

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.,
Petitioner,

v.

PORTSMOUTH NETWORK CORP.,
Patent Owner.

Case IPR2024-00505

Patent 6,917,986

PATENT OWNER RESPONSE

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Pursuant to 37 C.F.R. § 42.120, Patent Owner Portsmouth Network Corp. (“Patent Owner”) respectfully submits this Response to the Petition filed by Petitioner Cisco Systems, Inc. (“Petitioner”) regarding U.S. Patent No. 6,917,986 (EX1001, “’986 patent”).

I. Introduction

The ’986 patent claims a novel and non-obvious system to provide rapid reconfiguration of a network in response to network topology changes. In a network containing multiple interconnected switches, a failure in one switch may disrupt communication throughout the network. The ’986 patent’s system uses redundant ports and links to connect switches together so that data transmissions may continue in case a particular port or link fails. For example, when a switch detects a failure in one of its ports, it may activate a backup port and begin transmitting data through the link connected to the backup port. The ’986 patent discloses techniques and methods to detect and respond to a network failure without needing to modify existing standards or use special commands.

The Petition raises only one ground asserting single-reference obviousness based on *Gai* (EX1005).¹ However, Petitioner fails to establish that the challenged claims are unpatentable.

¹ Petitioner split Ground 1 into two subgrounds, Ground 1A and Ground 1B.

As will be described in more detail below, Petitioner’s primary reference, *Gai*, does not disclose sending dummy traffic “downstream” as required by claim limitations 12e and 24e. *Gai* also does not disclose sending dummy traffic “to the one or more access switches” as required by claim limitations 1e and 13f.

A. Grounds and Challenged Claims

The Board instituted review on the following obviousness ground. Paper 7 at 66.²

Ground	Claims Challenged	35 U.S.C. §	References/Basis
1	1–2, 4–7, 9–14, 16–19, 21–24	103(a)	<i>Gai</i>

The challenged claims include four independent claims: 1, 12, 13 and 24. Independent claim 1 is provided below. For purposes of this Response, Patent Owner uses the same claim limitation numbering as the Petition.

[1pre] A method for network communication, comprising:

[1a] coupling an edge switch in a network to one or more access switches via at least first and second redundant links, respectively connected to first and second ports of the edge switch;

² Petitioner separates Ground 1 into two subgrounds, Ground 1A and Ground 1B. The Board did not address each subground separately and instead addressed the subgrounds together in the analysis of relevant claim elements, such as element 1e. See Paper 7 at 23, fn. 8. Accordingly, Patent Owner adopts the Board’s approach and addresses the subgrounds together.

[1b] placing the first port in an active state, while placing the second port in a blocking state;

[1c] conveying communication traffic over the first link while the first port is in the active state, thereby causing each of the switches to build a respective database for use in forwarding the traffic;

[1d] responsive to a failure associated with the first link, placing the second port in the active state and the first port in the blocking state; and

[1e] sending dummy traffic from the edge switch over the second link to the one or more access switches, so as to cause each of the one or more access switches to modify its respective database responsive to the second port being in the active state.

Independent claim 12 is a method claim that includes limitations similar to claim 1. However, claim 12 does not recite “an edge switch” or “one or more access switches” and instead recites “a first bridge” and “a second bridge.” Furthermore, claim 12 recites that the second bridge must be located “downstream” of the first bridge and that dummy traffic from the first bridge must be sent “downstream to the second bridge. Claim 12 is reproduced below:

[12pre] A method for network communication, comprising:

[12a] coupling a first bridge in a network to a second bridge located downstream of the first bridge, by connecting at least first and second redundant

links to respective first and second ports of the first bridge so as to communicate with the second bridge;

[12b] placing the first port in an active state, while placing the second port in a blocking state;

[12c] conveying communication traffic over the first link while the first port is in the active state, thereby causing the bridges to build respective databases for use in forwarding the traffic;

[12d] responsive to a failure associated with the first link, placing the second port in the active state and the first port in the blocking state; and

[12e] sending dummy traffic from the first bridge over the second link downstream to the second bridge, so as to cause the second bridge to modify its database responsive to the second port being in the active state.

Independent claim 13 is an apparatus claim that includes similar limitations to method claim 1, which recites a network switching device that is adapted to be coupled to a core switch and to one or more access switches.

Independent claim 24 is an apparatus claim that includes similar limitations to method claim 12, which recites a bridge device having a spanning tree root that is coupled to an upstream root and to a further bridge device located downstream in the network relative to the root.

B. Claim Construction

For purposes of this Response, Patent Owner will apply the ordinary and customary meaning to the '986 patent's claim terms. Petitioner also asserts that no claim requires express construction for the grounds presented in the Petition. Petition at 11-12. Patent Owner notes that claim construction is ongoing in co-pending district court litigation, and Patent Owner's positions herein do not rely on any proposed construction.

Patent Owner also notes that in the co-pending district court litigation, Petitioner has asserted specific claim constructions for the following terms:

Term	Claims	Petitioner's District Court Proposed Construction
"edge switch"	1-4, 6-8, 11, 16, 19-20	"core switch that is directly connected to (an) access switch(es)"
"access switch"	1, 2, 5, 6, 10, 11, 13, 14, 17, 18, 22, 23	"switch with ports that connect to LANs and/or to other network endpoints"

See Plaintiff Portsmouth Network Corporation's and Defendant Cisco Systems, Inc.'s Joint Claim Construction and Prehearing Statement (EX2004) at 3, 5. In its Petition, however, Patent Owner has failed to address these constructions or explain how *Gai* discloses or renders obvious the challenged claims under these constructions.

C. Person of Ordinary Skill in the Art

Petitioner proposes a definition of a person of ordinary skill in the art (“POSA”) as of the priority date of the ’986 patent (January 7, 2002). Petition at 11. For purposes of this Response, Patent Owner uses the same definition of a POSA.

D. Legal Framework

Petitioner must prove that the ’986 patent’s claims are obvious by a preponderance of the evidence. 35 U.S.C. § 316(e). Obviousness requires a showing that (1) all of the claimed limitations are found in the prior art reference(s) and (2) a POSA would have been motivated to modify or combine the prior art reference(s) to achieve the claimed limitation. *Univ. of Strathclyde v. Clear-Vu Lighting LLC*, 17 F.4th 155, 160 (Fed. Cir. 2021); 35 U.S.C. § 103(a) (pre-AIA). Single-reference obviousness nonetheless requires a showing of motivation to modify the reference. *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016); *SIBIA Neurosciences, Inc. v. Cadus Pharm. Corp.*, 225 F.3d 1349, 1356 (Fed. Cir. 2000). Also, a prior art reference must be considered in its entirety, including portions that would lead away from the claimed invention. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568 (Fed. Cir. 1987).

An IPR petition must state “[h]ow the construed claim is unpatentable under [35 U.S.C. § 103],” and “must specify where each element of the claim is found in the prior art.” 37 C.F.R. § 42.304(b)(4). Conclusory statements alleging a

motivation to modify or combine the references are insufficient to demonstrate obviousness. *See e.g., SAS Inst., Inc. v. ComplementSoft, LLC*, IPR2013-00581, 2013 WL 8595535, at *6 (PTAB Dec. 30, 2013) (rejecting alleged motivation that “[the combination] would increase the functionality of the [primary reference]”); *Exacq Techs., Inc. v. JDS Techs., Inc.*, IPR2016-00568, 2016 WL 4987613 (PTAB June 14, 2016) (“Simply stating that the combination ‘would merely be the use of known validation techniques to improve a similar network camera system in the same way,’ ... without evidence, is not sufficient.”). “[H]indsight bias” cannot be “the thread that stitches together prior art patches into something that is the claimed invention.” *Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F.3d 1358, 1367 (Fed. Cir. 2017).

E. Institution Decision

The Institution Decision preliminarily determined that Petitioner’s showing was adequate based on the then-current record and for the purposes of institution. *See* Paper 7 at 66. This Response explains why Petitioner’s ground fails to render the challenged claims unpatentable.

