection” is necessary or required because the transformation algorithm in Denes **only applies** when the node and all its edges are present and the node wants to leave, and not, for example, in the situation where a node has left the network and there are open edges. Goodrich Decl. ¶¶72-73. That is, the ET^{-1}

transformation requires explicit knowledge of the leaving vertex, p , and its k incident edges. For without p , and knowledge of all k of its neighbors in the graph, the ET^{-1} equation makes no sense. Thus, the equation for the ET^{-1} transformation can apply only to the case of an orderly announced disconnection from the network, not to the case, as required in claims 6–10, of a healing of a disconnection of a first computer from a second computer. Goodrich Decl. ¶¶73, 101-102.

To perform a healing of a disconnection of a first computer from a second computer, a POSITA would understand that the second computer is no longer connected to the first computer after limitation 6c of Claim 6, because if the second computer were still connected to the first computer, the first computer would not need a connection. Moreover, given the temporal language of Claim 6, a POSITA would understand that the limitations of Claim 6 occur in temporal order, first 6b (attempting to send a message from the first computer to the second computer), then 6c (**when** the attempt to send the message is unsuccessful, broadcasting from the first computer a connection port search message indicating that the first computer needs a connection), and then 6d (having a third computer not already connected to said first computer **respond to said connection port search message** in a manner as to maintain an m -regular graph). See Goodrich Decl. ¶103.

Therefore, limitation 6d requires a network transformation in a circumstance in which the second computer is no longer part of the network; hence, the equation

for the ET^{-1} transformation cannot be used to satisfy limitation 6d. *See* Goodrich Decl. ¶103. Notably, Petitioner does not argue that Denes teaches a situation where a node (or computer) abruptly leaves. *Compare* Ex. 1003 at ¶163 (discussing Denes as disclosing disconnecting a node) with ¶¶ 165-166 (discussing that Rufino discloses stations abruptly leaving the token bus network); *see also* *See* Goodrich Decl. ¶69. As such, Denes fails to disclose “a method for healing a disconnection.”

Even more fundamentally, however, Denes does **not** teach “a general method of maintaining an m-regular graph when a node is removed from a network,” as asserted in the Petition. Petition at 29 (citing Karger ¶¶ 161–62)³; *See* Goodrich Decl. ¶¶66-69. In particular, Dr. Goodrich explains that Denes’ Theorem 3 means that the ET^{-1} transformation does not have general applicability because “[f]or every even $k \geq 4$ there is a graph $\Gamma_{n,k} \in PR_k$ which has no vertex p which is T-characterized.” Denes at 366.⁴ That is, there always exist graphs in which the ET^{-1} transformation cannot be practiced and discloses such a graph in Figure 2, which has been reproduced below. Goodrich Decl. ¶ 72.

³ ¶¶ 161–162 of the Karger Declaration (Ex. 1003) do not support this assertion.

⁴ Denes did not consider the case of $m=3$ because his paper was “only concerned with undirected, even-order regular graphs.” Denes at 365.

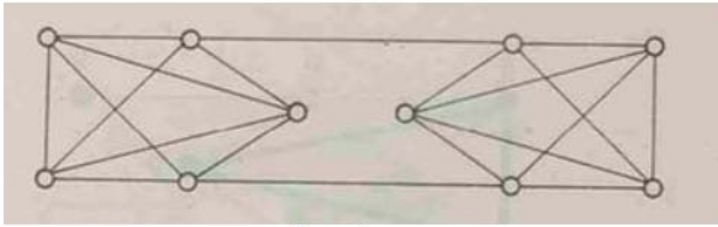
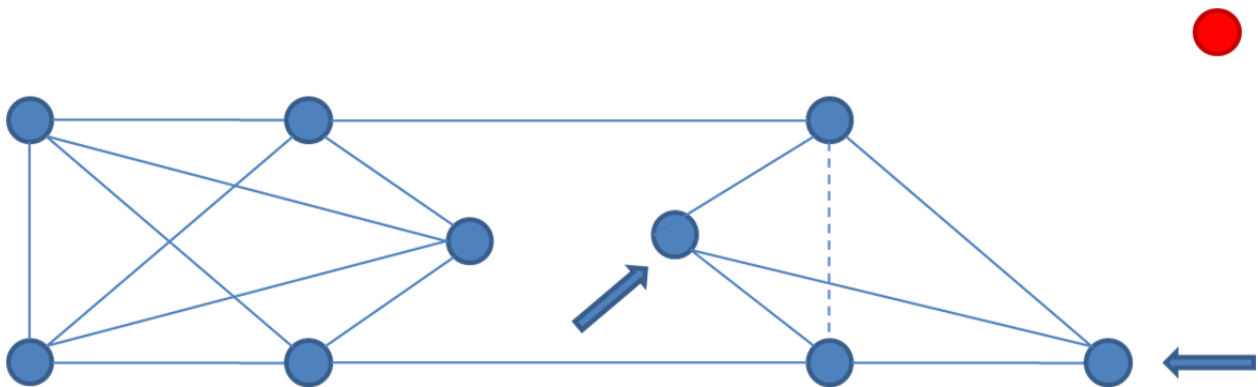


Figure 2

We will demonstrate that $\Gamma_{n,k}$ constructed in this way has does not have a T-characterized vertex.

With reference to Denes' Figure 2, it can be appreciated that the removal of a node (e.g., the upper-right most node in the graph) cannot be transformed in a way that maintains the graph as k -regular by applying the ET^{-1} transformation. Goodrich Decl. ¶¶ 71-72. Indeed, while one new edge (indicated with dotted lines) may be added to maintain k edges for two of the disconnected node's previous neighbors ($k=4$ in this example), two nodes (indicated with arrows in the figure below) remain with fewer than k connections and no nodes to which they can connect in order to return the graph to a k -regular state:



On the other hand, the '147 Patent discloses a technique for dealing with this very problem, which is referred to as "the 'neighbors with empty ports' condition."

'147 Patent at 9:52–57; Goodrich Decl. ¶ 75. Briefly, this technique requires the

first computer to recognize the condition to send a “condition check message to the other neighbor[, which] includes a list of the neighbors of the sending computer” to a receiving computer. ‘147 Patent at 9:66–10:4. The receiving computer then sends “a condition repair request to one of the neighbors of the sending computer which is not already a neighbor of the receiving computer[, which then] disconnects from one of its neighbors... and connects to the computer that sent the condition repair request.” *Id.* at 10:7–14. Finally, the two computers still in need of a connection connect to each other (if they are not already neighbors) or, if they are neighbors, “repeat the condition repair process until two non0neighbors are in need of connection.” *Id.* at 10:16–24; *see also* Goodrich Decl. ¶ 75.

