

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Cisco Systems Inc.,
Petitioner,

v.

Portsmouth Network Corporation
Patent Owner.

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

DECLARATION OF JAMES OLIVIER, Ph.D.

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	PROFESSIONAL BACKGROUND.....	1
III.	COMPENSATION	5
IV.	OVERVIEW OF TASK & BASIS FOR OPINIONS	6
V.	MATERIALS CONSIDERED	7
VI.	LEGAL CONSIDERATIONS	7
VII.	LEVEL OF ORDINARY SKILL IN THE ART	10
VIII.	The '986 Patent.....	11
IX.	OVERVIEW OF PRIOR ART REFERENCES.....	15
	A. U.S. Patent No. 6,032,194 (<i>Gai</i>)	15
X.	A POSITA WOULD NOT HAVE MODIFIED GAI	16
XI.	A POSITA WOULD NOT HAVE HAD A REASONABLE EXPECTATION OF SUCCESS IN MODIFYING GAI.....	19
XII.	GAI DOES NOT DISCLOSE EACH CLAIM FEATURE	20
	A. Independent Claims 1 and 12	20
	B. Independent Claim 13	43
	C. Independent Claim 24	44
	D. Dependent Claims 6 and 18	45
	E. Dependent Claims 11 and 23	47
XIII.	CONCLUSION.....	48

I, Dr. James L. Olivier, declare under penalty of perjury as follows:

I. INTRODUCTION

1. My name is James L. Olivier, Ph.D. I have been retained on behalf of Patent Owner, Portsmouth Network Corporation, as an independent expert and have been asked to provide my expert opinions regarding U.S. Patent No. 6,917,986. EX1001 (“the ’986 Patent”).

II. PROFESSIONAL BACKGROUND

2. My qualifications for forming the opinions given in this declaration are summarized here and are addressed more fully in my curriculum vitae, which is submitted as Exhibit 2002. My curriculum vitae also includes a list of my publications and technical consulting experience.

3. I am a recent Fulbright award winner in the areas of computer science and blockchain technologies, and I currently serve as an adjunct professor at Southern Methodist University.

4. I possess the knowledge, skills, experience, training, and education to form an expert opinion and testimony in this case. I am an expert in the field of networking technologies and have been an expert in this field since before 2002. I have designed and developed access systems such as those described in the ’986 Patent while working at Marconi Communications and teach MAC bridging and

Virtual Private LAN Services like those systems described in the '986 patent in my Multiprotocol Label Switching class.

5. I have a Ph.D. from The Ohio State University in Electrical Engineering with minors in Discrete Mathematics, Computer Science, and Microelectronics. My Ph.D. dissertation was based on coding theory and was titled "Concurrent Error Detection in Arithmetic Processors using GAN Codes," in which I developed new codes for use in Arithmetic Processors such as microprocessors. I have published papers on coding theory and continued my work in coding theory for arithmetic processors while at the General Motor Research Laboratory.

6. I have extensive experience in network systems design and development and have specialized in networking product development. I have developed and designed equipment for networks since my time at AT&T Bell Laboratories in the 1990s, where I worked on AT&T 5ESS, Network Control Point, and Autoplex Series base stations as a Member of the Technical Staff. These systems made extensive use of a counter-rotating ring network topology known as the Common Network Interface, much like the network described in the '986 Patent. It was there where I first began my work with telecommunication standards bodies as a contributing member of the Asynchronous Transfer Mode ("ATM") ATM Forum. Later at DSC Communications, I was the Senior Manager of the ATM systems engineering group developing ATM packet switches for a new generation base

station for Motorola's use in their Centralized Base Station Controller. While at DSC, I was also their corporate representative to the ATM Forum, participating in bi-monthly standards body development. I was one of the first contributors to the wireless standards at the ATM Forum.

7. At Samsung Telecommunications America, I was a Principal Engineer for wireless broadband services over Universal Mobile Telecommunications System ("UMTS"). UMTS is a third-generation ("3G") broadband standard developed by the 3rd Generation Partnership Project ("3GPP"). At Samsung, I worked on designing their next-generation cellular switch, a UMTS mobile switching center ("MSC"). While at Samsung, I was also their corporate representative to the International Telecommunication Union ("ITU"), the United Nations agency responsible for standardizing information and communication technologies. The ITU, under its International Mobile Telecommunications-2000 effort, was part of the 3GPP standards body. It was there that I participated in the development of standards for advanced wireless networks. While at Samsung, I was responsible for the 'services portion' of the UMTS switch. This subsystem provided Internet service, email, and the like to the subscribers.

8. At Marconi, I worked on several systems for the access market, such as Digital Subscriber Line ("DSL") modems and Digital Subscriber Line Access Multiplexers ("DSLAMs"), along with the design of point-to-point wireless systems.

At Navini Networks, I was responsible for layer 2 and layer 3 network protocols for their Wideband Code Division Multiplexed Access (“WCDMA”) wireless base stations and broadband modems. These layers were responsible for packet transmissions for various services over the WCDMA air interface. I was also responsible for the development of a Single Sign On (“SSO”) system which allowed users to gain information relating to their wireless subscription and delete or add services.

9. Currently I am an Adjunct Professor in the Network Engineering Graduate Program at Southern Methodist University’s School of Electrical Engineering, where I teach MPLS networked-enabled applications. Among the MPLS applications I teach is the use of MPLS in advanced network design, including content delivery networks, (CDNs) service provider network design and Intranet vs Internet network designs. In my class I also teach SONET/SDH rings, ADMs, and bandwidth models. I am also the owner of Olivier Consulting, where I provide consulting services for advanced network/product design along with Intellectual Property consulting. This year I received a three-year Fulbright specialist award in the area of computer science for my work at the Hunt Institute for Engineering and Humanity, which is part of the Lyle School of Engineering at Southern Methodist University in Dallas, Texas. There, I served as the Program Lead for Transformational Technology. Among the transformational technologies I

investigate at the Hunt Institute is the Internet of Things (“IoT”), which makes extensive use of Fourth-Generation and Fifth-Generation networks.

10. I am a co-inventor of U.S. patent No. 8,334,775 issued Dec. 18, 2012 and entitled “RFID-Based Asset Security and Tracking System, Apparatus and Method.” This invention relates to a Radio-Frequency Identification (RFID)-based Global Positioning System (GPS) tracking system to provide control and security of assets. This system integrates an RFID-based detection system with a conventional GPS tracking system. The GPS tracking system includes GPS receivers connected over a network to a centrally based GPS monitoring system.

11. Because of my background, training, and experience, I am qualified as an expert to explain the background of the technology encompassed by the ’986 Patent as well as to offer opinions related to the validity of the claims of the ’986 Patent in view of the prior art references discussed herein.

12. If called upon to do so, I could and would testify truthfully regarding the points stated below in this declaration.

III. COMPENSATION

13. I am being compensated for my independent analysis as an expert with respect to this *inter partes* review proceeding. My work on this matter is being billed at my customary rate of \$685.00 per hour. Also, I am being reimbursed for reasonable expenses I incur in relation to my services. My compensation is not

contingent in any way on the content of my analysis, the opinions that I offer, or the outcome of this proceeding. I have no financial interest in Petitioner or Patent Owner, and I have no financial interest in the '986 Patent.

IV. OVERVIEW OF TASK & BASIS FOR OPINIONS

14. I have been asked to review the '986 Patent in light of the materials cited and discussed herein and my knowledge and experience in this field during the relevant time frame, which I understand to be January 7, 2002. I have been asked to provide opinions related to certain issues from the perspective of a person of ordinary skill, having knowledge of the relevant art, January 7, 2002 and—except where otherwise noted—the opinions stated in this declaration are from that perspective. I describe the qualifications and abilities of such a person in Section “Level of Ordinary Skill in the Art” below. I have also been asked to consider whether certain combinations of references have rendered obvious the inventions described in the claims of the '986 Patent.

15. My findings, as explained below, are based on my study, education, training, and experience as well as items that I reviewed to prepare my opinions, including the documents listed in Dr. Houh’s declaration and any other items I reference in my below analysis.

16. I understand that other issues may arise that require further explanation, and I will provide that explanation if appropriate. As a result, I respectfully reserve

the right to update and supplement this declaration and the information and opinions provided herein.

V. MATERIALS CONSIDERED

17. In preparing this declaration and forming my opinions, I have considered: the claims, specification, and prosecution history of the '986 Patent; the Petition and declaration by Dr. Houh (including materials cited in each); and all materials cited and discussed in this declaration. As part of my analysis, I have also considered my own knowledge and experience, including my work and experience in the field.

