

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 IPR2016-00747
Patent 6,732,147 B1

Before SALLY C. MEDLEY, LYNNE E. PETTIGREW, and
WILLIAM M. FINK, *Administrative Patent Judges*.

FINK, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

Activision Blizzard, Inc., Electronic Arts Inc., Take-Two Interactive Software, Inc., 2K Sports, Inc., and Rockstar Games, Inc. (collectively, “Petitioner”) filed a Corrected Petition requesting an *inter partes* review of claims 1–16 of U.S. Patent No. 6,732,147 B1 (Ex. 1001, “the ’147 patent”). Paper 6 (“Pet.”). Patent Owner, Acceleration Bay LLC, filed a Preliminary Response. Paper 11 (“Prelim. Resp.”). We have jurisdiction under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted “unless . . . the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” *See also* 37 C.F.R. § 42.4(a).

For the reasons that follow, we institute *inter partes* review of claims 6–10, but not claims 1–5 and 11–16 of the ’147 patent.

A. Related Matters

Petitioner and Patent Owner identify the following pending matters as relating to the ’147 patent: *Activision Blizzard, Inc. v. Acceleration Bay LLC*, Case No. 3:16-cv-03375 (N.D. Cal., filed June 16, 2016); *Electronic Arts Inc. v. Acceleration Bay LLC*, Case No. 3:16-cv-03378 (N.D. Cal., filed June 16, 2016); *Take-Two Interactive Software, Inc. et al. v. Acceleration Bay LLC*, Case No. 4:16-cv-03377 (N.D. Cal., filed June 16, 2016); *Acceleration Bay LLC v. Activision Blizzard, Inc.*, Case No. 1:16-cv-00453 (D. Del., filed June 17, 2016); *Acceleration Bay LLC v. Electronic Arts Inc.*, Case No. 1:16-cv-00454 (D. Del., filed June 17, 2016); *Acceleration Bay LLC v. Take-Two Interactive Software, Inc. et al.*, Case No. 1:16-cv-00455 (D. Del., filed June 17, 2016). Paper 9, 1; Paper 10, 2–3.

In addition, the '147 patent is related to patents at issue in the following instituted *inter partes* reviews: IPR2015-01951, IPR2015-01953, IPR2015-01964, IPR2015-01970, IPR2015-01972, and IPR2015-01996. The '147 is also related to patents at issue in the following *inter partes* reviews: IPR2016-00724, IPR2016-00726, and IPR2016-00727, for which institution decisions will be issued contemporaneously with the instant proceeding. Paper 9, 1; Paper 10, 3–4.

B. The '147 Patent

The '147 patent relates “to a broadcast channel for a subset of a computers [sic] of an underlying [computer] network.” Ex. 1001, 1:29–31. The network consists of a graph of point-to-point connections between host computers (or nodes) through which the broadcast channel is implemented. *Id.* at 4:25–28. Figure 1 of the '147 patent is reproduced below:

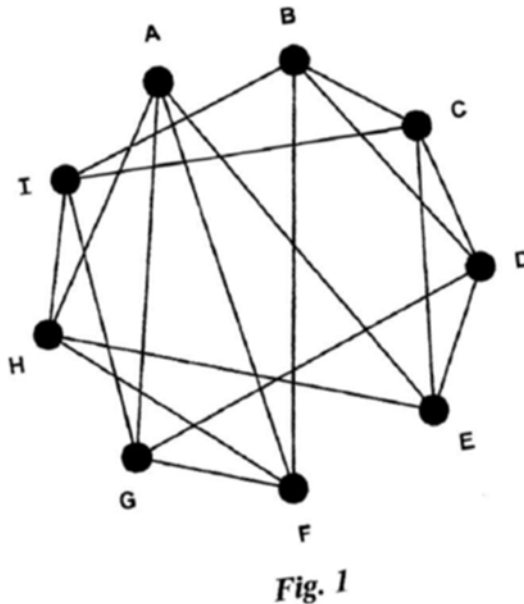


Figure 1 illustrates a broadcast channel represented by a “4-regular, 4-connected” graph. *Id.* at 4:50–51. The graph of Figure 1 is “4-regular”

because each node is connected to four other nodes (e.g., node A is connected to nodes E, F, G, and H). *Id.* at 4:40–41.

The '147 patent provides a method for the disconnection of a first host computer from a second computer in the network. Ex. 1001, Abstract.