Accordingly Shoubridge and Denes, alone or in combination fail to disclose “healing a disconnection.” Goodrich Decl. ¶¶ 74,101-102. Moreover, there is no motivation to combine the two references as further discussed below. Goodrich Decl. ¶¶ 143-152. Neither Petitioner nor its expert provide any evidence that these missing elements are taught by Rufino or Todd. *See* Ex. 1003 at ¶¶ 161–163, 235 (relying on Todd only to disclose the element “where m is greater than 3”); Goodrich Decl. ¶¶ 103-107. Because Petitioner has failed to show that Shoubridge in view of Denes, Rufino, and Todd discloses the claimed element, the Petitioner has failed to demonstrate that claim 6 is obvious. Claims 7–10 are not invalid as obvious for at least the same reasons.

3. Shoubridge fails to disclose “computers being connected to a broadcast channel, said broadcast channel being an m-regular graph where m is at least 3”

Petitioner relies solely on Shoubridge as allegedly teaching “a broadcast channel, said broadcast channel forming an m-regular graph where m is at least 3.” See Petition at 29 (“Shoubridge discloses a dynamic network including a first computer and a second computer being connected to a broadcast channel, said broadcast channel forming an m- m-regular graph where m is at least 3.”). Neither Denes nor any other reference is alleged to correspond to this claim element. See *id.* However, Shoubridge fails to show or suggest “a broadcast channel” as the term is understood in the context of the ‘147 Patent. See § IV.B, *supra*. As defined in the ‘147 Patent, a broadcast channel is “implemented using an underlying network system (e.g., the Internet) that allows each computer connected to the underlying network system to send messages to each other connected computer using each computer’s address.” ‘147 Patent at 4:17–21. In other words, “a broadcast channel **overlays** a point-to-point communications network.” *Id.* at 4:5–7 (emphasis added).

Petitioner fails to identify any teaching in Shoubridge that corresponds to a “broadcast channel” as the term is used in the context of the ‘147 Patent. Goodrich Decl. ¶¶ 95-97. Indeed, neither Petitioners nor Petitioners’ expert, Dr. Karger, provides any discussion whatsoever regarding how Shoubridge allegedly teaches a

broadcast channel. Rather, Petitioner ignores the term “broadcast channel” and focuses solely on whether Shoubridge discloses an m -regular graph where m is at least 3. See Petition at 20 (citing Shoubridge at 1383, ¶ 2 (“A 64 node network with connectivity of degree 4 is modeled as G . The network is a large regular graph forming a manhattan grid network that has been wrapped around itself as a torus to avoid edge effects.”)). Because Petitioners fail to give any weight to the term “broadcast channel” it has not met its burden to “specify where each element of the claim is found in the prior art patents or printed publications relied upon.” See 37 C.F.R. § 42.104(b)(4).

Moreover, Shoubridge does not teach a broadcast channel because it does not disclose an overlay network. Goodrich Decl. ¶ 98. Petitioner's expert confirmed that the broadcast channel of the '147 Patent is indeed an overlay, that Shoubridge does not disclose an overlay network, and that Shoubridge's disclosure is limited to network layer communications. Ex. 2010, 11/29/16 Karger Tr. 20:17-23 (admitting that the broadcast channel of the '147 Patent is an overlay); *id.* at 48:17-23 (admitting that Shoubridge does not teach an overlay network); *see also* Ex. 2011, 7/6/16 Karger Tr. at 102:22-103:4, Ex. 2012, 7/7/16 Karger Tr. at 81:7-19. Nor does Petitioner address the fact that the computers connected to the broadcast channel recited in the '147 Patent form an **application layer** overlay network. Goodrich Decl. ¶¶ 64, 89, 94. These omissions are fatal to the Petition.

Petitioner failed to argue that it would be obvious to modify Shoubridge to apply to the application layer and to be an overlay network. Indeed, it would not have been obvious to apply Shoubridge over the Internet because doing so would require rewriting and modifying the Internet Protocol to apply Shoubridge's routing algorithm, nor addressing the fact that applying Shoubridge's routing algorithm to the Internet is impracticable as flooding does not work in large networks. See Goodrich Decl. ¶¶ 99–100; Ex. 2013, Vu at 624-626, Figs. 3, 4 and 5; Ex. 1005 (“Shoubridge”) at 1381 (“flooding is very wasteful of network resources”), at 1384 (“Unfortunately, flooding results in low network utilization and therefore better routing strategies need to be sought.”). In other words, it's not a simple design choice because it requires an understanding of the operation of every layer of the OSI model and the use of standards. Goodrich Decl. ¶¶ 99–100. Petitioner's argument that Shoubridge is not limited to the networking layer of the OSI model is to ignore the purpose of Shoubridge. See Goodrich Decl. ¶¶ 64, 99–100.

4. Rufino Also Fails to Disclose a Broadcast Channel.

Although not explicitly relied upon for claim element, Petitioner sometimes refers to Rufino as disclosing sending messages on a broadcast channel. See Petition at 32 (“[T]he station broadcasts a connection port search message on the broadcast channel...”); *id.* at 33 (“[T]he station sends a who follows query

(connection port search message) on the broadcast channel..."); *id.* at 36 ("Rufino discloses broadcasting messages on the broadcast channel to maintain a regular graph..."). The Petition does not identify which aspect of Rufino's disclosure allegedly corresponds to the "broadcast channel." As explained below, neither Rufino's physical bus or logical token ring are broadcast channels as the term is defined in the '147 Patent. *See* Goodrich Decl. ¶¶ 104-107.

The Rufino reference is a "study on the Inaccessibility Characteristics of ISO 8802/4 Token-Bus LANs." Rufino at 1. Token-Bus Local Area Networks ("Token-Bus LANs") are well-defined systems that have been standardized under the IEEE 802.4 specification (which was "Adopted by the ISO/IEC and redesignated as ISO/IEC 8802-4"). Ex. 2014 at 1; Ex. 2007, ("Tanenbaum") at 275, 287. A Token-Bus LAN has two components: a physical "linear or tree-shaped cable onto which the stations are attached;" and a logical ring "with each station knowing the address of the station to its 'left' and 'right.'" Tanenbaum at 287; Goodrich Decl. ¶¶ 35-39; *see also* Rufino at 9 ("Access control is performed by a token passing protocol, which establishes a logical ring over the physical bus."). Fig. 4-25 of the Tanenbaum reference illustrates these physical and logical components of the token-bus network:

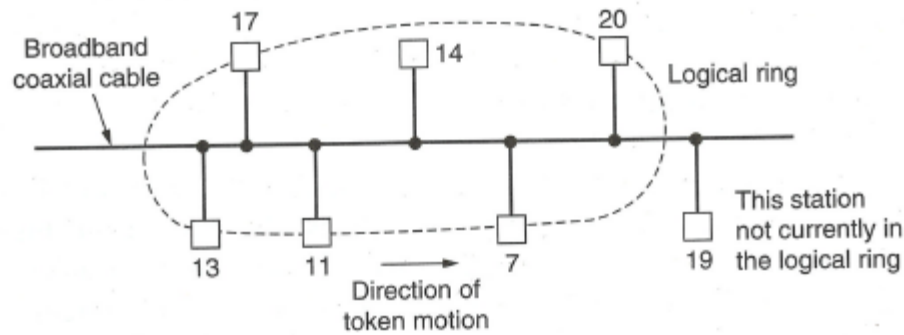


Fig. 4-25. A token bus.