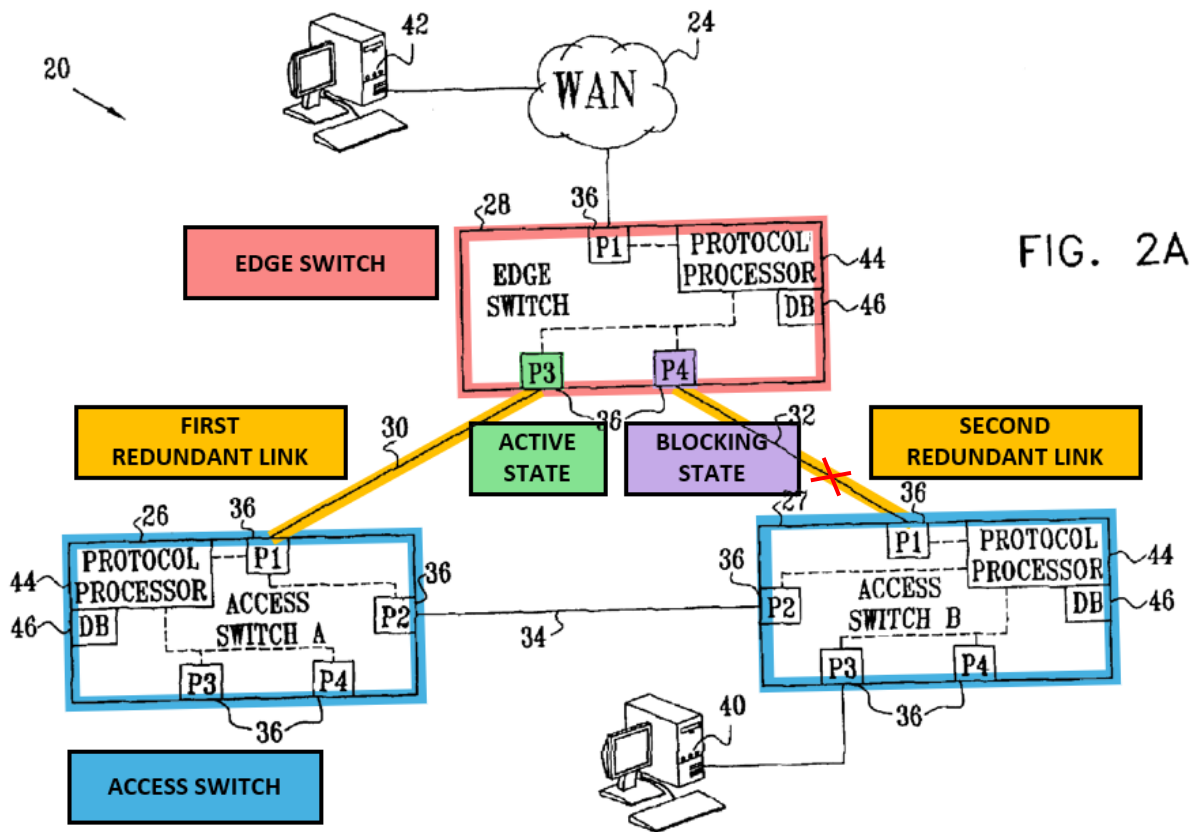
II. Ground 1: *Gai* Does Not Render Obvious Claims 1–2, 4–7, 9–14, 16–19, and 21–24

Petitioner has failed to show that claims 1–2, 4–7, 9–14, 16–19, and 21–24 of the ’986 patent are obvious over *Gai*. *Gai* is fundamentally different from the ’986 patent claims and does not teach or render obvious multiple elements and limitations

of the claims. Thus, as discussed in more detail below, a POSA would not have found that *Gai* renders obvious the claimed inventions.

A. *Gai* and the Inventions of the '986 Patent Are Fundamentally Different

The '986 patent claims are directed to methods and apparatuses for providing reliable, fault-resistant network access. EX1001, 1:7–8. The '986 patent discloses techniques to rapidly recover from network failures while maintaining compatibility with existing network equipment and protocols. *Id.* at 3:58–60. The claims comprise: (i) coupling an edge switch to one or more access switches via at least first and second redundant links, (ii) placing a first port of the edge switch in an active state and a second port of the edge switch in a blocking state so that communication traffic is conveyed over the first port, (iii) placing the second port in an active state and the first port in a blocking state in response to a failure of a first link associated with the first port, and (iv) sending dummy traffic from the edge switch over the second link to the one or more access switches so as to cause each switch to modify its respective database to account for the second port being activated. *See* Declaration of James Olivier, Ph.D. (EX2001), ¶ 38. An annotated version of '986 patent Figure 2A is provided below:

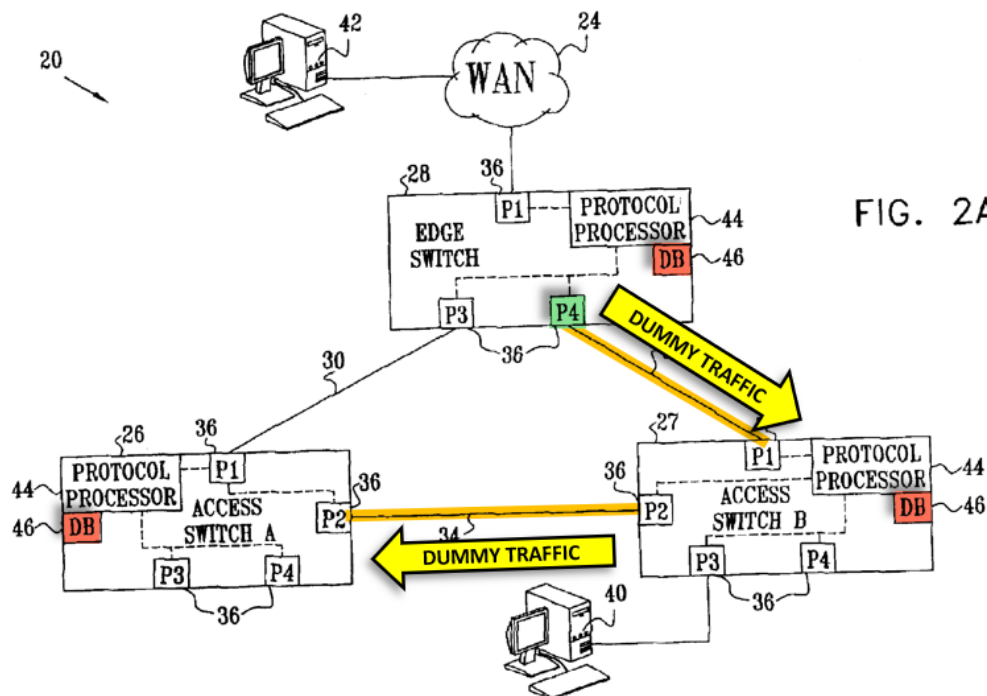


Ex. 1001 at Fig. 2A (annotated).

The annotated version of Figure 2A shows an edge switch (red) coupled to access switch A and access switch B (both in blue) over a first redundant link 30 and a second redundant link 32 (both in orange). Port P3 of the edge switch (green) is initially placed into an active state while port P4 (purple) is placed in a blocking state. Therefore, traffic from the edge switch may be transmitted from the edge switch to the access switches via port P3 and the first redundant link 30, but cannot be transmitted to access switch B directly via second redundant link 32 (red X). The

'986 patent recognizes that access switches and edge switches are common types of Media Access Control (MAC) bridges. As a result, the '986 patent refers to switches and bridges interchangeably. *See, e.g.*, EX1001, 1:26–30; EX2001, ¶ 35.

In response to a failure associated with the first link, port P3 is placed in a blocking state while port P4 is placed in the active state to provide an alternate route for network traffic. Dummy traffic is then sent from the edge switch over the second redundant link to access switch B and access switch A so that one or more of the access switches can modify their respective databases, as shown below.



Ex. 1001 at Fig. 2A (annotated); *see* EX2001, ¶ 36.

However, as explained below, *Gai* does not teach or suggest sending dummy traffic from the first bridge over the second link downstream to the second bridge, as required by limitations [12e] and [24e], or sending dummy traffic from the edge switch over the second link to the one or more access switches, as required by limitation [1e] and [13f]. *See, e.g.*, EX2001, ¶¶ 51, 79, 91, 94.

Gai's figures, which the Petition repeatedly relies on, demonstrate this. *See, e.g.*, Petition at 13, 16, 18. As shown in *Gai* Figure 1 below, *Gai* discloses a method for rapidly reconfiguring a computer network based on certain modifications to the spanning tree protocol.