VI. LEGAL CONSIDERATIONS

18. I am not an attorney. My understanding of the law is based on information provided by counsel for Patent Owner.

19. It is my understanding that assessing the validity/patentability of a U.S. patent claim based on a prior art analysis requires two essential steps. First, one must analyze the terms of the patent claims to understand what meaning one of ordinary skill in the art would give the terms. Second, one may then assess validity by comparing a patent claim to the "prior art." I understand that the teaching of the prior art is viewed through the eyes of a person of ordinary skill in the art at the time the invention was made. My opinion as to what constitutes a relevant person of ordinary skill in the art is set forth below.

20. I understand that a claim is invalid as obvious under 35 U.S.C. § 103 if the differences between the subject matter sought to be patented and the prior art are such that the subject matter of the claim as a whole would have been obvious at the time of the invention to a person having ordinary skill in the art. I have been informed that the following factors are used to determine whether or not the claimed subject matter would have been obvious: (i) the scope and content of the prior art; (ii) the differences between the prior art and the claimed invention; (iii) the level of ordinary skill in the field of the invention; and (iv) any relevant objective considerations of non-obviousness.

21. I also understand that a party asserting obviousness based on a combination of prior art references must demonstrate that one of ordinary skill in the art would have been motivated to combine the teachings of those references to achieve the claimed invention and that the skilled artisan would have had a reasonable expectation of success in doing so. It is my understanding that it is not enough to show that one skilled in the art could combine elements of multiple references, but instead there must be some reason that would have prompted a person of ordinary skill in the art to combine the elements in the way the claimed invention does. I understand that there must be some reasoned explanation as to why one of ordinary skill in the art would combine the references.

22. I understand that a combination of references would not have been obvious if the alleged modification(s) to be made to the reference(s) would have been inconsistent with the **reference's stated goals** or would have rendered the **combination inoperable for its intended purpose**. I further understand that for something to have been obvious, the party asserting obviousness must explain why a POSITA would have selected components for combination in the manner claimed.

23. I also understand that a party asserting obviousness based on a single prior art reference must nonetheless show a motivation to modify the reference.

24. I have been informed that a prior art reference must be considered in its entirety, i.e. as a whole, including portions that would lead away from the claimed invention.

25. It is my further understanding that obviousness cannot be based on a hindsight combination of components selected from prior art references. I also understand that an invention would not have been obvious simply because all of the elements of the invention may have been known separately in the prior art.

26. My opinions address what would have been logical to, and within the skill level of, a person of ordinary skill in the art ("POSITA") at the time of the invention, given the state of the relevant art, the knowledge and skill that a POSITA would have, the teachings of the references discussed below, and how a POSITA would have understood those teachings. My opinions also address whether a

POSITA would have had a reasonable expectation of the modified systems discussed below successfully yielding the results discussed below. I understand that a POSITA is a hypothetical person. I understand that a POSITA thinks along the lines of conventional wisdom. I understand that a POSITA is also a person of ordinary creativity, not an automaton (*see* Section “Level of Ordinary Skill in the Art,” below, for qualifications of a POSITA).

27. I understand that a claim term is given the meaning that the term would have to a POSITA at the time of the invention, which generally is the ordinary and customary meaning of the term. I further understand that the ordinary and customary meaning of a term may be evidenced by a variety of sources, including the words of the claims themselves, the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art. I also understand that a patentee can act as a lexicographer by clearly expressing an intent to define a claim term.

VII. LEVEL OF ORDINARY SKILL IN THE ART

28. Counsel for Patent Owner has informed me that a person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention.

29. For the purpose of this Declaration, and based on my opinions herein, the time of invention for the '986 Patent is January 7, 2002. However, I understand

that the conception dates of the inventions may have been earlier than that date. Any earlier or later conception date around January 7, 2002 would not alter my opinions herein.

30. Dr. Houh opined that a POSITA “would have had a bachelor’s degree in computer science, computer engineering, electrical engineering, or in an equivalent field, or approximately two years of experience working in the field of information technology and networking.” Ex. 1003 (Houh Decl.) at ¶ 72.

31. I agree with Dr. Houh’s opinion on the qualifications of a POSITA, and have applied this definition throughout my analysis.

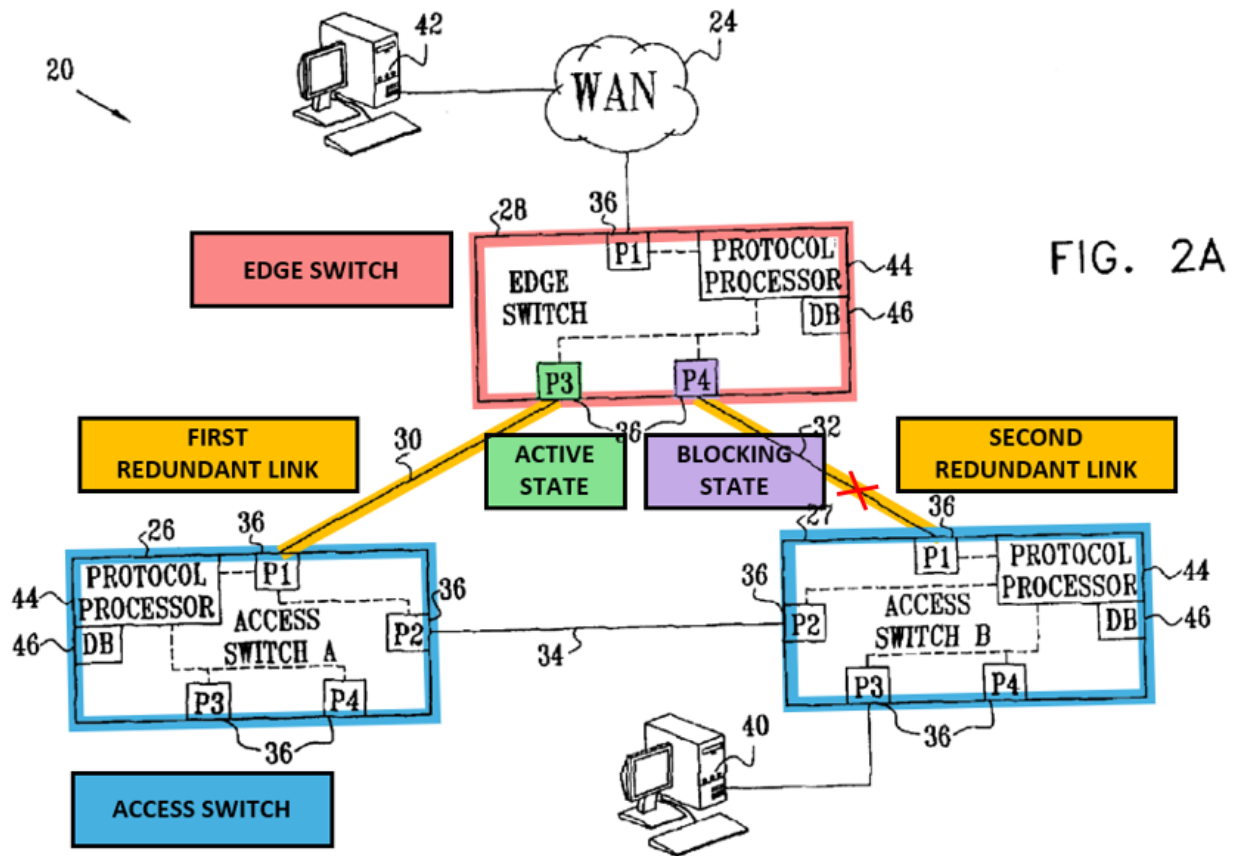
VIII. The ’986 Patent

32. The 986 Patent is directed to a novel system to provide rapid reconfiguration of a network in response to network topology changes. As described in the Patent, prior art systems “provide[d] multiple, redundant paths between switches in the network” Ex. 1001 (’986 Patent) at 2:7–9. However, existing techniques created “loops that disrupt the proper functioning of the learning process” and also caused serious network congestion, such as broadcast storms. *Id.* at 2:23–29. Additionally, existing techniques to remove network loops were “very slow in adapting to topology changes that may occur when a network link fails or is subsequently restored.” *Id.* at 2:65–67. To address these issues, the ’986 Patent teaches a system that 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 command.

33. The independent claims of the '986 Patent map out this process, which comprises: (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, e.g.*, EX1001 at claim 1.

