

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.
Petitioner

v.

PORTSMOUTH NETWORK CORP.
Patent Owner

IPR2024-00505
U.S. Patent No. 6,917,986

PETITIONER'S REPLY

Mail Stop Patent Board
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
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All citations to 35 U.S.C. §§ 102 and 103 in this paper refer to the pre-AIA statute.

All emphases are added unless otherwise noted.

PETITIONER'S EXHIBIT LIST

1001	U.S. Patent No. 6,917,986 to Mor et al. ("986 patent")
1002	Prosecution History of U.S. Patent No. 6,917,986
1003	Declaration of Dr. Henry Houh
1004	<i>Curriculum Vitae</i> of Dr. Houh
1005	U.S. Patent No. 6,032,194 to Gai <i>et al.</i> ("Gai")
1006	U.S. Patent No. 7,848,264 to Gai <i>et al.</i> ("Gai_264")
1007	"IEEE Standard for Information Technology, Telecommunications and Information Exchange between Systems, Local and Metropolitan Area Networks, Common Specifications, Part 3: Media Access Control (MAC) Bridges," published as ANSI/IEEE Standard 802.1D (1998) ("802.1D")
1008	Docket Control Order, <i>Portsmouth Network Corp. v. Cisco Sys., Inc.</i> , No. 2:23-cv-00441 (E.D. Tex. Dec. 18, 2023)
1009	Director's June 21, 2022, Memorandum on Discretionary Denials
1010	Prosecution History of U.S. Patent No. 7,848,264
1011	U.S. Patent No. 6,330,229 to Jain et al. ("Jain")
1012	U.S. Patent No. 7,200,110 to Burns et al. ("Burns")
1013	U.S. Patent No. 5,995,608 to Detampel et al ("Detampel")
1014	U.S. Patent Publication No. 2003/0021223 to Kashyap ("Kashyap")
1015	Notice of Disclosures, <i>Portsmouth Network Corp. v. Cisco Sys., Inc.</i> , No. 2:23-cv-00441 (E.D. Tex. Jan. 8, 2024)
1016	Declaration of Jordan Owens in support of <i>Pro Hac Vice</i> Motion
1017	Scheduling Order, IPR2024-00505, dated August 6, 2024

1018	Deposition Transcript of Dr. James Olivier, dated February 14, 2025

Citations to specific pages of exhibits follow the pagination added to those exhibits per 37 C.F.R. § 42.63(d)(2)(i).

I. INTRODUCTION

Patent Owner's Response ("POR") largely repackages arguments from its Preliminary Response ("POPR") that the Board already rejected when granting institution ("Decision"). Thus, the Board should reject Patent Owner's arguments for the same reasons it granted institution.

II. CLAIM CONSTRUCTION

Petitioner and Patent Owner agree that no claim term requires express construction for the purposes of this IPR proceeding. *See* Petition, 11-12; POR, 5.

Patent Owner nevertheless faults Petitioner for not addressing the terms "edge switch" and "access switch" because Defendant Cisco proposed constructions for those terms in the parallel district court litigation six months after the Petition was filed. But there was and is no need to address these proposed constructions in the Petition because they were and remain consistent with how Petitioner and the Board interpreted and used these terms in this proceeding.

III. GAI AND THE '986 PATENT ARE DIRECTED TO THE SAME SUBJECT MATTER

A. Gai And The '986 Patent Are Not "Fundamentally Different"

Patent Owner alleges that the '986 patent and Gai are "fundamentally different." POR, 7, 8, 12. But the '986 patent itself incorporates Gai by reference. EX1001, 3:15-41. Indeed, Patent Owner submitted Gai as relevant prior art in an Information Disclosure Statement during prosecution. EX1002, 30, 46. Patent

Owner's arguments are largely based on how the '986 patent characterized the teachings of Gai. *See* POR, 11-12, 13-14. But the germane question to the invalidity analysis is what a POSITA would have understood reading Gai—not how the '986 patent characterizes Gai. *See Acoustic Technology, Inc. v. Itron Networked Solutions*, 949 F.3d 1366, 1373 (Fed. Cir. 2020). Indeed, a POSITA would have readily understood that (1) both the '986 patent and Gai address the same problem, (2) both use redundant links to connect network devices, (3) both rely on the same Spanning Tree Protocol (STP) to create redundant links, and (4) both send dummy traffic to improve upon STP. *See* EX1018, 34:4-35:16, 35:22-36:2, 36:10-20.

(1) The '986 patent and Gai address the same problem. The '986 patent “relates generally to communication networks, and specifically to methods and devices for providing reliable, fault-resistant network access.” EX1001, 1:6-8. Specifically, the '986 patent seeks to “provide methods and devices enabling rapid reconfiguration in response to network topology changes.” *Id.*, 3:58-60.

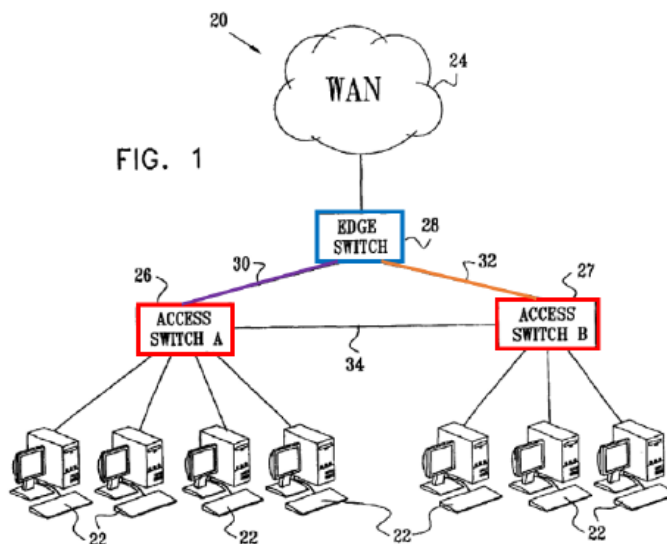
Similarly, Gai “relates generally to computer networks, and more specifically, to a method and apparatus for rapidly reconfiguring a computer network following a network change.” EX1005, 1:14-17. Gai further explains that its network change can include “a link failure or recovery.” *Id.*, 5:16-19.