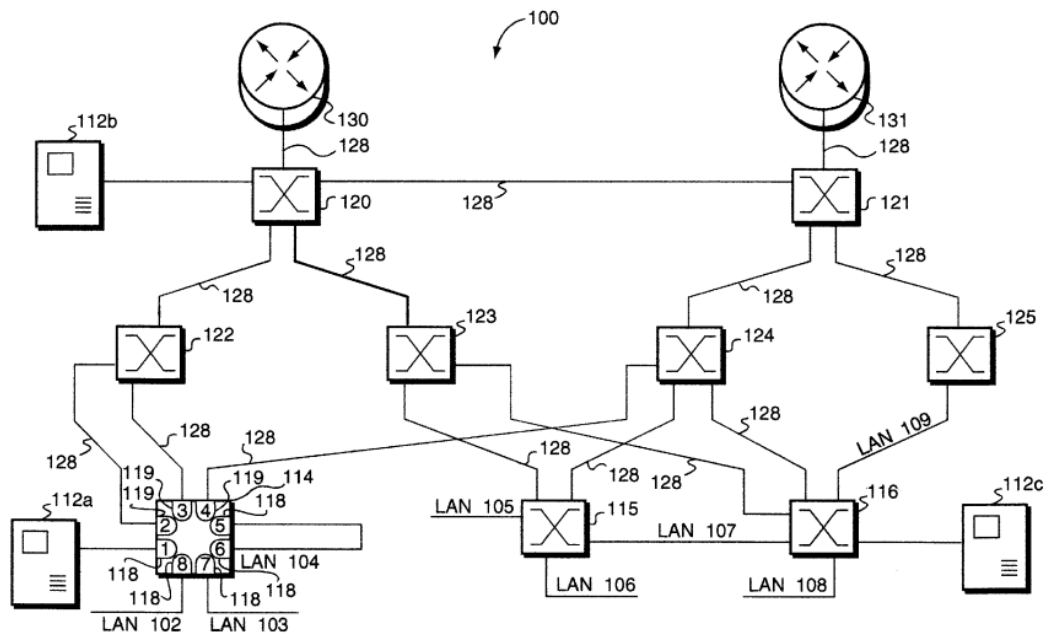


FIG. 1

EX1005, Fig. 1; *see* EX2001, ¶ 37.

Gai discloses transmitting dummy multicast messages toward the root (i.e. upstream) through a newly-active port, each of the messages containing the source address of an entity coupled to the switch or is downstream of the switch. EX1005 at 5:40-60; EX2001, ¶ 38.

Gai's disclosure is limited to transmitting dummy multicast messages upstream towards the root. As a result, *Gai* is ultimately incompatible with the requirements of the '986 patent's claimed inventions, which require the flexibility to transmit dummy traffic downstream or from an edge switch towards one or more access switches. *See, e.g.*, EX1001, Claims 1 and 12. Thus, *Gai*'s disclosures and method of dealing with a failed port are fundamentally different from the '986 patent's claimed inventions, because the '986 patent discloses sending dummy traffic from the edge switch over a second link to the one or more access switches, while *Gai* discloses transmitting dummy multicast messages toward the root (i.e. upstream) through a newly-active port. *See e.g.*, EX2001, ¶ 53.

B. A POSA Would Not Have Modified *Gai* to Arrive at the Claimed Inventions of the '986 Patent

A POSA would not have been motivated to modify *Gai*'s teachings to send dummy traffic downstream over a second link or to send dummy traffic from the edge switch to one or more access switches, as recited in the independent challenged claims of the '986 patent. EX2001, ¶ 39. Petitioner does not cite to any passage in *Gai* that supports this understanding. Instead, Petitioner cites to passages from a

number of unrelated patents that do not discuss why a POSITA would understand that dummy traffic may be sent downstream over the second link in *Gai*. See Petition at 41. For example, the Petition’s citation to *Burns* merely confirms that a port may fail for various reasons. See *id.* (citing to EX1012, 2:56–59 (“A signalling link or port may fail for various reasons, including a software defect, an equipment failure in the call control infrastructure or a failure in the transmission link.”)). Similarly, the Petition’s citation to *Detampel* states that a bridge status memory file is updated whenever a port fails. *Id.* (citing to EX1013, 16:59–60 (“[The] bridge status memory file is updated whenever any ports in any of said plurality of bridge servers fails.”)). But this is not part of Petitioner’s obviousness ground and does not cure *Gai*’s deficiencies. For example, none of Petitioner’s citations to *Burns* or *Detampel* indicate that *Gai* discloses transmitting dummy traffic downstream. Petitioner also cites to the declaration of its expert Henry H. Houh, but the expert declaration merely repeats the assertions and citations present in the Petition without providing any clarifying or additional explanations. See EX1003, ¶ 103; EX2001, ¶¶ 42, 43.

Furthermore, the ’986 patent itself distinguishes the claimed invention. See EX2001, ¶ 44. The ’986 patent discloses that “[Gai’s] method assumes that the switches in the network, including both core and access switches, have multiple trunk ports providing connectivity to the STP root via trunk switches ... The switch then *transmits dummy multicast messages toward the root (upstream)* through the

newly-active trunk port, each containing the source address of a network entity that is coupled to the switch itself or is downstream of the switch.” EX1001, 3:18-33 (emphasis added). Additionally, the ’986 patent states that *Gai* transmits dummy multicast messages towards the root upstream and that the source address comes from an entity downstream of the switch. *Id.* Therefore, a POSA would understand that *Gai* does not disclose sending any transmissions downstream. *See* EX2001, ¶ 44.

Furthermore, as is described in greater detail below in section II.D, a POSA would understand that Petitioner’s arguments are incompatible with *Gai*’s disclosure because *Gai* teaches away from Petitioner’s modified figures. *See* EX2001, ¶ 45. For example, *Gai* explicitly warns that making an access switch a root switch would lead to inefficiencies in the network. EX1005, 3:23–27. Accordingly, a POSA would understand that the techniques presented in *Gai* differ from the techniques disclosed in the ’986 patent and that following the techniques of *Gai* would not allow a POSA to arrive at the ’986 patent’s claimed inventions. *See* EX2001, ¶ 46.

C. Petitioner Fails to Establish a Reasonable Expectation of Success

Regardless of whether Petitioner has established a motivation to modify *Gai*, Petitioner has failed to establish a reasonable expectation of success in doing so. *See* EX2001, ¶ 48.

Obviousness requires Petitioner to establish that a POSA would have had a reasonable expectation of success in modifying the prior art to arrive at the claimed invention. *Eli Lilly & Co. v. Teva Pharm. Int'l GmbH*, 8 F.4th 1331, 1344 (Fed. Cir. 2021); *see also In re Stepan Co.*, 868 F.3d 1342, 1346 n.1 (Fed. Cir. 2017) (holding single-reference obviousness requires a reasonable expectation of success); *Stryker Corp. v. OsteoMed LLC*, IPR2022-00191, Paper 35 at 41-44 (PTAB May 30, 2023) (holding that reasonable expectation of success is required “[e]ven when only one reference is involved”). This requirement is separate and distinct from establishing a motivation to modify the prior art to begin with. *Eli Lilly*, 8 F.4th at 1344.

Petitioner presents no argument that a POSA would have had a reasonable expectation of success in modifying *Gai* to meet the claims. Neither the Petition nor Dr. Houh’s declaration includes any arguments even mentioning “reasonable expectation of success,” despite Dr. Houh’s declaration recognizing that it is a factor in determining whether a combination based on either a single reference or multiple references would have been obvious. Ex. 1003, ¶ 28; *see also* EX2001, ¶¶ 47–48. Reciting that a switch port may fail for various reasons fails to illuminate why a POSA would have modified *Gai*’s network and would have reasonably expected that *Gai*’s network would cover both upstream and downstream transmissions of dummy traffic. *See, e.g.*, Petition at 41; *see also* EX2001, ¶ 48. In fact, as discussed in more detail below, a POSA would not have expected this because *Gai* teaches away from

an upstream embodiment where an access switch acts as the root and also does not disclose Petitioner's modified downstream embodiments. *See* EX2001, ¶ 49. Accordingly, Petitioner has failed to meet its burden to prove that a POSA would have been motivated to modify the prior art and would have had a reasonable expectation of success in making the modification. *In re Stepan*, F.3d at 1347.