Figure 5A of the '147 patent is reproduced below:

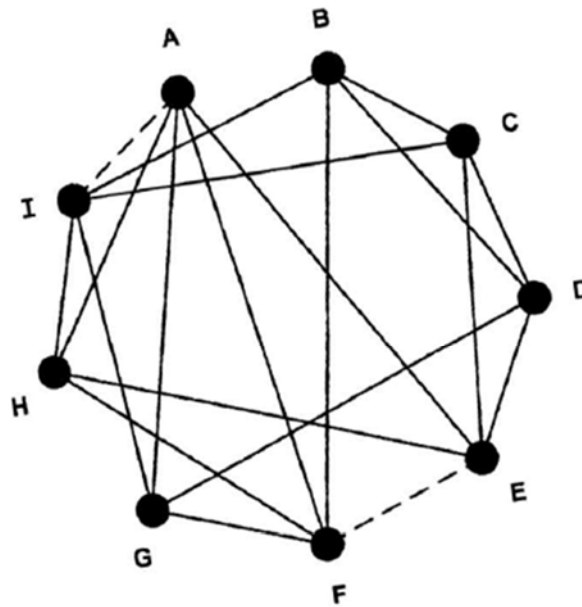


Fig. 5A

Figure 5A illustrates the disconnecting of a computer (node H) from the broadcast channel in a planned manner. *Id.* at 9:19–20. “When computer H decides to disconnect, it sends its list of neighbors to each of its neighbors (computers A, E, F, and I) and then disconnects from each of its neighbors.” *Id.* at 9:20–23. When computers I and A receive a disconnect message they establish connections between themselves as indicted by the dashed line. *Id.* at 23–25. Computers E and F similarly establish a connection between themselves. *Id.* at 9:25–26. The '147 patent also provides methods for disconnecting a computer in an unplanned manner. *See id.* at 9:27–51.

C. Illustrative Claims

Claims 1, 6, and 11 are independent claims. Claims 2–5 directly depend from claim 1, claims 7–10 directly or indirectly depend from claim 6, and claims 12–16 directly or indirectly depend from claim 11. Claims 1 and 6 are illustrative of the claimed invention and are reproduced below:

1. A method of disconnecting a first computer from a second computer, the first computer and the second computer being connected to a broadcast channel, said broadcast channel forming an m -regular graph where m is at least 3, the method comprising:

when the first computer decides to disconnect from the second computer, the first computer sends a disconnect message to the second computer, said disconnect message including a list of neighbors of the first computer; and

when the second computer receives the disconnect message from the first computer, the second computer broadcasts a connection port search message on the broadcast channel to find a third computer to which it can connect in order to maintain an m -regular graph, said third computer being one of the neighbors on said list of neighbors.

6. 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:

attempting to send a message from the first computer to the second computer; and

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

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.

Ex. 1001, 28:51:67, 29:12–26.

D. Asserted Grounds of Unpatentability

Petitioner asserts that claims 1–16 are unpatentable based on the following grounds:

| References | Basis | Challenged Claims |
|--|----------|-------------------|
| Shoubridge, ¹ Denes, ² and Rufino ³ | § 103(a) | 1–16 |
| Shoubridge, Denes, Rufino, and Hirviniemi ⁴ | § 103(a) | 4, 5, 15, and 16 |
| Shoubridge, Denes, Rufino, and Balph ⁵ | § 103(a) | 8 and 13 |
| Shoubridge, Denes, Rufino, and Todd ⁶ | § 103(a) | 1–16 |

¹ Peter J. Shoubridge & Arek Dadej, *Hybrid Routing in Dynamic Networks*, 3 IEEE INT’L CONF. ON COMMS. CONF. REC. 1381–86 (Montreal 1997) (Ex. 1005) (“Shoubridge”).

² Tamas Denes, *The “Evolution” of Regular Graphs of Even Order by their Verticies*, MATEMATIKAI LAPOK 365–377 (27th ed. 1976–1979) (Ex. 1016) and certified English translation of Ex. 1016 (Ex. 1017) (“Denes”).

³ Jose Rufino *et al.*, *A Study On The Inaccessibility Characteristics Of ISO 8802/4 Token-Bus LANs*, IEEE INFOCOM ’92 (1992) (Ex. 1004) (“Rufino”).

⁴ U.S. Patent No. 5,802,285 (Ex. 1021) (“Hirviniemi”).

⁵ U.S. Patent No. 4,700,185 (Ex. 1022) (“Balph”).

⁶ Terence Todd, *The Token Grid Network*, 2.3 IEEE Trans. Networking 279 (June 1994) (Ex. 1019) (“Todd”).

II. DISCUSSION

A. *Claim Interpretation*

In an *inter partes* review, claim terms in an unexpired patent are given their “broadest reasonable construction in light of the specification of the patent in which they appear.” 37 C.F.R. § 42.100(b); *see also Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142 (2016) (holding that the Patent Office had the “legal authority to issue its broadest reasonable construction regulation”). Under the broadest reasonable construction standard, claim terms are presumed to have their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

1. “*m*-regular”

Petitioner proposes the term “*m*-regular,” recited in at least independent claims 1, 6, and 11, means “each node is connected to exactly *m* other nodes.” Pet. 13 (citing Ex. 1001, 4:40–50, 14:51–15:6). Patent Owner does not offer a construction of this term. Prelim. Resp. 10. For purposes of this Decision, we agree Petitioner’s proposed construction accords with the broadest reasonable construction consistent with the Specification, which, for example, explains that a graph in which each node is connected to four other nodes is referred to as a 4-regular graph. Ex. 1101, 4:40–41, 5:55–57 (“Since the broadcast channel is a 4-regular graph, each of the identified computers is already connected to four computers.”).