34. For illustrative purposes, an annotated version of '986 patent Figure 2A is provided below.

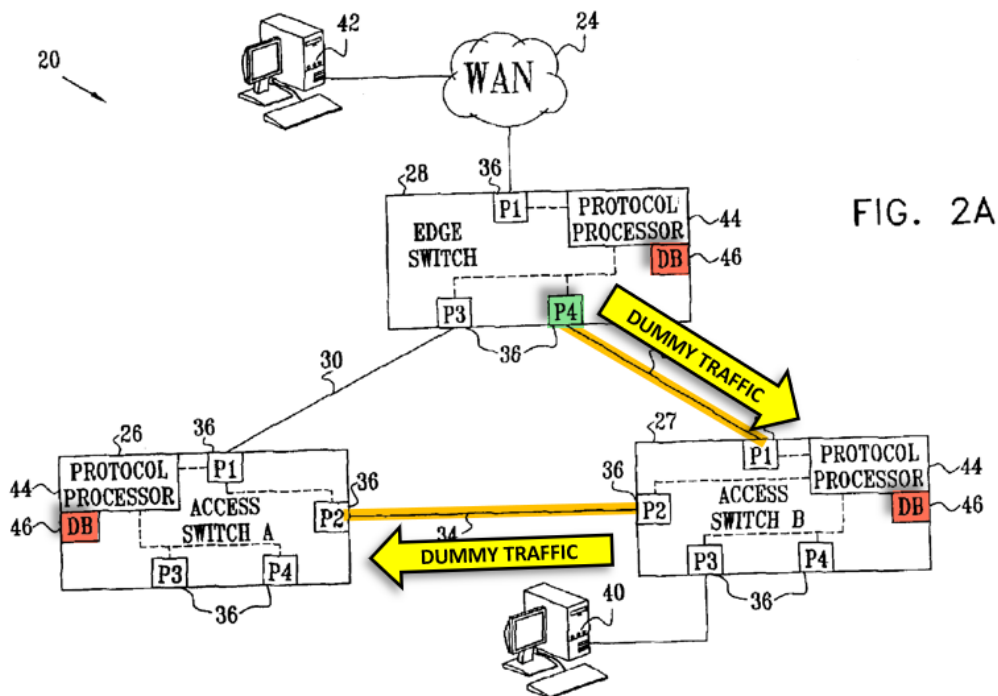


EX1001 at Fig. 2A (annotated).

35. 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.

36. 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.



EX1001 at Fig. 2A (annotated).

IX. OVERVIEW OF PRIOR ART REFERENCES

A. U.S. Patent No. 6,032,194 (*Gai*)

37. *Gai* is titled “Method and Apparatus for Rapidly Reconfiguring Computer Networks,” and was issued on Feb. 29, 2000. *Gai* is directed to “rapidly reconfigur[ing] a computer network having a plurality of devices executing the spanning tree algorithm” Ex. 1005 (*Gai*) at Abstract.

38. *Gai* discloses transmitting dummy multicast messages toward the root 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. *See* EX1005 at Abstract (“First, one or more devices are configured and arranged so that **one port, providing connectivity to the root, is in the forwarding state** and the **remaining ports, providing connectivity to the root, are in the blocked state**. Next, one or more of the blocked ports are designated as back-up ports. Upon detection of a failure at the active forwarding port, **one of the back-up ports immediately transitions from blocked to forwarding**, thereby becoming the new active port for the device.”) (emphasis added); *see also* EX1005 at 5:40-60 (“In accordance with the method, one or more devices are configured and arranged So that **one trunk port** is in the forwarding state and **other trunk ports are in the blocked state**. Additionally, one or more of the blocked ports are designated as back-up ports. Upon detection of a failure at the active forwarding port, the state of one of the **back-up**

ports immediately **transitions** from blocked to **forwarding**. ...Upon transition to the new forwarding port, the device begins transmitting “dummy” multicast messages through the new port. These 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.”) (emphasis added).

X. A POSITA WOULD NOT HAVE MODIFIED GAI

39. In my opinion, a POSITA 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.

40. Dr. Houh relies upon different modified versions of *Gai*’s figures to support his arguments. In my opinion, Dr. Houh’s reasoning for such modifications are unsupported and flawed. For example, Dr. Houh refers to the following modified figure of *Gai* to argue that a POSITA would have readily understood that *Gai* renders obvious sending dummy traffic downstream:

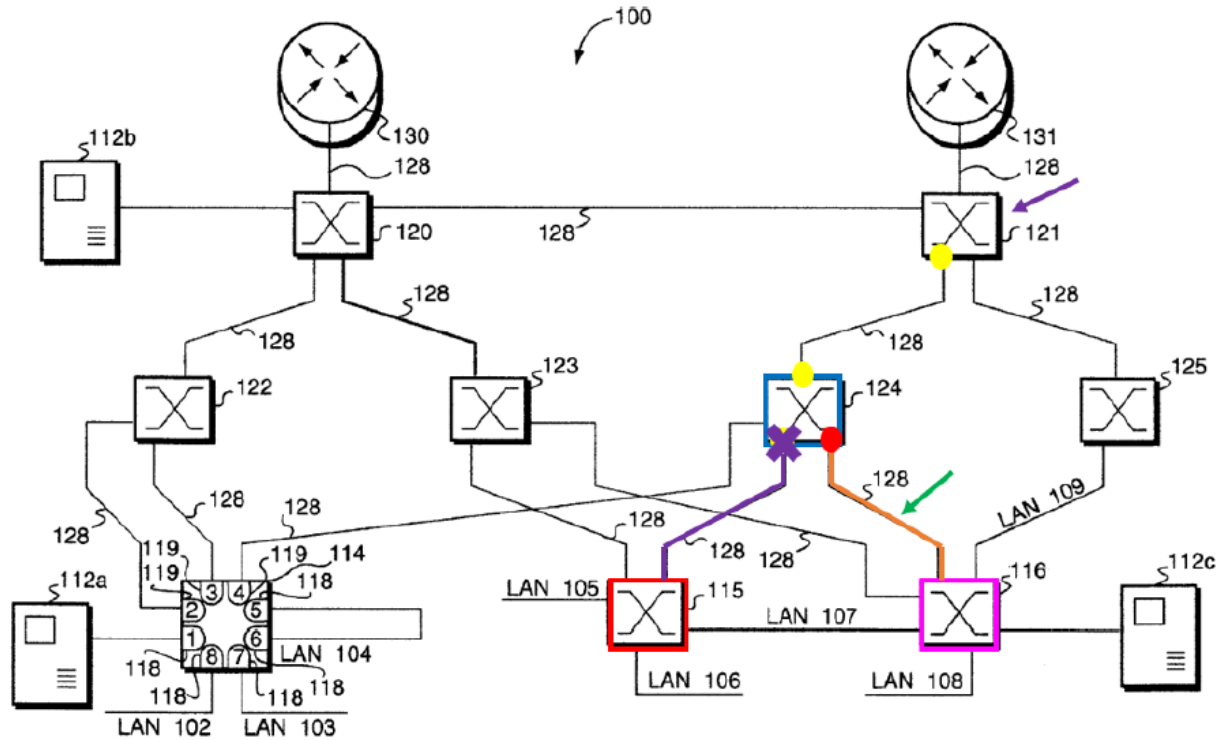


FIG. 1

EX1003 at ¶¶ 71, 104.

41. Dr. Houh asserts that such modifications are justified because *Gai* discusses the event of a failure in access switch 114, and a POSITA would have readily recognized that failures can happen at any other switches, such as in one of the ports of *Gai*'s switch 124. EX1003, ¶¶ 71, 103. However, Dr. Houh does not cite to any passage in *Gai* that supports this understanding. Instead, Dr. Houh 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*. *Id.* at ¶¶ 71, 103.

42. For example, Dr. Houh’s citation to *Burns* (EX1012) merely confirms that a port may fail for various reasons. *See e.g., id.* at ¶ 103 (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, Dr. Houh’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.”)).

43. I understand that references other than *Gai* are not part of the Petition’s only ground, and in my opinion, Dr. Houh’s reliance on these other references does not cure *Gai*’s deficiencies. For example, Dr. Houh’s citations to *Burns* or *Detampel* do not indicate that *Gai* discloses transmitting dummy traffic downstream.

44. Additionally, the ’986 patent distinguishes *Gai* from the claimed invention. The ’986 patent discloses that *Gai* “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.* In my opinion, this means that *Gai* does not disclose sending any dummy multicast transmissions downstream. *See* EX1005, Abstract.