In a token-bus network, a special data frame, called a token, “propagates around the logical ring, with only the token holder being permitted to transmit frames. Since only one station at a time holds the token, collisions do not occur” Tanenbaum at 288.

Importantly, because the physical bus is a broadcast medium, each station on the bus receives every frame and discards those not addressed to it. *Id.* However, despite the physical bus being a “broadcast medium,” it is not a “broadcast channel” as the term is defined in the ‘147 Patent. As discussed above, is properly construed as a “logical channel that overlays an underlying point-to-point communications network.” See § IV.B, *supra*. Rufino’s physical bus is neither a logical channel, nor does it overlay any communications network, let alone an underlying point-to-point communications network because it simply provides physical communications links between computers. Goodrich Decl. ¶¶ 81, 105. Indeed, as discussed below Rufino does not disclose “a third computer not already

connected to said first computer” because every station in a token bus LAN is directly connected to every other station on the physical bus, regardless of whether they are neighbors in the logical token ring. *See* § VI.B, *infra*.

Moreover, the physical bus is not the 2-regular graph referred to in the Petition, which is alleged to be Rufino's “logical token ring.” *See, e.g.*, Petition at 34. However, the logical token ring may not be considered a broadcast channel because it neither supports broadcast messages nor overlays an underlying point-to-point network. Indeed, the only message in the token bus network protocol that could be considered to be sent on the logical token ring is the “token frame specifically addressed to its logical neighbor in the ring.” Tanenbaum at 288; *see also* Goodrich Decl. ¶¶ 106-107. Every other frame used in the token-bus network protocol is either sent directly to another station, or sent to a group of stations, on the physical bus. *See* Ex. 2014 at 30 (“IEEE 802.4 / ISO 8802-4 Standard”) (“The *destination_address* parameter specifies either an individual or a group MAC-entity address.”); *see also* Ex. 2010, 11/29/16 Karger Tr. 68:6-9 (“Q. Is the “who follows” query sent on the physical bus? A. Yes. There is a “who follows” query that is transmitted on the physical bus.”). Nor does the logical token ring overlay an underlying point-to-point communications network as required of the broadcast channel of the ‘147 Patent. Goodrich Decl. ¶¶ 106-107. Instead, the underlying network in Rufino's token bus LAN is a broadcast medium—the physical bus.

Tanenbaum at 287; Rufino at 9 (“Access control is performed by a token passing protocol, which establishes a logical ring over the physical bus.”).

It may be appreciated, therefore, that Rufino's token bus LAN is in fact the precise antithesis of the broadcast channel of the '147 Patent. That is, rather than being a “logical [broadcast] channel that overlays an underlying point-to-point communications network,” Rufino's logical token ring is a logical point-to-point communications channel that overlays an underlying broadcast communications medium. As described in detail below, the topology of the token bus LAN discussed in Rufino, which provides a 2-regular logical ring over a physical bus, illustrates why Rufino's messaging technique is not extensible to m-regular networks in which $m > 2$. See § VII.B, *infra*.

B. Shoubridge in view of Denes, Rufino, and Todd does not disclose Claim Element 6(d): “having a third computer not already connected to said first computer respond to said connection port search message in a manner as to maintain an m-regular graph.”

Petitioner relies on Denes and Rufino for this claim element. See Petition at 34–35; Ex. 1003 at ¶172. Petitioner's argument that “Denes discloses having a third node not already connected to the first node respond in a manner as to maintain an m-regular graph” is facially false because Denes does not disclose any messaging that would permit “a third node not already connected to the first node **respond**.” See Ex. 2010, 11/29/16 Karger Tr. 55:13-16 (“Q. Does Denes disclose sending messages between nodes of graphs? A. I don't recall him doing so. I

doubt it.”). Moreover, as discussed above, Denes’ ET^{-1} transformation only applies in those circumstances where nodes leave in an orderly manner. See § VI.A.3, *supra*; see also Denes at 366 (“The ET^{-1} transformation can be applied to a graph $\Gamma_{n,k} = (P,K) \in PR_k$ **if and only if** there exists a T-characterized vertex $p \in \Gamma_{n,k}$.”) (emphasis added); Goodrich Decl. ¶¶ 66-69.

Rufino does not cure Denes’ deficiencies at least because it fails to disclose “having a third computer not already connected to said first computer respond to said connection port search message.” Goodrich Decl. ¶¶ 121-124. However, given the physical and logical topologies of Rufino’s token-bus LAN, there is no circumstance in which a “third computer not already connected to said first computer respond[s] to said connection port search message:”

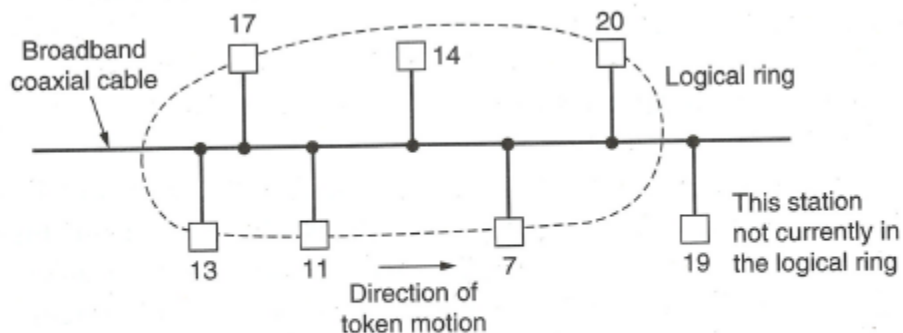


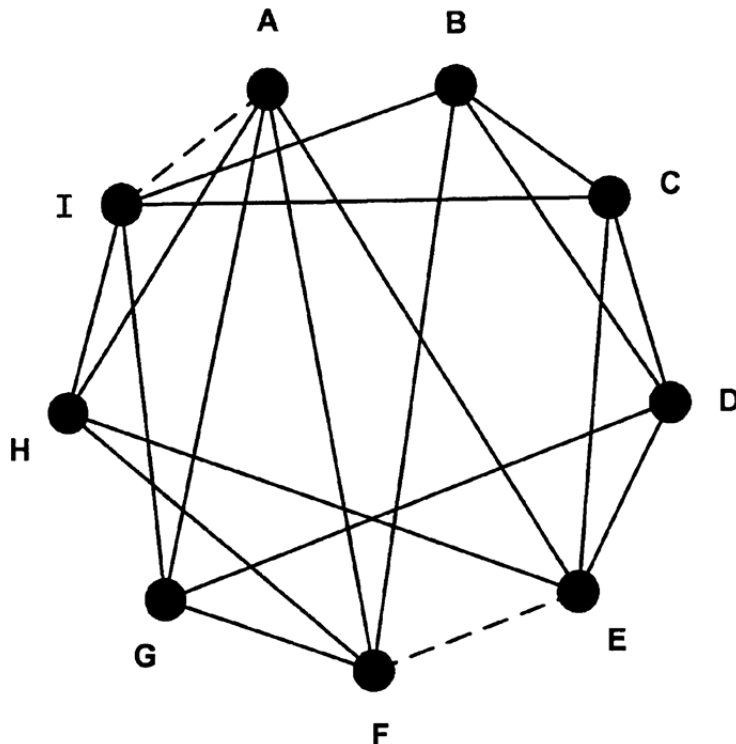
Fig. 4-25. A token bus.