2. Preamble

Although neither parties affirmatively states that the preamble of the independent claims is a limitation, we observe that Patent Owner bases arguments on the assumption that the preamble is a limitation. *See* Prelim. Resp. 13 (arguing the prior art fails to disclose “a broadcast channel, said broadcast channel forming an m-regular graph where m is at least 3”). Moreover, Petitioner presents analysis in the event that the preamble is deemed to be a claim limitation. Pet. 20. In view of Patent Owner’s arguments, we consider here whether the preamble is a limitation.

Whether to treat a preamble term 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 preamble may be construed as limiting “if it recites essential structure or steps, or if it is ‘necessary to give life, meaning, and vitality’ to the claim.” *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (quoting *Pitney Bowes, Inc. v. Hewlett-Packard*, 182 F.3d 1298, 1305 (Fed. Cir. 1999)). For example, when limitations in the body of the claim rely upon and derive antecedent basis from the preamble, the preamble may define a necessary component of the invention. *Pacing Techs., LLC v. Garmin Int’l, Inc.*, 778 F.3d 1021, 1024 (Fed. Cir. 2015).

Here, we determine the preamble to be a limitation because it provides antecedent basis for limitations in the body of the claim. Specifically, the preamble of independent claim 1 recites a “first computer” and a “second computer” “connected to a broadcast channel, said broadcast channel forming an m-regular graph where m is at least 3.” Ex. 1001, 28:51–55.

The body of the claim recites a method whereby the first computer disconnects from the second computer by sending a disconnect message to each neighbor, and the second computer broadcasts a search message on the broadcast channel to find a third computer to connect to, so as to maintain an m-regular graph. *Id.* at 28:56–67. Claim 6 recites a preamble similar to claim 1, but one in which the first and second computers are disconnected from the m-regular graph, and then recites steps for reconnecting a third computer in a manner that maintains an m-regular graph. *Id.* at 29:12–26.

In reciting such steps, the body of the independent claims rely on the preamble for providing the antecedent basis for “the first computer” and “the second computer,” as well as for the “broadcast channel” for connecting a third computer to, so as “to maintain an m-regular graph.” Because the foregoing preamble terms provide antecedent basis and are necessary to understand the limitations of the independent claims, we determine the preambles to claims 1, 6, and 11 are limiting.⁷ *See Pacing Techs.*, 778 F.3d at 1024 (holding the preamble is limiting where preamble terms “user” and “repetitive motion pacing system” provide antecedent basis for and are necessary to understand positive claim limitations).

In addition, in describing the prosecution history of the ’147 patent (Ex. 1025), Petitioner points out that in response to a rejection over the prior art Moore reference:

applicants amended the preamble of each independent claim to indicate that the claim is directed to an *m-regular graph where m is at least 3*. Ex. 1025 at 4-6. According to applicants, Moore proposed a daisy chain arrangement where clients act as “mini-

⁷ Claim 11 recites similar limitations in the body of the claim based on terms introduced in the preamble. *See* Ex. 1001, 30:4–20.

servers” to forward data to other clients. Ex. 1025 at 10.
Applicants argued that Moore did not disclose an m-regular graph where m is at least 3. Ex. 1025 at 11.

Pet. 6 (emphasis added). We agree with Petitioner that Patent Owner relied on the m-regular network where m is at least 3 in the preamble as a basis for distinguishing the prior art. Consequently, for this additional reason, we determine, for purposes of this Decision, the preamble term “broadcast channel forming an m-regular graph where m is at least 3” to be a limitation of claims 1, 6, and 11. *See Bass Pro Trademarks, LLC v. Cabela’s, Inc.*, 485 F.3d 1364, 1369 (Fed. Cir. 2007) (holding preamble term “vest,” added during prosecution, to be a limitation, when applicant relied on the vest to distinguish the prior art).

*B. Alleged Obviousness of Claims 1–16 over
Shoubridge, Denes, and Rufino, and over
Shoubridge, Denes, Rufino, and Todd*

Petitioner contends claims 1–16 would have been obvious over the combination of Shoubridge, Denes, and Rufino, and the combination of Shoubridge, Denes, Rufino, and Todd. Pet. 19–54, 59–60. Petitioner also relies upon Dr. Karger to support its contentions. Ex. 1003. Patent Owner disputes Petitioner’s contentions and relies upon Dr. Goodrich for support. Prelim. Resp. 10–34; Ex. 2001. We begin our discussion with brief summaries of the references and then address the parties’ contentions.

