

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. IPR2024-00506
U.S. Patent No. 8,014,394

DECLARATION OF JAMES OLIVIER, Ph.D.

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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. 8,014,394. EX1001 (“the ’394 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 ’394 Patent while working at Marconi Communications and teach MAC bridging and

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Virtual Private LAN Services like those systems described in the '394 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 specialty was fault tolerant computing and 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 fault tolerant computing and coding theory and continued my work 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 '394 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

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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

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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 DSLAMS, SONET/SDH rings, ADMs, Ethernet switch design and bandwidth allocation models. I also discuss multicast streams in MPLS and Virtual Private networks. 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

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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 ’394 Patent as well as to offer opinions related to the validity of the claims of the ’394 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 '394 Patent.

IV. OVERVIEW OF TASK & BASIS FOR OPINIONS

14. I have been asked to review the '394 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 February 11, 2009. 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, February 11, 2009 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 the 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 '394 Patent.

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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 discussed 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 '394 Patent; the Petition and declaration by Dr. Houh (including materials discussed 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

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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

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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 '394 Patent is February 11, 2009. However, I understand that the conception dates of the inventions may have been earlier than that date. An earlier or later conception date around February 11, 2009 would not alter my opinions herein.

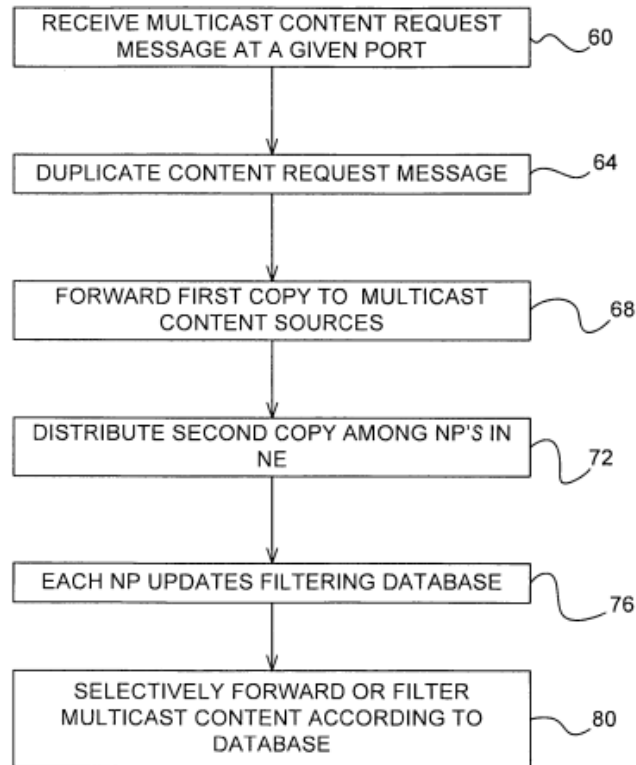
30. Dr. Houh opined that a POSITA “would have had a bachelor’s degree in computer science, computer engineering, electrical engineering, or an equivalent field, or approximately two years of experience working in the field of information technology and networking.” EX1002 (Houh Decl.) at ¶ 62.

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

VIII. The '394 Patent

32. The '394 Patent discloses “methods and systems for delivering multicast traffic over communication networks.” EX1001 at 1:6–8. The '394 Patent discloses techniques to rapidly adapt to multicast forwarding requests. *Id.* at 4:60–62. For example, Figure 2 of the '394 Patent is reproduced below.

FIG. 2



EX1001 at FIG. 2.

33. Figure 2 of the '394 Patent illustrates an exemplary method to respond to a multicast content request. A network element, such as a line card, may first receive a multicast content request (e.g., a request to start or stop receiving certain multicast content). The network element then duplicates the request and forwards a first copy of the request to multicast sources. A second copy of the request is distributed to network processors (e.g., processing units) in the network element. Each network processor that receives the second copy may then update their

respective databases accordingly. The network element may then selectively forward multicast content based on the updated databases. *Id.* at 7:27–8:35. The independent claims of the '394 Patent map out this process. *See, e.g., id.* at claim 1.

IX. OVERVIEW OF PRIOR ART REFERENCES

A. U.S. Patent Pub. No. 2005/0041665 (Weyman)

34. Weyman is titled “System and Method for Distributed Multicast Routing,” and published on Feb. 25, 2005. Weyman is directed to “packet-switched communication networks” and “a fabric of units organized as a single virtual multicast router and units intended for or capable of use in such a fabric.” EX1005 (Weyman) at [0001]. Weyman discloses connecting “a multiplicity of single bridge devices units” that are connected through fabric ports to create a distributed fabric. *Id.* at [0030]. Traffic is forwarded in a way that the bridging of data traffic through the distributed fabric appears identical to the bridging of data traffic through a single bridging unit. *See id.* at [0031].

B. WO 2007/140702 (Li)

35. Li is an international publication titled “Multicast service processing method, system, and access device” published on December 13, 2007. EX1007 (Li) at 70. Li discloses a multicast service processing method that receives a multicast program request message from a device, obtains a program rating parameter according to the request message, generating a multicast program data according to

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the program rating parameter, and sending the multicast program data to the device.

Id. at Abstract.

C. U.S. Patent Pub. No. 2006/0224877 (Jain)

36. Jain is a U.S. patent publication titled “System and Method for Controlling Boot-up Process in a Communications Network Switch” and published on October 5, 2006. Jain discloses detecting a system reset condition with respect to an Ethernet node, such as a boot-up condition or system failure, and executing a link down condition on ports of the node so that network traffic on the ports is discontinued. *See* EX1010 at [0007], [0019].

D. U.S. Patent No. 5,999,530 (LeMaire)

37. LeMaire is titled “Method and Apparatus for Transparent Immediate System Based Filtering on a LAN of Multicast Packets” and issued on Dec. 7, 1999. LeMaire is directed to “reducing unwanted WAN multicast packet traffic in a LAN.” EX1011 (LeMaire) at Abstract. LeMaire discloses improved LAN bridges that are capable of receiving WAN multicast packets (WMPs) and delivering them only on segments having at least one router. *See id.* at 7:8–22. The bridges in LeMaire accomplish this by monitoring all Routing Layer Multicast data and Multicast Router-to-Router Discovery Packets (MRRDPs) and making forwarding decisions for multicast packets. *See id.* at 7:23–31.