That is, because each station on the physical bus is directly connected to every other station on the physical bus, there is no circumstance in which the station that responds to a `who_follows` query was not already connected to the station that sent

the who_follows query—even if those stations (e.g., station 19 in Fig. 4-25, reproduced above) were not neighbors in the logical token ring. Goodrich Decl.

¶¶ 121-122.

In contrast, because of the nature of the point-to-point nature of the communications network that underlies the claimed broadcast channel of the '147 Patent, there exist computers connected to the broadcast channel (and which can, therefore, respond to a “connection port search message”) that are not, themselves, connected. For example, in Fig. 1 of the '147 Patent, which “illustrates a graph that is 4-regular and 4-connected which represents the broadcast channel,” computers A and B are neither “connected” via the broadcast channel nor the underlying point-to-point network:



‘147 Patent at Fig. 1; *id.* at 4:50–51. In other words, in the context of the ‘147 Patent, existence of an edge between two computers in the broadcast channel represents the existence of a point-to-point connection in the underlying network, and computers are only “connected” once an edge is established between them. ‘147 Patent at 4:25–28 (“The broadcast technique overlays the underlying network system with a graph of point-to-point connections (i.e., edges) between host computers (i.e., nodes) through which the broadcast channel is implemented.”).

On the other hand, in the context of Rufino, the establishment of two stations as neighbors in the logical token ring is irrelevant to whether those stations are “connected” to one another.

An important point to realize is that the physical order in which the stations connected to the cable is not important. Since the cable is inherently a broadcast medium, ***each station receives the frame***, discarding those not addressed to it. When a station passes the token, it sends a token frame specifically addressed to its logical neighbor in the ring, irrespective of where that station is physically located on the cable.

Tanenbaum at 288. Accordingly, when “the current token holder” receives “a response from the successor of the failed station” it is receiving a response from a station to which it is already connected. *See* Rufino at 13.

For at least the foregoing reasons, Petitioner has failed to demonstrate that the combination of Shoubridge, Denes, Rufino, and Todd discloses “having a third

computer not already connected to said first computer respond to said connection port search message in a manner as to maintain an m-regular graph.” Patent Owner Claims 7-10 are not invalid as obvious for at least the same reasons.

C. Shoubridge in view of Denes, Rufino, and Todd does not disclose Claim 7: “The method of claim 6 including: when a third computer receives the connection port search message and the third computer also needs a connection, sending a message from the third computer to the first computer proposing that the first computer and third computer connect.”

Petitioner relies only on Rufino for this claim element. Petition at 37-38; Ex. 1003 at ¶179. Petitioner’s argument regarding Rufino fails because, as discussed above, Rufino does not teach a broadcast channel (neither does Shoubridge, Denes, or Todd). Moreover, as discussed above, Rufino fails to disclose sending a message on a broadcast channel. Petitioner identifies that the “set_successor” packet is sent on a broadcast channel by the third computer to the first computer. However, “set_successor” is sent on the physical bus, not on the token ring on which the computer is connected as required by IEEE Standard 802.4. Goodrich Decl. ¶¶ 127-128. Thus, the claim cannot be rendered obvious.

Again, Petition only relies on Rufino as teaching this claim. As Rufino does not disclose the claim language, the combination Rufino with Shoubridge, Denes and Todd references cannot disclose the claim. Moreover, there is no motivation to combine the four references as further discussed below. Neither Petitioner nor its expert provide any evidence that these missing elements are taught by

Shoubridge, Denes or Todd. See Petition at 37-38; Ex. 1003 at ¶¶ 178-182, 235 (only relying on Todd to disclose where m is greater than 3). Because Petitioner has failed to show that Shoubridge in view of Denes, Rufino, and Todd discloses the claim, the Petitioner has failed to disclose how Shoubridge in view of Denes, Rufino, and Todd renders Claim 7 obvious. Claim 8 is not invalid as obvious for at least the same reasons.

D. Shoubridge in view of Denes, Rufino, and Todd does not disclose Claim 8: “The method of claim 7 including: when the first computer receives the message proposing that the first computer and third computer connect, sending from the first computer to the third computer a message indicating that the first computer accepts the proposal to connect the first computer to the third computer.”

Again, Petitioner relies only on Rufino for this claim element. Petition at 38-39; Ex. 1003 at ¶184. Petitioner's arguments fail for the same reasons as discussed above. Additionally, Petitioner's arguments namely fail because Petitioner fails to address the actual claim language. The claim requires that the first computer, **after** receiving a message proposing a connection from the third computer, **send a new message** to the third computer accepting the proposal. Petitioner's citation to Rufino (and as required by the IEEE Standard 802.4) only discusses that the third computer responds to the initial inquiry with a “set_sucessor” frame. Petition at 38-39. By design, there is no additional messages sent on the physical bus from the first computer to the third computer.

Petition at 39 quoting Rufino at 0962 col. 2 ¶ 9-0961 col. 1 ¶ 1 (“the current token holder [i.e., first computer] will receive ... a response from the successor of the failed station [i.e., third computer]. This establishes a new successor for the current token holder and **ends the recovery procedure.**”) (emphasis added). Thus there is no message from the first computer accepting the connection because the connection is established by the response of the third computer. See Goodrich Decl. ¶¶ 132-133. Accordingly, there is no evidence that this claim language is disclosed by Rufino and Petitioner provide no evidence supporting an additional message from the first computer accepting the connection to the third computer.

For at least the foregoing reasons, Petitioner has failed to demonstrate that Shoubridge in view of Denes, Rufino, and Todd discloses “sending from the first computer to the third computer a message indicating that the first computer accepts the proposal to connect the first computer to the third computer” therefore, Petitioner has failed to demonstrate that claim 8 is obvious.

E. Shoubridge in view of Denes, Rufino, and Todd does not disclose Claim 9: “The method of claim 6 wherein each computer connected to the broadcast channel is connected to at least three other computers.”

Petitioner relies only on Shoubridge for this claim element. Petition at 40; Ex. 1003 at ¶190. Petitioner's arguments fail for the same reasons as discussed above. Namely that Shoubridge does not disclose a broadcast channel. See Goodrich Decl. ¶¶ 98, 135-138. Notably, Petitioner does not rely on the same

alleged broadcast channel as it relied on in elements Claim 6(b-d) (i.e. the alleged Rufino broadcast channel).

