

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,

Petitioner,

v.

HEADWATER RESEARCH LLC,

Patent Owner.

Patent No. 8,799,451
Case No. IPR2026-00467

DECLARATION OF DR. BILL LIN, PH.D.

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I. INTRODUCTION

1. I have been retained by Google LLC (“Petitioner”) as an independent expert consultant in this proceeding before the Patent Trial and Appeal Board of the United States Patent and Trademark Office.

2. I am over 18 years of age and, if I am called upon to do so, I would be willing and able to testify as to the matters set forth herein.

3. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of any related proceeding.

4. I understand that this proceeding involves U.S. Patent No. 8,799,451 (“the ‘451 patent,” EX1001). I have been asked by the Petitioner to provide my opinion on whether the claims of the ‘451 patent would have been obvious to a person of ordinary skill in the art at the time of the earliest claimed priority date of the ‘451 patent. In performing my analysis, I have been asked to assume that the priority date is January 28, 2009, which is the filing date of the earliest provisional application to which the ‘451 patent claims priority. My opinions are set forth below.

5. Throughout this declaration, I refer to specific pages, figures, or line numbers of various exhibits. These citations are illustrative and are not intended to

suggest that they are the only support for the propositions for which they are cited.

II. SUMMARY OF OPINIONS

6. This declaration considers claims 1, 10, 17-19, 21, 29-32, 34, 35, 37-42, 45-49, and 51 of the '451 patent. Below, I set forth the opinions I have formed, the conclusions I have reached, and the bases for these opinions and conclusions. I believe the statements contained in this declaration to be true and correct to the best of my knowledge.

7. Based on my experience and knowledge of the art at the time of the earliest claimed priority date of January 28, 2009, it is my opinion that claims 1, 10, 17-19, 21, 29-32, 34, 35, 37-42, 45-49, and 51 of the '451 patent would have been obvious based on the grounds discussed below. A person of ordinary skill in the art would have found it obvious to combine the prior art references I cite and would have been motivated to do so with a reasonable expectation of success before the priority date.

III. QUALIFICATIONS AND BACKGROUND

8. I believe that I am well qualified to serve as a technical expert in this matter based upon my qualifications, discussed in detail below.

9. I am currently a Full Professor of Electrical and Computer Engineering and the Associate Dean for Research at the University of California, San Diego (UCSD).

10. I received a Bachelor of Science in Electrical Engineering and Computer Sciences from University of California, Berkeley in May 1985. I received a Master of Science in Electrical Engineering and Computer Sciences in May 1988 and a Ph.D. in Electrical Engineering and Computer Sciences in May 1991, both from the University of California, Berkeley.

11. I joined UCSD in 1997, and I have been a tenured professor since 1999. My teaching and research focus on computer architecture and computer network problems, including the design of high-performance switches and routers, high-speed packet processors, wireless networks, data networks, and various hardware accelerators for networking applications. I regularly teach a senior-level design course on the design of advanced processors, and I have taught graduate courses and advanced special topics in computer architecture and computer networks.

12. At UCSD, I am a Principal Investigator in the UCSD Center for Networked Systems (CNS). CNS brings together researchers to work on a range of challenges in the design of future networked systems. My contribution to CNS has been expertise in the design of computer architecture solutions for packet processing, computer networking, and network measurements. I am also a Principal Investigator in the UCSD Center for Wireless Communications (CWC). CWC brings together researchers to work on a range of challenges in the design of future wireless communications systems. My contribution to CWC has been expertise in the design of computer architecture solutions for wireless networking and mobile computing.

13. Prior to joining UCSD, I was the Head of the Systems and Communications Group at IMEC in Leuven, Belgium, where I led a team of researchers who worked on a range of computer design problems, including specialized processors for wireless communications and computer networking. I also previously held positions at Hewlett Packard, Hughes Electronics, and Western Digital.

14. During my career, I have received or worked on research efforts that received millions of dollars in research funding from both government agencies and industry, including funding for research in packet processing, computer

networks, network measurements, and wireless communications.

15. I have served as an Associate or Guest Editor for several journals published by the Association for Computing Machinery (“ACM”) and the Institute of Electrical and Electronics Engineers (“IEEE”). I have also served as General Chair of several ACM/IEEE conferences, and on the Organizing or Steering Committees of many ACM/IEEE conferences, and I have served on the Technical Program Committees of numerous ACM/IEEE conferences. I am the author of over 250 top-tier peer-reviewed publications in the field of computer engineering dating to the 1980s, including journal articles, conference papers, book chapters, technical reports, and invited papers. A number of these publications have received best paper awards or distinguished paper citations. I have also given numerous invited and keynote talks around the world.

16. I am a named inventor on six patents in the fields of computer design and computer networking.

17. My complete qualifications and professional experience are described in my curriculum vitae, filed as a separate Exhibit (EX1004).

IV. MATERIALS CONSIDERED

<u>Exhibit</u>	<u>Description</u>
EX1001	U.S. Patent No. 8,799,451 to Raleigh (“the ‘451 patent”).
EX1002	Prosecution History of U.S. Patent No. 8,799,451.
EX1005	U.S. Patent Appl. Publ. No. 2009/0017789 to Thomas et al. (“ <i>Thomas</i> ”).
EX1006	U.S. Patent Appl. Publ. No. 2008/0039102 to Sewall et al. (“ <i>Sewall</i> ”).
EX1009	U.S. Patent Appl. Publ. No. 2004/0103193 to Pandya et al. (“ <i>Pandya</i> ”).
EX1010	U.S. Patent Appl. Publ. No. 2008/0313327 to Sewall et al. (“ <i>Sewall</i> ’327”).
EX1012	U.S. Patent Appl. Publ. No. 2006/0031515 to Van Gassel et al. (“ <i>Van Gassel</i> ”).
EX1013	U.S. Patent Appl. Publ. No. 2003/0035397 to Haller et al. (“ <i>Haller</i> ”).
EX1014	U.S. Patent Appl. Publ. No. 2009/0046591 to Krishnaswamy et al. (“ <i>Krishnaswamy</i> ”).
EX1015	U.S. Patent Appl. Publ. No. 2007/0104169 to Polson (“ <i>Polson</i> ”).
EX1020	U.S. Patent No. 9,398,453 to Krishnaswamy et al. (“ <i>Krishnaswamy</i> ”).
EX1021	U.S. Patent Publication No. 2003/0088671 to Klinker et al. (“ <i>Klinker</i> ”).
EX1025	Joint Claim Construction Statement (D.I. 78) from <i>Headwater Research LLC v. Google LLC</i> , C.A. No. 7:25-cv-00376 (W.D. Tex.) (transferred to the Northern District of California as case number 3:26-cv-06230)

18. I have also relied on my education, experience, research, training, and knowledge in the relevant art and my understanding of legal principles described in this declaration.

19. All of the opinions contained in this declaration are based on the documents I reviewed and my knowledge and professional judgment. My opinions have also been guided by my understanding of how a person of ordinary skill in the art would have understood the claims of the '451 patent at the time of the earliest claimed priority date.

20. I reserve the right to supplement and amend any of my opinions in this declaration based on documents, testimony, and other information that becomes available to me after the date of this declaration.

V. LEGAL STANDARDS

21. In forming my opinions and considering the subject matter of the '451 patent and its claims in light of the prior art, I am relying on certain legal principles that counsel in this case explained to me. My understanding of these concepts is summarized below.

22. I understand that the claims define the invention. I also understand that an unpatentability analysis is a two-step process. First, the claims of the patent are construed to determine their meaning and scope. Second, after the claims are

construed, the content of the prior art is compared to the construed claims.

23. I understand that there are two ways in which prior art may render a patent claim unpatentable. First, I have been informed that the prior art can “anticipate” a claim. Second, I have been informed that the prior art can render a claim “obvious” to a person of ordinary skill in the art. I understand that a claim is patentable if it was not anticipated and would not have been obvious by the prior art at the effective filing date of the patent.

1. Claim Construction

24. I understand that the United States Patent and Trademark Office interprets claim terms in an *inter partes* review proceeding under the same claim construction standard that is used in a United States federal court. I understand that under this standard, the meaning of claim terms is considered from the viewpoint of one of ordinary skill in the art at the time of the alleged invention.

25. I have been informed that claim terms are generally given their ordinary and customary meaning as understood by one of ordinary skill in the art in light of the specification and the prosecution history pertaining to the patent. I understand, however, that claim terms are generally not limited by the embodiments described in the specification.

26. I understand that in addition to the claims, specification, and

prosecution history, other evidence may be considered to ascertain the meaning of claim terms, including textbooks, encyclopedias, articles, and dictionaries. I have been informed that this other evidence is often less significant and less reliable than the claims, specification, and prosecution history.

2. Anticipation under 35 U.S.C. § 102

27. I understand that a patent claim is invalid as anticipated if a single piece of prior art teaches every element of the claims, viewed from the perspective of a person of ordinary skill in the art. I also understand that an anticipatory reference does not have to recite word for word what is in the anticipated claims. Anticipation can also occur when a claimed limitation is inherent in the relevant reference. I have been advised that if the prior art necessarily functions in accordance with, or includes, the claims limitations, it can anticipate even though the limitation is not expressly disclosed.

3. Obviousness under 35 U.S.C. § 103

28. I understand that a patent claim is invalid as obvious if the claimed invention would have been obvious to a person of ordinary skill in the art at the time the claimed invention was made. This means that even if all of the elements of the claim cannot be found in a single prior art reference that would anticipate the claim, a person of ordinary skill in the field who knew about all the prior art would

have come up with the claimed invention. I understand that in an obviousness determination, the person of ordinary skill in the art is presumed to have knowledge of all prior art. I understand that whether a claim is obvious is based upon the determination of several factual issues.

29. In considering obviousness, I understand that one must determine the scope and content of the prior art. I also understand that one must determine what differences, if any, existed between the claimed invention and the prior art.

30. I understand that a patent claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was independently known in the prior art. In evaluating whether such a claim would have been obvious, one may consider whether a reason has been identified that would have prompted a person of ordinary skill in the art to combine the elements or concepts from the prior art in the same way as in the claimed invention. There is no single way to define the line between true inventiveness on the one hand (which is patentable) and the application of common sense and ordinary skill to solve a problem on the other hand (which is not patentable). For example, market forces or other design incentives may be what produced a change, rather than true inventiveness.

31. I also understand that, while there is no requirement that the prior art

contain an express suggestion to combine known elements to achieve the claimed invention, and while a suggestion to combine known elements to achieve the claimed invention may come from the prior art as a whole or individually and may consider the inferences and creative steps a person of ordinary skill in the art would employ, as filtered through the knowledge of one skilled in the art, obviousness grounds cannot be sustained by mere conclusory statements and must include some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. Moreover, I understand that a proper obviousness analysis requires a determination of whether a person of ordinary skill in the art would have a “reasonable expectation of success”—but not “absolute predictability” of success—in achieving the claimed invention by combining prior art references.

32. I understand that one may consider whether (1) the change was merely the predictable result of using prior art elements according to their known functions, or whether it was the result of true inventiveness; (2) there is some teaching or suggestion in the prior art to make the modification or combination of elements claimed in the patent; (3) the innovation applies a known technique that had been used to improve a similar device or method in a similar way; (4) the claimed invention would have been obvious to try, meaning that the claimed

innovation was one of a relatively small number of possible approaches to the problem with a reasonable expectation of success by those skilled in the art; (5) the invention merely substituted one known element for another known element in order to obtain predictable results; (6) the invention merely applies a known technique to a known device, method, or product to yield predictable results, or (7) known work in the field may have prompted variations of use of the same inventions in the same or different fields due to market forces or design incentives that would have been predictable to a person of ordinary skill in the art.

33. I understand that one must be careful not to determine obviousness using the benefit of hindsight; many true inventions might seem obvious after the fact. I understand that the determination should be based on the position of a person of ordinary skill in the field at the time the claimed invention was made and should not consider what is known today or what is learned from the teaching of the patent.

4. Secondary Considerations of Non-Obviousness

34. I understand that certain secondary considerations may be considered in evaluating obviousness in order to prevent hindsight bias. These secondary considerations include commercial success of products that practice the patent, long-felt need for the patented technology, failure by others to solve the problem

addressed by the patent, initial skepticism by others in the industry, industry recognition and praise of the patented products, and efforts by others to copy the patented technology. I am not presently aware of any secondary considerations that would apply here.

35. I have been informed that these secondary considerations of non-obviousness must be balanced against the strength of the prima facie case of obviousness. Where the invention represents no more than the predictable use of prior art elements according to their established functions, secondary considerations are inadequate to establish non-obviousness.

36. I have also been informed that the patentee must establish a nexus between any secondary consideration factors and the claimed invention. Where a secondary consideration factor results from something other than what is both claimed and novel in the patent, there is no nexus to the merits of the claimed invention.

37. I have been informed that, for example, the nexus requirement as it applies to the evidence of commercial success requires that the patentee must show that the sales of a product that allegedly practices the claimed invention must be a direct result of the unique characteristics of the claimed invention, as opposed to other economic and commercial factors that are unrelated to the patented

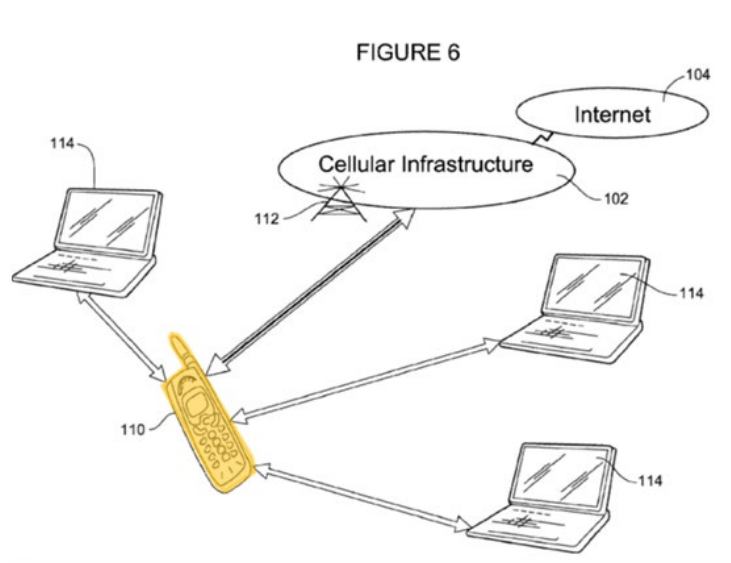
invention. I understand that this means if the commercial success is due to an element that existed in the prior art or that is not claimed by the patent, then no nexus exists.