D. Independent Claims 1 and 12

As explained in sections II.A-C, *Gai* fails to render obvious the challenged claims because *Gai* is fundamentally different from the claimed inventions of the '986 patent, and a POSA would not have modified *Gai* to arrive at the '986 patent's claimed inventions. *See* EX2001, ¶¶ 46, 50. Further discussed below are particular reasons why *Gai* fails to render obvious claims 1 and 12.³

1. 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)

Claim 12 recites “sending dummy traffic from the first bridge over the second link downstream to the second bridge, so as to cause the second bridge to modify its database responsive to the second port being in the active state.” The Petition relies

³ For purposes of this Response, independent claims 1 and 12 are discussed together because the Petitioner groups its analysis of claims 1 and 12 together. Petition at 25-46, 70-86.

on *Gai*'s figures as allegedly disclosing sending dummy traffic downstream. *See, e.g.,* Petition at 39–40. However, Petitioner's arguments fail. *See* EX2001, ¶ 51.

First, the '986 patent explicitly references and distinguishes *Gai* as part of the '986 patent's discussion of the background of the invention. *See* EX1001, 3:15-41. The '986 patent discloses that “[*Gai*'s] method assumes that the switches in the network, including both core and access switches, have multiple trunk ports providing connectivity to the STP root via trunk switches ... ***The switch then transmits dummy multicast messages toward the root (upstream)*** through the newly-active trunk port, each containing the source address of a network entity that is coupled to the switch itself or is downstream of the switch.” EX1001, 3:18-33 (emphasis added). Thus, the '986 patent expressly distinguishes *Gai* from the claims 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. *Id.*; *see also* EX2001, ¶ 52. In other words, the '986 patent distinguishes *Gai* from the claimed invention by stating that *Gai*'s method is limited to only transmitting dummy multicast messages upstream and that *Gai* does not disclose sending any transmissions downstream. *See* EX2001, ¶ 53. As claim limitation 12e explicitly requires downstream transmission, the '986 patent's differentiation establishes that *Gai* does not disclose this limitation and that *Gai* does not render the '986 patent's claims obvious.

Not only does the '986 patent explain that *Gai* is limited to upstream transmissions, but *Gai*'s own disclosure confirms this. *See* EX2001, ¶ 54. For example, *Gai* discloses that upon failure of the current root port, the access switch is configured to transition to one of its blocked trunk ports to the forwarding state and to begin transmitting dummy multicast messages through the new port. *See* EX1005 at 6:42–50. *Gai* also discloses utilizing a “better path toward the root.” *Id.*

a. Ground 1A: Downstream Embodiment

Despite this, Petitioner argues that *Gai* teaches or renders obvious the transmission of dummy traffic from the edge switch/first bridge downstream to the access switch/second bridge. *See, e.g.,* Petition at 39. As previously mentioned in sections II.B–C, Petitioner does not cite to any passage in *Gai* that supports this understanding. *See supra* sections II.B–C. Nor does Petitioner establish that a POSITA would have been motivated to modify *Gai* to transmit dummy traffic downstream.

Instead, Petitioner relies on a modified version of *Gai* to support its arguments. But its reliance on this modified Figure also fails. Simply put, Petitioner modified *Gai* Figure 1 in an attempt to show that dummy packets may be transmitted from an edge switch/first bridge downstream to an access switch/second bridge. *See* Petition at 42. The annotated figure is reproduced below:

Petition at 42.

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124 is now viable; and (8) highlights access switches 115 and 116 (red). *See, e.g.*, Petition at 22, 24. As discussed in greater detail below, Petitioner’s modifications blatantly assert a network configuration that is not actually disclosed by *Gai*. For example, *Gai* does not disclose blocking an active port of backbone switch 124, failing the link between access switch 115 and backbone switch 124, transitioning another port of switch 124 to a forwarding state, and marking link 128 between access switch 116 and backbone switch 124 as viable.

First, Petitioner equates *Gai*’s backbone switch 124 as the first bridge/edge switch and at least access switch 116 as the second bridge/access switch according to the Petition’s color coding. *See id.* at 41–42. Second, Petitioner defines backbone switch 121 as the root. *Id.* at 40–41. However, both of these comparisons do not align with *Gai*’s own description of Figure 1. *See* EX2001, ¶ 58. For example, Petitioner states that switch 124 “would start transmitting dummy messages, e.g., a dummy message to access switches 116 and 115 (in that order) through the new forwarding port (indicated by the red dot) over link 128.” Petition at 42. But *Gai* does not describe backbone switch 124 in such a way. *See* EX2001, ¶ 59. *Gai* discloses distributing a multicast message through all of its forwarding ports. But, in doing so, *Gai* clearly explains that such an action is in response to a port failure in access switch 114, not in switch 124. *See* EX1005, 13:14-49 (“Multicast message 400, having the address of server 112(a) loaded in SA field 412, is then forwarded

through the new root port (i.e., port number four) of switch 114). *See* EX2001, ¶ 60. Furthermore, *Gai* discloses that access switch 114 transmits multicast messages upstream towards backbone switch 124. *See* EX1005, 13:23-24 (“Multicast message 400 is first received at backbone switch 124 which examines its contents.”). Additionally, the initial transmission of the dummy multicast message passes through backbone switch 124, which is only one node away from root switch 121. Therefore, a POSA would also understand that the dummy multicast message is transmitted upstream from access switch 114 towards the root. EX2001, ¶ 61.

Petitioner argues that its modified downstream embodiment of *Gai* discloses limitation 12e because a POSA would understand that failure may happen at any port and that other configurations, such as Petitioner’s modified downstream embodiment, may exist in *Gai*’s network. But this vague and conclusory motivation is not sufficient to show that *Gai* itself teaches or renders obvious claim limitation 12e. *See* EX2001, ¶ 62. *Gai* does not provide support for Petitioner’s downstream embodiment, and a POSA would understand that *Gai* does not actually disclose such a configuration. *Id.* Even assuming that Petitioner’s modifications can be implemented in other networks, Petitioner fails to show that *Gai*’s disclosure would lead to such modifications in *Gai*’s own system.

Moreover, Petitioner is incorrect in stating that “one possible path includes sequentially access switch 116, access switch 115, switch 124, root switch 121, and

the links (LAN 107 and links 128) coupling those switches.” Petition at 22. Petitioner’s statement is contrary to the teachings of *Gai*.

Gai teaches that all switches will agree on a root and identify a root port which presents the lowest cost path to the root. EX1005 at 3:12-15 (“Eventually, all switches will agree on the root and each will be able to identify which of its ports presents the lowest cost path to the root (i.e., its root port).”). In Petitioner’s modified figure, the root is switch 121. *See* Petition at 22 (“Moreover, ‘assum[ing] that backbone switch 121...is the root’”). *Gai* discloses that each switch in the network selects one port as the root port, which gives the lowest cost path from the switch to the root. EX1005 at 2:53–56. *Gai* teaches that the link costs for backbone switches are typically “10” but that the link costs for access switches are much higher and are preferably increase to as much as “3000.” *See* EX1005 at 9:49– 63. *Gai* also teaches that the root ports for each switch are selected based on the switch ID of the root and the root path cost. EX 1005 at 3:1–15; *see also* EX2001, ¶ 65. In essence, the path towards the root is determined by finding the path with the lowest link costs, and paths with high costs will not be selected.

Therefore, based on the teachings of *Gai* and under Petitioner’s hypothetical where switch 121 is the root, the root port for switch 124 will be the port on the link connecting switch 124 and the root switch 121. *See* EX2001, ¶ 66. Based on the above description, *Gai* also teaches that the root port for switch 116 will be the port

on the link connecting switch 116 and switch 124. These root ports are shown (in green) below along with associated link costs (in red) in modified Figure 1 of *Gai*.