As Shoubridge does not disclose the claim language, the combination of the Shoubridge, Denes, Rufino and Todd references cannot disclose the claim. Moreover, there is no motivation to combine the four references as further discussed below. Neither Petitioner nor its expert provide any evidence that these missing elements are taught by Shoubridge, Denes, Rufino or Todd. See Petition at 40; Ex. 1003 at ¶¶190, 235 (only relying on Todd to disclose where m is greater than 3). Because Petitioner has failed to show that Shoubridge in view of Denes, Rufino, and Todd discloses the claim, the Petitioner has failed to disclose how Shoubridge in view of Denes, Rufino, and Todd renders Claim 9 obvious.

F. Shoubridge in view of Denes, Rufino, and Todd does not disclose Claim 10: “The method of claim 6 wherein the broadcasting includes sending the message to each computer to which the first computer is connected.”

Petitioner relies only on Shoubridge for this claim element. Petition at 40-41; Ex. 1003 at ¶¶193. Petitioner's arguments fail for the same reasons as discussed above. Namely that Shoubridge does not disclose a broadcast channel. See Goodrich Decl. ¶¶ 98, 139-142. Like with Claim 9, Petitioner does not rely on the same alleged broadcast channel as it relied on in elements Claim 6(b-d) (i.e. the alleged Rufino broadcast channel).

As Shoubridge does not disclose the claim language, the combination of the Shoubridge, Denes, Rufino and Todd references cannot disclose the claim.

Moreover, there is no motivation to combine the four references as further discussed below. Neither Petitioner nor its expert provide any evidence that these missing elements are taught by Shoubridge, Denes, Rufino, or Todd. See Petition at 40; Ex. 1003 at ¶¶190, 235 (only relying on Todd to disclose where m is greater than 3). Because Petitioner has failed to show that Shoubridge in view of Denes, Rufino, and Todd discloses the claim, the Petitioner has failed to disclose how Shoubridge in view of Denes, Rufino, and Todd renders Claim 9 obvious.

VII. A PERSON OF SKILL IN THE ART WOULD NOT HAVE COMBINED SHOUBRIDGE, DENES, AND RUFINO IN THE MANNER ADVANCED IN THE PETITION

Shoubridge, Denes and Rufino, and Todd are disparate systems that one of skill in the art would not have been motivated to combine. Indeed, to credit Petitioner's argument that it would have combined these references in order to arrive at the invention claimed in the '147 Patent requires that a POSITA would have (1) modified Shoubridge's simulated, fixed network topology in which nodes never enter or leave the network to use Denes' techniques for the intended adding and removing nodes from a graph; (2) modified the combination of Shoubridge and Denes, in the context of an m -regular network where $m > 2$, with the token bus network management messages disclosed in Rufino, which apply only to 2-regular

networks; and (3) modified Rufino's token bus network messaging system to work in the token ring network Todd, which does not and cannot use such broadcast messaging techniques. See Goodrich Decl. ¶¶ 143-144. As demonstrated in detail below, Petitioner has failed to "provide the glue" required to piece together the elements of its four references. *InTouch Techs., Inc. v. VGO Comm'ns Inc.*, 751 F.3d 1327, 1348-49 (Fed. Cir. 2014) ("[The challenger's] expert's testimony was nothing more than impermissible hindsight; she opined that all of the elements of the claims disparately existed in the prior art, but failed to provide the glue to combine these references.").

A. A POSITA Would Not Have Modified Shoubridge With Denes

Shoubridge is generally directed to "a routing strategy that smoothly adapts to changing network conditions by combining two distinct routing principles into a single hybrid routing procedure." Shoubridge at Abstract. Relevant to Petitioner's proposed mapping of Shoubridge to the claims of the '147 Patent, Shoubridge discloses a simulated network, *G*, which "has essentially fixed topology with links always existing between nodes and their respective neighbors." Shoubridge at 1382. Topology changes in the simulated network do not involve the addition or removal of nodes, but are rather "modelled by having link quality changing between one of two possible states": error free and failed. *Id*; See Goodrich Decl. ¶ 144.

Indeed, Dr. Karger conceded that Shoubridge's simulated network "is only going to have those edges fail or come back, and he's not going to introduce new edges in this simulation...." Ex. 2010, 11/29/16 Karger Tr. 51:20-23. On the other hand, Denes ET-¹ transformation operates precisely by removing known, existing edges from a node that is to be removed from the graph and producing new, previously non-existing edges. See Denes at 366 (describing the disconnection of edges connected to p and adding edges between pairs of nodes that were previously connected to p); Goodrich Decl. ¶ 145. Accordingly, the basis for Petitioner's argument that it would have been obvious to apply the Denes technique to "a dynamic network such as Shoubridge, **where nodes are being added and dropped**, is fundamentally incorrect. See Petition at 31 (emphasis added).

Given Shoubridge's fixed node topology, a POSITA would have had no reason to modify Shoubridge with Denes, which describes techniques for adding nodes and edges to and removing nodes and edges from a graph. That is, because **nodes** never fail in Shoubridge's network—only links between nodes fail. The solution for fixing a "link that has no useful transmission at all"—and maintaining an m -regular network—is simply to restore the link or ignore it. See Shoubridge at 1382. Denes' ET-¹ graph transformation, which is used to remove a node and its incident edges from a graph and add new previously non-existing edges, simply has no utility in the simulated network of Shoubridge in which nodes are never

removed and in which “a particular node’s neighbours at any given time always belong to the same subset of nodes as originally defined in *G*.” Shoubridge at 1382.

In proposing the modification of Shoubridge with Denes, therefore, Petitioner provides a solution in search of a problem. *See Ex Parte Ian Hector Frazer*, Appeal No. 2012-002760, Decision on Appeal at 4-5 (P.T.A.B. Jan. 9, 2014) (rejecting motivation to combine rationale that proposes to fix that which is not broken.).. Indeed, far from “maintain[ing] the reliability of the network” (see Petition at 32), modifying Shoubridge’s simulated network to practice the Denes ET^{-1} transformation would unduly complicate Shoubridge’s simulated network. Goodrich Decl. ¶ 145 (explaining that modifying Shoubridge to use Denes’ node and edge removal and addition technique, ET^{-1} , would introduce node topology changes that would complicate Shoubridge’s simplified approach). That is, Denes’ technique would change the “essentially fixed topology,” which Shoubridge particularly chose for as a “simplified approach [that] requires no topology control as a particular node’s neighbours at any given time always belong to the same subset of nodes as originally defined in *G*.” Shoubridge at 1382; Goodrich Decl. ¶¶ 144-145.

For at least the foregoing reasons, a POSITA would not have combined Shoubridge and Denes in the manner advanced in the Petition. Accordingly, the

Board should confirm the patentability of independent claim 6 and claims 7–10, which depend therefrom.