E. U.S. Patent Pub. No. 2007/0297406 (Rooholamini)

38. Rooholamini is titled “Managing Multicast Groups,” and published on Dec. 27, 2007. Rooholamini is directed to managing multicast groups such that switches may be configured or reconfigured when endpoints are added or removed from the multicast groups. EX1008 (Rooholamini) at Abstract. Rooholamini discloses using port path count tables to track the number of paths through the ports of switches configured to route multicast packets. *See id.* at [0029]. Paths through the ingress and egress ports in the switches are tracked so that the fabric manager may determine if switch multicast tables need to be reconfigured when there is a change in multicast group membership. *Id.*

X. DR. HOUH FAILS TO DEMONSTRATE THAT ANY CLAIM OF THE '394 PATENT WOULD HAVE BEEN OBVIOUS

39. In my opinion, Dr. Houh fails to demonstrate that any challenged claim would have been obvious. As I discuss below, it is my opinion that Dr. Houh’s declaration includes numerous, distinct failures. It is therefore my opinion that Dr. Houh fails to demonstrate any reasonable likelihood of success that any challenged claim would have been obvious.

XI. A POSITA WOULD NOT HAVE COMBINED WEYMAN AND LI AS DESCRIBED BY DR. HOUH

40. Dr. Houh opines that a POSITA would have been motivated to combine Li’s teachings to Weyman’s system. I disagree for a number of reasons.

41. First, the two references are in two different areas. Weyman “relates to **packet-switched** communication networks, particularly though not exclusively those employing media access control (MAC) addressing and network (IP) addressing of packets.” EX1005 at [0001] (emphasis added). In particular, Weyman relates to **network switches or units**. EX1005 at [0002] (“It is known, particularly for **network switches**, to interconnect a multiplicity of network units into a switching fabric so that in effect, and particularly in relation to the external network, the units act as a single network entity.”); *see also id.* at [0025] (“The functionalities required of a **network unit** may be divided into two broad categories.”) (emphasis added). In particular, Weyman teaches that the aggregation links do not go to users but instead only go to ethernet switches, as shown in FIG. 6 below. As such, Weyman’s aggregation links cannot connect into an access network.

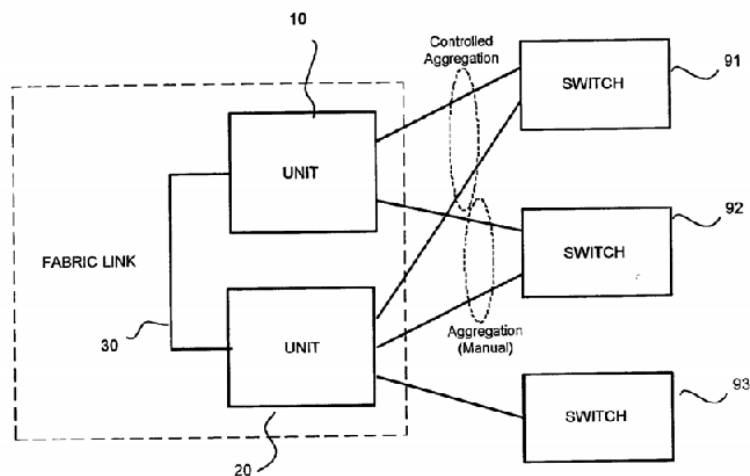


FIG.6

EX1005 at FIG. 6.

42. Li, on the other hand, relates to an **access device** for processing multicast service. EX1007 at 72:17–18 (“The present invention relates to the field of data communication, and, in particular, to a method, system, and access device for processing multicast service.”). Fig. 1 of Li shows a structural diagram of a multicast system which includes “a video multicast service system 10, an IP-based metropolitan area network (MAN) 11, an access network 12, and a home network 13.” EX1007 at 72:21–23; FIG. 1. Li further describes that the access network contains an access device containing xDSL modems connecting to a home network. See EX1007 at 72:23–25. Figure 1 of Li is provided below:

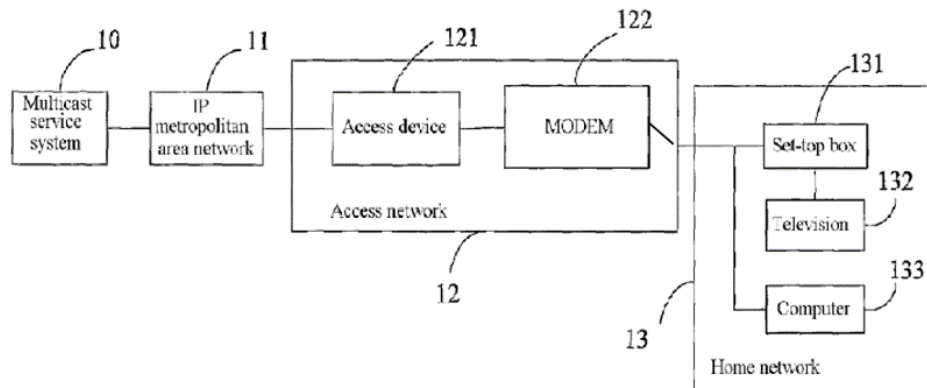


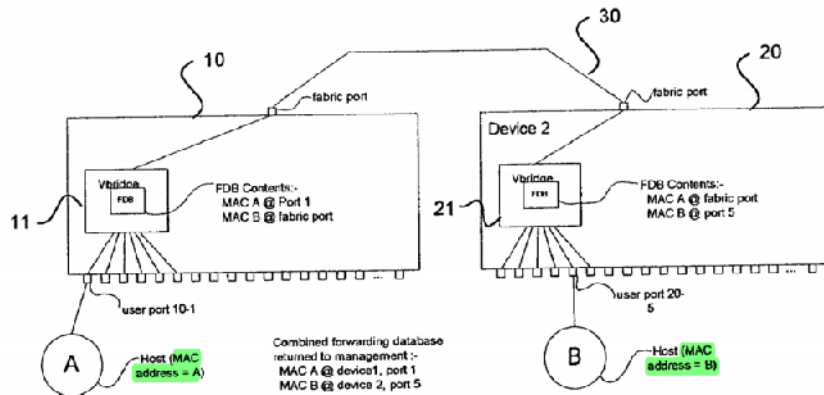
FIG. 1

EX1007, FIG. 1.

43. Thus, Weyman and Li are directed to two different types of networks: a packet switched network and an access network. Additionally, the devices disclosed in Weyman and Li operate on two different media in two different ways.

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Weyman operates according to layer 2 ethernet where all inputs and outputs to the network utilize ethernet. Moreover, Weyman's disclosure is based entirely on **ethernet** bridges which are capable of vlan switching and Vbridges defined by IEEE 802.1D. See EX1005 at [0028]. See annotated FIG. 2 shown below:



EX1005 at FIG. 2 (annotated).