1. Shoubridge (Ex. 1005)

Shoubridge describes techniques for routing messages to all the participants in a communications network. Ex. 1005, 1381. Specifically, Shoubridge models a communication network as a graph in which “[e]ach node functions as a source of user traffic entering the network where traffic

can be destined to all other nodes within the network.” *Id.* at 1382. In a specific example (not depicted in a figure), Shoubridge describes a “64 node network with connectivity of degree 4” modeled as a “large regular graph forming a manhattan grid network that has been wrapped around itself as a torus.” *Id.* at 1383. Shoubridge describes a routing protocol called “constrained flooding, the most efficient way to flood an entire network.” *Id.* at 1382. In constrained flooding, a packet received at a node is rebroadcast on all links except the link it was received on, and packets are numbered such that if “packets revisit a node with the same sequence number, they are discarded.” *Id.* at 1383. Shoubridge describes simulations using both constrained flooding and minimum hop algorithms that use routing tables. *Id.* at 1382–84.

2. Denes (Ex. 1016)

Denes describes even-order regular graphs with k vertices, Γ_k . Ex. 1017, 365. Figure 2 of Denes is reproduced below:

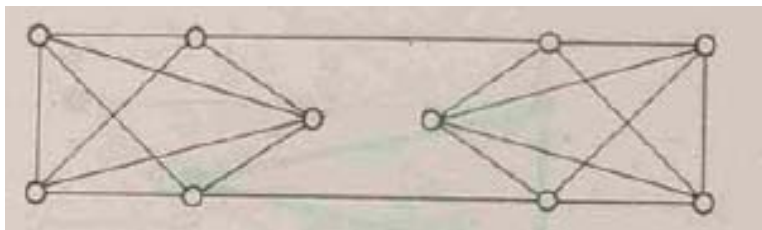


Figure 2 depicts a 4-regular graph with 10 vertices or nodes. *Id.* at 367.⁸ Denes discloses a transformation ET^{-1} for removing a node “p” from the graph by removing the connections between p and its neighbors p_1, p_2, \dots, p_k

⁸ The page numbers in the untranslated version of Denes (Ex. 1016) are at the bottom of each page. Therefore, the page numbers cites to the English translation of Denes (Ex. 1017) refer to the material above the cited page number.

and then connecting p_1, p_2, \dots, p_k as follows: “ $ET^{-1}: \Gamma_k \rightarrow \Gamma_{k-1} = (P', E')$, $P' = P \setminus \{p\}$; $E' = E \setminus \{ (pp_1), (pp_2), \dots, (pp_k) \} \cup \{ (p_1p_2), (p_3p_4), \dots, (p_{k-1}p_k) \}$.” *Id.* at 366.

3. *Rufino (Ex. 1011)*

Rufino describes a token-ring based local area network. Ex. 1011, 958. Specifically, Rufino describes a “token passing protocol, which establishes a logical ring over the physical bus. Access to the shared broadcast medium is only granted to the station which currently holds the token.” *Id.* at 959. Among other things, Rufino includes procedures for when a station or computer leaves the network whether in “an abrupt or orderly way.” *Id.* at 962. In the orderly-leave scenario, the leaving station must hold the token and, before passing it, issues a *set_successor* frame addressed to its predecessor station and carrying the address of its future successor station. *Id.* In the abrupt-leave scenario, a station fails and the token passing operation will not succeed. *Id.* at 962–963. After a specific period, the current token holding station issues a *who_follows* query and waits to receive a response from the successor of the failed station to end the recovery procedure. *Id.* at 963.

4. *Todd (Ex. 1019)*

Todd describes a “token grid network,” which “is a multidimensional extension of the token ring, where stations share access to a mesh formed by a set of overlapping rings.” Ex. 1019, 279. For example, Todd discloses “a two dimensional network structure arranged in R rows and C columns.” *Id.* Figure 1 of Todd is reproduced below:

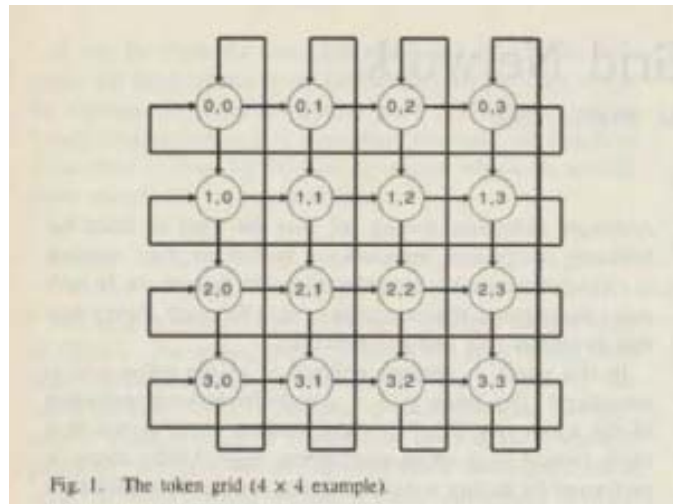


Figure 1 of Todd discloses a two-dimensional structure of 4 rows and 4 columns (i.e., $R = C = 4$). *Id.* Couplings between each of the stations in Todd are implemented in “a very simple fashion and under token control.” *Id.*

5. Analysis

a. Claims 1–5 and 11–16

Petitioner presents a proposed mapping of Shoubridge, Denes, and Rufino to claim 1. Pet. 19–29; *see also* Ex. 1003 ¶¶ 128–144. Regarding the preamble, Petitioner contends Shoubridge discloses a broadcast channel in the form of an m -regular graph, where m is at least 3, based on its description of a 64 node Manhattan grid network with connectivity of degree 4. Pet. 19–20 (citing Ex. 1005, 1983 (“The [64 node] network is a large regular graph forming a manhattan grid network.”)). Petitioner contends Denes describes a method for disconnecting a first computer from a second computer in a network having an m -regular graph topology where m is at least 3. Pet. 20–21 (citing Ex. 1017, 366–367, Fig. 2); *see also* Ex. 1003 ¶ 131.