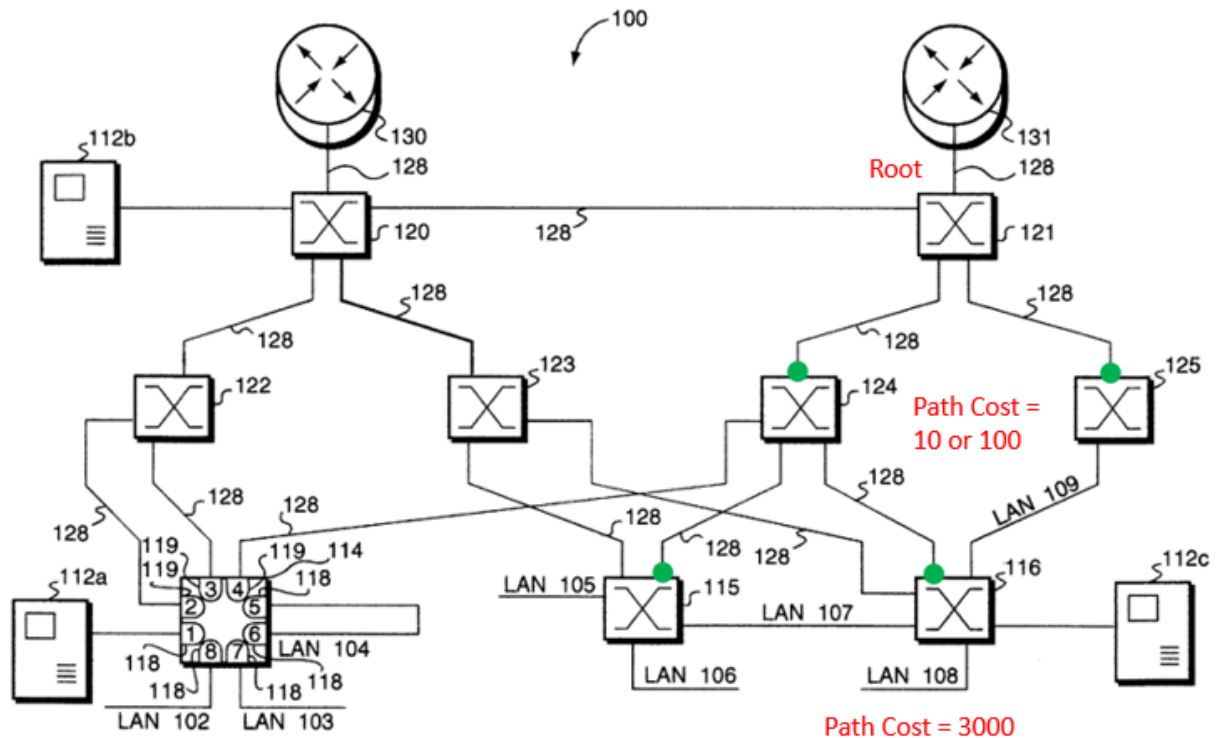


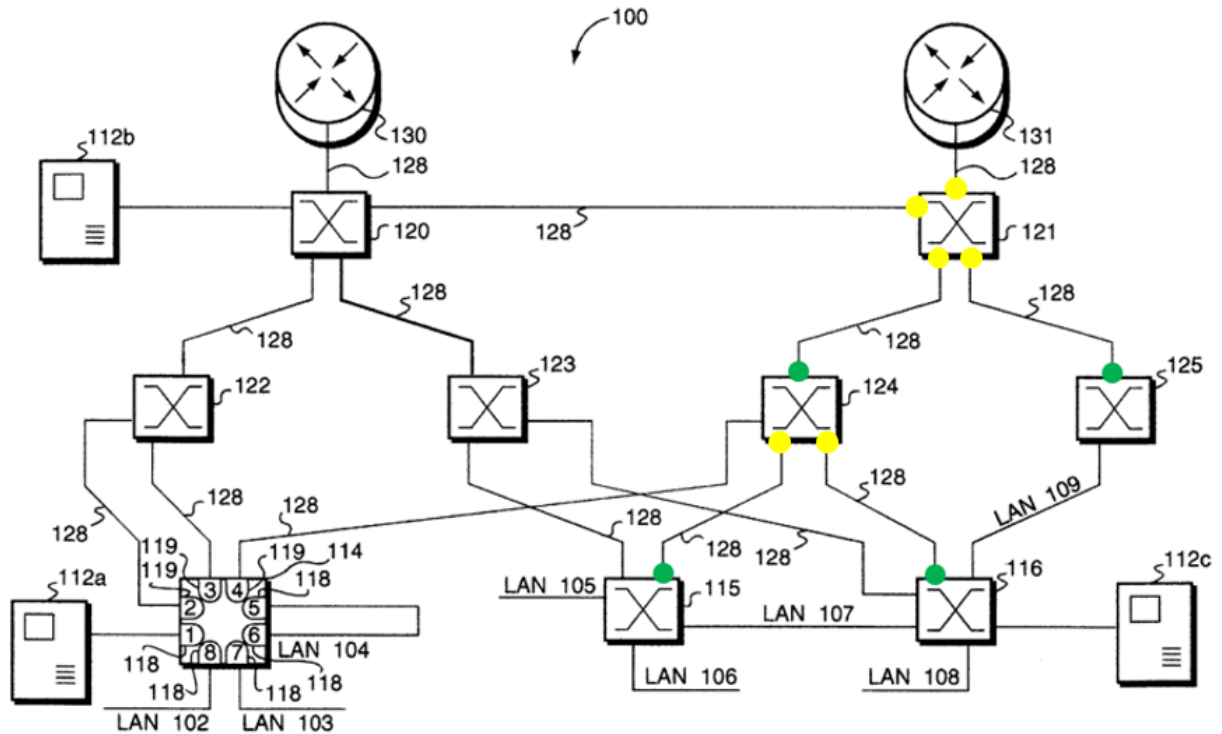
FIG. 1

EX1005, Fig. 1 (annotated); *see also* EX2001, ¶ 66.

A POSA would know that according to the spanning tree protocol (STP), there must be a path from the root ports on each switch to the root. EX2001, ¶ 67. Therefore, the ports on switch 124 going to switch 115 and 116 must be designated ports. *See id.*; EX1005 at 2:56–60. *Gai* teaches that the selection of designated switch ports is done by comparing the root cost path of the switches. *See* EX1005 at 3:37–47 (“To identify which switch should be the designated switch, switches again compare information in received BPDUs with their stored information. If the

root path cost stored by a first switch is lower than the root path cost contained in BPDUs received from a second switch, then the first switch is the designated switch. If the root path cost for both the first and second switches is the same, the first switch compares the next informational element in the BPDU, i.e., the switch IDs. If the switch ID of the first switch is less than the ID of the second switch, then the first switch is the designated switch, otherwise the second switch is the designated switch.”).

Therefore, based on the teaching of *Gai*, and under for Petitioner’s hypothetical where switch 121 is the root switch, the state of the ports on switches 124, 115, and 116 would be as shown below in modified Fig. 1 of EX1005, where the root ports are marked in green and the designated ports for each switch are marked in yellow.

**FIG. 1**

EX1005, Fig. 1 (annotated).

Therefore, based on the teachings of *Gai*, Petitioner’s hypothetical (e.g., a path that sequentially goes from access switch 116 to access switch 115, switch 124, and then root switch 121), is not taught by *Gai*. EX2001, ¶ 69. Instead, *Gai* actually teaches away from Petitioner’s hypothetical. Petitioner provides no analysis as to how *Gai* teaches this hypothetical embodiment or additional embodiments. Instead, Petitioner uses hindsight to come up with a scenario to support its claim that *Gai* teaches sending dummy traffic “from the first bridge over the second link downstream to the second bridge.”

Accordingly, Petitioner fails to establish that *Gai* teaches or renders obvious sending dummy traffic “from the first bridge over the second link downstream to the second bridge” under a downstream embodiment. *See* EX2001, ¶ 70.

b. Ground 1B: Upstream Embodiment

Confusingly, Petitioner also argues that *Gai* discloses sending transmissions downstream by presenting arguments related to *Gai*’s upstream embodiments. *See* Petition at 85–86. But Petitioner’s arguments here also fail. Specifically, Petitioner relies on modified versions of *Gai* Figure 1, reproduced below:

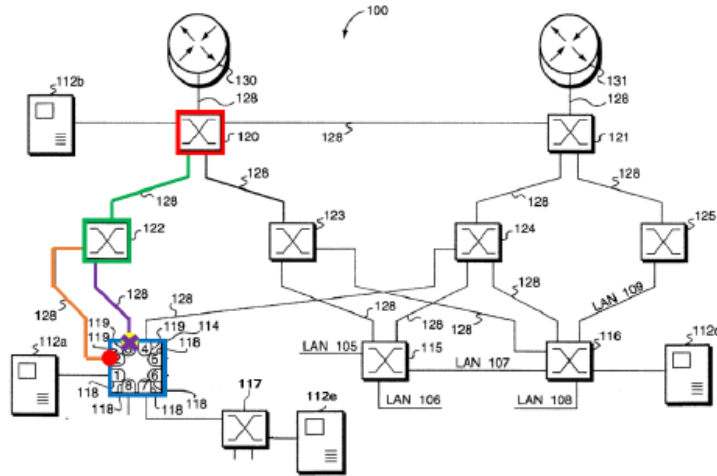


FIG. 1

EX1005, Figure 1 (modified).