45. Furthermore, as I describe in greater detail below in section XII.A, a POSITA would understand that Dr. Houh's arguments are incompatible with *Gai* because *Gai* teaches away from Dr. Houh's modified figures. For example, *Gai* explicitly warns that making an access switch a root switch would lead to inefficiencies in the network. EX1005, 3:23–27.

46. Therefore, a POSITA 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 POSITA to arrive at the '986 patent's claimed inventions.

XI. A POSITA WOULD NOT HAVE HAD A REASONABLE EXPECTATION OF SUCCESS IN MODIFYING GAI

47. Dr. Houh recognizes that multiple factors should be considered to determine whether a combination based on either a single reference or multiple references would have been obvious. EX1003, ¶ 28. Among these factors, Dr. Houh lists “whether the claimed elements represent one of a limited number of known design choices, and would have a reasonable expectation of success by those skilled in the art” as one such factor. *Id.*

48. However, Dr. Houh’s declaration does not include any arguments addressing a POSITA’s “reasonable expectation of success.” Although Dr. Houh asserts that a switch port may fail for various reasons, that explanation does not explain why a POSITA 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.

49. In my opinion, there are significant reasons why a POSITA would not have expected that modifications to *Gai* would succeed as portrayed by Dr. Houh. Importantly, *Gai* teaches away from Dr. Houh’s modifications related to an upstream embodiment of *Gai* where an access switch acts as the root because *Gai* discloses that doing so would actually be inefficient. *See, e.g.*, EX1005 at 3:1–16; 3:23–27; 9:47–63. *Gai* also does not disclose Dr. Houh’s modified downstream embodiments. I provide more detailed discussion of this point below in connection with specific claim limitations.

XII. GAI DOES NOT DISCLOSE EACH CLAIM FEATURE

A. Independent Claims 1 and 12

50. In my opinion, Dr. Houh fails to show how *Gai* renders obvious each limitation of claim 1 and claim 12.

1. Sending dummy traffic “from the first bridge over the second link downstream to the second bridge” (claim limitation 12e)

51. In my opinion, *Gai* does not disclose or render obvious sending dummy traffic “from the first bridge over the second link downstream to the second bridge” (claim limitation 12e). Dr. Houh relies on *Gai*’s figures as allegedly disclosing sending dummy traffic downstream. *See, e.g.*, EX1003 at ¶ 104. However, it is my opinion that Dr. Houh’s arguments fail.

52. 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.*

53. 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. In my opinion, 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.

54. Not only does the '986 patent explain that *Gai* is limited to upstream transmissions, but *Gai*'s own disclosure confirms this. See EX1005, Abstract ("First, one or more devices are configured and arranged so that **one port, providing connectivity to the root, is in the forwarding state and the remaining ports, providing connectivity to the root,** are in the blocked state. Next, one or more of the blocked ports are designated as back-up ports. Upon detection of a failure at the active forwarding port, **one of the back-up ports immediately transitions from blocked to forwarding,** thereby becoming the new active port for the device.") (emphasis added); 6:42–50 ("Upon failure of the current root port, this command additionally configures the access switch to immediately transition one of its blocked trunk ports to the forwarding state and to also begin *transmitting dummy multicast messages through the new port*, as mentioned above. Upon detection of a new or repaired link or device representing a *better path toward the root*, this command additionally configures the access switch to transition to the new path without suffering a loss of connectivity.") (emphasis added).

a. Ground 1A: Downstream Embodiment

55. Dr. Houh 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.*, EX1003 at ¶¶ 100–112. As previously mentioned in sections X and XI, Dr. Houh does not cite to any passage in *Gai* that supports this understanding. *See supra* sections X, XI. Dr. Houh also does not establish that a POSITA would have been motivated to modify *Gai* to transmit dummy traffic downstream.

56. Instead, Dr. Houh relies on a modified version of *Gai* to support his arguments. But Dr. Houh’s reliance on this modified figure also fails. In my opinion, Dr. Houh’s declaration includes a 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* EX1003 at ¶ 104. The annotated figure is reproduced below.

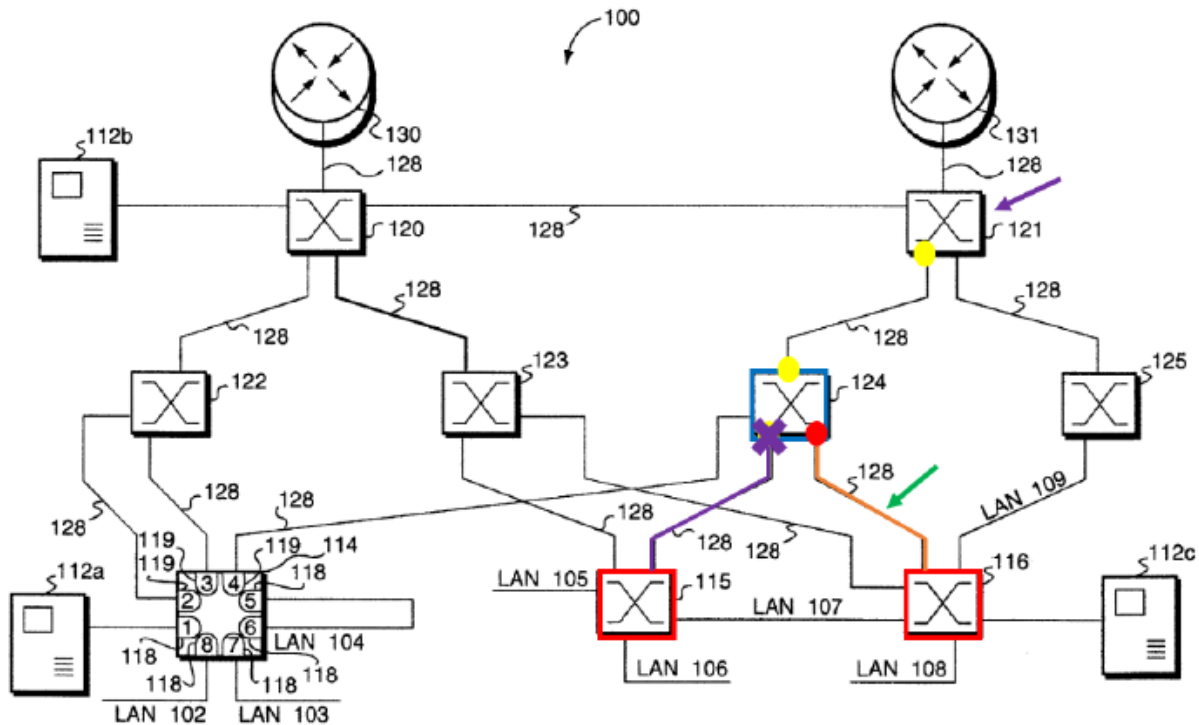


FIG. 1

Id.

57. Dr. Houh's declaration includes many annotations to *Gai* Figure 1 to support his arguments. For example, the annotated figure in Dr. Houh's declaration (1) marks backbone switch 121 as a root switch (purple arrow); (2) designates viable ports for a link between backbone switch 124 and root switch 121 (two yellow circles); (3) includes a green arrow to indicate a possible path from access switch 116 to root switch 121; (4) marks that an active port of switch 124 be blocked (purple X); (5) marks that link 128 between access switch 115 and backbone switch 124 fails (purple); (6) marks that a different port of switch 124 is unblocked (red circle); (7) marks that link 128 between access switch 116 and backbone switch 124 is now

viable; and (8) highlights access switches 115 and 116 (red). *See id.* As discussed in greater detail below, these 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.

58. First, Dr. Houh appears to equate *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 provided color coding. *See id.* at ¶¶ 104–05. Second, Dr. Houh defines backbone switch 121 as the root. *Id.* at ¶ 102. However, both of these comparisons do not align with *Gai*'s own description of Figure 1.

59. For example, Dr. Houh 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 port indicated by the red dot, i.e., through the new forwarding port, over link 128.” *Id.* at ¶ 105. In my opinion, *Gai* does not describe backbone switch 124 in such a way.

60. *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). Furthermore, *Gai* discloses that access switch 114 transmits multicast messages upstream towards backbone switch 124. *See e.g., id.* at 13:23–24 (“Multicast message 400 is first received at backbone switch 124 which examines its contents.”).

61. 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, it is my opinion that the dummy multicast message is transmitted upstream from access switch 114 towards the root.