Neither Shoubridge nor Denes is alleged to disclose disconnect messages as recited in the body of claim 1. *See* Pet. 25. However, Petitioner contends Rufino discloses a disconnect method “wherein when the first computer is disconnecting from the second computer, the first computer sends a disconnect message to the second computer,” as claim 1 requires. Pet. 22. Specifically, Petitioner contends Rufino’s description of a leaving station (i.e., “first computer”) in a token ring network leaving the network in an orderly way by sending a *set_successor* frame (i.e., “disconnect message”) to a predecessor station (i.e., “second computer”) discloses the foregoing limitation. *Id.* (citing Ex. 1011, 962; Ex. 1003 ¶¶ 134–136). Petitioner contends the *set_successor* frame includes the address of the future successor station, which is the current successor and neighbor of the leaving station. *Id.* (citing Ex. 1011, 962). As such, Petitioner contends Rufino discloses the recited sending “a list of neighbors of the first computer.” *Id.* at 22–23.

Petitioner further contends Rufino discloses that “when the second computer receives the disconnect message from the first computer, the second computer broadcasts a connection port search message on the broadcast channel in order to find a third computer to connect to . . . to maintain an m-regular graph,” as claim 1 also requires. Pet. 23–24. Here, Petitioner cites both *set_successor* frame described above as well as Rufino’s description of a management function which describes finding the successor of a failed station using a *who_follows* query to solicit a station to respond and establish a new successor (i.e., “third computer . . . being one of the neighbors on said list of neighbors”). Pet. 24–25 (citing Ex. 1011, 962–963; Ex. 1003 ¶¶ 140–141). We disagree that Rufino teaches this limitation.

Claim 1 requires that “*when the second computer receives the disconnect message . . . [it] broadcasts a connection port search message . . . to find a third computer,*” which Petitioner contends is disclosed by the *who_follows* query seeking to find a successor to a failed station. *See* Pet. 25. Patent Owner points out that “Rufino’s *who_follows* procedure only takes place in the event of an ‘abrupt’ leave of a station from the token ring, not in the case where a station leaves in an orderly manner by setting a *set_successor* frame, which Petitioners have mapped to the claimed disconnect message.” Prelim. Resp. 20 (citing Ex. 1011, 962–963). We agree. Rufino describes *set_successor* and *who_follows* as alternative ways to address a station leaving the network. Ex. 1011, 962 (“Stations may leave the logical ring either in an abrupt or orderly way.”). As such, the *who_follows* query (as the recited connection port search message) does not happen upon receiving the disconnect message as the claim requires. Petitioner does not address this difference between claim 1 and the teachings of Rufino.

Accordingly, because Petitioner has not provided sufficient evidence that the combination of Shoubridge, Denes, and Rufino teach or suggest the recited message limitations, we determine Petitioner has not established a reasonable likelihood in prevailing on its proposed grounds of obviousness with respect to claim 1. Todd is relied upon only to teach token ring messaging in the context of regular networks in which *m* is at least 3 and, therefore, is not alleged to cure the foregoing deficiency of Rufino. *See* Pet. 58–60. Independent claim 11 recites similar limitations. Consequently, we do not institute *inter partes* review of independent claims 1 and 11, as

well as claims 2–5 and 12–16, which depend from claims 1 and 11.⁹

b. Claim 6

Claim Limitations

Petitioner presents a proposed mapping of Shoubridge, Denes, Rufino, and Todd to independent claim 6. Pet. 29–37; *see also* Ex. 1003 ¶¶ 161–176. Similar to claim 1, Petitioner contends Shoubridge discloses a broadcast channel in the form of an m-regular graph, where m is at least 3, based on its description of a 64 node Manhattan grid network with connectivity of degree 4. Pet. 29 (citing Ex. 1005, 1983 (“The [64 node] network is a large regular graph forming a manhattan grid network.”)). Also similar to claim 1, Petitioner contends Denes describes a method for disconnecting a first computer from a second computer in a network having an m-regular graph topology where m is at least 3. Pet. 29–30 (citing Ex. 1017, 365–366, Fig. 2); *see also* Ex. 1003 ¶ 163.