44. In contrast, the access devices of Li are not ethernet-based. Li describes the access device as a DSLAM. EX1007 at 97:13–17 (“As illustrated in FIG. 9, in an IPTV access network, an **access device 91 of a multicast service is a Digital Subscriber Line Access Multiplexer (DSLAM)** functioning as a multicast router, and provides the user with a **Digital Subscriber Line (xDSL)** service port.”) (emphasis added). These devices communicate to the users exclusively over xDSL service ports which make use of the twisted pairs of wires running into a home or office. An access device as disclosed by Li is shown below:

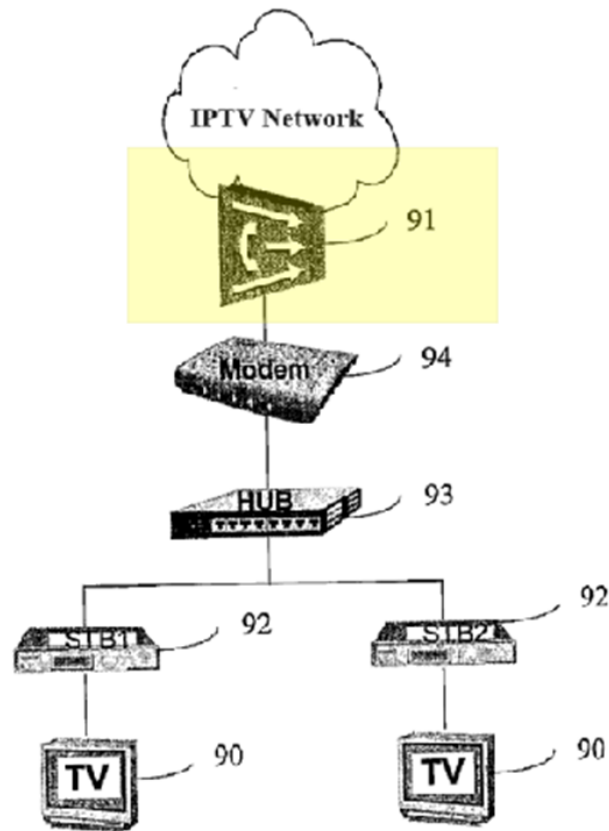


FIG. 9

EX1007 at FIG. 9 (annotated).

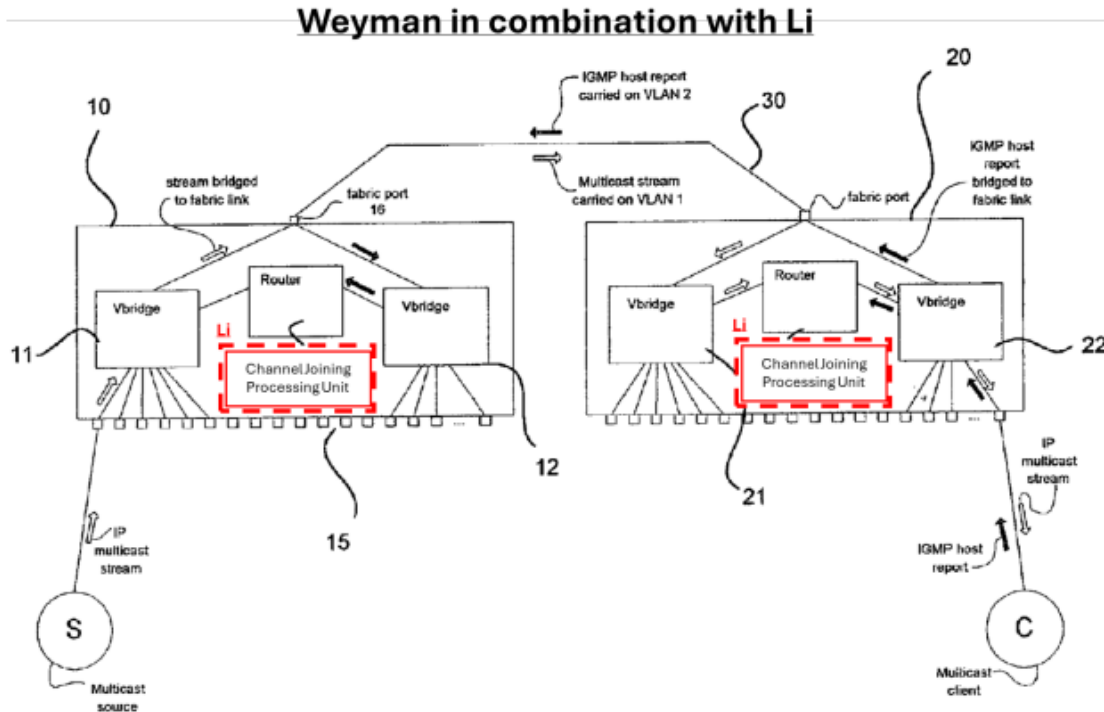
45. In my opinion, given that Weyman and Li are directed to two different types of products using two different types of media in two different types of networks, a POSITA would not have been motivated to combine Weyman and Li.

46. Furthermore, a POSITA would not have been motivated to combine Weyman and Li as Dr. Houh has suggested for a number of reasons, as discussed below.

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47. Dr. Houh opines that a POSITA would have been motivated to combine Weyman and Li because Weyman discusses workload sharing between units and that Li discloses a technique for improved port bandwidth control. See EX1002 at ¶¶ 85–87.

48. Dr. Houh therefore argues that a POSITA would have been motivated to combine Weyman’s multicast router with Li’s channel joining processing unit, as shown below:



Id. at ¶ 93.

49. Dr. Houh argues that a POSITA would have multiple reasons to make such a combination. For example, Dr. Houh notes that Li’s channel joining

processing unit would “ensure that Weyman’s distributed router does not overload any particular port (including the **aggregated link** in Weyman), thereby degrading the distributed router’s reliability.” *Id.* at ¶ 95 (emphasis added). Additionally, Dr. Houh states that a POSITA would have been motivated to include Li’s channel joining processing unit to **control the assignment of multicast streams to ports locally at each unit**. *See id.* at ¶ 96. Furthermore, Dr. Houh argues that such a configuration is desirable “because the alternative option (e.g., controlling the workload of each units’ ports globally) would have required using the internal fabric link to communicate with all of the units in the distributed router” and that Weyman discloses that the use of the fabric link should be minimized. *Id.* at ¶ 97.