B. A POSITA Would Not Have Modified Shoubridge in View of Denes With Rufino

Petitioners assert that “it would have been obvious to modify Shoubridge in view of Denes to include the orderly leave in Rufino, with the step of broadcasting a who_follows query (connection port search message) on the broadcast channel.” Petition at 25. Petitioner critically concedes, however that “Rufino relates to token ring which is a 2-regular topology.” Petition at 59; *see also id.* at 16 (“Rufino discloses messaging techniques for maintaining a 2-regular non-complete network when a node is disconnected from the network.”). Thus, Rufino is directed towards 2-regular systems not “a broadcast channel, said broadcast channel forming an m-regular graph where m is at least 3.” Goodrich Decl. ¶ 146.

Rufino's token-bus LAN utilizes “[s]everal types of protocol data frames... in order to provide logical ring housekeeping functions, essential for normal ring membership management, and for the preservation of ring integrity in the presence of faults.” Rufino at 10. These protocol data frames all operate on the assumption that “stations are organized into a ring... with each station knowing the address of the station to its ‘left’ and ‘right.’” Tanenbaum at 287. These stations to the “left” and “right” are also referred to “predecessor” and “successor” stations.

Tanenbaum at 287. The logical ring housekeeping frames are also known as token bus control frames:

Frame control field	Name	Meaning
00000000	Claim_token	Claim token during ring initialization
00000001	Solicit_successor_1	Allow stations to enter the ring
00000010	Solicit_successor_2	Allow stations to enter the ring
00000011	Who_follows	Recover from lost token
00000100	Resolve_contention	Used when multiple stations want to enter
00001000	Token	Pass the token
00001100	Set_successor	Allow station to leave the ring

Fig. 4-27. The token bus control frames.

Tanenbaum at 290.

Relevant to Petitioner's arguments regarding Rufino's application to the instituted claims are the "Who_follows" and "Set_successor" frames. See Petition at 32–37 (citing Rufino at 963 ("During this *who follows* query the current token holder waits for a *set_successor* frame, until the end of a three-slot-time period.")). The "Who_follows" query involves a station recognizing that its successor station has left the logical token ring and broadcasting a message to all other stations connected to the physical bus that identifies the departed station. See Tanenbaum at 292. When the departed station's "sees a WHO_FOLLOWS frame naming its predecessor, it responds by sending a SET_SUCCESSOR frame to the station whose successor failed, naming itself as the new successor." *Id.* These operations

work in the context of an $m=2$ logical token ring precisely because each station knows its predecessor and successor stations, and there is only a single station defined as the successor of the failed station. Goodrich Decl. ¶¶ 146-147. This messaging procedure is not generalizable to m -regular networks in which m is at least 3 at least because once m exceeds 2 there are no longer “predecessor” and “successor” stations who can reply to a WHO_FOLLOWS query. *Id.* Notably, Petitioner provides no explanation about how Rufino’s messaging technique could be implemented in order to perform Denes’ ET^{-1} transformation in an m -regular network in which $m \geq 3$, simply stating that “[a] POSITA would have further applied any well-known messaging technique to accomplish the communication between the nodes, including the techniques of Rufino.” Petition at 33; *see also id.* at 37 (“A POSITA would similarly have been motivated to use the messaging technique of Rufino to efficiently implement the node dropping techniques of Denes.”); *id.* at 38 (A POSITA would have considered it obvious to use the messaging protocols of Rufino in order for former neighbors of the removed node to locate each other and connect....”).

Additionally, Petitioner provides no reason why a person of ordinary skill in the art would have thought to combine elements of Shoubridge, Denes and Rufino, “to reach the claimed invention.” *See Heart Failure Techs., LLC v. CardioKinetix, Inc.*, IPR2013-00183, Paper No. 12 at 9 (P.T.A.B. July 31, 2013) (citing *KSR Int’l*

Co. v. Teleflex, Inc., 550 U.S. at 418) (“Petitioner must show some *reason* why a person of ordinary skill in the art would have thought to combine particular available elements of knowledge, as evidenced by the prior art, to reach the claimed invention.”). Rather, Petitioners merely reference previous boilerplate reasons that are unspecific to the language recited in challenged claims.

At most, Petitioners argue that it would have been obvious to combine because “Shoubridge teaches the use of its network in a dynamic setting, and Denes and Rufino address the problem of dynamic networks.” Petition at 17. This proffered motivation is insufficient as a matter of law, as arguing that the cited references describe dynamic networks is just another way of saying that they are in the same field- which is not sufficient motivation to combine these three references. *OpenTV, Inc. v. Cisco Tech., Inc.*, IPR2013-00328, Paper No. 13 at 21-22 (P.T.A.B. Nov. 29, 2013)(“The mere fact that [the cited references] describe similar [] systems is not, by itself, a sufficient rationale for a person of ordinary skill in the art to have made the asserted combination.”). In fact, Rufino teaches away from point-to-point graphs such as Denes because Rufino teaches that such solutions are “costly and complex.” See Goodrich Decl. ¶ 147; Rufino at 0958 (discussing specialized solutions such as “point-to-point graphs [6] or multiple LANs [7]. These solutions are however costly and complex.”). Thus, one of skill

in the art would not look to or combine Denes and Rufino because they are directed to completely different technologies and technical problems.

For at least the foregoing reasons, a POSITA would not have combined Shoubridge, Denes, and Rufino in the manner advanced in the Petition. Accordingly, the Board should confirm the patentability of independent claim 6 and claims 7–10, which depend therefrom.

C. A POSITA Would Not Have Modified Shoubridge in View of Denes and Rufino With Todd

As noted above, Petitioner recognizes that Rufino's messaging techniques are applicable only to a 2-regular topology. Petition at 59. Petitioner cites Todd in an attempt to demonstrate that those techniques are extensible to a 4-regular topology. See Petition at 59 ("While it would be within the knowledge of a POSITA to expand the messaging techniques from a 2-regular topology to a 4-regular topology, as specific reference (Todd) that does so is provided in this ground (Ground 4) if the Board deems it necessary."). Petitioner's position is indefensible because modified token ring network is (1) fundamentally incompatible with Rufino's token bus network and (2) does not use messaging of any sort—let alone Rufino's messaging techniques—to deal with the issue of failed nodes. See Petition at 59–60.