Petitioner contends each of Shoubridge, Denes, and Rufino discloses “attempting to send a message from the first computer to the second computer,” as claim 6 recites. Pet. 30–31 (citing, e.g., Ex. 1005, 1381; Ex. 1017, 365; Ex. 1011, 962–963). For example, Petitioner relies on Rufino’s disclosure of a station (i.e., first computer) attempting to pass the token to a failed station (i.e., second computer), as disclosing the foregoing

⁹ Because we do not institute *inter partes* review of claims 1–5 and 11–16, it is unnecessary to address Petitioner’s proposed ground of obviousness challenging claims 4, 5, 14, and 16, as the addition of Hirviniemi is not alleged to address the deficiencies in claims 1 and 11. *See* Pet. 54–56. Similarly, it is unnecessary to address Petitioner’s proposed ground of obviousness challenging claim 13, as the addition of Balph is also not alleged to address the deficiencies in claim 1 and 11. *See id.* at 56–58.

limitation. *Id.* Patent Owner disputes this contention. According to Patent Owner, “[t]he passage of a token does not send or receive any type of disconnect message between stations but rather only ‘establishes a logical ring over the physical bus.’” Prelim. Resp. 23 (quoting Ex. 1011, 959).

We are not persuaded by this argument, because Patent Owner fails to explain why the failure to pass a token from the computer holding the token to its successor, does not constitute “attempting to send a message” as the claim recites. To the extent Patent Owner contends failure to pass a token is not a “disconnect message,” claim 6 does not require the message to be a *disconnect* message. To the extent Patent Owner is arguing that the disclosed token is not a “message,” as that term is recited in the ’147 patent, Patent Owner has proffered no construction or analysis of the term “message” on which to base this argument. We observe that the ’147 patent uses the term “message” in the context of both internal ports for “broadcast messages” and external ports for “non-broadcast messages.” Ex. 1001, 6:10–22. The ’147 patent states that a computer seeking a connection uses external ports when locating a portal computer. *Id.* at 6:22–23. In other words, a message, as that term is used in the ’147 patent, may include messages used to seek connections and other “non-broadcast” functions. Consequently, for purposes of this Decision, we determine that attempting to pass a token teaches the recited attempting to send a message.

Petitioner contends Rufino also discloses that “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.” Pet. 33–34. For purposes of this Decision, we agree this limitation is taught by Rufino’s description of an unsuccessful attempt to

pass the token to the failed station, whereupon the station holding the token transmits a *who_follows* query to obtain a response from the successor to the failed station. *Id.* at 34–35 (citing Ex. 1011, 962–963). Similarly, for purposes of this Decision, we also agree Rufino’s description of the token holder receiving a response from the successor of the failed station teaches “having a third computer not already connected to said computer respond to said connection port search message in a manner as to maintain an m-regular graph,” as claim 6 recites. *Id.* at 34–35.

Like claim 1, claim 6 requires that “said broadcast channel be[] an m-regular graph where m is at least 3.” Ex. 1001, 29:14–15. Petitioner acknowledges Rufino teaches messaging in the context of a 2-regular topology only. Pet. 58 (citing Ex. 1003 ¶ 231). However, citing Todd, Petitioner contends it would have been known to a person of ordinary skill to expand this messaging technique to a 4-regular (i.e., $m = 4$) grid topology. *Id.* at 18 (citing Ex. 1003 ¶ 124). Petitioner also contends Todd’s teaching of a two-dimensional, token grid network allows for higher throughput and shows the modification to Rufino to a higher order network can be done in simple fashion by overlapping token rings. Pet. 59–60 (citing Ex. 1019, 1; Ex. 1003 ¶¶ 233–234).¹⁰

Patent Owner and its declarant, Dr. Goodrich, argue that Todd is only “2-connected” and therefore does not teach the required m-regular graph

¹⁰ Although these theories are presented as alternative grounds, we determine that Petitioner’s reliance on Todd—whether as evidence of background knowledge or as part of the proposed combination—is substantially the same for both grounds. We, therefore, exercise our discretion to proceed solely on the latter ground by explicitly including Todd in the proposed combination. *See* 37 C.F.R. § 42.108(a).

where m is at least 3. Prelim. Resp. 29 (citing Ex. 1019, 279 (“[E]ach station is two-connected.”)); Ex. 2001 ¶ 35 (same). For purposes of this Decision, we do not find this argument persuasive. Dr. Goodrich does not explain why 2-connected implies that m is not at least 3, and, at this stage of the proceeding, we must view testimonial evidence in the light most favorable to Petitioner’s declarant, who states that Todd discloses a 4-regular network. Ex. 1003 ¶¶ 231-232; *see* 37 C.F.R. § 42.108(c). Moreover, we observe that the overlapping token ring network in Todd depicts each station having exactly 4 connections to neighboring stations, and Todd, therefore, would appear to support Petitioner’s position that Todd discloses a 4-regular network despite describing itself as 2-connected. *See* Ex. 1019, Fig. 1.