(2) The '986 patent and Gai use redundant links to connect network devices.

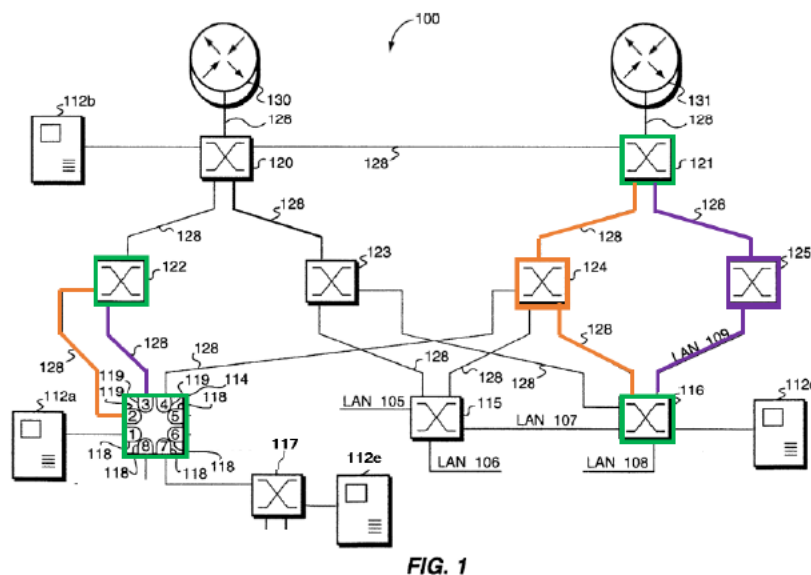
The '986 patent recognized that “[t]o protect against failures of network equipment

and communication media, it is common to provide multiple, redundant paths between switches in the network.” EX1001, 2:7-9. The use of redundant links is disclosed throughout the '986 patent's specification as well as its claims. *See, e.g., id.*, 4:58-61, 6:4-6, 7:8-12, 10:62-65.

Similarly, Gai acknowledged that “most computer networks include redundant communications paths so that a failure of any given link does not isolate any portion of the network.” EX1005, 2:14-16. Gai further described the use of redundant links. *See, e.g., id.*, 2:14-41, 7:53-61. Figure 1 from the '986 patent and Figure 1 from Gai, annotated below, illustrate their respective redundant links in purple and orange.



Petition, 21 (EX1001, Figure 1 (annotated)).



Petition, 2 (EX1005, Figure 1 (annotated)).

(3) The '986 patent and Gai rely on STP to implement redundant links. The '986 patent describes STP, introduced in IEEE 802.1D, as a solution for avoiding the creation of loops when using redundant links. EX1001, 2:31-34. The '986 patent further describes that “STP ensures that all data paths in a network of bridges are free of loops by disabling forwarding of packets through certain interfaces.” *Id.*, 2:34-36.

Gai similarly seeks “[t]o avoid the formation of loops, devices, such as switches or bridges” by “execut[ing] a spanning tree algorithm” which “effectively ‘severs’ the redundant links within the network.” EX1005, 2:30-33.

(4) The '986 patent and Gai send dummy traffic to improve upon STP. The '986 patent explains that “[a]lthough STP is effective in removing network loops, it

is very slow in adapting to topology changes that may occur when a network link fails or is subsequently restored.” EX1001, 2:65-67. The '986 patent teaches that “[i]n order to inform the access switches and other downstream equipment that they should now transmit their upstream traffic through the new active link, the edge switch sends dummy frames through the new active link to the access switches.” *Id.*, 4:16-19.

In fact, this solution was borrowed from Gai. The '986 patent recognized that “U.S. Pat. No. 6,032,194 [Gai], whose disclosure is incorporated herein by reference, describes a method for rapidly reconfiguring a computer network, based on certain modifications to the standard STP.” EX1001, 3:15-18. The '986 patent further describes that to address network topology changes, Gai “transmits dummy multicast messages” to propagate information relating to the new active port. *Id.*, 3:29-35. The '986 patent only purports to differ from Gai because Gai “require[s] network entities to be aware of and manage redundancies in their upstream ports,” *i.e.*, Gai teaches sending dummy traffic upstream.¹ *Id.*, 4:37-42.

¹ As explained in the Petition, the '986 patent mischaracterizes Gai because Gai discloses embodiments where dummy multicast messages can be transmitted upstream or downstream. *See* Petition, 19-25.

In summary, Patent Owner's only basis for claiming that the '986 patent and Gai are "fundamentally different" is the allegation that Gai and the '986 Patent transmit dummy traffic in different directions after a topology change. POR, 12. But, that too is incorrect.

B. Gai Discloses Sending Dummy Messages Downstream

Grounds 1A and 1B introduce evidence of relevant and contemporaneous references, not as a combination, but as support for the contention that it was well known *in the art* at the time of the '986 patent that failures could occur at any port or link in a connected network, including a downstream port. Petition, 41. Patent Owner does not dispute that *Jain*, *Burns*, *Detampel*, and *Kashyap* support the proposition that a failure could occur at any link or port, and it does not dispute that this proposition was well known in the art. *See* POR, 12-13. Tellingly, Patent Owner's expert, Dr. Olivier, confirmed that a POSITA would understand that a failure could be detected in any switch in the network. *See* EX1018, 61:14-62:1, 67:9-14.