50. In my opinion, Dr. Houh’s arguments are flawed. Dr. Houh’s proposed combination would not achieve the results Dr. Houh opines. A POSITA would not have combined Weyman’s multicast router with Li’s channel joining processing unit as he has described for a number of reasons. First, Dr. Houh’s proposed analysis does not consider Weyman’s teachings regarding the controlled aggregation links, which Dr. Houh equates to the high capacity ports of the ’394 Patent. *See* EX1002 at ¶ 151. An annotated version of FIG. 6 of Weyman is shown below, which displays aggregation links and two different network units in the distributed router:

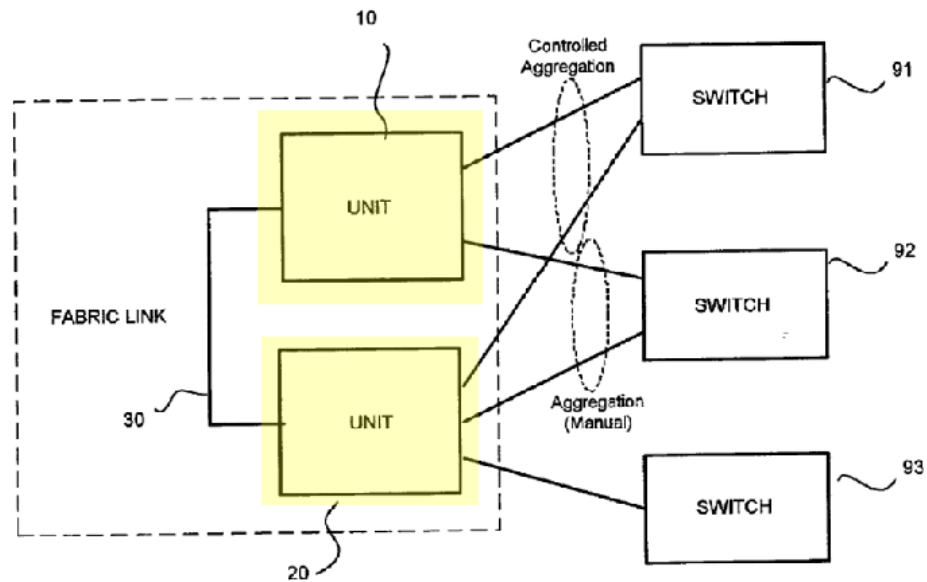
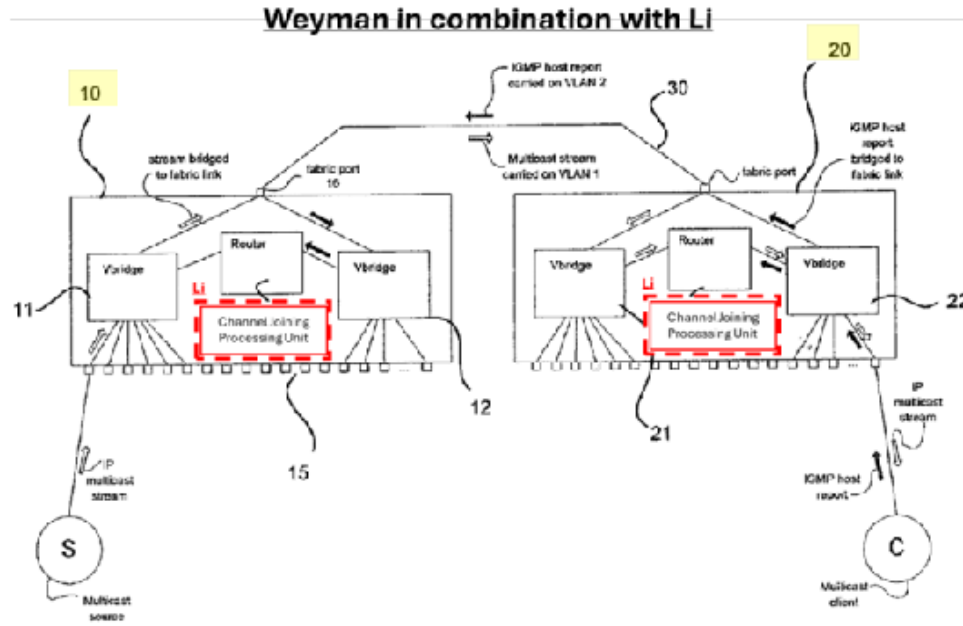


FIG.6

EX1005 at FIG. 6 (annotated).

51. As shown in FIG. 6, the controlled aggregation links of Weyman go from one switch, 91, to two different network units, 10 and 20. These two network units are the very same network units in Dr. Houh's proposed combination of Weyman with Li, which is provided below:



EX1002 at ¶ 105 (annotated).

52. Contrary to Dr. Houh's assertions, the combined system of Weyman and Li would instead appear as below based on the teachings of Weyman:

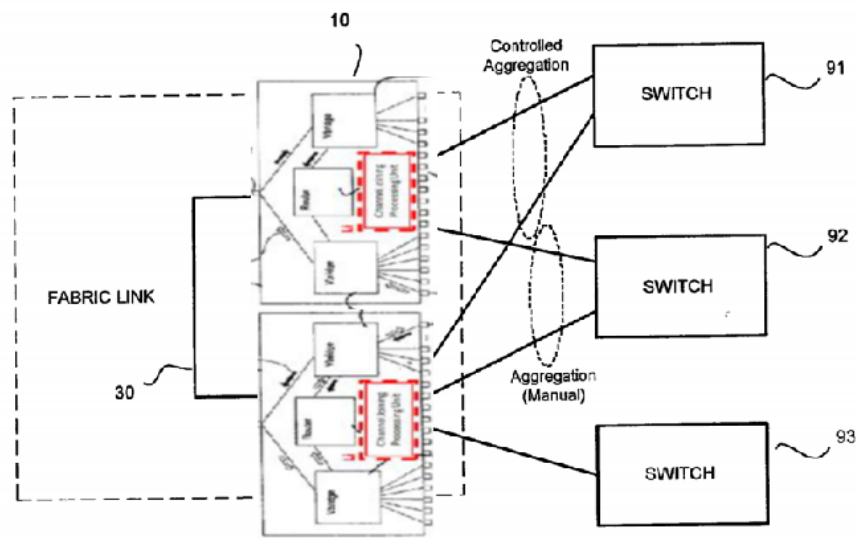
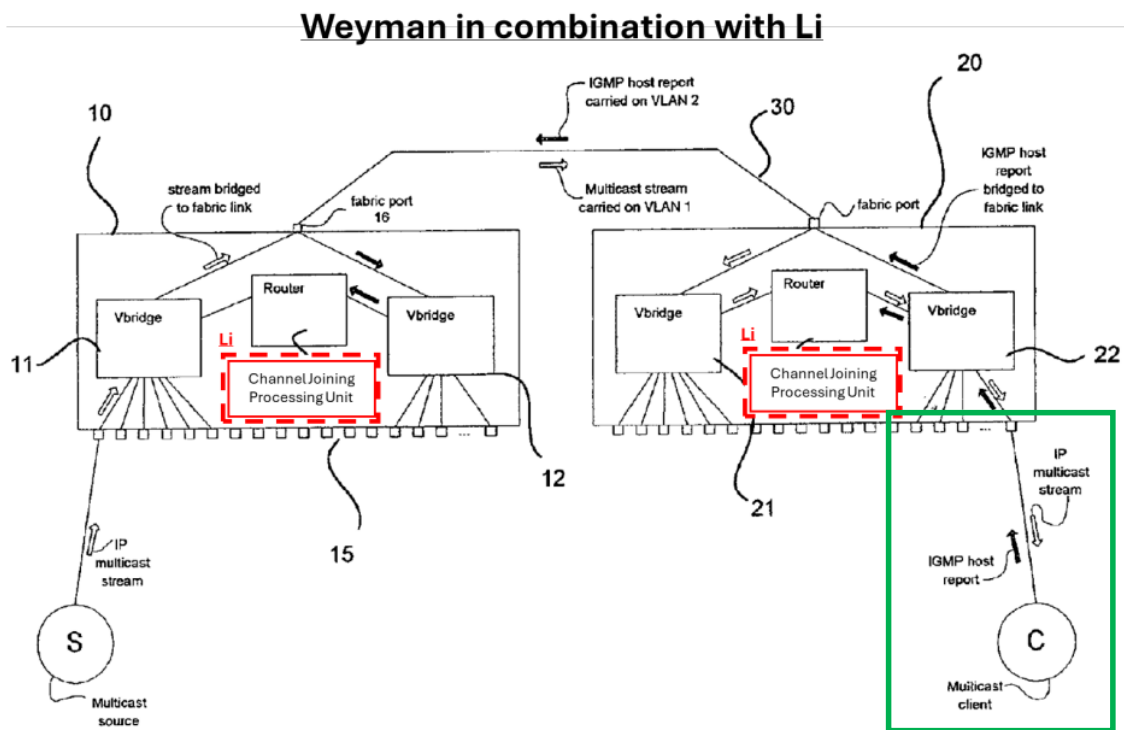