38. I have been further informed that, for example, the nexus requirement as it applies to the long-felt need element must likewise be supported by evidence. Where the differences between the prior art and the claimed invention are minimal, it cannot be said that any long-felt need was met by the patented invention or that the patent solved any technological problems that were unaddressed by others.

39. I have been informed that evidence of industry praise must also show a nexus with the claimed invention, and that self-serving statements by the patentee regarding the merits of the claimed invention are generally not given weight.

VI. TECHNOLOGY OVERVIEW

40. By January 2009, the '451 patent's earliest claimed priority date, using an end-user device to provide a forwarding service was not merely known, but was considered old and "conventional." EX1005, ¶28. For example, the representative figures below from several U.S. Patent Publications that were filed and/or published before January 2009, demonstrate how ubiquitous mobile hotspot technology was at the claimed priority date of the '451 patent.



EX1005, Fig. 6 (annotated) (published January 15, 2009), ¶25.

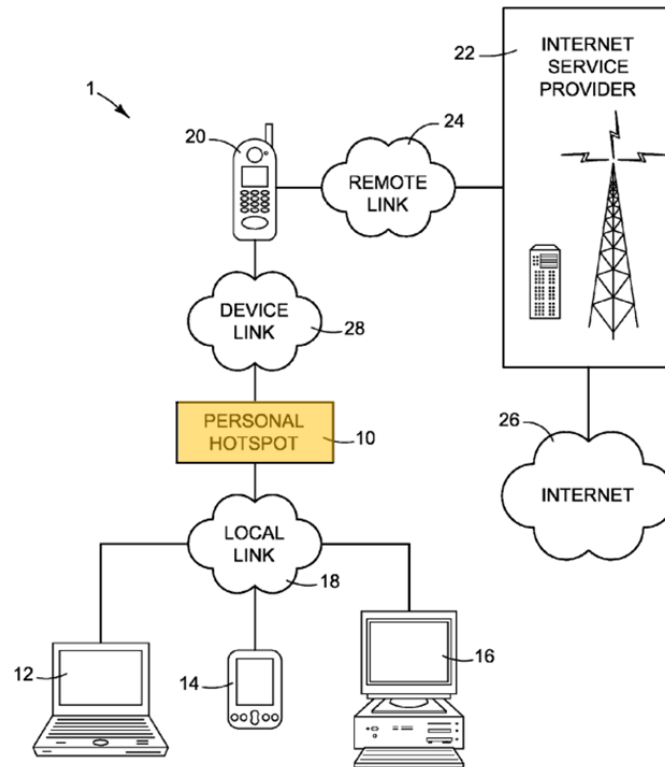


FIG. 1

EX1006, Fig. 1 (annotated) (published February 14, 2008), ¶9; EX1010, Fig. 1 (published December 18, 2008).

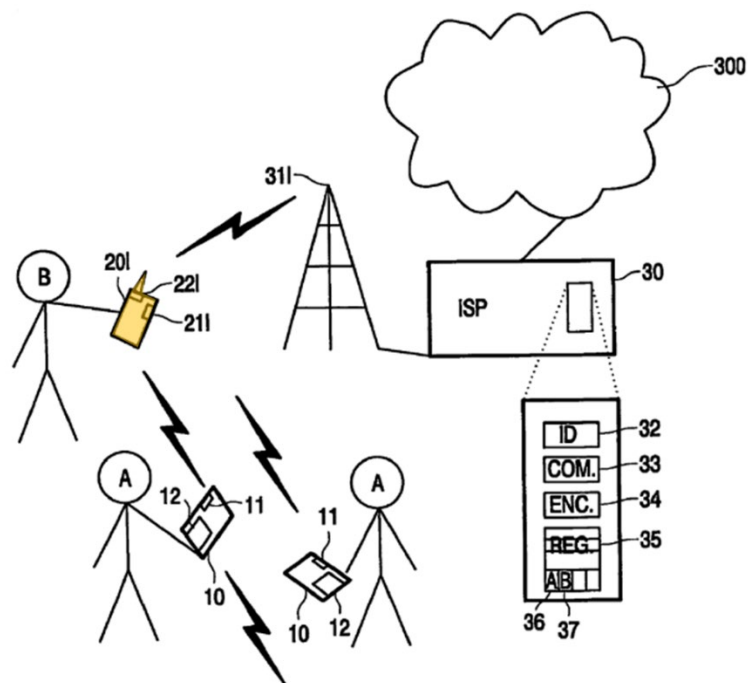


FIG. 1

EX1012, Fig. 1 (annotated) (published February 9, 2006), ¶¶69-71.

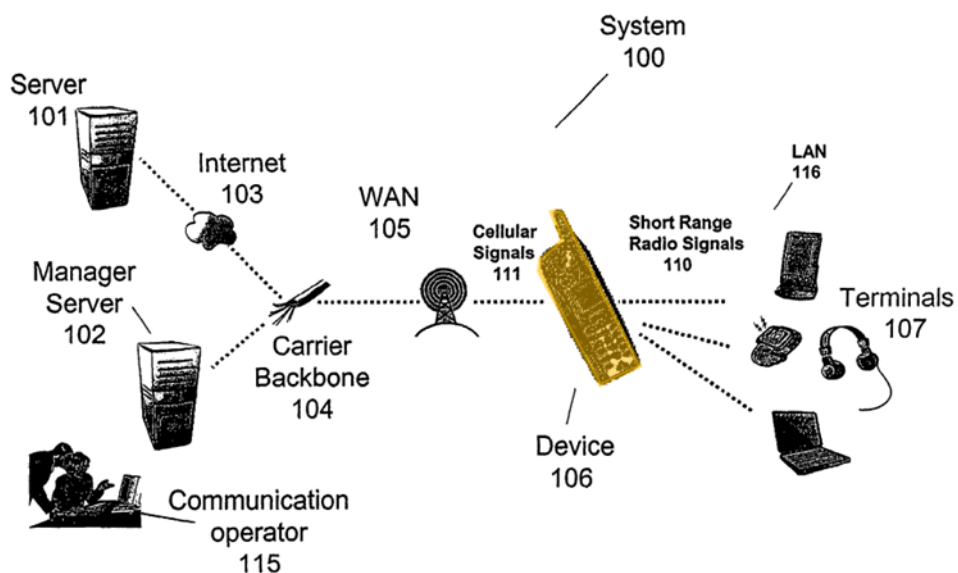


Fig. 1

EX1013, Fig. 1 (annotated) (published February 20, 2003), ¶¶40 and 43.

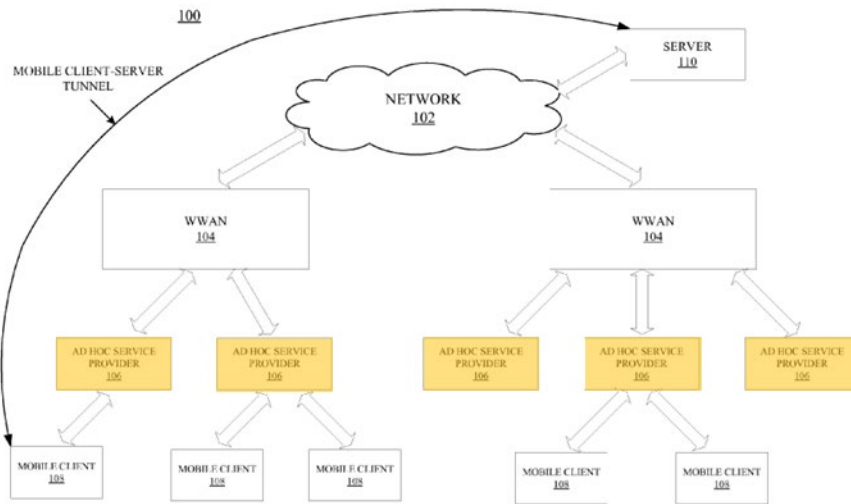
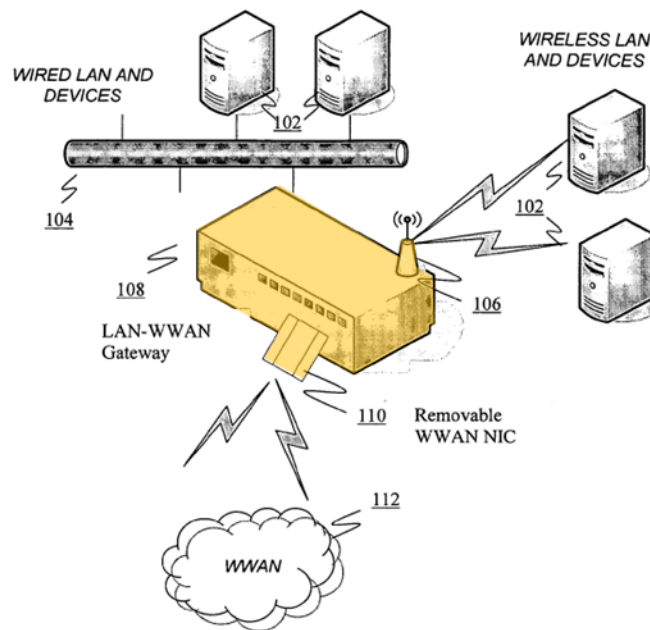


FIG. 1

EX1014, Fig. 1 (annotated) (published February 19, 2009 and claiming priority to Provisional App. No. 60/956,658, filed Aug. 17, 2007), ¶¶21-24.



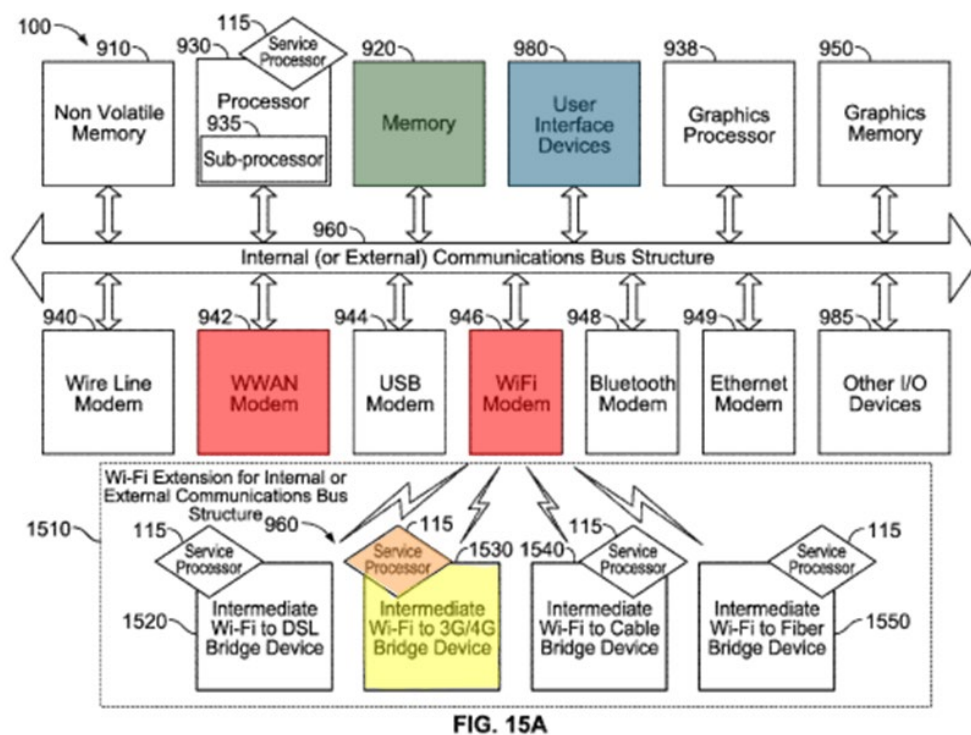
EX1015, Fig. 1 (published May 10, 2007), ¶20.

41. Providing service plans for end-user devices to enable a forwarding service, providing notifications to users regarding information about the forwarding service, accounting for usage of the forwarding service by other end user devices, and controlling traffic associated with the forwarding service were similarly well-known by January 2009. EX1005, ¶¶46, 49, 54, 56, 76, 77; EX1006, ¶¶22, 25, 33, 36, 37, 38.

VII. THE '451 PATENT

1. Overview

42. The '451 patent discloses a system that allows an end-user device to be used as an intermediate networking device. EX1001, 32:34-44, 35:21-30. Figure 15 reflects the purported invention:



EX1001, Fig. 15A (annotated).

43. The end-user device includes a **modem** for communicating with one or more networks and one or more other devices. The **service processor** executes instructions to provide a forwarding service to the other devices, implements service policies for controlling traffic, and monitors successful or attempted use of

the forwarding service. The **memory** of the end-user device is configured to provide the instructions for the service processor.

2. Prosecution History

44. The claims submitted in the original application that would become the '451 patent recited an “intermediate networking device” that acted as an intermediary between devices and a network. EX1002, 242. The examiner, however, found those claims were anticipated by prior art routers. EX1002, 1501 (discussing *Klinker*) and 508 (rejecting the claims based on *Klinker* and *Pandya*).