Because it is undisputed that a POSITA would have known that any link or port in a network could fail, a POSITA would have known Gai's dummy multicast messages can be sent downstream. For example, a failure at the port on edge switch 124 connecting to access switch 115 may occur. *See* EX1018, 61:14-62:1, 67:9-14. When this happens, the port connecting edge switch 124 to access switch 116 may

become the new forwarding port. And, as Gai discloses, “[u]pon transition to the *new forwarding port*, the device begins transmitting ‘dummy’ multicast messages *through the new port*.” EX1005, 5:54-56. Thus, edge switch 124 would send dummy multicast messages downstream to at least access switch 116 through the new forwarding port.

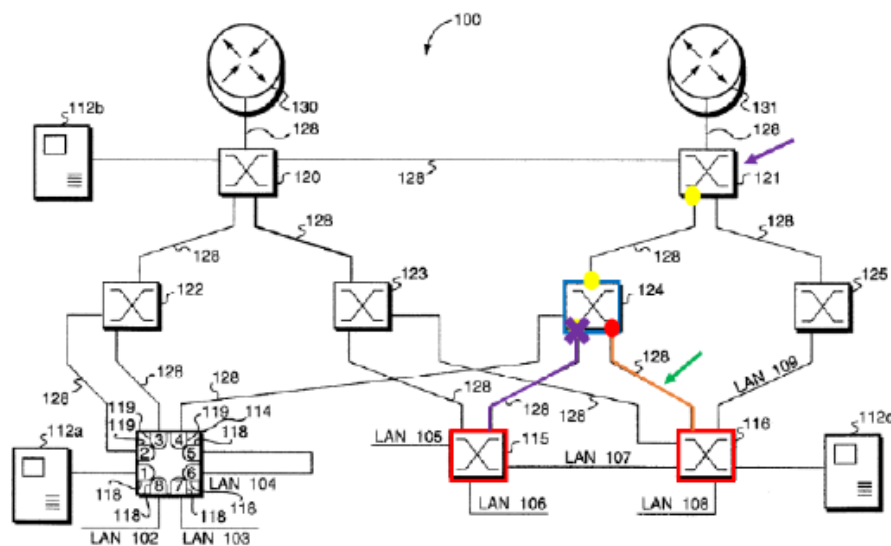


FIG. 1

Petition, 46 (EX1005, Figure 1 (annotated)).

Patent Owner fails to acknowledge this embodiment and fails to address Petitioner's evidence that a *continuation* application of Gai explicitly discloses and claims transmitting dummy messages “downstream.” See Petition, 43-44. Specifically, U.S. Patent No. 7,848,264 (EX1006) teaches that messages are sent downstream to inform devices of the new designated port. EX1006, 18:8-11 (“[T]ransmitting, by the back-up designated port, one or more messages, *the*

messages to tell devices downstream in the spanning tree that the router has a new designated port.”); see EX1018, 53:16-20. Gai’s continuation even claims transmitting messages “to tell devices downstream” that a new port is active. EX1006, 18:8-11.

IV. INDEPENDENT CLAIMS

A. Grounds 1A And 1B Are Based On The Express Disclosures Of Gai

Patent Owner argues that “Gai does not teach or render obvious sending dummy traffic ‘from the first bridge over the second link downstream to the second bridge’ (claim limitation 12e),” (POR, 16), and that “Gai does not teach ‘sending dummy traffic from the edge switch over the second link to the one or more access switches’ (claim limitation 1e)” (POR, 31). But Grounds 1A and 1B demonstrate how the challenged claims are obvious over Gai based on what a POSITA would reasonably understand from Gai’s express disclosures. Simply put, “the dispositive question is whether a skilled artisan would ‘reasonably understand or infer’ from a prior art reference that every claim limitation is disclosed in that single reference.” *Acoustic*, 949 F.3d at 1373 (quoting *Akamai Techs., Inc. v. Cable & Wireless Internet Servs., Inc.*, 344 F.3d 1186, 1192 (Fed. Cir. 2003)); *see also Adasa Inc. v. Avery Dennison Corp.*, 55 F.4th 900, 910 (Fed. Cir. 2022) (“[T]he reference need not disclose the elements in the very same terms used by the patent.”) (citing *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009). Furthermore, “[e]xpert testimony

may shed light on what a skilled artisan would reasonably understand or infer from a prior art reference.” *Acoustic*, 344 F.3d at 1373 (citing *Monsanto Tech. LLC v. E.I. DuPont de Nemours & Co.*, 878 F.3d 1336, 1345 (Fed. Cir. 2018)). Indeed, a POSITA would have reasonably understood or inferred from Gai that limitations 12e and 1e are taught and/or rendered obvious, as further explained below.

Patent Owner further alleges that Petitioner relies on a “modified” version of Gai. POR, 12-16. But Patent Owner’s “motivation to modify” argument is an irrelevant red herring. Invalidity based on single-reference obviousness does not necessarily require a motivation to modify analysis. In *Unification Techs. LLC v. Micron Tech. Inc.*, the Court explained:

The Board thus found the Challenged Claims unpatentable under 35 U.S.C. § 103 in light of a single prior art reference, Suda, which the Board found taught every limitation. Because no modification to Suda was necessary to arrive at the claimed invention, the Board was “not required to make any finding regarding a motivation to” modify Suda.

No. 2023-1348, 2024 WL 3738401, at *6 (Fed. Cir. Aug. 9, 2024). Here, Petition’s invalidity grounds rely only on Gai’s disclosure, and a motivation to modify finding is not required.

Petition’s Grounds 1A and 1B are firmly rooted in Gai. Ground 1A relies upon Gai’s teachings that the invention could be implemented at any device, which includes the downstream transmission of dummy messages to an access

switch/second bridge when a failure occurs at an edge switch/first bridge (Petition, 25-46). The Board agreed:

Based on the current record, we agree that this example is at least suggested by Gai's teaching that "the method and apparatus manifests, in part, as a series of novel commands that may be entered at the devices. The devices, moreover, may be classified as either access switches or backbone switches."