FIG.6

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EX1005 at FIG. 6 (modified).

53. Because the controlled aggregation links go to both network unit 10 and network unit 20, the IGMP host report, which Dr. Houh shows going to a single port on network unit 20, is incorrect, as annotated in green below.



EX1002 at ¶ 105 (annotated).

54. Instead of going to a single network unit as Dr. Houh has shown, an IGMP report message can go to either unit 10 or unit 20, as shown below.

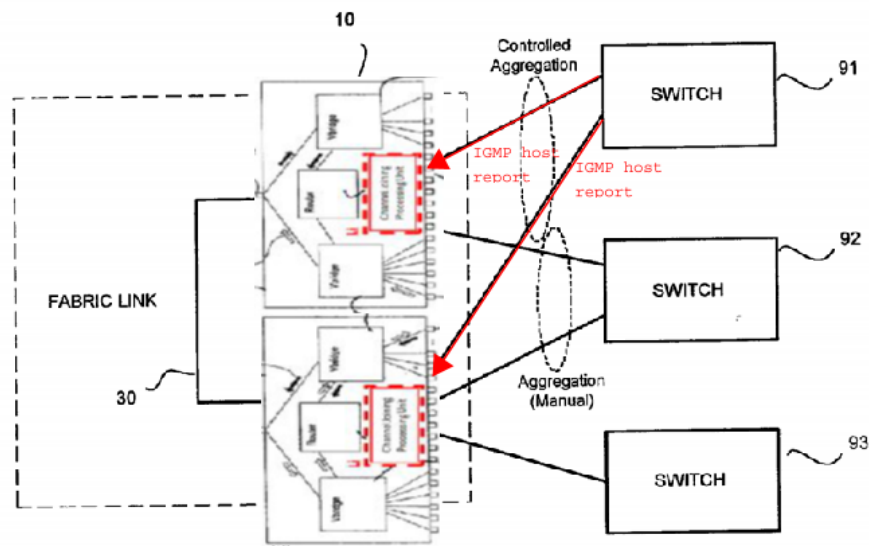


FIG.6

EX1005 at FIG. 6 (modified).

55. Because packets may be distributed in a number of ways under link aggregation, there is no way to determine which network unit will receive any particular IGMP report message beforehand. *See e.g.*, EX1025 at 7:15–51. Thus, the receipt of an IGMP report on either of the two units 10 or 20 must be coordinated in some way. The coordination of the reception of these IGMP report messages at two different network units will require using bandwidth on the fabric link. However, Weyman states that it is an object of the invention to minimize the usage of bandwidth on the links between fabrics. *See* EX1005 at [0005]. Therefore, a POSITA would not have been motivated to combine Weyman and Li because

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Weyman teaches against using additional bandwidth on the fabric link for the coordination of IGMP report messages.

56. The issue regarding increased bandwidth usage becomes apparent when combining Weyman with Li. For example, Li discusses the use of multicast quitting and multicast joining messages with respect to the operation of the channel joining processing unit. *See e.g.*, EX1007 at 80:6–22. The channel joining processing unit of Li requires the reception of the multicast joining messages from each of the STBs. EX1007 at 97:18–22 (“Operations of **each STB device 92** can be divided into three types of powering on, channel switching, and powering off. Particularly, the STB device 92 sends a multicast joining message when it powers on, first sends a multicast joining message of a current channel, and then sends a joining message of a new channel when it switches its channel, and sends a multicast quitting message of a current channel when it powers off.”) (emphasis added). Li also requires that the join or quit messages from each STB be coordinated. *Id.* at 99 (“This situation may occur when **a STB user** is powering off while **another STB user is powering on** and joining a channel being forwarded, or when a STB user is powering off while another STB user switches his channel to a channel being forwarded, or when a STB user switches his channel to a channel being forwarded.”) (emphasis added). Since the multicast joining messages may go to any network unit connected to the controlled aggregation links of Weyman, there is no guarantee that the same network

channel joining processing unit on one unit will receive all of the messages. In fact, given that the STBs will have different IP addresses and different MAC addresses, there is a strong likelihood that the multicast joining messages will be received by different network units. In the combined system of Weyman and Li, these messages would have to be coordinated between the two network units in order for the channel joining processing unit of Li to operate properly. As discussed above, the increased bandwidth required for this coordination between network units in the Weyman and Li combination contradicts Weyman's teachings. As a result, Dr. Houh's proposed combination will **not** "control the assignment of multicast streams to ports **locally** at each unit" or remove the need for **global control**.

57. Dr. Houh also opines that the aggregated links could have been treated as a "virtual port." EX1002 at ¶ 94. However, Dr. Houh provides no analysis as to how this could occur. I also note that neither Weyman nor Li use the term "virtual port."