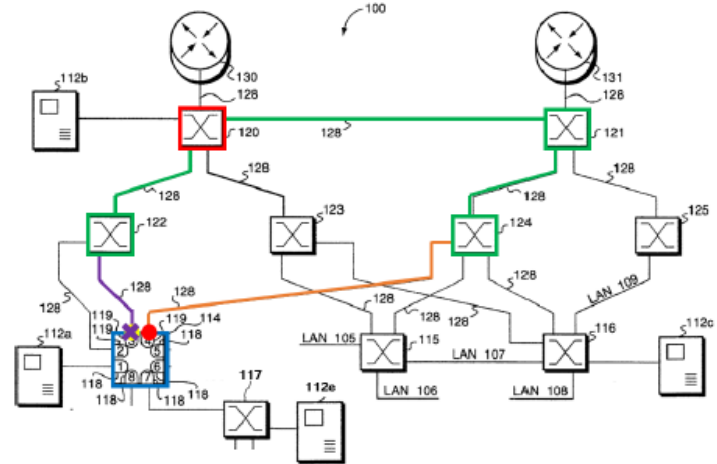


FIG. 1

EX1005, Figure 1 (modified). EX1003, ¶190.

Petition at 86.

The modified versions of *Gai* Figure 1 display a configuration where Petitioner makes the newly-added access switch 117 (which is not in *Gai*'s original Figure 1) the root. *See* Petition at 85–86. In support of Petitioner's argument, Petitioner asserts that any switch could be the root switch and that "it would have been obvious that first bridge 114 would send dummy traffic downstream through

the new active ports (indicated by the red dot) over link 128, away from the root switch and towards second bridge 120, if switch 117 was the root, because, e.g., it was the switch with the lowest switch identifier.” *Id.* at 85. But Petitioner’s argument is not supported by *Gai*.

First, Petitioner relies on fabricated versions of *Gai* Figure 1 that significantly change the appearance and intended functionality depicted in the original figure. For example, original *Gai* Figure 1 shows that access switch 114 is connected to LAN 102 and LAN 103 via port 8 and port 7, respectively. EX1005, Figure 1. By contrast, Petitioner’s modified figures completely delete LAN 102 and LAN 103 and include a new access switch 117 that is now connected to switch 114 via port 7. *Compare* EX1005, Figure 1 *with* Petition at 86.

Second, *Gai* teaches away from Petitioner’s improvised network arrangement because adopting Petitioner’s modifications would actually create an inefficient and poorly-optimized network. *Gai* teaches that the location of the root switch is important because it affects the overall performance of the network when transmitting messages. EX1005, 3:17–19 (“Depending on the configuration of a given network, the location of the root can significantly affect the distance that messages must travel.”). *Gai* further discloses that “[t]o reduce the average distance and avoid partitioning of the backbone switches, it is desirable to locate the root at a backbone switch.” *Id.*, 3:29–31. *Gai* clearly cautions against using an access switch

as the root. *Id.*, 3:23–29 (“If the root is located at an access switch and the principal server utilized by the end stations (i.e., clients) is coupled to a backbone switch, the average distance between end stations and the primary server may be quite high, resulting in inefficient network operation. In addition, the backbone switches may become partitioned as ports between them are blocked.”); *see also* EX2001, ¶ 74. In fact, forcing an access switch to be the root is so inefficient that *Gai* actually teaches using commands on each access switch to prevent *any* access switch from becoming the root. *Id.*, 6:27–30 (“A third command, Enable_Uplinkfast, is preferably entered at each access switch. This command substantially increases the values of access switches’ IDs, ***effectively precluding any access switch from becoming the root.***”) (emphasis added). Specifically, *Gai* states that the Enable_Uplinkfast command should be used to prevent an access switch from becoming the root so that the network may properly utilize *Gai*’s method and techniques. *Id.*; *see also* 6:12–26 (disclosing using a first command “Become_Root_Primary,” a second command “Become_Root_Secondary,” and a third command “Enable_Uplinkfast” on backbone switches or access switches to properly configure *Gai*’s network).

In view of *Gai*’s own teachings, a POSA would not treat the newly-added switch 117 as a root at all. EX2001, ¶ 76. The Petition repeatedly refers to switch 117 as an access switch when describing the various modified versions of *Gai* Figure 1. *See, e.g.*, Petition at 70 (“In this exemplary network, switch 114 is both an access

switch and an edge switch, because it is a core switch (a switch that interconnect access switches 115-117, 120, and 125 into a WAN, e.g., by direct connection between core switch 114 and access switch 117) that is directly connected to an access switch (switch 117).”); *id.* at 71 (“[S]witch 114 is directly connected to access switch 117.”); *id.* at 89 (“Switch 117 is shown as an access switch in modified Figure 1 above, but a POSITA would have understood that switch 117 would satisfy a ‘core’ switch, if, for example, one of its ports was connected to another switch.”). Petitioner’s modified figures therefore use access switch 117 as the root. Although Petitioner argues that switch 117 could be a core switch if specific conditions are met, this is merely a hypothetical that is not actually disclosed anywhere in *Gai*. Therefore, a POSA would understand that switch 117 is an access switch. EX2001, ¶ 76; *see also* Deposition Tr. of Dr. Henry Houh (EX2002), 48:9–23.

Additionally, a POSA would understand, simply by reading *Gai*, that Petitioner’s modifications would actually worsen the performance of network 100. *See* EX1005, 3:23–29; EX2001, ¶ 77. For example, Petitioner’s upstream embodiment forces access switch 117 to be the root. *See* Petition at 85–86. As discussed above, however, *Gai* explicitly teaches that forcing an access switch to be the root is inefficient and that each access switch should use a command to preclude any access switch from becoming the root. *See* EX1005, 3:23–29; 6:27–30. A POSA would therefore understand that Petitioner’s modifications to *Gai*, which

involve forcing access switch 117 to be the root, would never be implemented in a normal, efficient network. EX2001, ¶ 77. In view of *Gai*'s explicit teachings, a POSA would find Petitioner's upstream embodiment to be a completely nonsensical implementation of *Gai*'s network. *Id.*

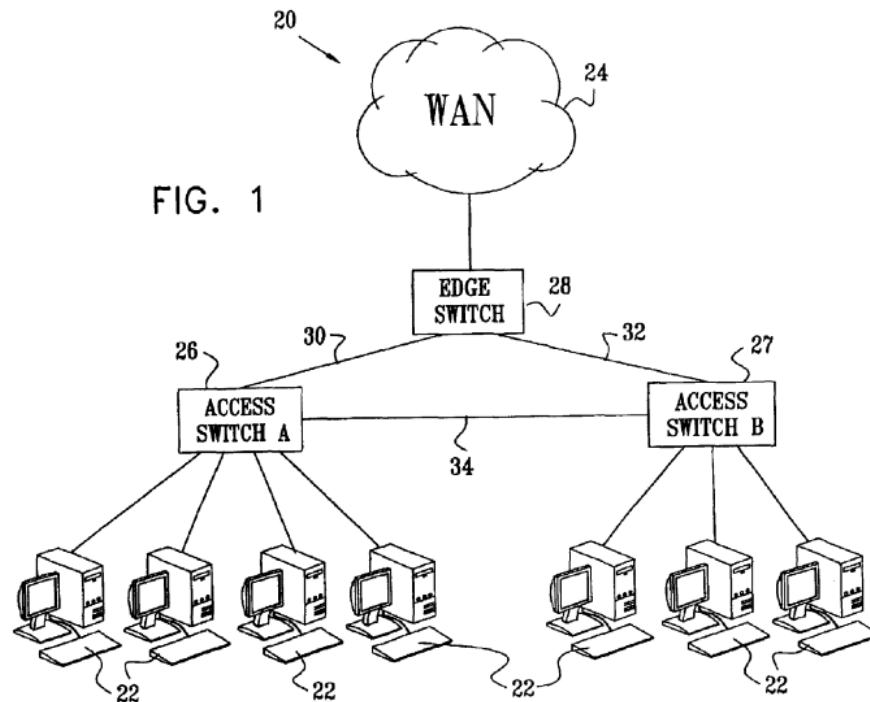
Moreover, a POSITA would understand that the network would not function correctly if access switch 117 was the root switch. EX2001, ¶ 78. In Petitioner's hypothetical, switch 117 has only one port connecting it to the network. According to the STP, port 7 of switch 114 would be the root port. Broadcast traffic from server 112a to server 112c would pass through switch 114 and then to root switch 117. But switch 117 has no path to server 112c. Therefore, the network would not operate correctly. *Id.*