Patent Owner also argues that, as a token ring network, Todd can transmit to only one station at a given instant in contrast to the “claimed computers of the ‘broadcast channel.’” Prelim. Resp. 30. Even if true, we do not find this argument persuasive, because Patent Owner does not attempt to construe or define broadcast channel as requiring transmission to more than one computer or station at a time (i.e., simultaneously).

Accordingly, at this stage of the proceeding, we are persuaded that respective portions of Shoubridge, Denes, Rufino, and Todd teach or suggest the limitations of claim 6.

Rationale for Combining

Petitioner proposes a rationale for combining Shoubridge, Denes, Rufino, and Todd. *See* Pet. 17–19, 58–60. Citing its declarant, Dr. Karger, Petitioner contends Shoubridge teaches a 4-regular network as an example of a reliable network and teaches that such networks can be dynamic, while Denes teaches how to maintain an m -regular non-complete topology when

removing a node. *Id.* at 18 (citing Ex. 1003 ¶¶ 121–123). Petitioner further contends Rufino teaches a messaging technique used to implement a node removal operation in an m-regular network as taught by Denes.¹¹ *Id.* (citing Ex. 1003 ¶ 124). Petitioner contends that a person of ordinary skill would have been motivated to apply the messaging techniques disclosed in Rufino to coordinate the node removal operation disclosed in the Denes and Shoubridge combination. *Id.*; *see also* Ex. 1003 ¶ 168 (“[I]t would have been obvious to use the technique of Rufino to identify a failed port Rufino discloses . . . that an attempted transmission can be used to identify a failed node in the network.”). Finally, Petitioner contends Todd discloses a grid of overlapping token rings in a 4-regular network and the proposed modification to Rufino to add additional connections could be done in a simple fashion to obtain the advantages of better transmission as taught by Todd. *Id.* at 58–59 (citing Ex. 1003 ¶¶ 233–234).

Patent Owner argues that Petitioner fails to show why a person of ordinary skill in the art would have been motivated to combine Shoubridge, Denes, and Rufino in the manner suggested. Prelim. Resp. 24–27. In particular, Patent Owner contends Shoubridge’s network is a simulation and not based on a “real-world network” and neither Denes nor Rufino is about routing algorithms or simulating a network. *Id.* at 25.

We are not persuaded by this argument. Although Shoubridge describes the simulation of a 64 node Manhattan grid network, it suggests

¹¹ We observe that once Rufino’s failed node operation is applied to Todd, this combination would also appear to teach node removal in the context of a 4-regular topology, regardless of whether Denes is included in the combination.

the simulation is intended to model a “real system.” *See* Ex. 1005, 1382–1383 (“In a real system, this information may be piggybacked on return user packets.”). Moreover, like Shoubridge, Todd also refers to Manhattan grid network topologies (*see* Ex. 1019, 280), suggesting such a network was known in the art and suitable for real world applications. Given that Shoubridge also discloses that such networks may be dynamic (*see* Ex. 1005, Abstract (“[N]etwork topologies may vary from nearly static to very dynamic.”)), we determine that, at this stage of the proceeding, Petitioner’s articulated reasoning for combining Shoubridge with Denes and Rufino—both of which are alleged to teach the removal of a node and reconnecting of the network so as to maintain a regular topology—to be based on rational underpinnings. *See KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

For the same reasons, we also are not persuaded by Patent Owner’s contention that Petitioner’s rationale based on Shoubridge’s teaching of dynamic networks and Denes’s and Rufino’s teachings in regards to the problems of dynamic networks are just another way of saying the references are in the same field and insufficient as a matter of law as motivation to combine the references. Prelim. Resp. 26–27. As discussed, Petitioner has provided a more particularized rationale than just stating the references are in the same field.

Although Patent Owner contends Shoubridge simulates adding or removing a network by modifying link value and distributing changes evenly, which are not discussed by Denes or Rufino (Prelim. Resp. 25 (citing Ex. 1005, 1383)), we are not persuaded because Patent Owner fails to

direct us to what this means and how it undermines the teachings of the proposed combination.

Patent Owner also argues Rufino teaches away from point-to-point graphs such as Denes because Rufino teaches such solutions are “costly and complex.” Prelim. Resp. 27 (quoting Ex. 1011, 958); *see also* Ex. 2001 ¶ 32. We disagree for two reasons. First, we view Rufino to be promoting the benefit of a token ring topology, not discouraging a person of ordinary skill from using point-to-point networks, which Rufino admits are important despite their limitations. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2005). For purposes of this Decision, we determine that a person of ordinary skill would have been motivated to use the teachings of Rufino in Shoubridge’s network even at the expense of foregoing the benefit of token ring’s delivery latency. *See In re Urbanski*, 809 F.3d 1237, 1242–1243 (Fed. Cir. 2016) (affirming the Board’s determination that a person of ordinary skill would have combined the references even at the expense of the benefit of one reference, where there was no evidence the references would have interacted in an unpredictable way).