58. In view of the above, Dr. Houh's proposed combination of Weyman and Li will add to the usage of bandwidth on the fabric links. Additionally, the combination of Weyman and Li would not control the assignment of multicast streams to ports locally at each unit or remove the need for global control. Therefore, it is my opinion that a POSITA would not have been motivated to combine Weyman and Li in the manner Dr. Houh describes.

XII. WEYMAN IN VIEW OF LI DOES NOT DISCLOSE EACH CLAIM FEATURE

A. Independent Claim 1

59. In my opinion, Dr. Houh fails to show how Weyman in view of Li renders obvious each limitation of claim 1.

1. Aggregating ports by “setting an upper limit on a number of the multicast packet streams that are permitted for forwarding over the high-capacity port” (claim limitation 1k)

60. In my opinion, the combination of Weyman and Li does not disclose or render obvious “wherein aggregating the ports comprises setting an upper limit on a number of the multicast packet streams that are permitted for forwarding over the high-capacity port” (claim limitation 1k). Dr. Houh relies on Li as allegedly disclosing setting an upper limit on a number of multicast packet streams. *See, e.g.*, EX1002 at ¶ 154. However, it is my opinion that Dr. Houh’s arguments fail.

61. First, Li never describes using a channel joining processing unit with an aggregated link. The only type of link Li describes applying the channel joining processing to is an xDSL link. This is always a single xDSL link because each end of the link contains a modem. Therefore, the xDSL link cannot be an aggregated link or a high-capacity port.

62. Additionally, Dr. Houh opines “that when the distributed router receives a multicast join request, Weyman/Li’s **channel joining processing unit** determines if the number of channels that are currently being forwarded over the

particular port or an aggregated link is below the maximum number of multicast streams that are permitted for forwarding over that particular port or aggregated link.” EX1002 at ¶ 154 (emphasis added). As I described above, this is not possible because no single channel joining processing unit is assured to receive both the channel joining and channel quit messages. *See supra* Section XI.

63. Dr. Houh also states “Li discloses that ‘each xDSL service port is configured with the **maximum number of accessed multicast channels allowable.**’” EX1002 at ¶ 154. Dr. Houh further explains that “Li’s channel joining processing unit is able to determine whether a maximum number of the channels has been exceeded.” *Id.* Dr. Houh therefore appears to compare Li’s “channels” to the ’394 Patent’s “multicast packet streams.”

64. Dr. Houh’s comparison is improper because Li’s channels are content provider or program channels sent over an xDSL link. Such channels typically have at least one video stream and at least one audio stream. For example, U.S. Patent 8,516,531 (“’531 Patent”) discloses that program channels contain both video and audio multicast streams.¹ *See* EX2005 at 6:26–33 (“A source video stream 202 received and/or propagated (Step A of FIG. 2) through network 102 (FIG. 1). In one embodiment, video stream 202 is a real-time multicast video stream which has been

¹ The ’531 Patent was published on December 6, 2007 as US 2007/0280298.

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encoded for eventual transmission to a presentation device 116 via network 102. Video stream 202 typically contains multimedia content corresponding to **a program channel, such as video and audio content of a content provider's channel.**") (emphasis added); 4:43-50 ("A decoder is first required to extract from an MPEG-2 transport stream a (1) program association table 'PAT' packet indicating the PID of a PMT; (2) a program map table 'PMT' packet, indicating the PIDs of **the video and audio streams**, and (3) a video sequence start code indicating the sequence resolution, frame rate, decoding matrices, etc., all prior to beginning to decode the first picture delivered to it.") (emphasis added). The '531 Patent also makes clear that the streams that make up the program channels correspond to multicast data streams. *Id.* at 1:19–23 ("Broadband providers (e.g., cable, satellite, **DSL** or fiber optic-to-home providers) often deliver a real-time broadcast of a digital **video multicast data stream (video stream)** to subscribers over an internet protocol (IP) network.") (emphasis added).

65. Because different program channels correspond to different multicast packet streams, setting an upper limit on a number of program channels is different than setting an upper limit to the number of multicast packet streams. Therefore, it is my opinion that Dr. Houh fails to establish that the combination of Weyman and Li teaches or renders obvious "setting an upper limit on a number of the multicast packet streams that are permitted for forwarding over the high-capacity port."

B. Independent Claim 11

66. In my opinion, Dr. Houh fails to show how Weyman in view of Li renders obvious each limitation of claim 11.

67. In my opinion, Dr. Houh's analysis for claim 11 fails for the same reasons discussed regarding claim 1, as claim 11 is substantially similar to claim 1. That is, limitation 11j is substantially similar to limitation 1k. A comparison of the limitations 1k and 11j is provided below.

[1k] wherein aggregating the ports comprises setting an upper limit on a number of the multicast packet streams that are permitted for forwarding over the high-capacity port	[11j] wherein an upper limit is set on a number of the multicast packet streams that are permitted for forwarding over the high-capacity port, and
---	--

68. Dr. Houh relies on his analysis of the limitations for claim 1 for purposes of analyzing the limitations of claim 11. For example, Dr. Houh expressly cites to his analysis of limitation 1k for purposes of limitation 11j. See EX1002 at ¶ 188. Thus, claim 11 is non-obvious for the same reasons as claim 1.²

² As Grounds 2, 3, and 7 challenge only dependent claims, the fact that Weyman and Li fail to render obvious the claims in Ground 1 equally applies to the claims in Grounds 2, 3, and 7.

XIII. WEYMAN IN VIEW OF JAIN AND LEMAIRE DOES NOT DISCLOSE EACH CLAIM FEATURE

A. Independent Claim 8

69. In my opinion, Dr. Houh fails to show how Weyman in view of Jain and LeMaire renders obvious each limitation of claim 8.

70. Dr. Houh’s combination of Weyman, Jain, and LeMaire is impractical for a number of reasons. Jain teaches to de-activate or de-energize all active links of the entire network node under conditions such as catastrophic failure, reset, power down or rebooting. EX1010 at [0019] (“When network node 102A is down for some reason, e.g., a **catastrophic switch software and/or hardware failure, reset, power down, rebooting, etc., its link port interfaces are deactivated or de-energized, including the device-side and network-side interfaces.**”) (emphasis added). This is due to the fact that ports can exhibit spurious logic conditions that may cause the interfacing entities (e.g., active links) “to commence network traffic while the **switch software (i.e., system software)** is still in an incomplete operational state.” *Id.* (emphasis added); *see also* EX1002 at ¶¶ 224, 228.