Todd discloses a token grid network, which is described to be "a multidimensional extension of the token ring." Todd at 1, col. 2. Critically, the

“token ring” referred to in Todd is the well-known “token ring network,” standardized under IEEE 802.5, which is fundamentally different Rufino’s well-known, “token bus network,” which is standardized under IEEE.802.4. Goodrich Decl. ¶¶ 148-150. In a token ring network, the “ring is not really a broadcast medium, but a collection of individual point-to-point links that happen to form a circle.” Tanenbaum at 298. The topology of a token ring network, in which subsequent stations’ ring interfaces are connected by individual point-to-point connections is illustrated below:

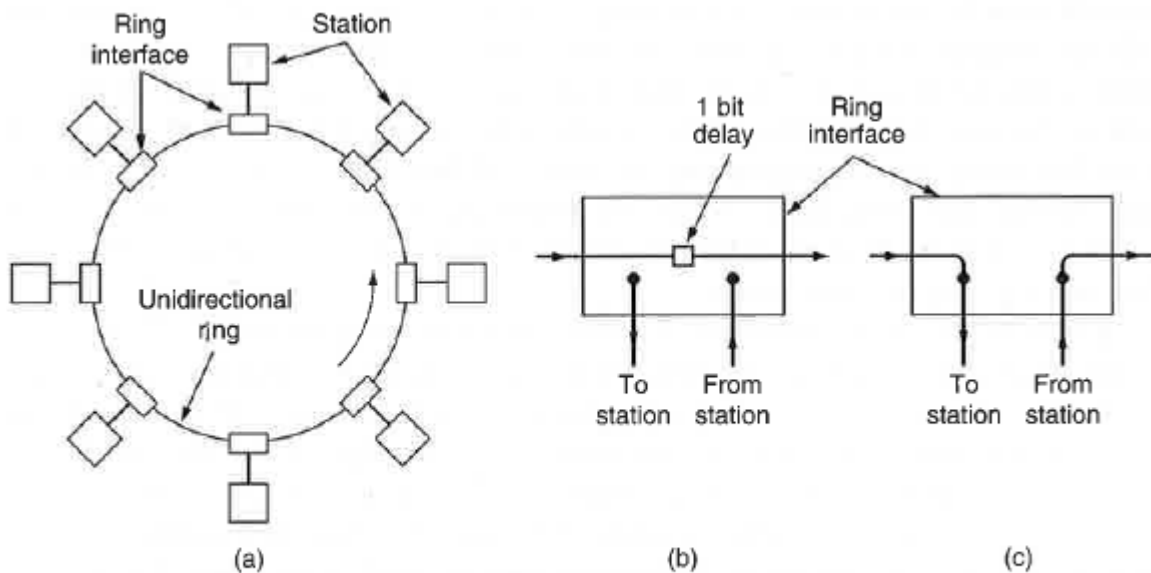


Fig. 4-28. (a) A ring network. (b) Listen mode. (c) Transmit mode.

Tanenbaum at 293.

Unlike Rufino’s token bus network, token ring networks do not establish a logical ring over an underlying broadcast bus. See Tanenbaum at 287, 292.

Rather, in a token ring network the “ring” refers to the physical connections

between the stations themselves. *Id.* at 292. Todd's "token grid network" only differs from the traditional token ring network defined in IEEE 802.5 in that it is multidimensional. Todd at 1, col. 2 ("The token grid is a multidimensional extension of the token ring [2], [4] where stations share access to a mesh formed by a set of overlapping rings." (referencing [2] "ANSI/IEEE Standard 802.5, "Token ring access method and physical layer specifications, 1985")). Thus, given the incompatibility of the topologies of Rufino's token bus network and Todd's token ring network, Petitioner is simply incorrect to say that "Todd... shows that the modification to Rufino can be done 'in a very simple fashion' by overlapping token rings." Petition at 60. Indeed, Petitioner fails even to address the differences between token bus networks and token ring networks—misleadingly characterizing the Rufino reference as "relat[ing] to a token ring." Petition at 59.

The incompatibility of Rufino's token bus network and Todd's modified token ring network may be best understood with reference to Petitioner's argument that Todd teaches how "to expand [Rufino's] messaging techniques from a 2-regular topology to a 4-regular topology." Petition at 59. Specifically, the way that Rufino and Todd handle the issue of failed nodes is completely different, with Todd's technique not relying on messaging whatsoever. As described above, Rufino discloses using the `who_follows` and `set_successor` control frames in order to define the failed node's successor as its predecessor's new successor. *See*

§ VII.B, *supra*. In stark contrast, in the Todd token grid network, “optical bypass switches are used to maintain ring integrity following a station power failure.”

Todd at 8, col. 2. That is, Todd uses physical switches to simply bypass a failed station rather than using messages—let alone Rufino’s messaging technique—to deal with a failed station. Goodrich Decl. ¶¶ 87, 148, 151. In fact, Dr. Karger conceded that token bus network and token grid networks use different procedures for recovering from a failed station:

Q. Is the procedure for recovering from a failed station different in token-bus networks and token ring networks?

A. Well, there are a number of different recovery procedures that one could imagine. Rufino describes a particular recovery mechanism for the token-bus network. Todd describes another recovery mechanism which involves sort of shortcutting a failed station in order to recover from that failure.

11/29/16 Karger Tr., 75:9–18.

For at least the foregoing reasons, a POSITA would not have combined Shoubridge, Denes, Rufino, and Todd in the manner advanced in the Petition. Accordingly, the Board should confirm the patentability of independent claim 6 and claims 7–10, which depend therefrom.

VIII. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS

D. Objective Indicia of Non-Obviousness Demonstrate That The Claims Would Not Have Been Obvious

Petitioner's failure to perform a secondary consideration analysis is fatal to its petition. *Plantronics, Inc. v. Aliph, Inc.*, 724 F.3d 1343, 1355 (Fed. Cir. 2013) ("This court has consistently pronounced that all evidence pertaining to the objective indicia of nonobviousness must be considered before reaching an obviousness conclusion.") (citations omitted). Indeed, Petitioner was well aware that it was required to consider secondary considerations, as Petitioner filed its Petition in this case nearly two months after Patent Owner filed its Preliminary Response in six other proceedings against the same Petitioner. *Compare*, e.g., Paper 2 (Petition filed March 12, 2016) *with Activision Blizzard, Inc., et al., v. Acceleration Bay, LLC*, IPR2015-01951, Paper 8 at 39–41 (Patent Owner Preliminary Response filed on January 19, 2016, discussing Petitioner's failure to address secondary considerations in its obviousness analysis).

"Whether before the Board or a court, consideration of objective indicia is part of the whole obviousness analysis, not just an afterthought." *Intri-Plex Techs., Inc. v. Saint-Gobain Performance Plastics Rencol Ltd.*, IPR2014-00309, Paper No. 83 (PTAB Mar. 23, 2013) (citing *Leo Pharm. Prods.*, 726 F.3d at 1358). In other words, objective indicia of nonobviousness must always be considered as it "serve[s] to resist the temptation to read into the prior art teachings of the invention

in issue.” *Plantronics*, 724 F.3d at 1355 (quoting *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1076 (Fed. Cir. 2012)). Evidence of secondary considerations “may often be the most probative and cogent evidence of nonobviousness in the record.” *Ortho-McNeil Pharm. v. Mylan Labs., Inc.*, 520 F.3d 1358, 1365 (Fed. Cir. 2008). Accordingly, “fact finders must withhold judgment of an obviousness challenge until it considers all relevant evidence, including that relating to the objective considerations.” *Intri-Plex Techs.*, IPR2014-00309, Paper No. 83 (citing *Cyclobenzaprine*, 676 F.3d at 1075-76). Here, secondary considerations of non-obviousness establish the non-obviousness of the claims at issue. *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 662-63 (Fed. Cir. 2000).