45. The applicant next amended the claims to recite a “first end user device capable of operating” as an intermediate networking device and argued that the prior art did not disclose such a device. EX1002, 10, 24-25. The applicant also amended the claims to require providing a “forwarding service.” EX1002, 10, 24-25. But the examiner issued a final office action that withdrew the pending claims, finding the amendments departed too much from the originally submitted claims. EX1002, 56 (“Election by Original Presentation”).

46. The applicant next filed a request for continued examination cancelling all claims and presenting new ones. EX1002, 67. A different examiner then took over the case but rejected the claims as anticipated based on a new reference, *Robinson*. EX1002, 327. After receiving the rejection, the applicant

again heavily amended the claims and added 54 new claims in response. EX1002, 661.

47. A Notice of allowance followed; however, the Examiner did not provide any comments on the reasons for allowance. EX1002, 837. In my opinion, as I detail further below, the examiner clearly erred because the prior art already disclosed the allowed claims.

VIII. PRIOR ART

1. *Sewall*

48. *Sewall* discloses a device, such as a cellular phone, that is capable of routing communications between client devices and the internet. EX1006, Abstract. This device of *Sewall* functions as a personal hotspot and may implement access rules that limit network access to its traffic-forwarding service. EX1006, ¶¶7-9. The hotspot device of *Sewall* applies different network access rules based on different identified users or user types. EX1006, ¶22. The access rules may be defined by configuration data that can be modified and updated. EX1006, ¶¶24-25. The access rules and configuration data restrict data usage or otherwise control network access provided by the personal hotspot. EX1006, ¶34

2. *Thomas*

49. *Thomas* discloses a wireless device that provides access to the internet or other WAN for one or more other computing devices via a wireless local area

network. EX1005, Abstract, ¶25. *Thomas*'s wireless device provides a dynamic, secure, and flexible networking environment by allowing real-time configuration of network connections. EX1005, ¶29.

50. As reflected in Figure 3, annotated below, the wireless device of *Thomas* includes a DSP, a memory including a client access application, a display, and a processor:

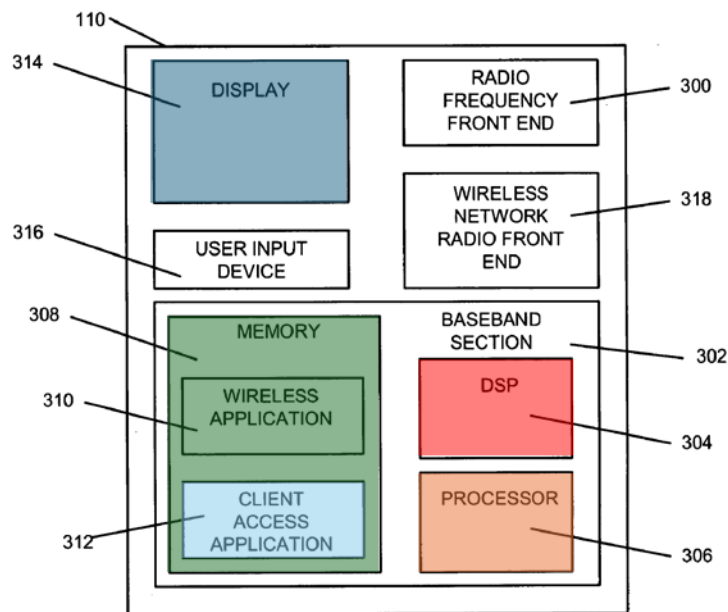
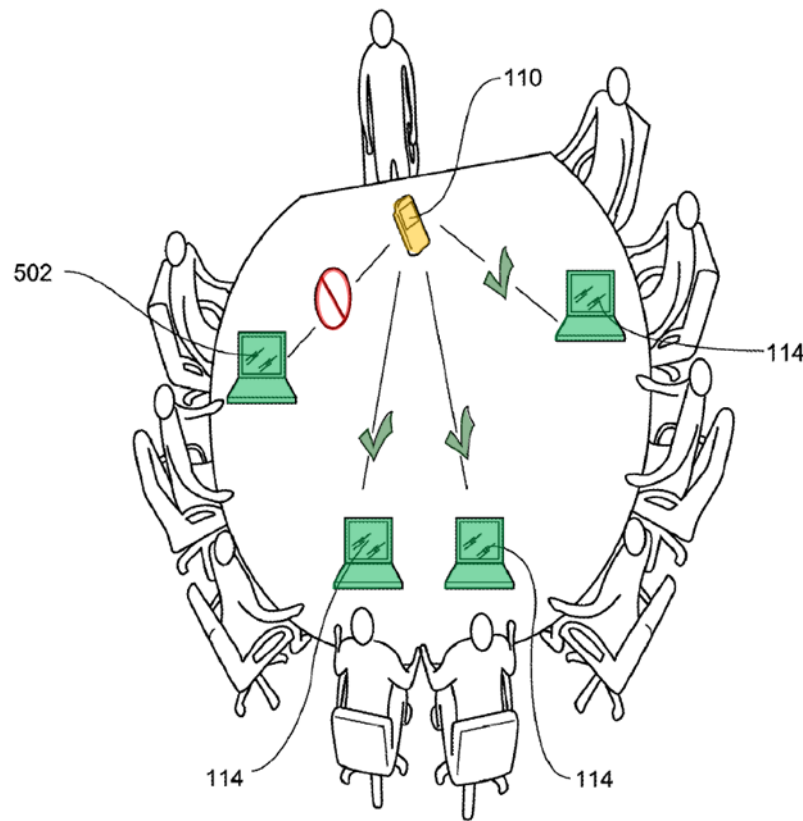


FIGURE 3

EX1005, ¶¶33-34, Fig. 3 (annotated). In my opinion, the DSP is a modem that “modulates and demodulates data” to process signals received from or transmitted to the radiofrequency front end. EX1005, ¶33. The client access application of *Thomas*'s wireless device provides “application-level point of presence capabilities” to the wireless device. EX1005, ¶34.

51. As further shown in Fig. 5, annotated below, the wireless device 110 of *Thomas* may authorize networking traffic by allowing a user, through a user interface, to accept or deny requests from client devices 114 to access the internet.

FIGURE 5



EX1005, Fig. 5 (annotated), ¶44. *Thomas*'s wireless device 110 may enable or disable the forwarding service by sending start and stop messages to a server, and the server may determine if the wireless device is authorized to provide the forwarding service. EX1005, ¶¶58-59, 65.

3. *Polson*

52. *Polson* discloses a gateway that is adapted to establish a connection between itself and a wireless wide area network (WWAN) with a WWAN interface adapted to receive data from and transfer data to the WWAN on behalf of devices (e.g., PCs or wireless mobile phones) of a local area network (LAN). EX1015, Abstract. *Polson* also discloses WWAN access management strategies, including adapting its gateway to prioritize specific data over the WWAN to manage conflicts between LAN end-user devices that are sharing limited WWAN capacity. EX1015, ¶46.

53. Furthermore, *Polson* recognizes that the mobility of its gateway is important and that the ability to connect to multiple WWANs is necessary when one WWAN is not available due to the location of the user, issues with the service provider, or the features of a service agreement. EX1015, ¶¶52-53. The gateway of *Polson* comprises a socket adapted to removably receive one or more WWAN interfaces 110, for example, a PC Card or Modem that plugs into the socket, that are adapted to send and receive data through one or more WWANs. EX1015, ¶¶20, 51.

4. *Krishnaswamy*

54. *Krishnaswamy* discloses an ad hoc service provider for a wireless network that includes a processing system configured to support both a first wireless access protocol and a wireless access point for at least one mobile client that utilizes a second wireless access protocol. EX1020, Abstract, 1:47-52. The ad hoc service provider 106 includes a service provider application 208 that maintains a session with the server 110 over the network 102 to exchange messages. EX1020, 6:62-64, Figs. 1-2. The service provider application 208 controls the interconnection and session monitoring module 206, which monitors the amount of content to and from the mobile clients 108 as well as WWAN and WLAN network resource utilization. *Id.*, 7:1-12, Figs. 1-2.

55. The ad hoc service provider 106 of *Krishnaswamy* may also be configured to alter the ad hoc service provider's ability to provide service for a wireless network in response to a resource-related event, like an indication that an available bandwidth is below a bandwidth threshold. EX1020, 10:51-54, 11:3-25. Once a resource-related event has been detected, the ad hoc service provider may alter one or more of its service attributes, like the data rate or duration of the service, and notify some or all of the mobile clients 108 that an alteration has occurred. EX1020, 11:26-44. *Krishnaswamy* discloses that the ad hoc service

provider may also hand off mobile clients 108 to other ad hoc service providers based on, for example, quality of service factors. EX1020, 6:1-16.

IX. LEVEL OF ORDINARY SKILL IN THE ART

56. I am informed that patentability must be analyzed from the perspective of “one of ordinary skill in the art” in the same field as the patent-in-suit at the time of the invention. I am also informed that several factors are considered in assessing the level of ordinary skill in the art, including (1) the types of problems encountered in the art; (2) the prior art solutions to those problems; (3) the rapidity with which innovations are made; (4) the sophistication of the technology; and (5) the education level of active workers in the field.

57. In my opinion, a person of ordinary skill in the art pertinent to the ‘451 patent as of its earliest priority date would have had at least a bachelor’s degree in computer science, electrical engineering, or a related field, and at least two years of work/research experience in the field of computer networking and networking devices. More related education would compensate for fewer years of work experience (and vice versa). I meet this definition of one of ordinary skill in the art now and at the priority date of the ‘451 patent.

X. CLAIM CONSTRUCTION

58. In my opinion, no claim terms need to be expressly construed.

59. I have been informed and understand that, in a different proceeding (*Headwater Research LLC v. Google LLC*, C.A. No. 7:25-cv-00376 (W.D. Tex.) (transferred to the Northern District of California as case number 3:26-cv-06230)), the parties submitted a joint claim construction statement. EX1025. The distinction between the parties' proposed constructions is not material to my patentability analysis here.

XI. GROUND 1 Claims 1, 10, 19, 29-32, 34, 35, 37-39, 41, 47, and 48 ARE OBVIOUS OVER *SEWALL*

1. Independent Claim 1

60. In my opinion, claim 1 would have been obvious to one of skill based on *Sewall*.

a. 1[pre]: “A first end-user device capable of operating as an intermediate networking device, the first end-user device comprising:”

61. *Sewall* discloses 1[pre]. *Sewall* discloses a personal hotspot that allows users to connect to the internet. EX1006, ¶7. The personal hotspot 10 is a device, such as an internet enabled cellular telephone (“mobile hotspot”), that is capable of routing network communications between client devices 12, 14, and 16 and the internet 26 via a data exchanger 20 that may be incorporated into the same device. *Id.*, ¶¶7, 9, 16. The personal hotspot 10 and its environment are illustrated in Figure 1 of *Sewall* (reproduced and annotated

below).

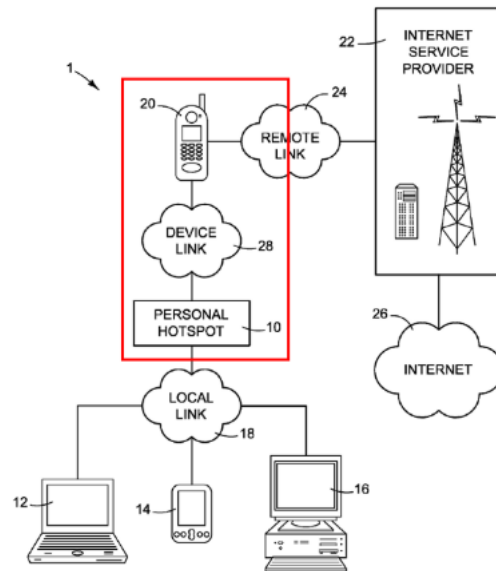


FIG. 1

62. One of skill would have understood that *Sewall*'s mobile hotspot is “[a] **first end-user device** capable of operating as an intermediate networking device,” as recited in claim 1[pre].

b. 1[a]: “one or more modems enabling the first end-user device to communicate with a network system over a first network and with one or more other end-user devices over a second network, the first network comprising a wireless access network;”

63. *Sewall* discloses 1[a]. One of skill would have understood that mobile hotspots include a modem for communicating with the internet and with other computing devices utilizing the forwarding services (client devices). *Sewall*'s mobile hotspot is no different.

64. *Sewall* discloses that personal hotspot 10 may be “any combination of hardware and/or programming capable [of] functioning as a router for directing network communications between client devices and the internet via a data exchanger such as a data capable cellular device, DSL modem, or cable modem.” EX1006, ¶17. One of skill would have understood that every data-capable cellular device has a modem.

65. As illustrated in Figure 1 of *Sewall* (reproduced and annotated below), the modem in *Sewall*'s personal hotspot enables the personal hotspot to communicate (1) with the internet (**network system**) via remote link 24 (**first network**) and (2) with the client devices 12, 14, and 16 (other end user devices) via local link 18 (**second network**). EX1006, ¶¶7, 10, 13, 17, Fig. 1.

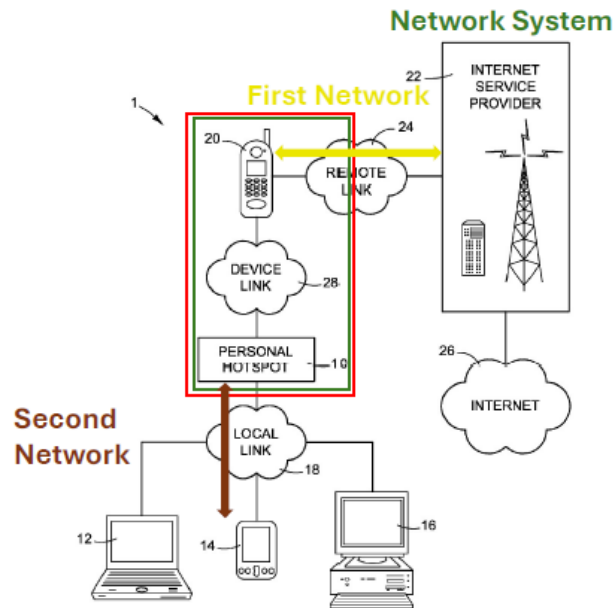


FIG. 1

Sewall further discloses that remote link 24 connecting (and supporting communication between) the personal hotspot 10 and service provider 22 may be a wireless connection. *Id.*, ¶13.