71. However, Dr. Houh states that Jain teaches disabling “certain user ports” rather than deactivating all active ports. EX1002 at ¶ 229. This is inconsistent with the teachings of Jain, which teaches deactivating **all of the active ports in a network node** while the **system software is in an incomplete operational state.** *See* EX1010 at [0019]. Additionally, Jain does not use the term “user ports,” and

FIG. 1 of Jain displays an exemplary network environment that shows only network nodes and remote devices:

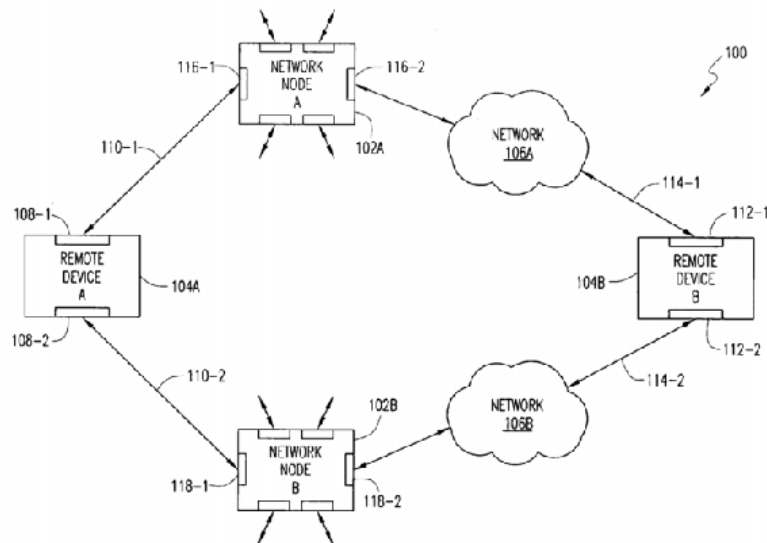


FIG. 1

EX1010 at FIG. 1.

72. Dr. Houh argues that a POSITA would have been motivated to combine the distributed router disclosed by Weyman with Jain's controlled boot-up process to deactivate only certain user ports and not the fabric port. See EX1002 at ¶ 227. But Weyman teaches that fabric ports are just ports which are connected internally to other units within the fabric and not externally. EX1005 at [0025] ("fabric ports (i.e. ports connected only to other units within the fabric and not to the external network)."). In fact, Weyman teaches that the same port can be a fabric port or a

user port. *Id.* at [0036] (“Alternatively, products may have dual purpose ports that may be configured to be either user ports or fabric ports.”).

73. As there is no material difference between fabric ports and user ports, fabric ports would experience the same issues as the active ports of Jain, such as spurious logic conditions and various deleterious effects with respect to the integrity of the traffic when the new unit is powering-on or booting up. Dr. Houh has not opined on how only the user ports and not the fabric ports would experience these issues. Therefore, in my opinion and contrary to Dr. Houh’s assertions, a POSITA would not be motivated to combine Jain with Weyman because a POSITA would understand that the fabric ports would need to be de-activated also, which would interfere with critical operations described in Weyman. *See* EX1002 at ¶ 227.

74. Even more impractical is Dr. Houh’s proposed combination of LeMaire with Weyman/Jain. LeMaire teaches the opposite of Jain: that on power-up or reset, ports should begin to transmit IGMP Query messages. EX1011 at 9:12–15 (“**On power up or system reset** or when none of its ports are designated as Router Ports, an improved bridge 62 according to the invention, **transmits IGMP Query packets at regular intervals out of each of its ports A-E.**”) (emphasis added). To get around this problem, Dr. Houh introduces the concept of other user ports. *See* EX1002 at ¶¶ 234–36. Again, LeMaire does not teach the concept of user ports or

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other user ports. Instead, *LeMaire* teaches that all ports that are not router ports begin transmitting on system reset.

75. To get around this obvious problem that a port cannot be both disabled and transmitting, Dr. Houh introduces the concept of other user ports, those ports not connected to the new unit but still connected to users in the distributed router of Weyman. In this way, some of the ports can be deactivated and some can be active. However, Dr. Houh provides no reason as to why a POSITA would ignore the express teachings of Jain and LeMaire in regards to ports. Again, LeMaire does not teach the concept of user ports or other user ports. Instead, LeMaire teaches that all ports that are not router ports begin transmitting IGMP message on system reset. To be clear, user ports of Weyman can be connected to routers. *See e.g.*, EX1005 at FIG. 12. However, it is not clear under Dr. Houh's analysis if these user ports connected to the router would or would not begin transmitting IGMP messages.

76. In addition, since the fabric port of the "new processing unit" would not be a router port, the application of LeMaire to Weyman would have IGMP Query messages going across the fabric link. This conflicts with one of the express objects of the Weyman invention, which is to minimize bandwidth usage on the fabric links. *See* EX1005 at [0005].

77. For the reasons above, in my opinion, a POSITA would not combine Weyman, Jain, and LeMaire.

1. “deactivating the ports to which the new processing unit is assigned” (claim limitation 8k)

78. In my opinion, the combination of Weyman, Jain, and LeMaire does not disclose or render obvious “deactivating the ports to which the new processing unit is assigned” (claim limitation 8k).

79. As I stated above, Jain specifically teaches to disable all the active ports of a network element when the network element is being reset or power down. Dr. Houh seems to agree. See EX1002 at ¶ 224 (“Jain discloses that adding a node in a network (e.g., a switch), for example, after the node has been down (e.g., ‘reset, power down, rebooting’), may involve executing a ‘controlled boot-up process’ by the node and for its configuration. EX1010 at [0019] (‘When network node 102A is down for some reason, e.g., a catastrophic switch software and/or hardware failure, reset, power down, rebooting, etc., its **link port interfaces are deactivated or de-energized, including the device-side and network-side interfaces.**’).”) (emphasis added). Therefore, it is my opinion that Dr. Houh fails to establish that the combination of Weyman, Jain, and Li teaches or renders obvious “deactivating **the ports to which the new processing unit is assigned.**”

B. Independent Claim 18

80. In my opinion, Dr. Houh fails to show how Weyman in view of Jain and LeMaire renders obvious each limitation of claim 18.

81. Dr. Houh's analysis for claim 18 fails for the same reasons discussed in section XIII.A regarding claim 8, as claim 18 is substantially similar to claim 8. In fact, limitation 18j is the same as limitation 8k. A comparison of the limitations 8k and 18j is provided below.

[8k] deactivating the ports to which the new processing unit is assigned	[18j] deactivating the ports to which the new processing unit is assigned
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82. Dr. Houh relies on his analysis of the limitations for claim 8 for purposes of analyzing the limitations of claim 18. For example, Dr. Houh expressly cites to his analysis of limitation 8k for purposes of limitation 18j. See EX1002 at ¶ 279. Thus, claim 18 is non-obvious for the same reasons as claim 8.