Decision, 36 (citing EX1005, 6:6-9). Gai requires no "modification" to meet the '986 patent's dummy multicast messages sent downstream or to an access switch. *See Bell Semiconductor LLC v. NXP B.V.*, No. 2023-1260, 2024 WL 4984053, at *2 (Fed. Cir. Dec. 5, 2024) (concluding that "a person of ordinary skill in the art would have understood [single-reference] Chin's disclosure to apply to an integrated circuit package substrate" because Chin separately disclosed "multi-layer substrates" and "semiconductor implementations"). The downstream embodiment is therefore disclosed in Gai, requiring no motivation to modify.

Similarly, Ground 1B of the Petition is expressly disclosed in Gai; it is not a "modification." Ground 1B relies upon Gai's addition of an access switch and the subsequent transmission of dummy messages, which is expressly disclosed—"if port number seven at switch 114 were *coupled to another access switch*, entity 234 would transmit multicast messages 400 carrying the source address of *entities directly coupled to this additional access switch* as well"—and properly presented

as a single-reference obviousness ground. EX1005, 13:60-63. Gai teaches sending dummy messages both from an edge switch (*e.g.*, switch 114) through the newly-active port to inform the other devices of the newly-active port, as well as sending dummy messages away from the root switch (*i.e.*, downstream). *See* Petition, 81-86.

Because Petitioner did not modify Gai, Patent Owner's complaints regarding a lack of motivation to modify Gai hold no water. *See Unification Techs.*, 2024 WL 3738401, at *6. For example, Patent Owner complains that Petitioner's citations to *Burns* and *Detampel* fail "to discuss why a POSITA would understand that dummy traffic may be sent downstream over the second link in *Gai*." POR, 13. But Petitioner ***does not*** rely on these references for that purpose; instead, Petitioner establishes the well-understood state of the art that a failure can happen at any port or link. Notably, Patent Owner does not dispute those teachings. And Patent Owner's claim that Gai teaches away from Petitioner's annotated figures entirely disregards the Board's rejection of the same argument. Decision, 47-49.

Finally, even if Gai's teachings were hypothetically modified in the Petition, a POSITA would have been motivated to modify Gai to send dummy traffic downstream and/or to an access switch. A POSITA would have understood that a failure can happen at any link or port (*see* Petition, 41; EX1018, 61:14-62:1, 67:9-14), and a POSITA would have been motivated to modify Gai's transmission of

dummy traffic to update network devices of the newly-active port to *all* network devices regardless of whether they are upstream or downstream. For example, in *Burns*, when a signalling link or port fails, “the signalling entities adjacent to the link failure ... release all switched connections which utilize the failed signalling link or port.” EX1012, 2:64-3:3. Moreover, a POSITA would have reasonably expected such a modification to succeed because, as Dr. Olivier admitted, it was well-known in the art that messages could be sent in both the upstream and downstream directions. EX1018, 37:11-22. As further explained in *Burns*, the signalling entities adjacent to the link failure send release messages to the switched connections “[i]n both the upstream and downstream directions of a signalling failure[.]” EX1012, 3:3-7; *id.*, 12:40-65. Given that Gai discloses sending dummy traffic to inform network devices of a new active port—as Patent Owner does not dispute—a POSITA would have been motivated to modify Gai to include sending dummy traffic downstream and to an access switch.

B. Gai Discloses And/Or Renders Obvious Claim Limitation 12e

Patent Owner argues that the '986 patent distinguishes Gai as only sending upstream dummy traffic, so the Board should accept that characterization at face value. POR, 17-18; *see also* POPR, 2-3, 8. But as the Petition already explained (*see* Petition, 19-25, 68-70), the '986 patent mischaracterizes Gai, and the Board adopted Petitioner's arguments (Decision, 43-49).

Specifically, Patent Owner argues that Gai cannot teach or render obvious claim limitation 12e because the '986 patent “references and distinguishes *Gai* as part of the '986 patent's discussion of the background of the invention” “by stating that *Gai* transmits dummy multicast messages towards the root upstream and that the source address comes from an entity downstream of the switch.” POR, 17. But the '986 patent's self-serving description of Gai cannot be accepted as fact. The '986 patent only accounts for a single preferred embodiment of Gai and fails to address Gai's other embodiments such as where additional switches may be added to the network, allowing dummy traffic to be sent downstream. *See supra*, 6-7. And the Board rejected Patent Owner's exclusive reliance on Gai's preferred embodiment “in view of Gai's teaching that the method of the invention can also be implemented on backbone switches (which include edge switches)” and Gai's teaching “that it is possible that any switch can be designated as the root switch[.]” Decision, 46, 48.

1. Ground 1A: Downstream Embodiment

Ground 1A relies on the teachings of Gai, which Petitioner has depicted by annotating Gai's figures.