66. Accordingly, *Sewall*'s mobile hotspot comprises "one or more modems enabling the first end-user device to communicate with a network system over a first network and with one or more other end-user devices over a second network, the first network comprising a wireless access network," as recited in claim 1[a].

c. 1[b]: “at least one processor configured to execute one or more instructions that, when executed by the at least one processor, cause the at least one processor to:”

67. *Sewall* discloses 1[b]. One of skill would have understood that mobile hotspots include a processor that is configured to execute one or more instructions. *Sewall*’s mobile hotspot is no different. *Sewall* discloses that its personal hotspot 10 may be embodied in “any computer-readable media for use by or in connection with an instruction execution system such as a computer/processor based system or an ASIC (Application Specific Integrated Circuit) or other system that can fetch or obtain the logic from computer-readable media and execute the instructions contained therein.” EX1006, ¶58.

68. Accordingly, *Sewall*’s mobile hotspot comprises “at least one processor configured to executed one or more instructions,” as recited in claim 1[b]. As detailed below, when executed by the processor(s), those instructions cause the processor(s) to perform the various functions recited in claim 1[b][i]-[iv].

d. 1[b][i]: “provide a forwarding service to the one or more other end-user devices, the forwarding service for forwarding **first traffic between the one or more other end-user devices and the network system,”**

69. *Sewall* discloses 1[b][i]. As discussed above, *Sewall*’s personal hotspot 10 is “a device [that is] capable o[f] routing network communications between client devices 12, 14, and 16 and [the] internet 26 via a data exchanger

20.” EX1006, ¶9. As illustrated in Figure 1 of *Sewall* (reproduced and annotated below), the mobile hotspot (data exchanger 20 and personal hotspot 10) forwards **first traffic** between the client devices 12, 14, and 16 (i.e., “the one or more other end-user devices”) and the internet 26 via local link 18 and remote link 24. *Id.*,

Fig. 1.

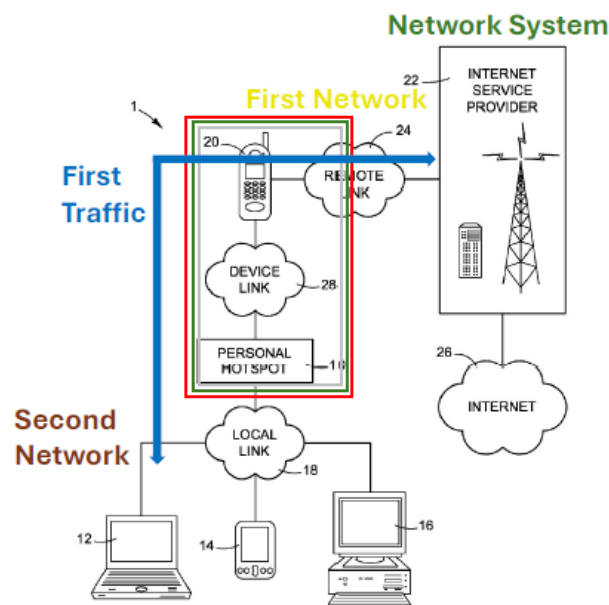


FIG. 1

“Communication between client devices 12, 14, and 16 and internet 26 is dependent upon personal hotspot 10” and the forwarding service it provides. *Id.*, ¶15.

70. One of skill would have further understood that *Sewall*’s mobile hotspot comprises a processor that executes instructions from computer-readable

media, as discussed above, and that those instructions, when executed, cause the mobile hotspot to provide the forwarding service to client devices. EX1006, ¶¶ 18, 57-58, claim 11.

e. 1[b][ii]: “implement a **first service policy, the first service policy for assisting in control of the first traffic,”**

71. *Sewall* discloses 1[b][ii]. As defined in claim 1 of the ’451 patent, the “**first service policy**” assists in the control of “first traffic” between the “one or more other end-user devices” and the network system. EX1001, Claim 1. In this regard, *Sewall*’s personal hotspot contains a limiter 40, which includes configuration data 42 with access rules for the personal hotspot. EX1006, ¶¶19, 23, Fig. 3, Fig. 4. These elements are illustrated in Figures 3 and 4 of *Sewall* (reproduced and annotated below).

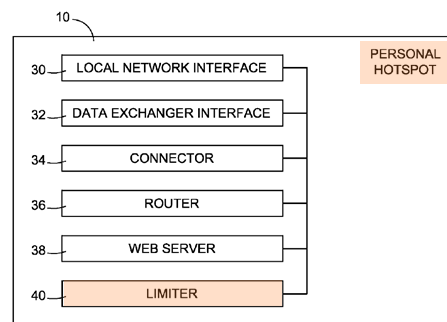


FIG. 3

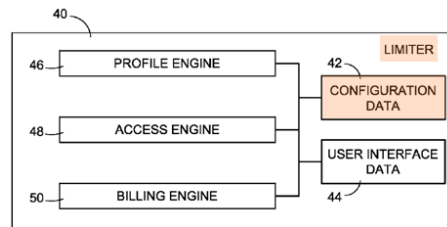


FIG. 4

72. *Sewall*'s personal hotspot—specifically, the limiter 40—is capable of distinguishing among the users of client devices and applying different internet access rules for different users. EX1006, ¶¶15, 22. For example, certain internet access rules may apply to the owner of the personal hotspot—i.e., “the individual or entity that is a subscriber with respect to a service provider” who also typically has physical possession or control of the personal hotspot. *Id.*, ¶22. Different internet access rules can apply to users that are authorized by the owner. *Id.* And “[y]et other internet access rules apply to anonymous users” who are able to connect their client device with the personal hotspot wirelessly but are not known by the owner. *Id.*

73. As depicted in Figure 5 of *Sewall* (reproduced and annotated below), the configuration data includes default profiles that are used by the limiter 40, specifically its access engine 48, to determine whether or not a communication from a client device (and its user) will be blocked. *Id.*, ¶¶ 26, 33, Fig. 5.

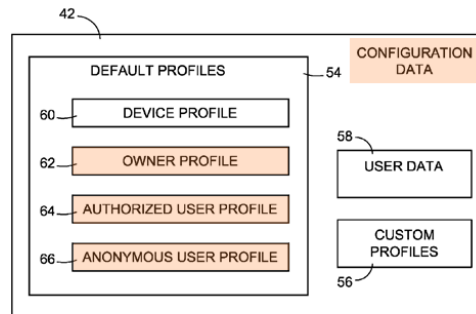


FIG. 5

These default profiles include an owner profile 62, authorized user profile 64, and anonymous user profile 66, as follows:

- Owner profile 62 represents access rules for the owner of the mobile hotspot;
- Authorized user profile 62 represents access rules for the users of the mobile hotspot that are authorized by the owner; and
- Anonymous user profile 66 represents access rules for anonymous users of the mobile hotspot. *Id.*, ¶36.

Further, the owner of the personal hotspot may provide custom profiles 56 with customized access rules for a particular user. *Id.*, ¶37. For example, the owner may desire “to provide a spouse or personal friend with less limited access than other authorized users” or “to provide a child with more limited access.” *Id.*

Accordingly, the first access rules (**first service policy**) vary depending on the client device and its associated user profile.

74. *Sewall*’s first access rules (**first service policy**) assist in the control of “first traffic” between the “one or more other end-user devices” and the network system, as recited in claim 1. Specifically, the first access rules may “specify

upload and download bandwidth limits” or “limit the amount of data transfer allowed in a given time period.” EX1006, ¶36. “Typically, anonymous user access rules will be more limiting than authorized user access rules, and authorized user access rule[s] will be more limiting than owner access rules.” *Id.* In fact, the anonymous user profile “may indicate anonymous user[s] are to be blocked” altogether or that “payment is required” for access. *Id.*; *see id.*, ¶22 (stating that internet access rules for anonymous users “may be quite limiting”).

75. When the user of a client device sends a request for content from the internet through *Sewall*’s personal hotspot, before that communication is routed, the access engine 48 applies access rules obtained from configuration data 42. EX1006, ¶26. “The configuration data may indicate that the source of the communication is not an owner and is not authorized by the owner to access personal hotspot 10.” *Id.* If the configuration data 42 indicates that such anonymous communications are to be blocked, the access engine 48 prevents the communication from being routed to the internet. *Id.* If paid access is allowed, the billing engine 50 will cause the server to return a user interface having controls for supplying payment information to a payment service on the internet. *Id.*, ¶28. If the payment information is verified, the anonymous user is authorized for access. *Id.*, ¶29.

76. When *Sewall*'s personal hotspot receives a routable communication—i.e., a communication that is not *per se* blocked—the personal hotspot identifies the communication type based on its associated user profile (owner, authorized, anonymous, custom). EX1006, ¶47. This may be accomplished by examining identifying information associated with the communication—for example, a hardware address identifying the client device from which the communication originated. *Id.* If the source of the communication is known to personal hotspot 10, the access engine 48 identifies first access rules for its source by parsing the configuration data and identifying the corresponding user profile associated with the source. *Id.*, ¶48. “From the identified profile, access engine 48 extrapolates the access rules for the source [of the communication] and limits access to personal hotspot 10 according to those access rules.” *Id.*, ¶49. The communication may be blocked if it violates the applicable access rules, for example, by exceeding a limit on the (i) available bandwidth, (ii) amount of data that may be uploaded or downloaded, or number of simultaneous connections. *Id.* Otherwise, the communication is routed to its intended destination. *Id.*

77. Accordingly, one of skill would have understood that *Sewall*'s mobile hotspot implements first access rules (**first service policy**) based on the user profile associated with each client device in order to assist in the control of “first traffic”

between the “one or more other end-user devices” and the network system, as recited in claim 1[b][ii]. One of skill would have further understood that *Sewall*’s mobile hotspot comprises a processor that executes instructions from computer-readable media, as discussed above, and that those instructions, when executed, cause the mobile hotspot to implement the **first service policy**. EX1006, ¶¶ 26, 46-55, 57-58.

- f. 1[b][iii]: “implement a **second service policy**, the second service policy for assisting in control of **second traffic**, the **second traffic** associated with access by the first end-user device to one or more services over the first network, wherein the second service policy differs from the first service policy, and”

78. *Sewall* discloses 1[b][iii]. As defined in claim 1 of the ’451 patent, the “**second service policy**” assists in the control of “second traffic” between the first end-user device and the first network. EX1001, Claim 1. As discussed above, *Sewall*’s personal hotspot contains a limiter 40, which includes configuration data 42 with access rules for the personal hotspot. EX1006, ¶¶ 19, 23, Fig. 3, Fig. 4; *supra* § XI.1.e. These elements are illustrated in Figures 3 and 4 of *Sewall* (reproduced above in § XI.1.e).

79. As depicted in Figure 5 of *Sewall* (reproduced and annotated below), the configuration data includes default profiles that are used by the access engine 48 to determine whether or not a communication from a client device (and its user)

will be blocked. *Id.*, ¶¶ 26, 33, Fig. 5.

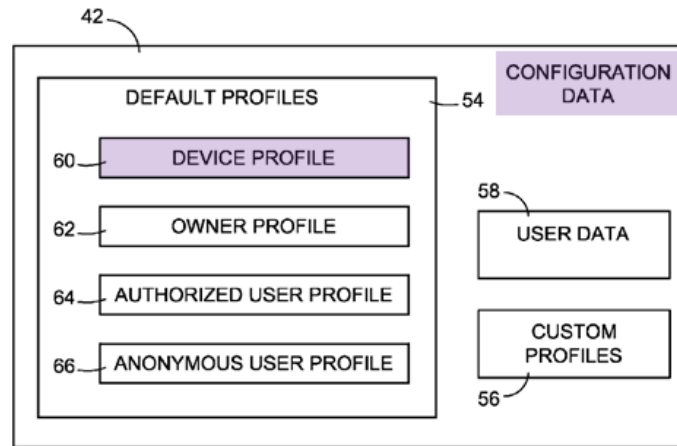


FIG. 5

One of the default profiles is the device profile 60, which provides access rules that apply to all users of personal hotspot 10. *Id.*, ¶34. These device access rules may “specify upload and download bandwidth limits,” “limit the amount of data transfer allowed in a given period,” or “limit the number of simultaneous users or sessions supported by [the] personal hotspot.” *Id.* Moreover, “the nature of the device access rules may be dependent upon the nature of the data subscription package the owner of [the personal hotspot] has with [the] service provider.” *Id.* As *Sewall* explains, “[a] basic subscription package [paid for by the owner of the personal hotspot] might . . . have more stringent access rules than a premium subscription package.” *Id.*, ¶25.

80. When *Sewall*’s personal hotspot (through data exchanger 20)

establishes a data connection with the service provider, the service provider 22 returns configuration data for use by the limiter. EX1006, ¶¶25, 43-44. For example, the service provider will supply a device profile, which may not be editable by the owner of the personal hotspot. *Id.*, ¶35. The limiter—specifically, access engine 48—will then limit access for all users of the personal hotspot in accordance with the access rules in the device profile obtained from the service provider. *Id.*, ¶¶23, 26.

81. One of skill would thus understand that *Sewall*'s mobile hotspot implements second access rules (**second service policy**) based on the device profile 60 to assist with controlling the **second traffic** between the mobile hotspot and the internet via remote link 24, as recited in claim 1[b][iii]. *Id.*, ¶34.