Second, and more importantly, Patent Owner’s teaching away argument does not address the fact that Todd also teaches the beneficial use of token ring networks, as taught by Rufino, in a 4-regular Manhattan grid topology (also used by Shoubridge), as discussed above. Therefore, even if we agreed Rufino discourages the use of point-to-point networks as a general matter, this does not overcome the fact that Todd specifically contemplates using token ring in the context of the recited network topology (i.e., where m is at least 3). *See DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1360 (Fed. Cir. 2006)

(“[M]otivation to combine may be found . . . *in the prior art* references themselves.”) (emphasis in original).

Similarly, Patent Owner also contends it would not have been obvious to combine Todd with Shoubridge and Denes, because “Todd requires a convoluted Token Grid Protocol.” Prelim Resp. 30–32 (citing Ex. 1019, 281 (“Protocol 1”)). Such complexity, Patent Owner argues, is contrary to the goal of Rufino, which seeks to avoid complex point-to-point solutions. *Id.* at 32. Patent Owner also observes that Todd was available nearly 20 years “before the ’147 patent was filed, yet there is no evidence anyone sought to modify Rufino using Todd to reach the claimed invention.” *Id.* However, these arguments are unavailing because, as just noted, Todd explicitly contemplates the use of token ring protocol—as Rufino teaches—within the token grid network. As such, Petitioner’s contention that a person of ordinary skill in the art would have modified Rufino to use Todd in the context of Todd’s network is supported sufficiently for purposes of this Decision.

Finally, Patent Owner contends Petitioner improperly failed to explain how the references would be modified by Todd to reach the claimed invention. Prelim. Resp. 32. At this stage of the proceeding, we disagree. When Rufino’s description of the node removal protocol in a token ring is applied to Todd’s grid network of overlapping token rings, as Petitioner proposes (Pet. 59–60), the alleged result—a 4-regular network with overlapping token rings using the node removal protocol of Rufino—is a predictable combination of familiar elements. *See KSR*, 550 U.S. at 416.

For the foregoing reasons, we determine Petitioner has established a reasonable likelihood of prevailing on the proposed ground of obviousness under § 103(a) over Shoubridge, Denes, Rufino, and Todd against claim 6.

c. Claims 7–10

Claims 7–10 depend directly or indirectly from claim 6. Petitioner presents a proposed mapping of Shoubridge, Denes, Rufino, and Todd to claims 7–10. Pet. 37–41. Patent Owner does not present specific rebuttals to Petitioner’s contentions with respect to claims 7–10 at this stage of the proceeding. We have reviewed Petitioner’s proposed mapping and, for purposes of this Decision, we determine Petitioner has sufficiently shown how the foregoing references teach the respective claim limitations. For example, Petitioner contends claim 7’s requirement that the third computer proposes that the first and third computer connect is taught by Rufino’s *set_successor* packet following the *who_follows* query. See Pet. 37–38 (citing Ex. 1011, 962–963). Similarly, for claim 8, Petitioner contends its requirement that the first computer send a message indicating it accepts the third computer’s proposal to connect is taught by the result of Rufino’s *who_follows* query, which is that the new successor for the current token holder (i.e., first computer) is established. *Id.* at 38–39. Accordingly, for these claims, as well as claims 9 and 10, we determine Petitioner has established a reasonable likelihood of prevailing on the proposed ground of obviousness under § 103(a) over Shoubridge, Denes, Rufino, and Todd.

*B. Alleged Obviousness of Claims 8 and 13 over
over Shoubridge, Denes, Rufino,
Todd, and Balph*

Petitioner proposes an additional challenge to claims 8 and 13 that adds Balph to the above combination Shoubridge, Denes, Rufino, and Todd

“[t]o the extent the Board believes the aforementioned limitations are not disclosed by Rufino.”¹² Pet. 56–58. However, as discussed above, for purposes of this Decision we agree claim 8 is taught by the combination Shoubridge, Denes, Rufino, and Todd. Accordingly, as it is unnecessary to consider the additional ground based on Balph with respect to claim 8, we exercise our discretion and decline to institute review based on this ground. *See* 37 C.F.R. § 42.108(a).

III. CONCLUSION

For the foregoing reasons, we determine that the information presented establishes a reasonable likelihood that Petitioner would prevail in showing that claims 6–10 of the ’147 patent are unpatentable. At this stage of the proceeding, the Board has not made a final determination with respect to the patentability of the challenged claims.

IV. ORDER

In consideration of the foregoing, it is

ORDERED that an *inter partes* review is instituted as to claims 6–10 of the ’147 patent on the grounds of obviousness under 35 U.S.C. § 103(a) over Shoubridge, Denes, Rufino, and Todd;

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the ’147 patent is instituted with trial commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is given of the institution of the trial; and

¹² Although this ground is based explicitly on Shoubridge, Denes, and Rufino, Petitioner contends the analysis is the same if Todd is included. Pet. 4 (“The analysis for Grounds 2 and 3 can easily depend from either Ground 1 or 4.”).

FURTHER ORDERED that the trial is limited to the grounds identified immediately above, and no other ground is authorized.

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