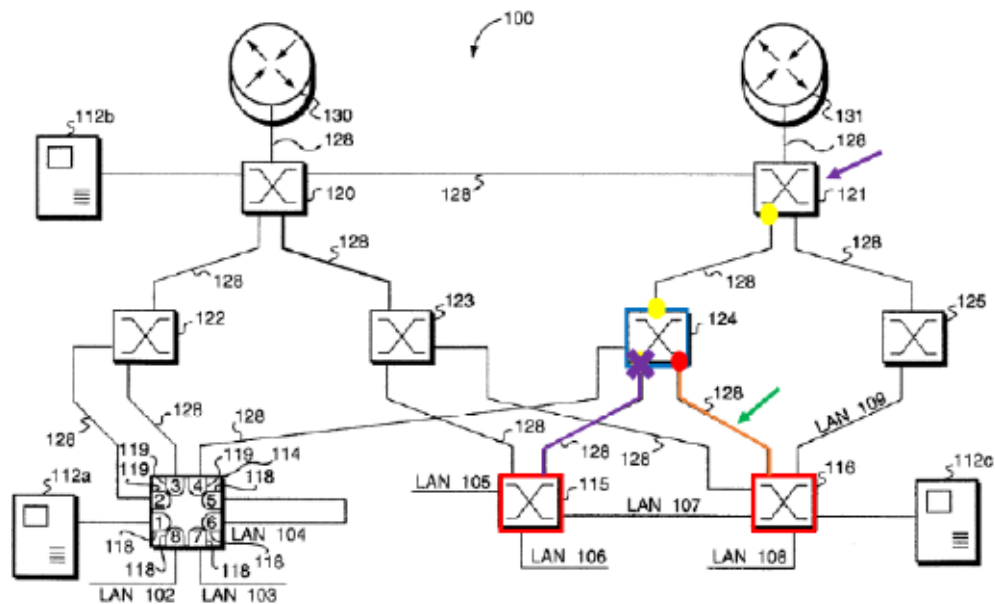


FIG. 1

Petition, 25, 42 (EX1005, Figure 1 (annotated)).

Patent Owner raises two arguments against Ground 1A. First, Patent Owner claims that Petitioner's annotations depicting switch 124 as the edge switch/first bridge, switch 116 as the access switch/second bridge, and switch 121 as the root are flawed. Specifically, Patent Owner argues that Gai does not describe switch 124 as an edge switch/first bridge, and it instead describes that multicast messages are sent in response to a failure at switch 114, not switch 124. POR, 19-21. But Dr. Olivier conceded that a POSITA would have understood that a failure could occur at switch 124, which would cause switch 124 to send dummy multicast messages. EX1018, 61:14-62:1, 67:9-14. And Patent Owner provides no plausible rebuttal to the fact that a POSITA would have understood that Gai's disclosure would have easily been

applied to switch 124 as well. *See* Petition, 24. Indeed, Gai expressly contemplates that “the method and apparatus manifests, in part, as a series of novel commands that may be entered at the devices,” which allows the very implementation depicted in Petitioner’s annotated Figure 1 above. EX1005, 6:6-8. The Board agreed with Petitioner and found Patent Owner’s argument an attempt to limit Gai to its preferred embodiment:

Switch 124 is a backbone switch because it interconnects at least access switches 114-116, and, according to Gai, the invention can be implemented on that switch by entering the corresponding commands on it.

Patent Owner appears to be trying to limit Gai’s teaching to the preferred embodiment that describes the failure occurring at switch 114, which we do not find warranted in view of the general teaching from Gai discussed above saying the invention can also be implemented on backbone switches. *See Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1076 (Fed. Cir. 2015) (“A reference must be considered for everything it teaches.”).

Decision, 36-37.

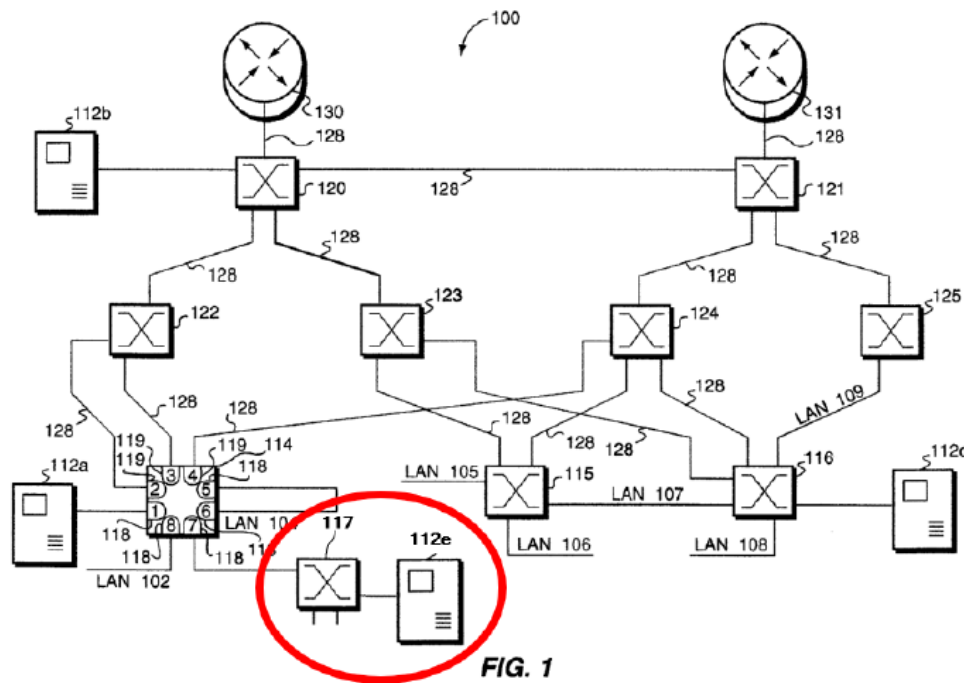
Second, Patent Owner focuses on an embodiment in Gai where the root and root ports are selected to achieve low-cost paths to argue against Petitioner’s Figure 1 annotations. POR, 21-25. Specifically, Patent Owner assigns path costs to links based upon a single embodiment within Gai to counter Petitioner’s embodiment

where switch 121 is the root and switch 124 is the edge switch/first bridge. *Id.* But a POSITA would understand that the path costs Patent Owner relies on are examples and could be different values in different networks, and that selecting a root port with the lowest-cost path to the root is not a required implementation. Further, the Board already recognized that Gai's invention could be applied to edge switch/first bridge 124 in Petitioner's annotated Figure 1, and that "the transmission of the dummy message after activating the red port is downstream over the second link because it is getting further away from the root switches (either switch 120 or switch 121)." Decision, 45-46.