62. Dr. Houh argues that the modified downstream embodiment of *Gai* discloses limitation 12e because a POSITA would understand that failure may happen at any port and that other configurations, such as Dr. Houh’s modified downstream embodiment, may exist in *Gai*’s network. *See* EX1003 at ¶¶ 103, 104. In my opinion, this motivation is vague and conclusory and is not sufficient to show that *Gai* itself teaches or renders obvious claim limitation 12e. *Gai* does not provide support for Dr. Houh’s’s downstream embodiment, and in my view *Gai* does not actually disclose such a configuration. Even assuming that the modifications included in Dr. Houh’s declaration can be implemented in other networks, Dr. Houh

fails to show that *Gai*'s disclosure would actually lead to such modifications in *Gai*'s own system.

63. Moreover, it is my opinion that Dr. Houh is incorrect when he states “[t]hat is, **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”). EX1003 at ¶ 69 (emphasis added). Dr. Houh's statement is contrary to the teachings of *Gai*.

64. *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).**”) (emphasis added). In Dr. Houh's hypothesis, the root is switch 121. See EX1003 at ¶ 69. *Gai* teaches that the link costs for backbone switches are “10” but that the link costs for the access switches are increased to “3000.” EX1005 at 9:49–63 (“Turning next to FIG. 3C, an Enable_Uplinkfast command 330 is preferably entered at each access switch 114-116 within the network 100, as shown at block 332. This command 330, at block 334, preferably **increases the respective switch ID of each of the access switches 114-116 to preclude any of the access switches 114-116 from becoming the root.** Specifically, the Enable_Uplinkfast command 330 preferably increases the settable portion of the switch ID stored at respective memory 240 from the IEEE default

value of ‘32768’ to ‘49152’. At block 336, the Enable_Uplinkfast command 330 also **significantly increases the path costs of all the ports of the respective access switch**. For example, the path costs stored at memory 240 for each port are preferably increased from the IEEE **default value of ‘10’ (for 100 Mbps ports) to ‘3000’.**”) (emphasis added).

65. *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 (“Each BPDU typically includes, in part, the following information: the identifier of the switch assumed to be the root (by the switch transmitting the BPDU), the root path cost to the assumed root and the identifier of the switch transmitting the BPDU. Upon receipt of a BPDU, its contents are examined and compared with similar information (i.e., assumed root ID, lowest root path cost and switch ID) stored by the receiving switch. If the information from the received BPDU is ‘better’ than the stored information, the switch adopts the better information and begins transmitting it (adding the cost associated with the receiving port to the root path cost) through its ports, except for the port on which the "better" information was received. 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).**”) (emphasis added).

66. Therefore, based on the teachings of *Gai* and under Dr. Houh’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. 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 modified Fig. 1 of EX1005.

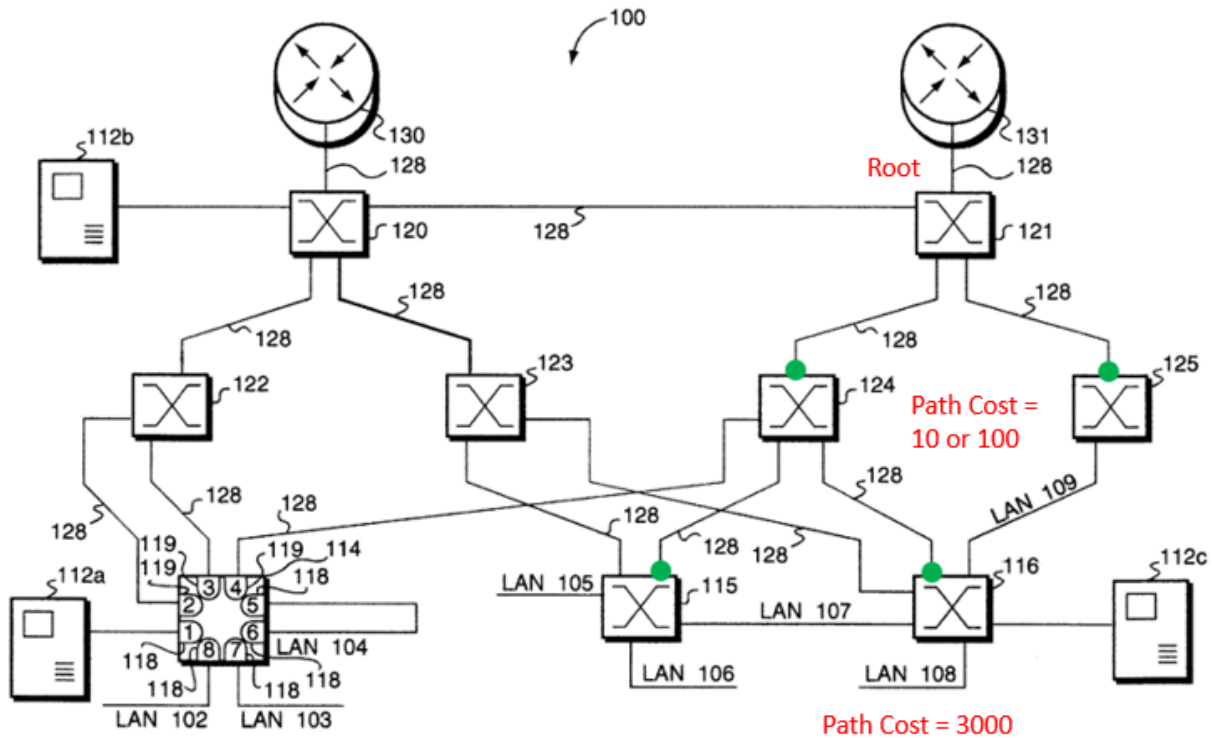


FIG. 1

EX1005, Fig. 1 (annotated).

67. A POSITA 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. Therefore, the ports on switch 124 going to switch 115 and 116 must be designated ports. EX1005 at 2:56–60 (“**The root ports and designated switch ports** are selected for inclusion in **the spanning tree** and are **placed in a forwarding state** so that data

frames may be forwarded to and from these ports and thus onto the corresponding paths or links.”) (emphasis added). 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.”) (emphasis added). EX 1005 10:62-65 (“Determination of the designated switch, moreover, depends in part on the **path costs at the relevant ports of the two switches coupled to LAN 109**”)

68. Therefore, based on the teaching of Gai, and under Dr. Houh’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.

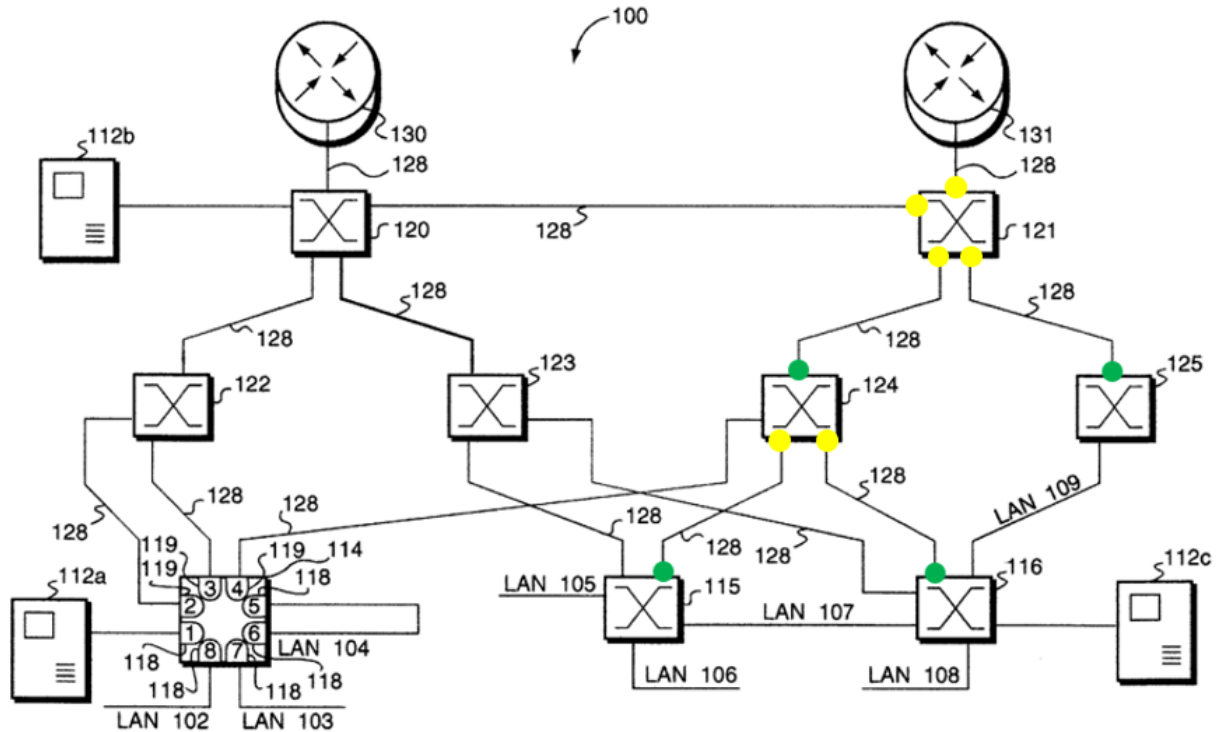


FIG. 1

EX1005, Fig. 1 (annotated).