Accordingly, *Gai* does not teach or render obvious sending dummy traffic “from the first bridge over the second link downstream to the second bridge” under either Petitioner's downstream or upstream embodiments. *Id.*

2. *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)

Gai does not teach “sending dummy traffic from the edge switch over the second link to the one or more access switches.” EX2001, ¶ 79. The '986 patent discloses that “[a]n access switch has ports that connect to LANs and/or to other network endpoints.” EX1001, 1:31–33. The '986 patent also discloses that edge

switches are “[c]ore switches that are directly connected to access switches.” EX1001, 1:36-38. The ’986 patent illustrates an embodiment of a computer network where an edge switch 28 is coupled to two access switches 26 and 27, which are connected to multiple end user terminals:



EX1001, Fig. 1.

a. Ground 1A: Downstream Embodiment

Petitioner argues that *Gai* discloses limitation 1e in a downstream embodiment because a failure could happen at any port or link in the network. Petition at 41. In support of its argument, Petitioner provides the following modified version of *Gai* Figure 1.

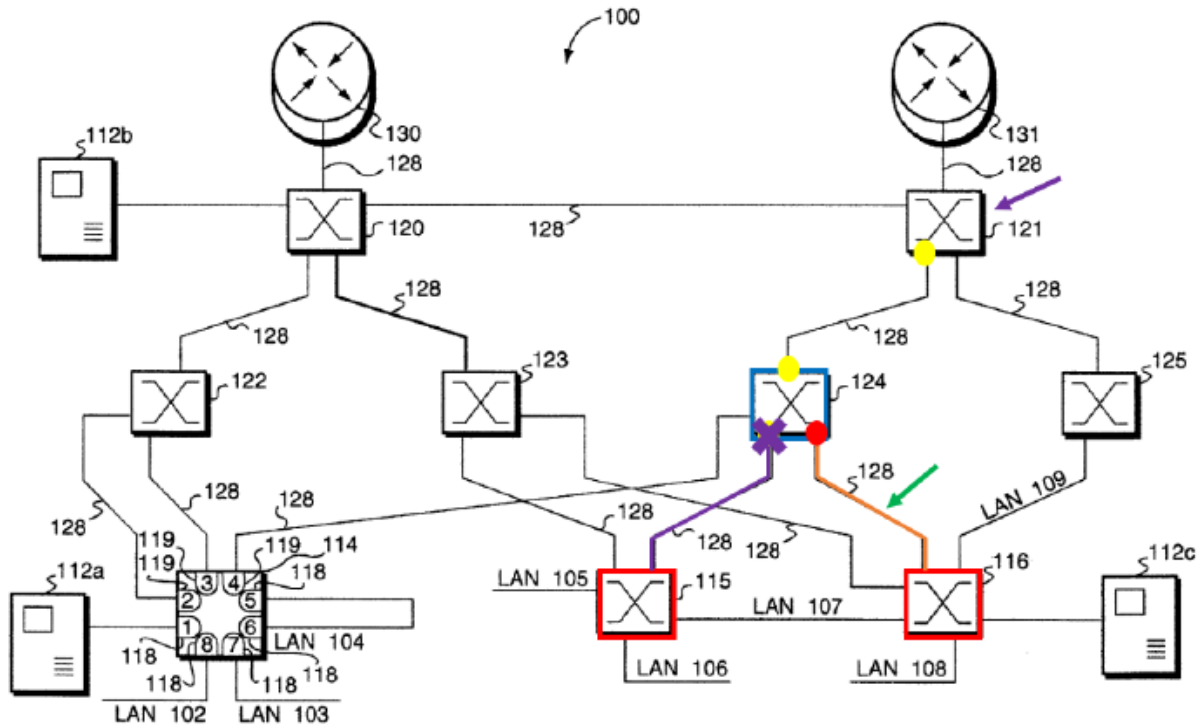


FIG. 1

Petition at 42 (disclosing an annotated version of *Gai* Figure 1).

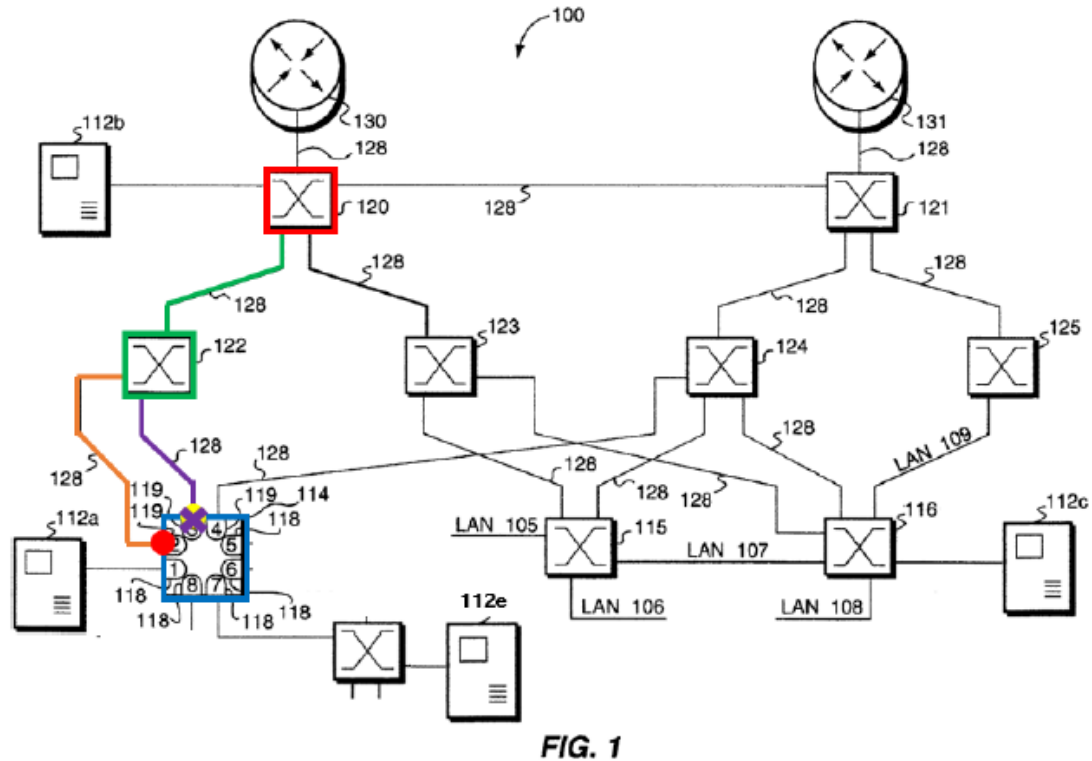
Petitioner argues that, because a POSA would understand that failure can happen at any port or link, a POSA would realize that switch 124 could transmit dummy messages to one or more access switches 115 and 116. Petition at 41-42. As discussed above in section II.B, *Gai* itself does not support Petitioner's argument, and Petitioner instead relies on multiple unrelated references to support its assertions. *See supra* section II.B.

In essence, Petitioner attempts to convince the Board that its modified downstream embodiment of *Gai* discloses limitation 1e because a POSA would

understand that failure could happen at any port in the network. But this vague and conclusory motivation is not sufficient to show that *Gai* itself teaches or renders obvious claim limitation 1e. *Gai* does not provide support for Petitioner's downstream embodiment, and a POSA would understand that *Gai* does not actually disclose such a configuration. Even assuming that Petitioner's modifications can be implemented in other networks, Petitioner fails to show that *Gai*'s disclosure would lead to such modifications in *Gai*'s own system. Additionally, Petitioner fails to establish that *Gai* discloses this limitation under the constructions it proposes for "edge switch" and "access switch" in the co-pending district court case. *See* EX2004 at 3, 5. Accordingly, Petitioner fails to establish that *Gai* teaches or renders obvious "sending dummy traffic from the edge switch over the second link to the one or more access switches" under a downstream embodiment.

b. Ground 1B: Upstream Embodiment

Petitioner's arguments related to an upstream embodiment of *Gai* also fail. Petitioner relies on another modified version of *Gai* Figure 1, reproduced below:



Petition at 83.