1. Long-Felt But Unresolved Need and Recognition of a Problem

The patented invention weighs in favor of finding non-obviousness because it addressed a long-felt but unmet need. *See, e.g., Geo M. Martin Co. v. Alliance Mach. Sys. Int’l LLC*, 618 F.3d 1294, 1304 (Fed. Cir. 2010). Specifically, the patented invention solved the problem of dealing with planned and unplanned disconnections from an m-regular broadcast channel network, while maintaining an m-regular network. Ex. 2004 (“Bims Decl.”) at ¶¶ 36–38. In fact, the inventors of the invention described in the ‘147 Patent initially began trying to solve the problem because of a request by management at Boeing to create a peer-to-peer

communication platform that would allow for more than two users to communicate with high reliability and low latency. Bourassa Decl. at ¶¶ 3, 4, 7. Significantly, Dr. Bims acknowledged that this problem existed for years prior to the filing of the '147 Patent. Bims Decl. at ¶¶ 36–38; *see, e.g., In re Piasecki*, 745 F.2d 1468, 1473 (Fed. Cir. 1984) (“Firsthand practical knowledge of unsolved needs in the art, by an expert, is evidence of the state of the art.”).

The inventors recognized the problem—namely, that the technology at the time was ill-equipped to achieve such a function. In the related patents, the inventors specifically addressed the problem of point-to-point network protocols did not scale as the number of participants increased; client/server middleware systems faced bottleneck performance issues as participants stored information in order to be shared and risked the failure of communications between the clients due to a server failure; multicasting networks were limited to single local-area networks; and peer-to-peer middleware communications systems relied on a user to assemble a point-to-point graph of the connections used for sharing the information and thus were not suitable for the needs of large-scale collaboration. *See* Ex. 2028 (Invention Disclosure Form); Bourassa Decl. at ¶¶ 5, 6. The inventors further recognized that the need for dealing with planned and unplanned disconnections. The fact that none of the technologies that were available could

address the problems solved by the '147 Patent demonstrates a long-felt need and failure by others. Bims Decl. at ¶¶ 35–40; see also Goodrich Decl. at ¶ 75.

As a result, the '147 Patent is not obvious because the inventors had recognized a problem, and solved a long-felt, but unresolved need which others had failed to do.

2. Unexpected Results

Another measure of whether a claimed invention was not obvious is whether there were unexpected results. Although the inventors initially believed that reaching their goal would only take a matter of a few weeks, it took them nearly three years to successfully identify a solution. Bourassa Decl. at ¶¶ 8–39. This three-year period consisted of twenty-eight different epiphanies that were not readily apparent based on what was known in the art at that time. Bourassa Decl. at ¶¶ 8–39; Bims Decl. at ¶¶ 41–43. Accordingly, the unexpected results and extensive experimentation demonstrate that the '147 Patent is not obvious. Bims Decl. at ¶¶ 41–43.

3. Commercial Success

The patented invention has gained a level of commercial success that weighs against a finding of obviousness. *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1376 (Fed. Cir. 2005); see also *Minnesota Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1575 (Fed. Cir. 1992)

(stating that taking a license “provide[s] a colorful picture of the state of the art, what was known by those in the art, and a solid evidentiary foundation on which to rest a nonobviousness determination.”). Specifically, the patented invention described in the ‘147 Patent gained commercial success through its successful licensing of the claimed invention to Sony. See Bims Decl. at ¶¶ 27-31; Ex. 2009 (Sony License).

Additionally, Sony PlayStation has obtained increased sales as a result of products that practice the recitations of the challenged claims. Boeing and Sony entered into a license agreement so that Sony could sell and offer for sale products that fall within the scope of the patented technology. See Bims Decl. at ¶¶ 27-29 (referring to charts showing a nexus between Sony Products and the licensed patents). Specifically, Sony’s PlayStation Product is a commercial embodiment of the claimed invention of the ‘147 Patent. Bims Decl. at ¶¶ 28-29; *see also* Ex. 2016 (chart showing a nexus between Sony Products and the licensed patents); *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1130 (Fed. Cir. 2000) (“However, if the marketed product embodies the claimed features, and is coextensive with them, then a nexus is presumed and the burden shifts to the party asserting obviousness to present evidence to rebut the presumed nexus.”). As Dr. Bims explains, each and every element of the challenged claims

of the '147 Patent is found in the Sony PlayStation demonstrating that there is a sufficient nexus. Bims Decl. at ¶ 28–29.

Further, as indicated in Sony's SEC filings for the fiscal year ending in March 31, 2008, Sony's Game division experienced an increase of \$267.5 billion yen in division sales. See Bims Decl. at ¶ 31; Ex. 2022 (SEC Filings). Sony's hardware unit sales of PlayStation 3 enjoyed an increase of 5.63 million units sold, with the total sale units being 9.24 million units. See Bims Decl. at ¶ 31; Ex. 2022 (SEC Filings). The sale of Sony's PlayStation product, which is covered under the '147 Patent, was made possible through its licensing agreement with Boeing.

Therefore, the actual license to Sony of the patented invention coupled with the increased sales of Sony's PlayStation products further demonstrates the nonobviousness of the patented invention.

4. Industry Praise

The praise the patented invention described in the '147 Patent received supports a finding that the '147 Patent was not obvious. Shortly after the inventors completed SWAN, Boeing launched its "Horizon 3" initiative, which looked for Boeing's internal technologies that had commercial potential. Bourassa Decl. at ¶ 40. SWAN was selected and became the leader in the portfolio of potential Boeing spin-out companies. *Id.*

Further, the '147 Patent has been cited in **9 other patent applications** by companies including, among others, Sony Computer Entertainment America Inc. and Samsung Electronics Co., Ltd. Bims Decl. at ¶ 32; *see also* Ex. 2020 (showing forward citations of the '147 Patent); *Institut Pasteur & Universite Pierre Et Marie Curie v. Focarino*, 783 F.3d 1337, 1346 (Fed. Cir. 2013) (evidence that competitors “praised, and copied” claimed inventions served as dispositive objective indicia of non-obviousness). Therefore, the praise the '147 Patent has received from others further demonstrates that the invention disclosed in the '147 Patent was not obvious.

Accordingly, all of these factors indicate that the patented invention was not obvious.

IX. CONCLUSION

Petitioners have not established a reasonable likelihood that it will prevail in establishing that claims 6–10 of the '147 Patent are invalid. Patent Owner accordingly requests that the Board confirm the patentability of the challenged claims over the asserted prior art.

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE WITH 37 C.F.R. § 42.24

This paper complies with the type-volume limitation of 37 C.F.R. § 42.24.

The paper includes 12,489 words, excluding the parts of the paper exempted by §42.24(a).

This paper also complies with the typeface requirements of 37 C.F.R. § 42.6(a)(ii) and the type style requirements of § 42.6(a)(iii)&(iv).

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned certifies that a true and correct copy of the foregoing Patent Owner's Response was served on December 12, 2016, by filing this document through the PTAB E2E system as well as delivering via electronic mail upon the following counsel of record for Petitioner:

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