Patent Owner's argument at best presents one possible implementation of Gai's invention, and does not undercut Petitioner's Ground 1A downstream embodiment, which the Board correctly found renders claim 12 obvious.

2. Ground 1B: Upstream Embodiment

Ground 1B is based on Gai's express disclosure of the addition of an access switch. EX1005, 13:60-63 ("[I]f port number seven at switch 114 were *coupled to another access switch*, entity 234 would transmit multicast messages 400 carrying the source address of *entities directly coupled to this additional access switch* as well."); see Petition, 68-70.



Petition, 69 (EX1005, Figure 1 (adding switch 117 and server 112e)). Patent Owner incorrectly argues that Petitioner “modified” Figure 1 by incorporating this express teaching by adding access switch 117. But there is no dispute that a POSITA would reasonably understand that Gai expressly teaches that (1) switch 117 is “another access switch” and (2) Petitioner’s “modified” Figure 1 shows that port 7 at switch 114 is coupled to this “another access switch” 117 as disclosed in Gai. Indeed, Dr. Olivier confirmed that switch 117 is an access switch. EX1018, 85:6-9.

Patent Owner further argues that adding access switch 117 and designating it as the root would create an inefficient network taught away by Gai. POR, 28-31. Patent Owner claims that a POSITA would understand that selecting access switch 117 as the root, “would worsen the performance of network 100” and “not function

correctly[.]” POR, 30, 31. But Gai explicitly discloses that any switch can be the root (EX1005, 3:17-19, 10:29-34) and the Board found that Gai teaches **any** switch can be designated as the root depending on the configuration. Decision, 48 (“Gai teaches that it is possible that any switch can be designated as the root switch, but cautions that designating an access switch as root may be inefficient ‘[d]epending on the configuration’ and gives reasons why that may be the case.”). Dr. Olivier also conceded that “depending on the network” an access switch **could** be selected as the root. EX1018, 98:1-11. Further, a POSITA, according to Dr. Houh, would not have to extrapolate whether designating switch 117 as the root would work correctly, particularly if “it was the switch with the lowest switch identifier,” (EX1003, ¶ 190), nor would a POSITA need a motivation to modify Gai’s teachings; Gai specifically contemplates this embodiment.

Patent Owner’s issue with selecting switch 117 as the root is based on the limited view of a single preferred embodiment in Gai. But Gai explicitly discloses that when using conventional STP, the algorithm “simply selects the switch having the lowest ID to become the root, regardless of where in the network 100 this switch is located. As a result, an access switch is often elected to be the root.” EX1005, 10:29-34. Thus, Gai’s disclosure does not limit the selection of the root or use of specific commands to any particular switch or location.

Patent Owner's final argument that "switch 117 has no path to server 112c" for broadcast messages is also incorrect. POR, 31. Broadcast messages are sent through all active ports except the one on which it was received. *See* EX1001, 1:51-56. Switch 114 provides a path through which broadcast messages between server 112c and server 117 would be sent to and from any of server 114's active ports 2, 3, and 4.

At bottom, Ground 1B under Gai renders claim limitation 12e obvious. When switch 117 is selected as the root and switch 114 (*i.e.*, the first bridge) sends dummy traffic away from root switch 117 (*i.e.*, downstream) to switch 120 (*i.e.*, the second bridge), claim limitation 12e is met. Indeed, Dr. Olivier agrees that in this scenario, "switch 114 would then send dummy messages out of port number 4 towards switch 124" which would be "sending traffic away from switch 117" (*i.e.*, downstream) towards switch 120. *See* EX1018, 82:21-83:2, 97:1-10. Accordingly, Ground 1B renders claim limitation 12e obvious.

C. Gai Discloses And/Or Renders Obvious Claim Limitation 1e

1. Ground 1A: Downstream Embodiment

Except for one additional point, Patent Owner offers the same arguments for claim limitation 1e as it does for claim limitation 12e.

Specifically for claim limitation 1e, Patent Owner alleges that Petitioner failed to show that Gai discloses claim limitation 1e using the constructions proposed in

the parallel district court case for “edge switch” and “access switch.”² But the Petition applied the same understanding of “edge switch” and “access switch,” which comes from the ’986 patent’s specification. EX1001, 1:29-38. The Board similarly applied these characterizations to the network switches discussed in Gai. Decision, 25, n.9. Using the ’986 patent’s characterizations for network switches, switch 124 is properly considered an edge switch as used in claim limitation 1e and the Board agreed. Decision, 27 (“For example, switches 122 and 124 are both edge switches because, as discussed above, they are core switches that connect to access switches 114 and 115, respectively.”)

Thus, under the ’986 patent’s definitions, as well as for the same reasons set forth above relating to claim limitation 12e (*see supra*, 10-16), Patent Owner’s arguments regarding Ground 1A for claim limitation 1e fail.

² Not only were these constructions exchanged nearly six months after the Petition was filed, Patent Owner argued in the district court that these terms are broader than Petitioner’s proposed constructions. *See* EX2004, 3-5 (construing “edge switch” to mean “switch located at the edge of a network” and “access switch” to mean “switch providing access to a network”). Tellingly, Patent Owner does not explain whether or not Gai meets these limitations under its own broader proposals.

2. Ground 1B: Upstream Embodiment

As for Ground 1B as applied to claim limitation 1e, Patent Owner repeats the same flawed arguments it introduced in its Preliminary Response. *See* POPR, 21-23. Specifically, Patent Owner claims that Petitioner's annotations of Gai's Figure 1 incorrectly identify switch 114 as an edge switch and switch 120 as an access switch.