Petitioner treats switch 114 as an edge switch and switch 120 as an access switch. *Id.* at 82-83. Even though Figure 1 has been modified by coupling access switch 114 to an additional switch and server 112e via port number 7 so that switch 114 could be considered an edge switch, the modified figure still fails to disclose sending traffic to an access switch because switch 120 is still a backbone switch. EX2001, ¶ 86. *Gai* clearly defines switch 120 as a backbone switch in the description of *Gai*'s original Figure 1. *See, e.g.*, EX1005, 7:8-10 ("Access switches 114-116 are interconnected with each other through a plurality of backbone switches 120-125."). Although Petitioner asserts that switch 120 is an access switch in the

modified figure, there is no modification to switch 120 itself to justify such a label. *See* EX2001, ¶ 87.

Further, Petitioner's label is not supported by *Gai*'s disclosure and runs contrary to the '986 patent's description of an access switch. *See id.* For example, Petitioner's own expert acknowledges that *Gai* refers to switch 120 as a backbone switch instead of an access switch. *See* EX2002, 77:13-24. Further, a POSA would not find that switch 120 is an access switch precisely because *Gai* refers to switch 120 as a backbone switch and separately refers to other switches as access switches. EX2001, ¶ 87. Therefore, even in the modified figure, *Gai* does not disclose transmitting dummy traffic to the one or more access switches. *See* EX2001, ¶ 88. Further, Petitioner fails to establish that *Gai* discloses this limitation under the constructions it proposes for "edge switch" and "access switch" in the co-pending district court case. *See* EX2004 at 3, 5.

Accordingly, the Petition fails to establish a reasonable likelihood that Petitioner would prevail in showing the unpatentability of independent claim 1.

E. Independent Claim 13

As explained in section II.D, *Gai* fails to render obvious the challenged claims. Additionally, *Gai* fails to render obvious claim 13, and Petitioner's analysis for claim 13 fails, for the same reasons discussed in section II.D regarding claim 1, as claim 13 is substantially similar to claim 1. That is, limitation 13f is substantially

similar to limitation 1e. A comparison of the limitations 1e and 13f is provided below.

[1e] sending dummy traffic from the edge switch over the second link to the one or more access switches, so as to cause each of the one or more access switches to modify its respective database responsive to the second port being in the active state	[13f] to send dummy traffic through the second access port over the second link to the one or more access switches, so as to cause each of the one or more access switches to modify its respective access switch database responsive to the second access port being in the active state
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Petitioner expressly relies on its analysis of the limitations for claim 1 for purposes of analyzing the limitations of claim 13. For example, Petitioner expressly cites to its analysis of limitation 1e for purposes of limitation 13f. Petition at 52. Petitioner also argues that *Gai* discloses limitation 13f because *Gai*'s rapid reconfiguration entity 234 informs other devices of its new forwarding port. *Id.* (citing EX1005, 12:62-65). However, Petitioner's argument does not cure the deficiencies of Petitioner's analysis in connection with claim 1. Indeed, Petitioner merely repeats the same statement found in Petitioner's analysis of limitation 1e and even relies on the same citations. *Compare* Petition at 40 (citing to EX1005, 12:62-66) *with* Petition at 52 (citing to EX1005, 12:62-65). Thus, claim 13 is non-obvious for the same reasons as claim 1. *See* EX2001, ¶ 91.

F. Independent Claim 24

As explained in sections II.D and II.E, *Gai* fails to render obvious the challenged claims.

Additionally, *Gai* fails to render obvious claim 24, and Petitioner’s analysis for claim 24 fails, for the same reasons discussed in section II.D regarding claim 12, as claim 24 is substantially similar to claim 12. Petition at 54. That is, limitation 24e is substantially similar to limitation 12e. A comparison of the limitations 12e and 24e is provided below.

[12e] sending dummy traffic from the first bridge over the second link downstream to the second bridge, so as to cause the second bridge to modify its respective database responsive to the second port being in the active state	[24e] the protocol processor being further adapted [...] to send dummy traffic over the second link downstream to the further bridge device, so as to cause the further bridge device to modify its database responsive to the second downstream port being in the active state
--	---

Petitioner expressly relies on its analysis of limitation 12e for purposes of limitation 24e. *Id.* Petitioner does not present any new arguments in its analysis of limitation 24e. Thus, claim 24 is non-obvious for the same reasons as claim 12. *See* EX2001, ¶¶ 95, 96.

III. Dependent Claims

Dependent claims 2, 4–7, 9–11, 14, 16–19, 21–23 are non-obvious based on Petitioner’s failure to establish obviousness of the underlying independent claims from which they depend, as explained in sections II.D–F. Additionally, the limitations of specific dependent claims are discussed below.

- A. Gai does not teach or render obvious “wherein [sending] the dummy traffic comprises [sending] 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” (claim limitations 6a, 18a)

Petitioner groups its arguments for claim limitations 6a and 18a together. Petition at 59, 94. For reference, a comparison of dependent claims 6 and 18 is provided below.

[6pre] A method according to claim 1,	[18pre] A device according to claim 13,
[6a] wherein sending the dummy traffic comprises sending 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.	[18a] wherein the dummy traffic comprises 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.

Gai does not teach “wherein [sending] the dummy traffic comprises [sending] 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.” Petitioner cites to portions of *Gai* that disclose transmitting traffic originating from access switch 114 rather than an edge switch. *See* Petition at 59; EX1005, 13:14-33; 13:50-14:3. Petitioner appears to recognize this deficiency and thus also argues that that *Gai*’s backbone switch 124 would transmit a dummy message with the source address of server 112a and that server 112a is accessible to access switches 115 and 116 through switch 124. *See* Petition at 59–60. But no portion of *Gai* actually discloses Petitioner’s

hypothetical scenario, and Petitioner in fact does not cite to any passage in *Gai* to support its argument. *Id.* at 59. Furthermore, because *Gai* itself does not disclose sending data frames originating at the edge switch while having source addresses corresponding to other network entities accessible to the access switches via the edge switch, a POSA would understand that *Gai* does not disclose limitation 6a or 18a. EX2001, ¶ 101. Furthermore, Petitioner cites to no other references to cure *Gai*'s deficiencies. *See* Petition at 59–60. Accordingly, *Gai* fails to teach or render obvious limitations 6a and 18a and Petitioner has failed to establish that claims 6 and 18 are rendered obvious. *See* EX2001, ¶¶ 101, 1012.

B. *Gai* fails to teach or render obvious “wherein [sending the dummy traffic comprises sending data frames downstream]/[the dummy traffic comprises data frames sent downstream] from the edge switch toward the access switches” (claim limitations 11a, 23a)

Petitioner groups its arguments for claim limitations 11a and 23a together. Petition at 65, 95. For reference, a comparison of dependent claims 11 and 23 is provided below.

[11pre] A method according to claim 1,	[23pre] A device according to claim 13,
[11a] wherein sending the dummy traffic comprises sending data frames downstream from the edge switch toward the access switches.	[23a] wherein the dummy traffic comprises data frames sent downstream from the edge switch toward the access switches.

Petitioner solely refers to its arguments in connection with claim 1 for its analysis of claim limitations 11a and 23a. *See* Petition at 65, 95. *Gai* fails to disclose

“wherein [sending the dummy traffic comprises sending data frames downstream]/[the dummy traffic comprises data frames sent downstream] from the edge switch toward the access switches” for the same reasons as discussed in sections II.D.1–2. *See supra* sections II.D.1–2. Accordingly, *Gai* fails to teach or render obvious dependent claim limitations 11a and 23a and thus fails to render obvious claims 11 and 23. *See* EX2001, ¶¶ 105, 106.

IV. Conclusion

For the foregoing reasons, Petitioner has not established that any challenged claims of the '986 patent are obvious, and the Board should affirm the patentability of the challenged claims.

Date: November 12, 2024

Respectfully submitted,

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CERTIFICATION UNDER 37 C.F.R. § 42.24

Under the provisions of 37 C.F.R. § 42.24, the undersigned hereby certifies that the foregoing document contains 8,138 words, and thus complies with the word-count limits of 37 C.F.R. § 42.24.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing PATENT OWNER RESPONSE was served on November 12, 2024 by filing this document through the P-TACTS platform as well as by delivering a copy via the delivery method indicated to the attorneys of record for the Petitioner as follows:

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