83. Therefore, it is my opinion that Weyman in view of Jain and LeMaire does not render claim 18 obvious.³

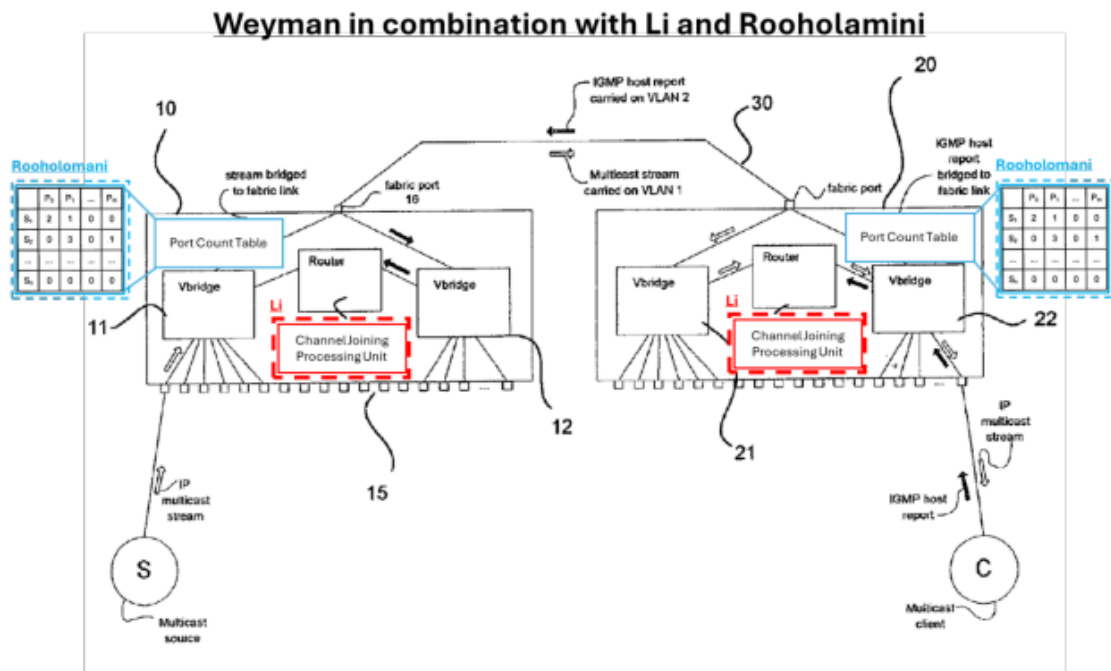
XIV. WEYMAN IN VIEW OF LI AND ROOHOLAMINI DOES NOT DISCLOSE EACH CLAIM FEATURE

A. Dependent Claims 5 and 15

84. As Ground 2 only challenges dependent claims, the fact that Weyman and Li fail to render obvious the claims in Ground 1 equally applies to the claims in Ground 2.

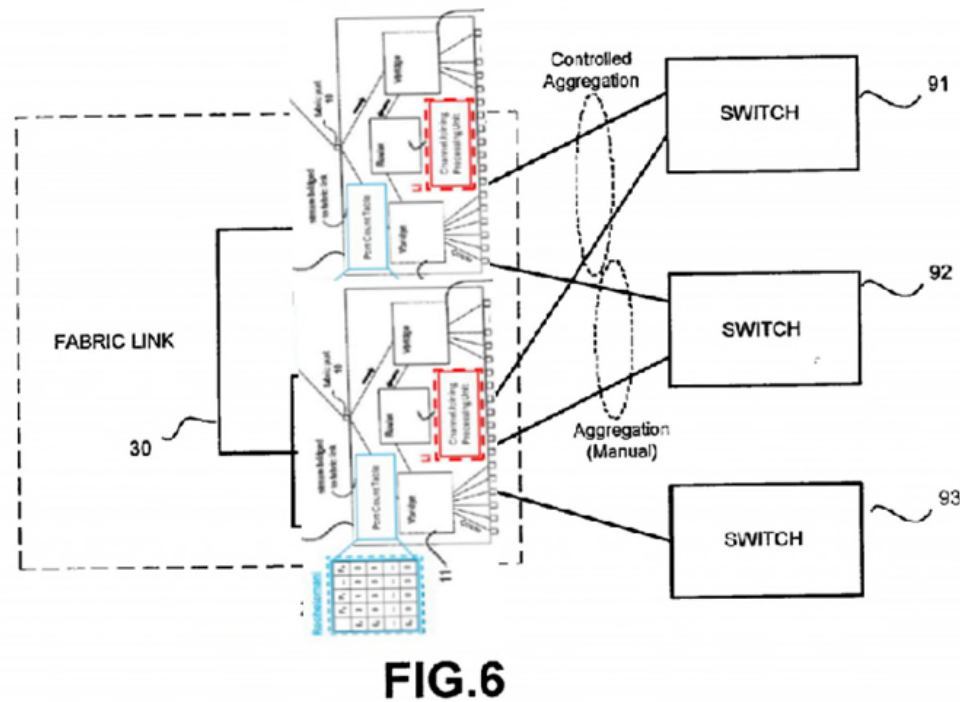
³ As Grounds 5 and 6 challenge only dependent claims, the fact that Weyman, Jain, and LeMaire fail to render obvious the claims in Ground 4 equally applies to the claims in Grounds 5 and 6.

85. Dr. Houh also argues that a POSITA would have been motivated to combine Weyman, Li, and Rooholamini to disclose claims 5 and 15 and presents the modified system below:



EX1002 at ¶ 196.

86. As discussed above in section XI, a POSITA would not have been motivated to combine Weyman and Li. *See supra* section XI. Below, I have modified Dr. Houh's figure to take into account the teachings of Weyman regarding aggregated links:



EX1005 at FIG. 6 (modified).

87. In my opinion, a POSITA would also not have been motivated to add Rooholamini to the combined Weyman and Li system as Dr. Houh has opined. As I described earlier, adding Rooholamini's port count table to each unit in Weyman would once again force further synchronization efforts in the distributed router system which would lead to increased bandwidth usage in the fabric. This is because Rooholamini teaches the port count is done at the individual fabric switches or Vbridges as Dr. Houh has depicted in his figure. See EX1002, ¶ 196. As I have described above, the multicast messages traveling to each Vbridge would need to be coordinated in some way, which would require using bandwidth on the fabric link

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because it is the only link connecting the two Vbridges. However, as discussed in section XI, Weyman discloses minimizing fabric bandwidth usage, not increasing it. *See supra* section XI. Accordingly, a POSITA would not have been motivated to combine Weyman, Li, and Rooholamini for similar reasons as discussed in section XI. *Id.*

88. Therefore, it is my opinion that Dr. Houh has failed to establish that claims 5 and 15 are rendered obvious.

XV. CONCLUSION

89. 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.

90. 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.

January 23, 2025
Date

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