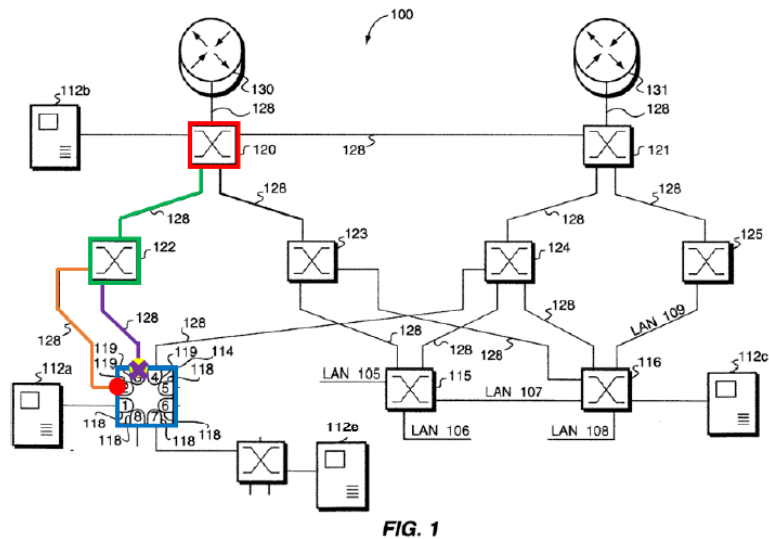


FIG. 1

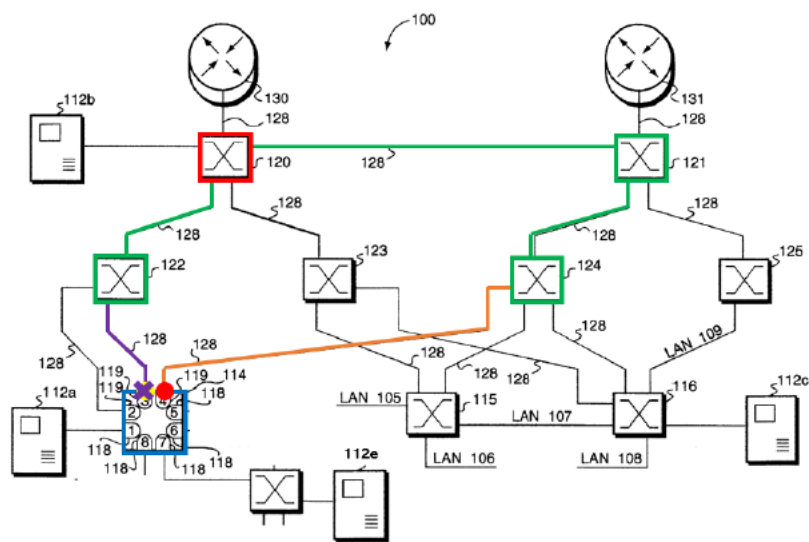


FIG. 1

Petition, 83-84 (EX1005, Figure 1 (annotated)). But Petitioner's annotations reflect Gai's disclosure that "if port number seven at switch 114 were *coupled to another access switch*, entity 234 would transmit multicast messages 400 carrying the source address of *entities directly coupled to this additional access switch* as well," *i.e.*, the addition of another switch connected to port 7 of switch 114 would transform access switch 114 into edge switch 114. *See* EX1005, 13:60-63. And the Board already agreed, finding that access switch 114 became edge switch 114 under the '986 patent's characterizations upon the addition of another access switch, and that "*edge switch 114* sends dummy traffic over the second link, which is to edge switch 124, and then the dummy traffic is further transmitted to multiple switches, including switch 121, and then to *access switch 120*, causing that switch to update its filtering database." Decision, 38-39.

Further, Patent Owner's argument that switch 120 cannot be considered an access switch because it is described as a backbone switch in one embodiment of Gai is wrong. Pursuant to the '986 patent's definition of "access switch," which was adopted by the Board, "[s]witch 120 is an access switch, since it has a port that is connected to server 112b, and thus has 'ports that connect to LANs and/or other network endpoints, such as user computer systems.' Ex. 1001, 1:31-33; Ex. 1005, 7:19-22[.]" Decision, 39; *see also id.*, 25, n.9. Even Dr. Olivier agrees switch 120 is an access switch. EX1018, 85:10-86:7.

Therefore, the sending of dummy traffic from edge switch 114 to access switch 120 in view of Gai's embodiments described in Ground 1B renders claim limitation 1e obvious.

D. Independent Claims 13 And 24

Patent Owner relies on the same arguments made in connection with independent claims 1 and 12 for claims 13 and 24. Specifically, Patent Owner recognized that claims 13 and 24 are substantially similar to claims 1 and 12 (*see* POR, 36-38), and the parties' arguments regarding claim limitations 13f and 24e are the same as claim limitations 1e and 12e, respectively. Accordingly, for the same reasons, Gai renders obvious challenged claims 13 and 24.

V. DEPENDENT CLAIMS

Patent Owner provides some cursory arguments for dependent claims 6, 11, 18, and 23. *See* POR, 38-41. Each of Patent Owner's arguments fails as explained below.

A. Dependent Claims 6 And 18

Patent Owner claims that Gai does not teach or render obvious claim limitations 6a and 18a, which require that transmitted dummy traffic is comprised of "data frames originating at the edge switch while having source addresses corresponding to network addresses of other entities in the network that are

accessible to the access switches via the edge switch.” Patent Owner’s arguments are incorrect for at least two reasons.

First, as explained above in connection with claim 1 (*see supra*, 19-23), Patent Owner’s claim that Gai only teaches dummy traffic originating at access switch 114 is rebutted by Gai’s disclosures. Petitioner illustrated Gai’s embodiments wherein dummy traffic originating at edge switch 124 is sent to access switches (Petition, 39-46) and wherein switch 114 becomes an edge switch upon the addition of access switch 117 (Petition, 81-86). Both grounds were found persuasive by the Board. *See* Decision, 36-38.