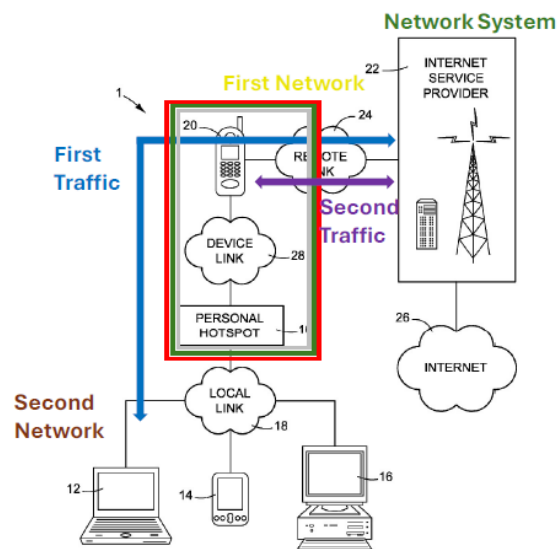


FIG. 1

In my opinion, one of skill would have further understood that *Sewall*'s mobile hotspot comprises a processor that executes instructions from computer-readable media, as discussed above, and that those instructions, when executed, cause the mobile hotspot to implement the **second service policy**. EX1006, ¶¶ 25-26, 34-35, 43-45, 57-58.

82. One of skill would have further understood that the **second service policy** implemented by *Sewall*'s personal hotspot differs from the first service policy. Whereas **first traffic** involves data that the personal hotspot forwards on behalf of the other devices, **second traffic** involves the hotspot's own network communication with the network system (over the first network). In contrast to *Sewall*'s first access rules (first service policy), which are user-specific, *Sewall*'s second access rules apply generally to the personal hotspot and to all users of the personal hotspot. One of skill would understand that the second access rules dictate the types of services (e.g., email, web browsing, multimedia) that are supported over the first network and available for the personal hotspot itself as well as other connected devices.

g. 1[b][iv]: “monitor or identify successful use or attempted use of the forwarding service; and”

83. *Sewall* discloses 1[b][iv]. As detailed above (in §XI.1.e), when *Sewall*'s mobile hotspot receives a communication from a computing device

attempting to use its forwarding service, the access engine 48 applies access rules obtained from configuration data 42. EX1006, ¶26. To do so, the access engine 48 monitors the source of the communication from user data 58 and identifies a profile (e.g., owner, authorized user, anonymous user, or custom) that is associated with the source of the communication. *Id.*, ¶¶38-39, 47-48, Figs. 4-5, 8.

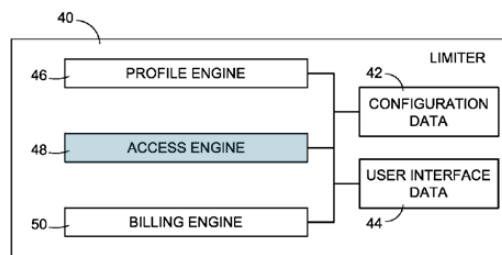


FIG. 4

“From the identified profile, access engine 48 extrapolates the access rules for the source [of the communication] and limits access to personal hotspot 10 according to those access rules.” *Id.*, ¶49. This process is illustrated in Figure 8 of *Sewall* (reproduced and annotated below).

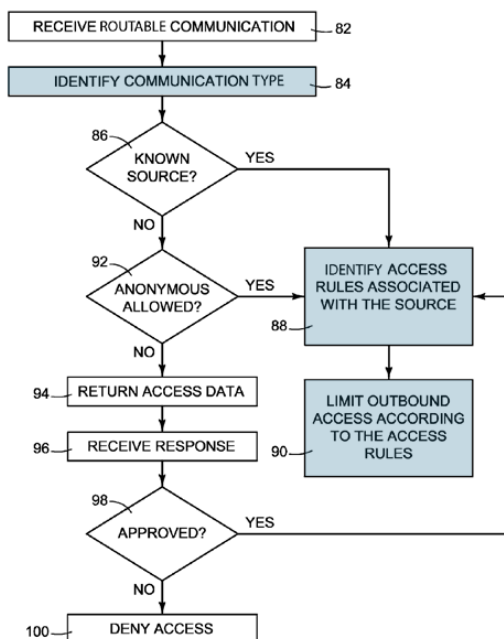


FIG. 8

84. As illustrated in Figure 9 of *Sewall* (reproduced below), a user's session with personal hotspot 10 is further monitored (step 112) to determine if that session has ended (step 114). EX1006, ¶55, Fig. 9.

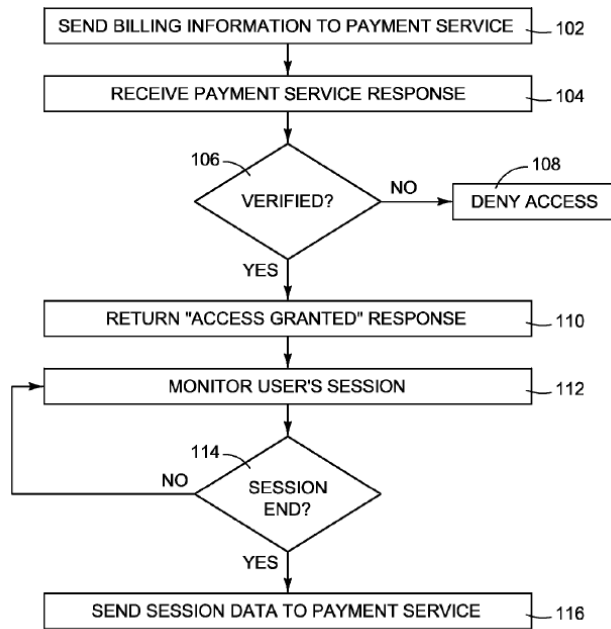


FIG. 9

As long as a user's session is active, user data 58 for that particular user may be present in the configuration data 42. *Id.*, ¶55. When the session ends, user data for that session is send to the payment service so that the payment service can bill the user accordingly. *Id.*, ¶56.

85. Accordingly, *Sewall*'s mobile hotspot "monitor[s] or identif[ies] successful use or attempted use of the forwarding service," as recited in claim 1[b][iv]. In my opinion, one of skill would have understood that *Sewall*'s mobile hotspot comprises a processor that executes instructions from computer-readable media, as discussed above, and that those instructions, when executed, cause the mobile hotspot to perform the above functions for monitoring or identifying

successful or attempted use of the forwarding service

h. 1[c]: “memory coupled to the at least one processor and configured to provide the at least one processor with the one or more instructions.”

86. *Sewall* discloses 1[c]. As discussed above, *Sewall* discloses that its personal hotspot 10 may be embodied in “any computer-readable media for use by or in connection with an instruction execution system such as a computer/processor based system or an ASIC (Application Specific Integrated Circuit) or other system that can fetch or obtain the logic from computer-readable media and execute the instructions contained therein.” EX1006, ¶58. *Sewall* further states that “computer-readable media” may be “any media that can contain, store, or maintain programs and data for use by or in connection with the instruction execution system,” including, for example, “a portable magnetic computer diskette such as floppy diskettes or hard drives, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory, or a portable compact disc.” *Id.*

87. Accordingly, *Sewall*’s mobile hotspot comprises “memory coupled to the at least one processor and configured to provide the at least one processor with the one or more instructions,” as recited in claim 1[c].

2. Claim 10

88. In my opinion, claim 10 would have been obvious to one of skill based on *Sewall*.

a. 10[a]: “wherein provide the forwarding service to the one or more other end-user devices comprises: a first device of the one or more other end-user devices or a particular user of the first device,”

89. *Sewall* discloses 10[a]. According to *Sewall*, the mobile hotspot may provide its forwarding service to client devices 12, 14, and 16, which are associated with a user profile such as an owner profile 62, authorized user profile 64, or anonymous user profile 66. EX1006, ¶¶7, 9, 16, 34, 36 Figs. 1-2. Accordingly, one of skill in the art would recognize that *Sewall*’s forwarding service is provided to the first device or user of the first device recited in claim 10[a].

b. 10[b]: “based on the identification of the first device or the particular user of the first device, provide the forwarding service with a first characteristic to the first device, and”

90. *Sewall* discloses 10[b]. Its mobile hotspot device implements first access rules based on the owner 62, authorized user 64, and anonymous user 66 device profiles to provide the forwarding service to the client devices and limit first traffic between the client devices and the internet. EX1006, ¶¶34, 36. In my opinion, *Sewall*’s first access rules depend on the device profile and may

implement different characteristics for forwarding-service usage. For example, the hotspot device may provide the forwarding service with specific upload and download bandwidth limits or limits on the amount of data transfer that may be allowed in a given time period. *Id. Sewall* explains that access rules for anonymous user devices will usually be more limiting than access rules for authorized-user devices. *Id.* Similarly, access rules for authorized users will be more limiting than access rules for owners' devices. *Id. Sewall* also teaches that the owner's client device will tend to have the largest upload and download bandwidth limits and the largest amount of data transfer allowed in a given time period. One of skill would understand these features to be characteristics of the devices involved in *Sewall's* forwarding service, like a first device, and that providing the forwarding service reflects these characteristics. Accordingly, *Sewall* discloses all features recited in 10[b].

c. 10[c]: “provide the forwarding service with a second characteristic to a second device of the one or more other end-user devices.”

91. *Sewall* discloses 10[c]. As I explained above, *Sewall's* mobile hotspot device may provide the forwarding service to multiple client devices with different characteristics depending on the first access rules associated with the user profiles of those devices, for example, owner, authorized, or

anonymous users. *Supra* §VI.A.2.b. For instance, *Sewall* teaches that the client device of an anonymous user usually has the smallest upload and download bandwidth limits and the minimum amount of data transfer allowed in a given time period when compared with authorized devices or the hotspot owner's devices. EX1006, ¶¶34-36. One of skill in the art would recognize this to be a characteristic of *Sewall*'s forwarding service that is a reflection of the end user device.

92. Accordingly, claim 10 would have been obvious over *Sewall*.

3. Claim 19: “wherein the first service policy or the second service policy is based on a time of day or a time period.”

93. In my opinion, *Sewall* discloses claim 19. *Sewall* discloses that its mobile hotspot device implements access rules to help control traffic. *E.g.*, EX1006, ¶26. One of the many limitations that may be imposed according to these access rules includes limiting the term or time period for which access to the forwarding service is allowed. *Id.* For instance, the first access rules may grant the user of a client device access for a fixed amount of time, like an hour, a day, a week, or some other period, or the rules may grant the user access during a particular time period each day.

94. Accordingly, claim 19 would have been obvious to one skilled in the art based on *Sewall*.

4. Claim 29: “wherein implement the first service policy comprises throttle or restrict the first traffic.”

95. In my opinion, *Sewall* discloses claim 29. *Sewall* discloses a mobile hotspot device that implements first access rules for the owner 62, authorized user 64, and anonymous user 66 device profiles to help control the traffic between the client devices and the internet, i.e., the first traffic. EX1006, ¶36. In addition to other things, the access rules may impose limitations on a user’s duration of use, available bandwidth, or the amount of data that may be downloaded within a certain timeframe. *Id.*, ¶¶26, 36. Access engine 48 is responsible for blocking communications to and from the user once that user has reached the specified duration, bandwidth, or download limit. *Id.*, ¶26. One of skill in the art would recognize *Sewall*’s access rule-imposed limitations as throttling or restricting first traffic to implement a first service policy.

96. Accordingly, the subject matter of claim 29 would have been obvious based on *Sewall*.

5. Claim 30: “wherein implement the first service policy comprises impose a limit on the first traffic or establish an allowance for the first traffic.”

97. In my opinion, *Sewall* discloses claim 30 for essentially the same reasons discussed above for claim 29. As I mentioned, *Sewall* discloses a mobile hotspot device that implements first access rules for the various user profiles to

help control the first traffic. EX1006, ¶36. For example, in addition to other things, the access rules may impose limitations on a user's duration of use, available bandwidth, or the amount of data that may be downloaded within a certain timeframe. *Id.*, ¶¶26, 36. *Sewall* also discloses that the access engine 48 is responsible for blocking communications to and from the user once that user has reached the specified duration, bandwidth, or download limit. *Id.*, ¶26 One of skill in the art would recognize all of these limitations of *Sewall* as limitations imposed on the first traffic. In that same vein, one of skill in the art would also recognize *Sewall*'s access rules can establish an allowance for the first traffic.

6. Claim 31: “wherein the first service policy is based on a limit or allowance, the limit limiting at least an aspect of usage of the forwarding service, the allowance allowing a specified amount of the forwarding service.”

98. In my opinion, *Sewall* discloses claim 31 for the same reasons discussed above for claims 29 and 30. Again, *Sewall* discloses that the access rules may impose limitations on a user's duration of use, available bandwidth, or the amount of data that may be downloaded within a certain timeframe, all of which are aspects of using the forwarding service. *Id.*, ¶26 One of skill in the art would also recognize that the limitations disclosed in *Sewall* allow a specified amount of its forwarding service.

7. Claim 32: “wherein the limit or allowance is based on a user preference.”

99. Claim 32 depends from claim 31, which would have been obvious as discussed above. *supra* §VI.A.4, 6. *Sewall* also discloses that the owner of the mobile hotspot may select the settings for all of the configuration data 42, which includes the owner 62, authorized user 64, and anonymous user 66 profiles, as shown in Figure 5, annotated below. EX1006, ¶¶33-34, 37, 45.

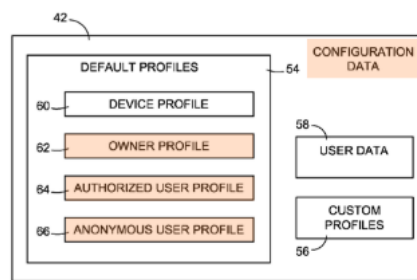


FIG. 5

Id., Fig. 5 (annotated). Additionally, as I have explained above, *Sewall*'s mobile hotspot implements first access rules that are based on the user profiles, and among other things, these access rules may impose limitations on a user's duration of use, available bandwidth, or the amount of data that may be downloaded within a certain timeframe. *Id.*, ¶¶26, 36. A person of ordinary skill in the art would understand that allowing the owner to choose the settings that influence the user profiles and, consequently, the access rules of the forwarding service is a form of user preference.