69. Therefore, based on the teachings of *Gai*, Dr. Houh's hypothetical is not taught by *Gai*, but instead *Gai* actually teaches away from Dr. Houh's hypothetical. I note that Dr. Houh provides no analysis as to how *Gai* teaches this hypothetical embodiment or any other "additional embodiments." Instead, Dr. Houh uses hindsight to come up with a scenario to support his opinion that *Gai* teaches sending dummy traffic "from the first bridge over the second link downstream to the second bridge." Indeed, *Gai* teaches away from this hypothetical embodiment, teaching that if the link between switch 124 and switch 116 needed to be blocked for some reason, it is **the port on switch 116 that would be blocked**, not the port on

switch 124. EX 1005 10:65-11:7 (“Since the path costs at access switch 116 have been increased to “3000”, whereas the path costs at backbone switch 125 remain at the default value of “100 for ports operating at a data rate of 10 Mb/s or “10” for ports operating at 100 Mb/s, **the port at backbone switch 125 coupled to LAN 109 will be deemed the designated switch** port and placed in the forwarding state. Furthermore, unless the port at access switch 116 coupled to LAN 109 represents the root port for switch 116, **it will be placed in the blocked state.**”) (emphasis added). A POSITA would understand that this analysis for LAN 109 would also apply to the port connecting switch 116 with switch 124.

70. Therefore, it is my opinion that Dr. Houh 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.

b. Ground 1B: Upstream Embodiment

71. Dr. Houh also argues that *Gai* discloses sending transmissions downstream by presenting arguments related to *Gai*’s upstream embodiments. See EX1003 at ¶¶ 184–90. In my opinion, Dr. Houh’s arguments here also fail. Specifically, Dr. Houh relies on modified versions of *Gai* Figure 1, reproduced below. See EX1003 at ¶ 190.

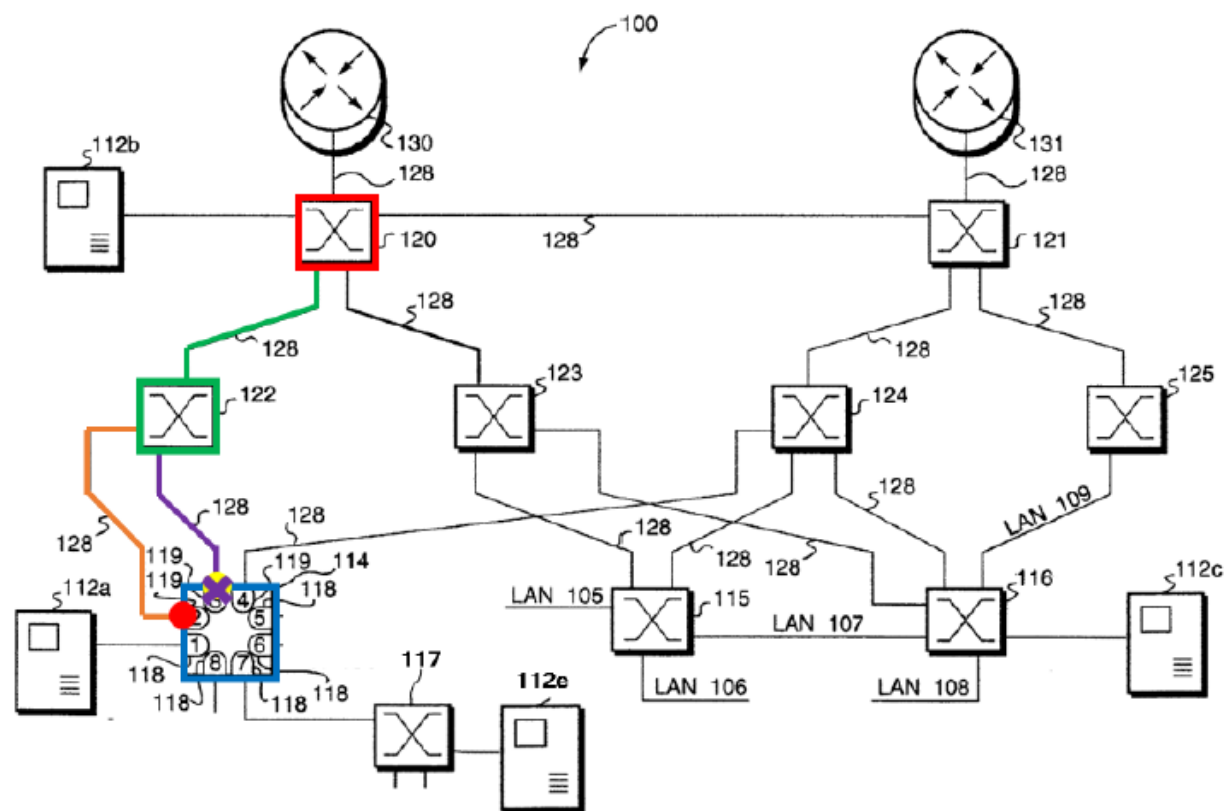


FIG. 1

EX1005, Figure 1 (modified).

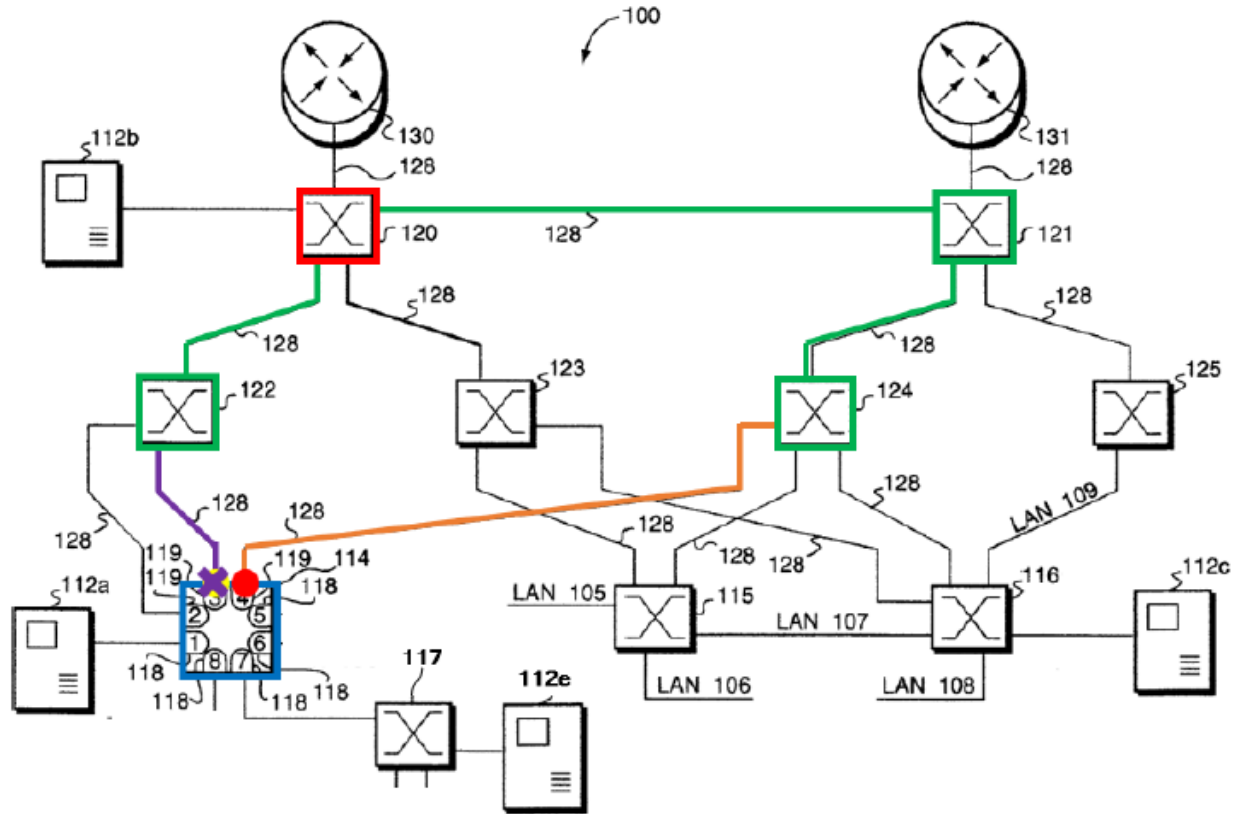


FIG. 1

EX1005, Figure 1 (modified).