Second, Patent Owner’s rigid reliance on Gai’s preferred embodiment descriptions—which the Board rejected (*see* Decision, 36-37)—ignores Gai’s express teaching that “dummy multicast messages carry the source address of each entity that is directly coupled to the device with the new active port or downstream thereof (relative to the root) and are received by other devices in the computer network.” EX1005, 5:56-60. Further, Gai discloses that the source addresses correspond to an entity directly coupled to the edge switch. *Id.*, 13:14-18 (“Next, rapid reconfiguration entity 234 (FIG. 2) loads SA field 412 with the address of an entity directly coupled to switch 114. For example, in a first multicast message 400, entity 234 loads the address of server 112a into the source address field 412.”).

Accordingly, as determined by the Board, Gai explicitly discloses these limitations (Decision, 59-60, 64-65) and teaches and/or renders obvious claims 6 and 18.

B. Dependent Claims 11 And 23

Patent Owner repeats the same arguments it raises for independent claims 1 and 12 against claims 11 and 23—arguments the Board has already rejected. *See* POR, 40-41; Decision, 62, 65. For the same reasons explained above and in the Petition (Petition, 65, 95), Gai renders obvious claims 11 and 23.

C. Dependent Claims 5 And 17

Patent Owner elected to not address dependent claims 5 and 17 in its Response. As such, Patent Owner has waived its arguments as to claims 5 and 17 and its right to address the following discussion in its Sur-Reply. EX1017, 7 (“any arguments not raised in the response may be deemed forfeited”); *see Finjan, Inc. v. Cisco Sys., Inc.*, 837 F. App’x 799, 809, n.10 (Fed. Cir. 2020).

Claims 5 and 17 depend on claims 4 and 16, respectively. Claims 4 and 16 require updating the edge switch’s database responsive to placing the second port in the active state so that the database entries correctly point to the second (newly-active) port instead of the first (failed) port. Claims 5 and 17 further require that updating the edge switch’s database entries occurs “before receiving the communication traffic from one or more access switches on the second port.” EX1001, claims 5, 17.

The Board distinguishes claims 4 and 5 (and 16 and 17) on the basis that claim 5 (and 17) has a timing requirement not present in claim 4 (and 16). The Board interprets this timing requirement to mean “that switch 124 must update its database immediately upon transitioning to the new port either before or at the same time it transmits dummy messages to the access switches.” Decision, 58. Respectfully, Petitioner contends that a POSITA would reasonably understand Gai to teach this temporal requirement.

Gai repeatedly discloses that the network (including the edge switch) is rapidly reconfigured once a new link is activated. *See, e.g.*, EX1005, Abstract; 8:65-9:3; 12:13-15:51. For example, a failure at the forwarding port on switch 114 causes the immediate transition to a new forwarding port, the identity of which “must be propagated to the other devices,” wherein “[s]witch 114, via rapid reconfiguration entity 234, preferably informs the other devices of its new forwarding port by transmitting dummy multicast packets through the new port[.]” *Id.*, 12:56-66. Accordingly, the impacted switch (*e.g.*, switch 114) ***first*** transitions to its new forwarding port and ***then*** informs the other devices of the new forwarding port by propagating dummy messages through the new forwarding port. *See id.*, 5:54-56, 6:42-46.

Applying the same teachings to Petitioner's embodiments, it would have been obvious to a POSITA that switch 124 in Gai updates its database before or

contemporaneously with sending the dummy multicast messages to the access switches. *See id.* Indeed, Dr. Olivier, agreed that “a switch that is then sending dummy multicast messages out of its new forwarding port” “needs to update the information to use it.” EX1018, 107:12-108:5. In other words, “some information storage needs to know that the new forwarding port has been selected in order to begin transmitting the dummy multicast messages out of that port[.]” *Id.*, 109:22-110:4.

A POSITA would have also understood that the edge switch's database entries must be updated “before receiving the communication traffic from one or more access switches on the second port.” Without updating the edge switch's database to point to the second port—which then allows the edge switch to send the dummy multicast messages to the access switches to inform them to update their own databases (*see id.*)—the access switches would not know how to send communication traffic to the second port on the edge switch. At bottom, the access switches must update their own databases in response to receiving the dummy multicast messages before sending communication traffic over the new active port to prevent message loss. *See* EX1005, 12:59-62 (“Thus, the identity of the new root port (e.g., port number four) must be propagated to the other devices, such as access switches 115-116 and backbone switches 120-125 to prevent messages from being

lost or misdirected.”). Dr. Olivier confirmed these facts. EX1018, 110:15-111:6, 120:6-16.

Accordingly, as Petitioner explained regarding claim 4, “it would have been obvious to update the edge switch database to reflect the change in the active ports, such that when rapid reconfiguration entity 234 generates the dummy message(s) or when forwarding entity 238 forwards communication messages they would use the new port.” Petition, 92. This applies equally for claim 4 and claim 5, where communication traffic can only be received over the new forwarding port (*i.e.*, the second port) after the access switches’ databases are updated using the dummy messages sent by the edge switch over the new forwarding port, which in itself requires the edge switch to first update its own database.

VI. CONCLUSION

For the reasons stated above in the Reply, Cisco respectfully requests the Board to cancel all challenged claims.

Dated: February 18, 2025

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CERTIFICATION UNDER 37 C.F.R. § 42.24(d)

I hereby certify that this paper, excluding the portions exempted under 37 C.F.R. § 42.24(c), has 5576 words as counted by Microsoft Word for Office 365, the word-processing program used to prepare this paper.

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned certifies that on February 18, 2025, a complete copy of Petitioner's Reply in Support of Its Petition and EX1017-EX1018 were served on counsel of record for Patent Owner by filing this document through P-TACTS and by sending the documents via electronic mail to the following addresses:

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