8. Claim 34: “wherein the second service policy is not based on the limit or allowance.”

100. Claim 34 also depends from claim 31, which would have been obvious as discussed above. *supra* §VI.A.6. As discussed above for claim 1[b][iii], Sewall’s mobile hotspot implements second access rules, i.e. a second service policy, based on the device profile 60 to help control the second traffic between the mobile hotspot and the internet. EX1006, ¶34. The second access rules are device access rules, which set limits that apply generally to use of the mobile hotspot—as opposed to the user-specific restrictions imposed by the first access rules. *Id.*, ¶34. For example, the second access rules “may limit the number of simultaneous users or sessions supported by [the] personal hotspot.” *Id.* The nature of second access rules are usually dependent on the data subscription package the owner of the mobile hotspot has with internet service provider 22, for example, more restrictive rules for basic subscription packages and vice versa. *Id.*; *see also id.*, ¶¶43-44. Accordingly, the second access rules are not based on limits or allowances like the first access rules. EX1006, ¶¶26, 36.

9. Claim 35: “wherein the limit or allowance is a first limit or allowance, and wherein the second service policy is based on a second limit or allowance.”

101. Claim 35 also depends from claim 31 which would have been obvious for the reasons discussed above. *supra* §VI.A.6. Sewall’s first access rules, which

help control the first traffic between the client devices and the internet, apply to particular users (e.g., the owner 62, authorized users 64, and anonymous users 66) and set limits related to the upload and download bandwidth for a user or the amount of data transfer allowed by a user within a certain timeframe. EX1006, ¶36. *Sewall*'s second access rules, which help control the second traffic between the mobile hotspot and the internet, apply to the mobile hotspot and set limits related to the upload and download bandwidth for the mobile hotspot, the amount of data transfer the mobile hotspot allows within a certain timeframe, or the number of simultaneous users or sessions supported by the mobile hotspot. *Id.*, ¶34. Thus, in my opinion, the first access rules are different than the second access rules, and the limits set by the first access rules for individual client devices cannot exceed the limits set by the second access rules. One of skill in the art would recognize the differentiation of *Sewall*'s first and second access rules as first and second limits or allowances.

10.Claim 37: “wherein the first service policy comprises a first control policy, and wherein the second service policy comprises a second control policy.”

102. *Sewall* discloses claim 37 for the same reasons I have identified above for claim 35. *Sewall*'s first access rules, which help control the first traffic between the client devices and the internet, apply to particular users (e.g., the owner 62,

authorized users 64, and anonymous users 66) and set limits related to the upload and download bandwidth for a user or the amount of data transfer allowed by a user within a certain timeframe. EX1006, ¶36. Conversely, *Sewall*'s second access rules, which help control the second traffic between the mobile hotspot and the internet, apply to the mobile hotspot and set limits related to the upload and download bandwidth for the mobile hotspot, the amount of data transfer the mobile hotspot allows within a certain timeframe, or the number of simultaneous users or sessions supported by the mobile hotspot. *Id.*, ¶34. One of skill in the art would understand that the differences in which aspects of the forwarding service are controlled by *Sewall*'s first and second access means the rules would also have their own control policies.

11.Claim 38: “wherein: implement the first service policy comprises apply a first control to the first traffic, and implement the second service policy comprises apply a second control to the second traffic.”

103. *Sewall* discloses claim 38 for the same reasons I have identified above for claim 35. *supra* §VI.A.9. For instance, the first service policy may limit the upload and download bandwidth for the owner 62, an authorized user 64, and an anonymous user based on their individual device profiles. The second service policy, on the other hand, may limit the amount of data transfer the mobile hotspot allows in a given time period or limit the number of simultaneous users of the

forwarding service. EX1006, ¶¶34-36. In my opinion, the limitations imposed by *Sewall*'s "service policies" represent different controls being applied to the two sets of traffic.

12.Claim 39: "wherein: implement the first service policy comprises apply a first control to the first traffic, and implement the second service policy comprises do not apply the first control to the second traffic."

104. *Sewall* discloses claim 39 for the same reasons I have identified above for claim 35. *supra* §VI.A.9. For instance, the first service policy may impose limits on the upload and download bandwidth for particular users based on the identified user profile (owner 62, authorized user 64, or anonymous user). The second service policy, on the other hand, limits the total amount of data transfer the mobile hotspot allows in a given time period without otherwise limiting the upload and download bandwidth. EX1006, ¶¶34-36. In my opinion, implementing the second service policy includes *not* applying the limits of the individual client device to the second traffic between the mobile hotspot device and the network system.

13.Claim 41

a. 41[a]: "wherein: implement the first service policy comprises direct the first traffic to a first end-point or server, and"

105. *Sewall* discloses 41[a]. Figure 8, as shown below, illustrates that when

the mobile hotspot receives a communication (step 82), it identifies the communication type (step 84), meaning whether the communication originated from the owner, an authorized user, or an anonymous user. EX1006, ¶47. If the communication's source is unknown, like if it originated from an anonymous user, and anonymous communications are not allowed (determined in step 92), then the hotspot returns access data to the source of the communication (step 94). *Id.*, ¶¶50-51.

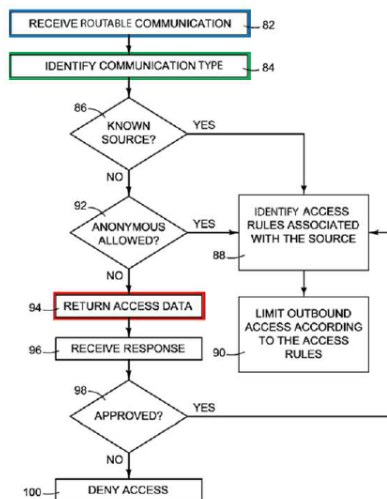


FIG. 8

Id., Fig 8 (annotated).

106. *Sewall* discloses that access data, (here, a first end-point or server), may be a web page informing a user how to contact the owner of the mobile hotspot to request to become an authorized user, a web page for providing payment information to a payment service another end-point or server,

instructions for manually approaching the owner of mobile hotspot and verbally requesting access, or a web page having instructions for sending an electronic request to the owner. *Id.*, ¶¶51-54, Fig. 8. *Sewall* also explains that step 94 may be accomplished because access engine 48 causes web server 38 to access user interface data 44 and return an appropriate user interface to the source of the communication. *Id.* In my opinion, *Sewall*'s discloses directing first traffic to a first end point or server.

b. 41[b]: “implement the second service policy comprises direct the second traffic to a second end-point or server.”

107. *Sewall* also discloses 41[b]. During the steps I have discussed above, the mobile hotspot remains connected to the internet, or the second end-point or server, such that for client devices that have been granted access, the mobile hotspot can continue to route communications between those client devices and the internet. EX1006, ¶46.

14.Claim 47: “wherein the first service policy or the second service policy is dependent on whether the first network is associated with a cost.”

108. *Sewall* discloses claim 47. *Sewall* discloses that the first and second access rules are governed by configuration data 42. As discussed above and reflected in Figure 5 annotated below, the configuration data 42 includes the device profile 60, which is associated with the second access rules that help control the

second traffic between the mobile hotspot and the internet. EX1006, ¶34. The configuration data 42 also includes the owner 62, authorized user 64, and anonymous user 66 profiles, which are associated with the first access rules that help control the first traffic between the client devices and the internet. *Id.*, ¶34.

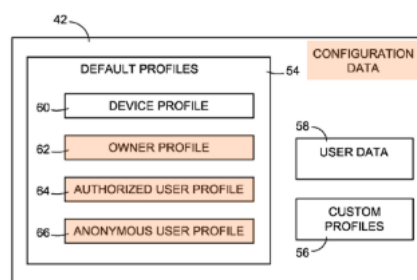


FIG. 5

Id., Fig. 5 (annotated)

109. *Sewall* teaches that the configuration data 42 may be provided by the internet service provider 22. *Id.*, ¶25. Furthermore, *Sewall* discloses that the configuration data 42 can be based on the subscription plan that the hotspot owner pays for, with basic subscription packages having more stringent access rules than a premium subscription package, for instance. *Id.* One of skill in the art would recognize and expect that a basic subscription package would cost less than a premium subscription package and vice versa. Evidently, at least one of the access rules disclosed in *Sewall* is based on whether the first network is associated with a cost, which, in this case, would be the subscription package.

15.Claim 48: “wherein the first service policy is dependent on whether the second network is associated with a cost.”

110. *Sewall* discloses claim 48. *Sewall* discloses that configuration data 42 on the mobile hotspot includes the owner 62, authorized user 64, and anonymous user 66 profiles. EX1006, ¶¶34, 36. *Sewall*’s first access rules are implemented for these user profiles in order to help control the traffic between the client devices and the internet (“first traffic”). *Id.*, ¶36. *Sewall* teaches that the owner of the mobile hotspot may update the first access rules. *Id.*, ¶25. For instance, the owner may configure the first access rules for the anonymous user profile to indicate that payment is required for use of the forwarding service over the first network, i.e. the remote link 24 and second network, i.e. the local link 18. *Id.*, ¶36. Furthermore, the anonymous user may pay to use the service for a specified amount of time or may be charged based on use. *Id.*, ¶29. Consequently, one of skill in the art would understand that the first access rules for the anonymous user profile in *Sewall* depend on whether the owner of the mobile hotspot is requiring the user to pay to use the first and second networks.

**XII. GROUND 2: CLAIMS 45, 49, AND 51 ARE OBVIOUS OVER
*SEWALL AND THOMAS***

1. Motivation to Combine

111. One of skill would have recognized that *Sewall* and *Thomas* are analogous art to the ‘451 patent. They are in the same field of endeavor: mobile

devices and wireless access points for computer networking. EX1005, ¶¶2, 6, 9, 23, 28, 84-85, Figs. 1-11; EX1006, ¶¶3, 7-8, 11, Figs. 1-9.

112. *Sewall* and *Thomas* also share a common goal with the ‘451 patent: improving the customizability and monetization of mobile hotspot technology. These references disclose using end-user devices for bridging or routing traffic from other devices to a network system (e.g., the internet), including the provisioning of services seeking to improve usage control, user interactivity and notifications via graphical user interfaces, and billing features. EX1005, ¶¶23, 28, 44-45, 54-55, 79-80; EX1006, Abstr., ¶¶7-9, 17, 22, 25, 28-31; EX1001, 32:38-34:64, 65:31-67, 122:52-123:27, Fig. 15A-F.

113. In my opinion, one of skill would have been motivated to combine *Sewall*’s and *Thomas*’s end user devices for providing a personal hotspot, which would include a user interface for receiving user input and presenting notifications, access and usage restrictions, and billing features. In my opinion, as detailed below, one of skill would have been motivated to make this combination for several reasons. Indeed, these references disclose highly compatible hotspot features that one of skill would have readily combined with a reasonable expectation of success.

114. First, these references both describe the same types of devices for

advantageously providing internet access to other computing devices. *Sewall* describes using an internet-enabled cellular telephone as a “personal hotspot.” EX1006, ¶7, Figs. 1, 2. That hotspot service allows laptops, PDAs, and other computing devices to access the internet. *Id.* *Thomas* similarly describes using cell phones or other wireless devices to provide an “ad hoc point of presence on a wireless network.” EX1005, ¶¶2, 9, Figs. 5, 6. *Thomas*’s point-of-presence feature is another way of describing a hotspot service, as the owner of user device 110 may use it to provide internet access to other computing devices.

115. Second, both references provide compatible solutions for extending internet access to users who may not have their own subscriptions to an internet-enabled wireless plan (e.g., 2G, 3G, or 4G service providers). EX1006, ¶¶2-3, 22; EX1005, ¶¶32, 54-56, 83. One of skill would recognize that the ad hoc point-of-presence (hotspot) features of *Sewall* and *Thomas* provide flexible, on-demand internet access without requiring all users to have their own wireless plan subscriptions.

116. Third, *Sewall* and *Thomas* support using mobile devices’ WLAN capabilities to provide hotspot services to a greater number of computing devices than was previously possible. As *Thomas* discloses, its ad hoc point of presence technology overcomes some of the known limitations of previous hotspot services

that depended on range-limited Bluetooth or infrared connections between a mobile device and a laptop, which often precluded more than one laptop at a time from accessing the internet via the mobile device. EX1005, ¶¶27-28. *Sewall* also discloses personal hotspots that use IEEE 802.11 WLAN capabilities to connect to other computing devices as appropriate alternatives to Bluetooth or infrared connections. EX1006, ¶¶14, 18.

117. Fourth, *Sewall* and *Thomas* provide complementary billing and reward systems encouraging mobile device users to provide hotspot services to others. As *Thomas* discloses, a wireless carrier “reward” plan may incentivize mobile device users to share internet access with others. EX1005, ¶¶55-56 (“For example, for every new connection session, a payment could be credited to the user.”). As *Sewall* discloses, its hotspot device may include a billing agent to facilitate computing devices seeking access to the hotspot service in making direct payments to the hotspot owner. EX1006, ¶¶28-32.

118. One of skill would have been motivated to implement a combination having both *Thomas*’s wireless carrier “reward” and *Sewall*’s billing agent features. One of skill would have understood that these complementary reward systems incentivize mobile users to provide hotspot services while minimizing or eliminating their responsibility for any increased data or bandwidth costs due to

providing the hotspot service. Moreover, combining these features provides for increased flexibility for potentially compensating the owner of *Thomas*'s wireless device 110 or *Sewall*'s hotspot owner and encouraging them to extend their hotspot services to other devices, as those owners could earn payments from either the wireless carrier, users of other computing devices, or both.