72. The modified versions of *Gai* Figure 1 display a configuration where Dr. Houh makes the newly-added access switch 117 (which is not in *Gai*'s original Figure 1) the root. See EX1003 at ¶ 190. In support of his argument, Dr. Houh 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, for example, it was the switch

with the lowest switch identifier.” *Id.* In my opinion, Dr. Houh’s argument is not supported by *Gai*.

73. First, Dr. Houh 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, the modified figures in Dr. Houh’s declaration 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* EX1003 at ¶ 190.

74. Second, *Gai* teaches away from Dr. Houh’s improvised network arrangement because adopting Dr. Houh’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.”).

75. 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, hence teaching away from making an access switch a root switch. *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).

76. In view of *Gai*’s own teachings, it is my opinion that Dr. Houh’s newly-added switch 117 cannot be considered a core switch either. Dr. Houh repeatedly refers to switch 117 as an access switch when describing the various modified versions of *Gai* Figure 1. *See, e.g.*, EX1003 at ¶ 166 (“Switch 114 is a core switch,

because it interconnects *access switches 117*, 120, 115, 116, and 125 into a WAN, e.g., by direct connection between core switch 114 and *access switch 117*.”); *id.* at ¶ 171 (“[S]witch 114 is directly connected to *access switch 117*.”) (emphasis added); *id.* at ¶ 193 (“As shown in modified Figure 1 above, switch 117 is an access switch, because it is connected to a network endpoint, e.g., server 112e.”). The modified figures in Dr. Houh’s declaration therefore use access switch 117 as the root. Although Dr. Houh 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, it is my opinion that switch 117 is an access switch.

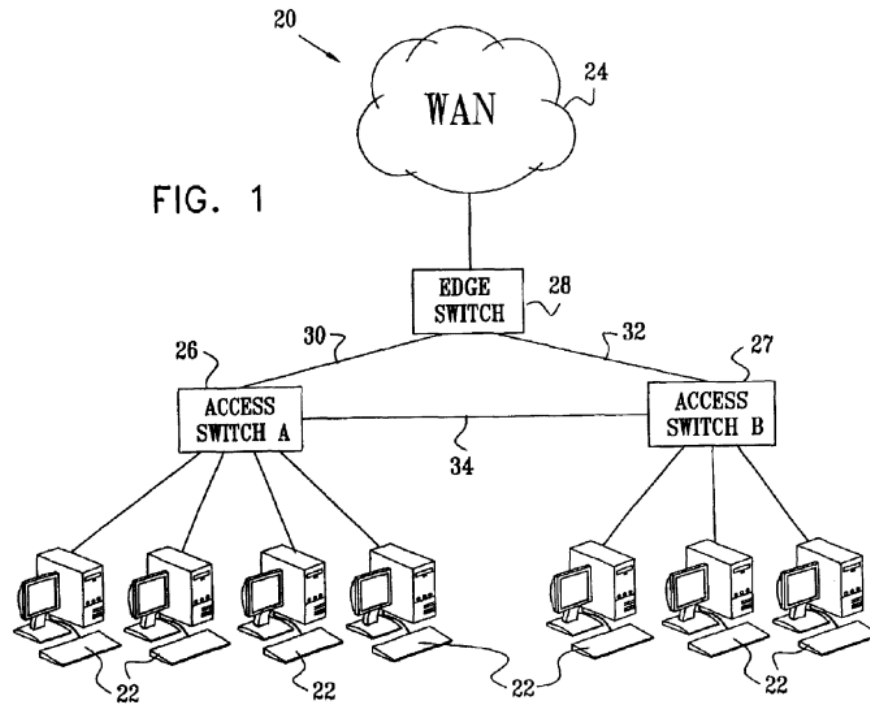
77. Simply by reading *Gai*, it is my opinion that Dr. Houh’s proposed modifications would actually worsen the performance of network 100. *See* EX1005, 3:23–29. For example, Dr. Houh’s upstream embodiment forces access switch 117 to be the root. *See* EX1003 at ¶ 190. As discussed above, however, *Gai* 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. Therefore, it is my opinion that Dr. Houh’s modifications to *Gai*, which involve forcing access switch 117 to be the root, would never be implemented in a normal, efficient network. In view of *Gai*’s explicit teachings, it is my opinion that Dr. Houh’s upstream embodiment is an inefficient and nonsensical implementation of *Gai*’s network.

78. Therefore, it is my opinion that *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 Dr. Houh’s downstream or upstream embodiments.

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)

79. In my opinion, *Gai* does not disclose “sending dummy traffic from the edge switch over the second link to the one or more access switches” (claim limitation 1e).

80. 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

81. Dr. Houh argues that *Gai* discloses limitation 1e in a downstream embodiment because a failure could happen at any port or link in the network. EX1003 at ¶¶ 103–104. In support of its argument, Dr. Houh provides the following modified version of *Gai* Figure 1.

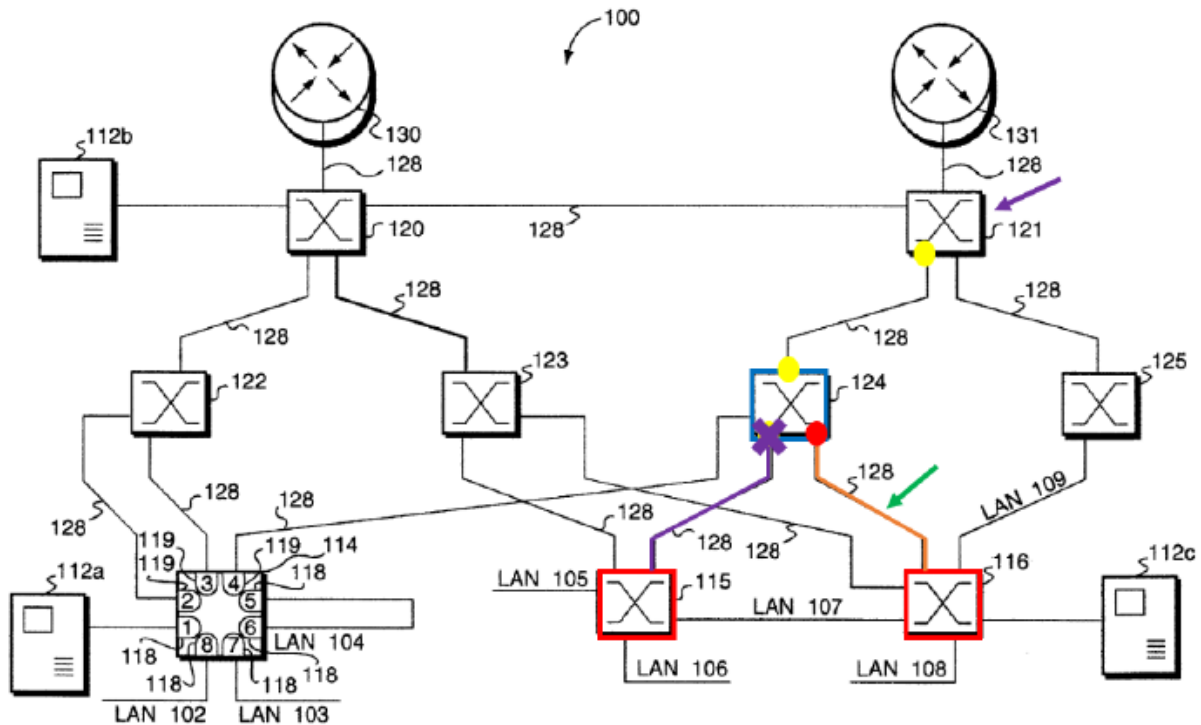


FIG. 1

EX1003 at ¶ 104.

82. Dr. Houh argues that, because a POSITA would understand that failure can happen at any port or link, a POSITA would realize that switch 124 could transmit dummy messages to one or more access switches 115 and 116. *Id.* at ¶¶ 103-05. As discussed above in section X, *Gai* itself does not support Dr. Houh's argument, and Dr. Houh instead relies on multiple unrelated references to support his assertions. *See supra* section II.X.