119. Fifth, *Sewall* and *Thomas* describe complementary features for controlling or limiting access to their personal hotspot services. *Thomas* provides a user interface that provides users with the ability to identify and select which other computing devices (e.g., laptops) can access the service. *Id.*, ¶¶44-46, Figs. 5, 6. *Sewall* discloses configuring a mobile hotspot with user profiles associated with other computing devices that provide access, limit access, or deny access to the hotspot service. EX1006, ¶¶47-50. As a result, differing access rules may be applied to computing devices of the hotspot owner, computing devices of other users authorized by the owner, and computing devices of anonymous users (to whom potentially the most restrictive rules may apply). *Id.* *Sewall* discloses configuring a mobile hotspot with user profiles (e.g., owner, authorized user, anonymous user) that provide access, limit access, or deny access to the hotspot service, which are implemented by, e.g., *Sewall*'s hotspot limiter, configuration data, user-interface data, and access engine components. EX1006, ¶¶47-50.

120. One of skill would have been motivated to implement a combination with both *Sewall*'s and *Thomas*'s access-control features. Using a user interface to make on-the-fly determinations would improve the flexibility and customizability of *Sewall*'s profile-based access configurations, including during conditions in which the hotspot operator may desire to deviate from default access rules (e.g., during roaming sessions, if network bandwidth is low, or based on needs of a given hotspot session). EX1005, ¶¶29, 54-56, Figs. 5, 6. One of skill would also have recognized the benefits of combining *Sewall*'s user profiles with *Thomas*'s system so that trusted devices (e.g., the wireless device 110 owner's other computing devices or other previously authorized devices) could easily and quickly access the hotspot service without necessitating a manual approval from wireless device 110.

121. In my opinion, for any or all of the potential benefits detailed above that *Sewall* and *Thomas* individually and collectively disclose and suggest, one of skill would have been motivated to combine *Sewall* and *Thomas*. One of skill also would have had a reasonable expectation of success in doing so, given that both references are generally directed to conventional mobile hotspot technologies. Combining their disclosures was within a POSITA's capabilities and would predictably apply known techniques such as hotspot access controls, billing services, user profiles, and user-interface features to known mobile cellular devices

to provide known and “conventional” hotspot services that advantageously allow other computing devices to access network systems.

2. Claim 45: “wherein the first service policy or the second service policy is dependent on whether the first network comprises a roaming network.”

122. Claim 45 would have been obvious based on *Sewall* and *Thomas*. *Sewall* discloses first-access rules, for example, rules based on user profiles, to help control first traffic between the client devices and the internet as well as second-access rules to help control second traffic between the hotspot device and a network like the internet. EX1006, ¶¶34, 36; see §VI.A.1.e-f. *Thomas* discloses security features for its wireless device 110 to promote roaming awareness and management and also discloses that data plans may include roaming within the plan coverage. EX1005, ¶¶70-71.

123. A POSITA would have been motivated to modify the first and/or second access rules disclosed in *Sewall* to accommodate using a roaming network in view of *Thomas*’s disclosure of roaming awareness, management, and data plans in order to allow *Sewall*’s client devices to maintain access to the internet. See §VI.B.1. A POSITA would understand from *Thomas* that data transfer over a roaming network would typically be more costly and would in turn modify *Sewall*’s first and/or second access rules to reduce data transfer in

those instances. In my opinion, modifying *Sewall*'s user and device profiles to implement access rules that provide for more restrictive upload and download bandwidth limits, limit data transfer, or block access for particular users, anonymous or even authorized users, to depend on whether the combination's hotspot device is on a roaming network would have been obvious to one skilled in the art. EX1006, ¶¶47-50; EX1005, ¶¶70-71.

124. Accordingly, claim 45 as a whole would have been obvious to one of skill in the art based on *Sewall* and *Thomas*.

3. Claim 49: “wherein the first network comprises a roaming network, and wherein implement the first service policy comprises restrict or block the first traffic.”

125. In my opinion, claim 49 would have been obvious to one of skill based on *Thomas* and *Sewall*.

126. As I have discussed above, a POSITA would have been motivated to implement a combination having *Sewall*'s user profiles to impose restrictions on upload and download bandwidth limits, limit data transfer, or block access for particular users (e.g., anonymous users). EX1006, ¶¶47-50. *Thomas* also discloses restricting or blocking the first traffic, teaching that usage may be metered based on how long a computing device has been connected to the forwarding service, the number and size of packets that have been

transmitted, and other factors like peak or off-peak usage. EX1005,

¶54. Furthermore, *Thomas* discloses that the wireless device may also be programmed to accept computer traffic from a select number of computing devices and allow or disallow access. EX1005, ¶¶46, 44.

127. A person of skill in the art would have been motivated to apply the traffic limitation features of *Sewall and Thomas* in instances where roaming networks are being used in view of *Thomas*'s disclosure of roaming awareness, management, and data plans. Accordingly, the claim would have been obvious based on *Sewall and Thomas*.

4. Claim 51: “wherein an aspect of the second service policy differs from the aspect of the first service policy when the first network is associated with a cost.”

128. Claim 51 would have been obvious. *Sewall* discloses first-access rules based on user profiles for the combination's hotspot device and second-access rules for the device profile. EX1006, ¶¶34, 36; *see* §VI.A.1.e-

f. *Sewall* discloses that user profiles may differ depending on the user, e.g., anonymous users may need to pay for access to the network (e.g., internet) over the forwarding service. EX1006, ¶¶22-23, 28, Fig. 4. *Sewall* also discloses that the second access rules (“second service policy”) based on a device profile, which are different than a first-service policy, may depend on subscription package

the owner of the mobile hotspot has with internet service provider. *Id.*,

¶¶25 (a “basic subscription package might then have more stringent access rules than a premium subscription package”),

34, 4344. *Thomas* also discloses a subscriber plan to incentivize the wireless device 110 owner to make access to the network over the forwarding service available to third-party client-computing devices 114. EX1005, ¶¶54-56. One of skill in the art would understand that *Thomas* provides a solution to compensate the owner for the costs accrued from a network service provider while continuing to provide the forwarding service to others. *Id.*

129. As such, the features of claim 51 are obvious under *Sewall* and *Thomas*.

XIII. GROUND 3: CLAIMS 18, 21, 40, 42, AND 46 ARE OBVIOUS OVER SEWALL IN VIEW OF KRISHNASWAMY

1. Motivation to Combine

130. One of skill would have recognized that *Sewall* and *Krishnaswamy* are analogous art to the ‘451 patent. They are in the same field of endeavor: mobile devices and wireless access points for computer networking. EX1020, Abstract, 3:51-4:21, Figs. 1-2. *Sewall* and *Krishnaswamy* also share a common goal with the ‘451 patent: improving the customizability and monetization of mobile hotspot technology. These references disclose using end-user devices to bridge or route

traffic from other devices to a network system like the internet, including the provisioning of services seeking to improve usage control, user interactivity and notifications via graphical user interfaces, and billing features. EX1020, Abstract, 3:51-4:21, 6:1-16, 7:61-8:15, 9:54-63, 11:26-44, Figs. 1-2.

131. In my opinion, one of skill would have been motivated to combine *Sewall*'s and *Krishnaswamy*'s access-limitation and access-enabling features for providing forwarding services through a mobile hotspot. Indeed, these references disclose highly compatible hotspot features that one of skill would have readily combined with a reasonable expectation of success. For instance, one of skill would have been motivated to modify *Sewall*'s user and/or device profiles to incorporate additional access limiting features disclosed in *Krishnaswamy* for the mobile hotspot device to utilize, including geographic restrictions and usage restrictions (some based on quality of service parameters). EX1020, 3:66-4:5, 4:49-5:2, 5:21-28. Additionally, and as I have detailed below, one of skill would have been motivated to implement *Krishnaswamy*'s secure channel features in user and/or device profiles to enhance security and privacy of using the forwarding service in *Sewall*. EX1020, 5:10-20, 5:32-67, Fig. 1. A.

132. In my opinion, for any or all of the potential benefits detailed above that *Sewall* and *Krishnaswamy* individually and collectively disclose and suggest,

one of skill would have been motivated to combine *Sewall* and *Krishnaswamy*. One of skill also would have had a reasonable expectation of success in doing so, given that both references are generally directed to conventional mobile hotspot technologies. Combining these references' disclosures was within a POSITA's capabilities and would predictably apply known access-limiting techniques to known mobile hotspot devices and profiles to further *Sewall*'s purpose of providing forwarding services with access limitations through mobile hotspots. EX1006, ¶8.

2. Claim 18: “wherein the first service policy or the second service policy is based on a geographic location of the first end-user device.”

133. In my opinion, claim 18 would have been obvious to one of skill based on *Sewall* and *Krishnaswamy*.

134. *Sewall*'s second access rules, which are based on device profile, help control the second traffic between its mobile hotspot and the internet. EX1006, ¶34; see §VI.A.1.f. Additionally, *Sewall*'s mobile hotspot can request configuration data from the service provider to be used for providing the forwarding service to other devices. EX1006, ¶¶43-44, 16. The service provider may then determine if authorization is warranted. EX1006, ¶44 (determining “if and/or what configuration data is to be returned”).

135. *Krishnaswamy* discloses that server 110, which may act as an “exchange” with a service provider to monetize unused bandwidth, may determines whether to allow an ad hoc service provider (e.g., mobile hotspot) to provide its forwarding service within a geographic location. EX1020, 3:66-4:5, 4:49-5:2. Furthermore, *Krishnaswamy* teaches that server 110 may limit the number of mobile hotspots at a given location if additional ones will adversely affect performance in the WWAN. EX1020, 5:21-28.

136. In my opinion, one of skill would have been motivated to modify *Sewall*’s mobile hotspot and its device profile in view of *Krishnaswamy* to account for geographic location when authorizing the mobile hotspot to provide the forwarding service, as the geographic location may result in unwanted effects on performance. For example, the access rules may be configured to prevent the mobile hotspot from providing the service if the hotspot device is in a location where the service provider has little to no coverage and is unable to provide an internet connection. *Id.* If implementing this modification one of skill in the art would understand they could do so by configuring the second-access rules (“second service policy”) of the device profile to restrict or deny access to the forwarding service. *See* §VI.C.1

3. Claim 21: “wherein the first service policy or the second service policy is based on a quality of service.”

137. In my opinion, claim 18 would have been obvious to one of skill based on *Sewall* and *Krishnaswamy*.

138. *Sewall* and *Krishnaswamy* disclose claim 21. *Sewall* discloses first access rules that are based on the user profiles to help control the first traffic between other devices and the internet. EX1006, ¶36; *see* §VI.A.1.f. These profiles may lead to different access and usage restrictions depending on if the user is an owner, authorized user, or anonymous user. EX1006, ¶¶8, 22, 26, 28-29, 47-50.

139. In my opinion, one of skill would have been reasonably motivated to implement *Krishnaswamy*’s hot spot user quality-of-service into *Sewall*’s user profiles. For instance, the hotspot may base the decision to allow a particular device to access the forwarding service or to transfer it to a different hotspot on the QoS required for that particular device. EX1020, 6:1-16. By implementing *Krishnaswamy*’s QoS requirements into *Sewall*’s profiles, the combination’s hotspot device would provide for improved on-the-fly access configurations, including during conditions that are less than optimal, for example, during data-restricted roaming sessions, low network bandwidth, or based on needs of a given hotspot session. It further would have been obvious based on *Sewall* to apply different QoS requirements for different users. For

example, anonymous devices may have their forwarding-service sessions terminated and/or be transferred to a different hotspot before an owner's device. *See supra* §VI.C.1.

4. Claim 40

a. 40[a]: “wherein: implement the first service policy comprises direct the first traffic to a first virtual or logical channel, and”

140. In my opinion, 40[a] would have been obvious to one of skill based on *Sewall* and *Krishnaswamy*.

141. As I've discussed above, *Sewall* discloses first access rules for the user profiles to help control the first traffic between other devices and the internet. EX1006, ¶36; *see* §VI.A.1.e. These profiles may provide for different access and usage restrictions depending on the type of user - either the owner, an authorized user, or an anonymous user. EX1006, ¶¶8, 22, 26, 28-29, 47-50.

142. *Krishnaswamy* discloses establishing a secure session channel, a VPN tunnel for instance, between a user of a device accessing the forwarding service and a server 110 through which audio, video, and advertising content and services like internet routing may be provided. EX1020, 5:10-20, 5:32-67, Fig. 1. In my opinion, one of skill would have understood that a secure session channel like a virtual-private-network tunnel is an example of a virtual or logical channel, as

claimed.

143. Furthermore, one of skill would have been motivated to modify *Sewall*'s user profiles to include default options for implementing *Krishnaswamy*'s secure session channels for traffic between hotspot users and a network to enhance the privacy of the transfer of first traffic. Indeed, a POSITA would have recognized from *Sewall* that hotspot users may submit and receive identifying information, usernames and passwords, personal information, payment information, and other types of sensitive information that the device user would want to protect. EX1006, ¶¶23, 37-39, 51-54; *see also* EX1020, 5:10-20, 5:52-67 (disclosing use of encryption to “provide increased privacy for a mobile client 108”).

b. 40[b]: “implement the second service policy comprises direct the second traffic to a second virtual or logical channel.”

144. *Sewall* discloses second access rules for its mobile hotspot's device profile to help control the second traffic between the mobile hotspot and the internet. EX1006, ¶34; *see* §VI.A.1.f. *Krishnaswamy* discloses establishing a second secure session channel between the server 110 and an ad hoc service provider 106. EX1020, 10:10-20, 10:52-67. In my opinion, one of skill would have considered this secure session channel (e.g., a VPN channel) to be a virtual or

logical channel and would have understood it to enhance privacy for second traffic between the mobile hotspot device and a network. Furthermore, one of skill would have been motivated to modify *Sewall*'s device profiles by implementing *Krishnaswamy*'s secure session channels for such traffic between the mobile hotspot device and a network. Recognizing that *Sewall* discloses that mobile-hotspot device owners may submit and receive sensitive information like passing identification and user payment information that the device user would desire to protect, one of skill would have found *Krishnaswamy*'s secure session channels to be an obvious improvement to the hotspot device. EX1006, ¶¶33-35, 43-45 37-39, 51-54; *see also* EX1020, 5:10-20, 5:32-67.

145. Accordingly, 40[b] would have been obvious to one of skill based on *Sewall* and *Krishnaswamy*.

5. Claim 42: “wherein implement the first service policy comprises send information to at least a portion of the one or more other end-user devices, the information for assisting the at least a portion of the one or more other end-user devices to control their usage of the forwarding service.”

146. *Sewall* teaches first access rules based on its user profiles to help control first traffic between the client devices and the internet. EX1006, ¶¶36, 29; *see* §VI.A.1.f. As *Krishnaswamy* discloses, such traffic may include audio, visual, or other traffic through a secure tunnel. EX1020, 5:59-67.

147. One of skill would recognize that *Sewall* and *Krishnaswamy* both disclose providing information to other client devices that is intended to help them to control their usage of the hotspot device's forwarding service. For instance, *Sewall* discloses that the hotspot device may allow anonymous devices to pay to use the forwarding service, either for a specified amount of time or specified amount of use, through a user interface. EX1006, ¶¶28-29. In this way, one of skill in the art would recognize that the anonymous devices are assisted in controlling their usage, as well as their associated costs, of the forwarding service. *Id.*;

148. *Krishnaswamy* also discloses providing information to help other devices control their usage during a forwarding-service session. For example, it discloses that hotspot devices may experience "resource related events" such as reduced available bandwidth or higher loads. EX1020, 11:3-44. One of skill would understand that if such events were to occur, the hotspot device may notify other devices using the forwarding service of the resource related event and any response that the hotspot device may be preparing to take. EX1020, 11:40 ("notify some or all of the mobile clients 108"). Providing this information to the other devices helps them control their usage of the forwarding traffic and allows them the opportunity to adjust accordingly, either through their data usage, like using audio instead of video, or time using the forwarding service, which includes

potentially electing to cease usage altogether and switching to a different hotspot device's forwarding service. EX1020, 5:59-6:8 (disclosing mobile client 108 switching from one hotspot device to another based on, e.g., quality of service and loading factors).

149. In my opinion, one of skill would have been motivated to combine these usage-control features disclosed in *Sewall* and *Krishnaswamy* to improve user flexibility and transparency within a forwarding-service session. This includes providing information to users throughout a forwarding-service session about usage limitations, costs, and resource-related events that users may rely upon to optimize and control their forwarding-service usage.

150. Accordingly, claim 42 would have been obvious to one of skill based on *Sewall* and *Krishnaswamy*.

XIV. GROUND 4: CLAIM 17 IS OBVIOUS OVER *SEWALL* IN VIEW OF *POLSON*

1. Motivation to Combine

151. One of skill in the art would have recognized that *Polson*, like *Sewall*, is analogous art to the '451 patent. It also is in the field of endeavor of mobile devices and wireless access points for computer networking. EX1015, Abstract, ¶¶2, 16, 20-23, 26, 56, Figs. 1, 2, 9-15. *Sewall* and *Polson* share a common goal with the '451 patent: using devices to bridge or route traffic from

other devices to a network system (e.g., the internet). EX1015, Abstract, ¶¶2, 16, 20-23, 26, 29-35, 38-39, 44-46, 52-53, 56, 78-79, Figs. 1, 2, 9-15.

152. In my opinion, one of skill would have been motivated to combine *Sewall*'s profiles for implementing access rules on its end-user hotspot device with *Polson*'s WWAN access management features. Both references disclose highly compatible hotspot features that one of skill would have readily combined with a reasonable expectation of success. For example, *Polson* discloses that its hotspot ("gateway 108") device may be capable of accessing multiple WWANs via different service providers. EX1015, ¶¶38-39. One of skill would have recognized that having multiple WWANs available would improve the flexibility and reliability of the combination's end-user hotspot services, for instance, allowing for WWAN switching and avoiding loss of internet access). In fact, one of skill would recognize from *Polson* that the mobility of its gateway is important and that the ability to connect to multiple WWANs is necessary when one WWAN is not available due to the location of the user, issues with the service provider, or the features of a service agreement. EX1015, ¶¶52-53. Furthermore, one of skill also would have had a reasonable expectation of success in combining these references since both seek to improve routing traffic between networks and devices. Thus, combining these references'

disclosures was within a POSITA's capabilities and would predictably apply known techniques like implementing multiple WWAN interfaces to provide access to different WWANs) to obtain predictable results like continued internet access across different WWANs). *KSR*, 550 U.S. at 420.

- 2. Claim 17: “wherein, when executed by the at least one processor, the one or more instructions further cause the at least one processor to: detect a network connection change by the first end-user device, and in response to detecting the network connection change by the first end-user device, modify at least an aspect of the first service policy or at least an aspect of the second service policy.”**

153. In my opinion, claim 17 would have been obvious to one of skill based on *Sewall* and *Polson*.

154. *Sewall* discloses second access rules for its device profile to help control the second traffic between the mobile hotspot and the internet via remote link 24. EX1006, ¶34; *see* §VI.A.1.f. As I have discussed above, *Polson* discloses that the hotspot device may access WWANs via different service providers. EX1015, ¶¶38-39. Indeed, *Polson* discloses that the combination's hotspot device may be configured to have multiple sockets that allow it to receive multiple WWAN interfaces 110. EX1015, ¶53. A POSITA would recognize this ability to access multiple WWANs means that if WWAN 112 is not available for reasons like user location, WWAN 112 service provider issues,

or service agreement stipulations, WWAN access may be provided via another WWAN connection. *Id.*

155. In my opinion, one of skill would have found it obvious to combine Polson's ability to connect to multiple WWANs with *Sewall's* forwarding service and access rules to have an end-user hotspot device capable of detecting a network change, like recognizing WWAN unavailability and switching to another WWAN, and, in response, modifying an aspect of the first or second service policies. For example, *Polson* discloses that features of combination's hotspot device may depend on the WWAN being accessed and the terms of any subscription plan associated with that WWAN service provider. EX1015, ¶¶38-39. From *Polson*, one of skill in the art would have recognized that different aspects of the first and second service policies may also be modified based on a WWAN change, such as different access, upload bandwidth, and download bandwidth limits applied to each owner, authorized, or anonymous user. EX1006, ¶36. Furthermore, these modifications could apply to the different limitations on the amount of data transfer allowed by each user in a given time period. *Id.* Likewise, access and bandwidth limits due to a WWAN change may apply to the mobile hotspot device, including limiting the number of simultaneous users or sessions. EX1006, ¶34. *Sewall* discloses that the nature of these access

rules may depend on the nature of the data subscription package with internet service provider 22; for example, a premium package may have less stringent limitations than a basic subscription package. *Id.* Accordingly, one of skill would reasonably expect that changing from one data subscription plan-associated WWAN to another, as disclosed in *Polson*, would result in modifying and replacing *Sewall*'s access rules.

156. Thus, the subject matter of claim 17 would have been obvious to one skilled in the art based on *Sewall* and *Polson*.

XV. GROUND 5: CLAIM 46 IS OBVIOUS OVER *SEWALL* IN VIEW OF *THOMAS AND KRISHNASWAMY*

1. Motivation to Combine

157. As I have discussed above, one of skill in the art would recognize *Sewall*, *Thomas*, and *Krishnaswamy* as analogous art to the '451 patent. *Supra* §§VI.B.1, VI.C.1. All three references are in the same field of endeavor as the '451 patent: mobile access devices and wireless access points for computer networking. Additionally they all share common goals with the '451 patent, including using end-user devices for bridging or routing traffic from other devices to a network system, and provisioning services to make mobile hotspot technology more customizable and reliable. *Supra* §§VI.B.1, VI.C.1.

158. In my opinion, one of skill would have been motivated to

combine *Sewall*'s, *Thomas*'s, and *Krishnaswamy*'s access-limitation and access-enabling features for providing forwarding services over a mobile hotspot to make obvious improvements to the technology. For instance, one of skill would have been motivated to modify *Sewall*'s first access rules to incorporate additional limits that depend on the type of network connection being used between a client device and the mobile hotspot device. Indeed, *Thomas* proposes using farther-reaching wireless networks like Wi-Fi to provide forwarding services to multiple client devices and with greater bandwidth in comparison to limited Bluetooth or infrared connections. EX1005, ¶¶6, 28, 32. Furthermore, *Krishnaswamy* discloses passing off client devices from one mobile hotspot connection to another based on quality of service. EX1020, 6:1-16. Combining these references' disclosures was within a POSITA's capabilities and would predictably apply known techniques for improving forwarding-service access and performance using known networking-connection technologies to known mobile hotspot devices, furthering *Sewall*'s purpose of providing forwarding services with access limitations using mobile hotspots. EX1006, ¶8.

2. Claim 46: “wherein the first service policy is dependent on whether the second network comprises a roaming network.”

159. *Sewall* discloses that the combination's mobile hotspot device communicates with client devices via local link 18, which corresponds to the

second network. EX1006, ¶¶7, 10, 17, Fig. 3. From *Sewall*, one skilled in the art would recognize that the local links may include a cable, wireless, or remote link via a telecommunication link, an infrared link, a Bluetooth link, a radio frequency link, or any other connector or system that provides electronic communication between client devices and the hotspot device. *Id.* Furthermore, *Sewall* discloses user profiles having first access rules to help control the first traffic between the client devices and the internet, which can also be routed through local link 18. EX1006, ¶¶34-36; *see* §VI.A.1.e. Such profiles may include profiles for the owner of the hotspot, authorized users, or anonymous users. EX1006, ¶¶34-36.

160. In my opinion, based on *Sewall* and *Thomas*, it would have been obvious to one skilled in the art to have the combination's user profiles and access rules depend on whether a client device is accessing the mobile hotspot via a roaming network rather than through a short-distance local connection. For example, *Thomas* discloses that conventional hotspot solutions involve a laptop user connecting to an internet-enabled cellular device over "short range" networks, such as Bluetooth or infrared. EX1005, ¶6. In view of *Thomas*, one of skill would have recognized numerous shortcomings with these local links, including limited transmission distances and insufficient bandwidth:

[S]ome short range wireless technologies, such as Bluetooth, offer limited connectivity options (e.g., generally point-to-point connections), limited transmission distance and power (e.g., close, unobstructed line-of-sight communication with a laptop), and insufficient bandwidth for high speed data connections.

EX1005, ¶6. *Thomas* further discloses that the tight coupling of these conventional hotspot links typically prohibited looser relationships, including the use of the hotspot device “by a laptop that was previously unknown to the cellular device.”

EX1005, ¶28; *see also* EX1006, ¶¶22-23, 33-34. Similarly, conventional hotspot links also precluded the concurrent use of a hotspot by more than one client device at a time, as Bluetooth and infrared are typically point-to-point connections.

EX1005, ¶¶6, 28.

161. Based on *Sewall* and *Thomas*, it would have been obvious for one of skill to implement user profiles and access rules that depend on the type of local network connection used by a client device. For example, if a non-roaming, short-distance connection were used to connect the client device to the hotspot, first-access rules based on anonymous-user profiles would most likely deny access to that device. EX1006, ¶36 (anonymous user profiles will be more limiting than other profiles, including blocking access); EX1005, ¶28 (Bluetooth connections may preclude use of the forwarding service by “unknown” devices). Indeed, one of skill would recognize that in short distance connection

situations, the hotspot owner would likely be using the hotspot for his or her own laptop or client device and thus would be disinclined to allow anonymous user access over the point-to-point connection. EX1005, ¶28;

162. On the other hand, one of skill would recognize that the short-range network limitations mentioned above likely should not apply if the second network was a roaming network that expands access to more potential client devices. For example, in the case of farther-reaching wireless networks like roaming networks, authorized and anonymous client devices may both use the combination's mobile hotspot forwarding service and access the internet in accordance with their own user profile access rules. EX1006, ¶¶34-36, 39, 50-54.

163. While one of skill would find claim 46 to be obvious under *Sewall* and *Thomas* alone, the claim is additionally obvious based on *Sewall*, *Thomas*, and *Krishnaswamy*. *Krishnaswamy* discloses that client devices may choose from available hotspot devices and that a client device may be handed off between ad hoc service providers based on factors like the quality of service required by the mobile client. EX1020, 6:1-16, 9:54-10:4. One of skill would have understood that an client device may access the mobile hotspot via a network, in this case, the local link 18, that was not their home or default network but a roaming network to connect to a different mobile hotspot device. *Id.*

164. In my opinion, one of skill would have been motivated to modify *Sewall*'s first access rules such that a session for a user may be terminated and the client device may be switched to a roaming network to access a different mobile hotspot if the quality of service dropped below a certain threshold, as *Krishnaswamy* discloses. *Id.* One of skill would have recognized that this modification would allow anonymous users, who are unable to control the hotspot's location, to maintain internet access even when the mobile hotspot moves out of range.. Additionally, it would allow the owner of the mobile hotspot to ensure a certain quality of service, which one of skill would have understood to be an important metric based on *Krishnaswamy*. EX1020, 6:1-16, 8:6-15, 9:54-63; see §VI.C.1.

165. Accordingly, the subject matter of claim 46 would have been obvious to one skilled in the art based on *Sewell*, *Thomas*, and *Krishnaswamy*.

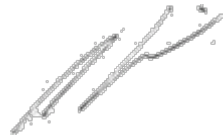
XVI. CONCLUSION

166. For the reasons set forth above, it is my opinion that claims 1, 10, 17-19, 21, 29-32, 34, 35, 37-42, 45-49, and 51 of the '451 patent are unpatentable in view of the prior art. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may

be subject to cross-examination in this case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

167. I declare that all statements made herein of my knowledge are true, that all statements made on information and belief are believed to be true, and 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.

Dated: August 28, 2026

By: 
Bill Lin, Ph.D