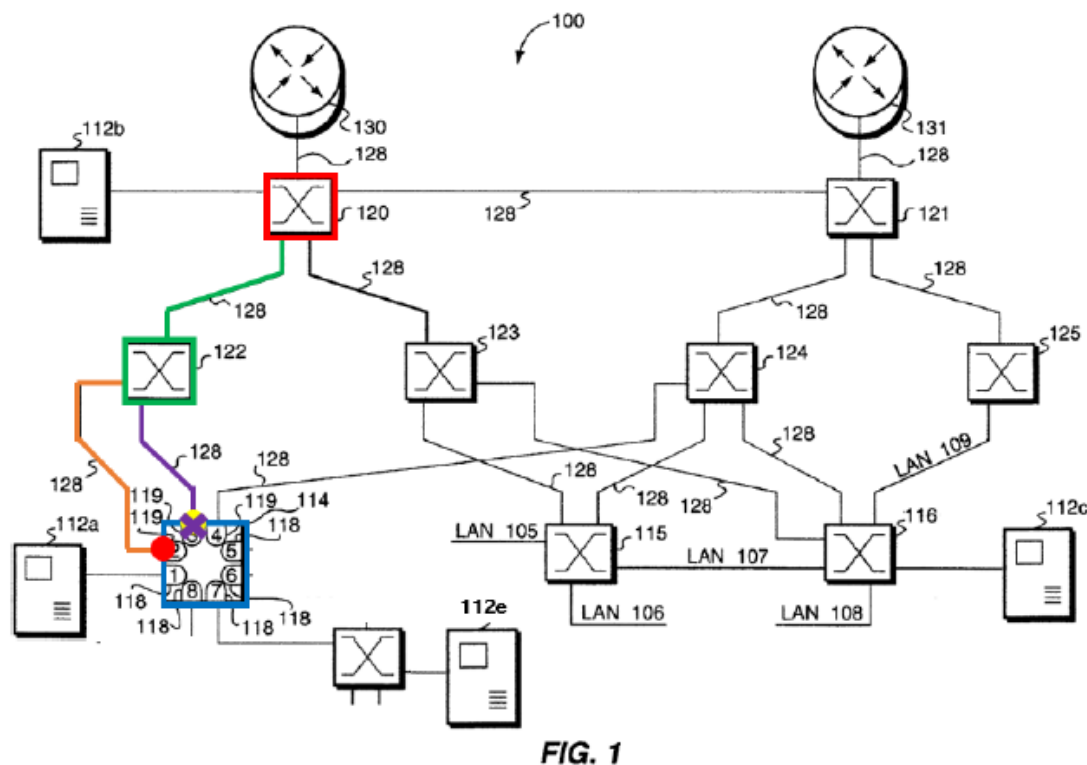
83. Dr. Houh opines that his modified downstream embodiment of *Gai* discloses limitation 1e because a POSITA would understand that failure could happen at any port in the network. In my opinion, this proposed motivation is

insufficient to show that *Gai* itself teaches or renders obvious claim limitation 1e. *Gai* does not provide support for Petitioner's downstream embodiment, and a POSITA would understand that *Gai* does not actually disclose such a configuration. Even assuming that Dr. Houh's proposed modifications can be implemented in other networks, Dr. Houh fails to show that *Gai*'s disclosure would lead to such modifications in *Gai*'s own system.

84. Therefore, it is my opinion that Dr. Houh 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

85. It is my opinion that Dr. Houh's arguments related to an upstream embodiment of *Gai* also fail. Dr. Houh relies on another modified version of *Gai* Figure 1, reproduced below.



86. Dr. Houh appears to treat switch 114 as an edge switch and switch 120 as an access switch. EX1003 at ¶¶ 185–87. 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, it is my opinion that the modified figure still fails to disclose sending traffic to an access switch because switch 120 is still a backbone switch. *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.”).

87. Although Dr. Houh 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.

Dr. Houh's label is not supported by *Gai*'s disclosure and, in my opinion, runs contrary to the '986 patent's description of an access switch. Further, it is my opinion that switch 120 is not an access switch precisely because *Gai* refers to switch 120 as a backbone switch and separately refers to other switches as access switches. Therefore, even in the modified figure, it is my opinion that *Gai* does not disclose transmitting dummy traffic to the one or more access switches.

88. Accordingly, it is my opinion that Dr. Houh fails to show that *Gai* teaches this limitation.

B. Independent Claim 13

89. In my opinion, Dr. Houh fails to show how *Gai* renders obvious each limitation of claim 13.

90. In my opinion, Dr. Houh's analysis for claim 13 fails for the same reasons discussed in section XII.A 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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91. Dr. Houh relies on his analysis of the limitations for claim 1 for purposes of analyzing the limitations of claim 13. For example, Dr. Houh expressly cites to his analysis of limitation 1e for purposes of limitation 13f. *See* EX1003 at ¶¶ 123, 198. Dr. Houh also argues that *Gai* discloses limitation 13f because *Gai*'s rapid reconfiguration entity 234 informs other devices of its new forwarding port. *See id.* at ¶ 123 (citing EX1005, 12:62-65). However, in my opinion, Dr. Houh's argument does not cure the deficiencies of his analysis in connection with claim 1. For example, Dr. Houh merely repeats the same statement in his analysis of limitation 1e and even relies on the same citations. *Compare* EX1003 at ¶ 101 (citing to EX1005, 12:62-66) with EX1003 at ¶ 123 (citing to EX1005, 12:62-65). Thus, claim 13 is non-obvious for the same reasons as claim 1.

92. Therefore, it is my opinion that *Gai* does not render claim 13 obvious.

C. Independent Claim 24

93. In my opinion, Dr. Houh fails to show how *Gai* renders obvious each limitation of claim 24.

94. In my opinion, Dr. Houh's analysis for claim 24 fails for the same reasons discussed in section XII.A regarding claim 12, as claim 24 is substantially similar to claim 12. 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	[24e] the protocol processor being further adapted [...] to send dummy
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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	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
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95. Dr. Houh expressly relies on his analysis of limitation 12e for purposes of limitation 24e. EX1003 at ¶¶ 129, 204. Dr. Houh does not present any new arguments in his analysis of limitation 24e. Thus, claim 24 is non-obvious for the same reasons as claim 12.

96. Therefore, it is my opinion that *Gai* does not render claim 24 obvious.

D. Dependent Claims 6 and 18

97. In my opinion, Dr. Houh fails to show how *Gai* renders obvious each limitation of claim 6 and claim 18.

98. Dr. Houh groups his arguments for claim limitations 6a and 18a together. See EX1003 at ¶¶ 141, 213. For reference, a comparison of dependent claims 6 and 18 is provided below.

[6pre] A method according to claim 1, [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.	[18pre] A device according to claim 13, [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.
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99. In my opinion, *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.” Dr. Houh cites to portions of *Gai* that disclose transmitting traffic originating from access switch 114 rather than an edge switch. See EX1003 ¶ 141; EX1005, 13:14-33; 13:50-14:3.

100. Dr. Houh 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 EX1003 at ¶ 142. But no portion of *Gai* actually discloses Dr. Houh’s hypothetical scenario, and Dr. Houh does not cite to any passage in *Gai* to support his argument. *Id.*

101. 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, it is my opinion that *Gai* does not disclose limitation 6a or 18a.

102. Therefore, it is my opinion that *Gai* fails to teach or render obvious limitations 6a and 18a and Dr. Houh has failed to establish that claims 6 and 18 are rendered obvious.

E. Dependent Claims 11 and 23

103. In my opinion, Dr. Houh fails to show how *Gai* renders obvious each limitation of claim 11 and claim 23.

104. Dr. Houh groups his arguments for claim limitations 11a and 23a together. *See* EX1003 at ¶¶ 155, 221. 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.

105. Dr. Houh solely refers to his arguments in connection with claim 1 for his analysis of claim limitations 11a and 23a. *See* EX1003 at ¶¶ 155, 221. *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 XII.A.1–2. *See supra* sections XII.A.1–2.

106. Therefore, it is my opinion that *Gai* fails to teach or render obvious dependent claim limitations 11a and 23a and thus fails to render obvious claims 11 and 23.

XIII. CONCLUSION

107. This declaration reflects my opinions as currently held. However, my analysis may continue such that I may consider additional information that may result in additional observations.

108. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

November 12, 2024
Date

/s/ James Olivier
James Olivier, Ph.D.