

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,

Petitioner,

v.

HEADWATER RESEARCH LLC,

Patent Owner.

Patent No. 8,631,102
Case No. IPR2026-00050

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. 8,631,102 (“the ’102 patent,” EX1001). I have been asked by the Petitioner to provide my opinion on whether the claims of the ’102 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 ’102 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 ’102 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 1-30 of the '102 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 1-30 of the '102 patent would have been anticipated and/or obvious based on the asserted 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 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. 8,631,102 to Raleigh (“the ’102 patent”).
EX1002	Prosecution History of U.S. Patent No. 8,631,102.
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> ”).
EX1007	U.S. Patent Appl. Publ. No. 2009/0028049 to Boudreau et al. (“ <i>Boudreau</i> ”).
EX1008	U.S. Patent No. 9,691,082 to Burnett et al. (“ <i>Burnett</i> ”).
EX1009	U.S. Patent Appl. Publ. No. 2004/0103193 to Pandya et al. (“ <i>Pandya</i> ”).

<u>Exhibit</u>	<u>Description</u>
EX1010	U.S. Patent Appl. Publ. No. 2008/0313327 to Sewall et al. (“ <i>Sewall '327</i> ”).
EX1011	U.S. Patent Appl. Publ. No. 2005/0197098 to Trossen (“ <i>Trossen</i> ”).
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> ”).

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 '102 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 '102 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.

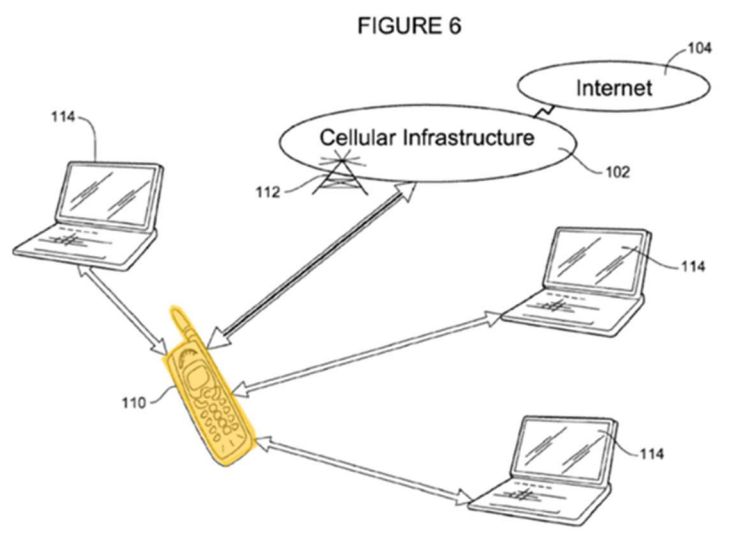
37. I have been informed that, for example, the nexus requirement as it applies to the evidence of commercial success requires that the patentee must show that the sales of a product that allegedly practices the claimed invention must be a direct result of the unique characteristics of the claimed invention, 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 '102 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 '102 patent.



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

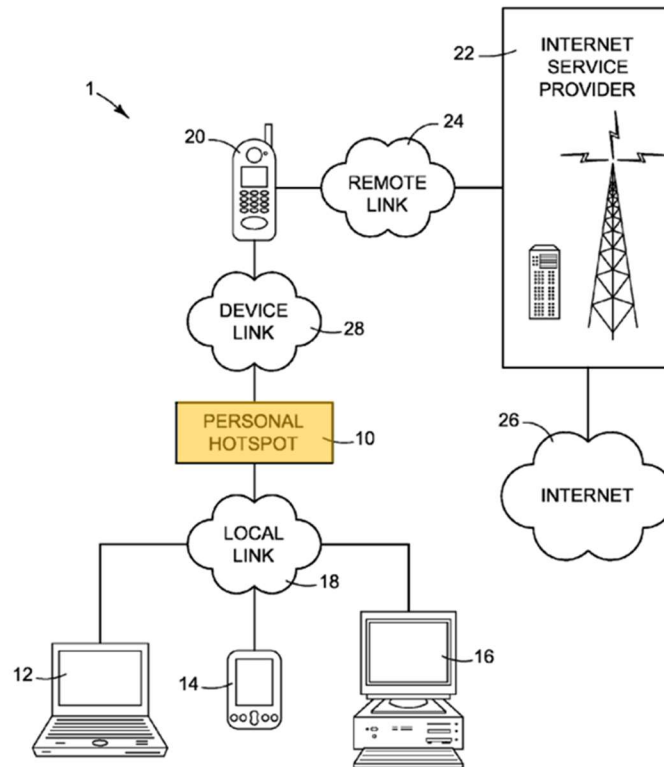


FIG. 1

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

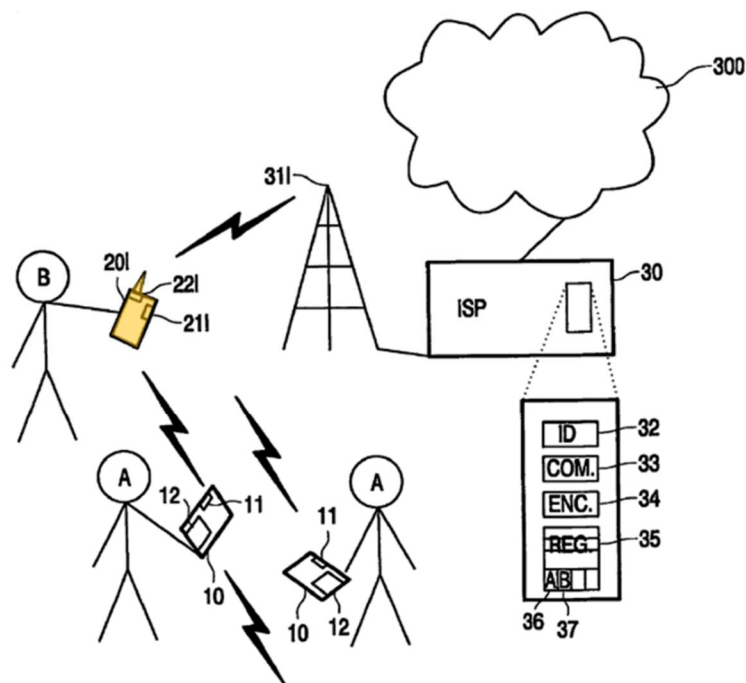


FIG. 1

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

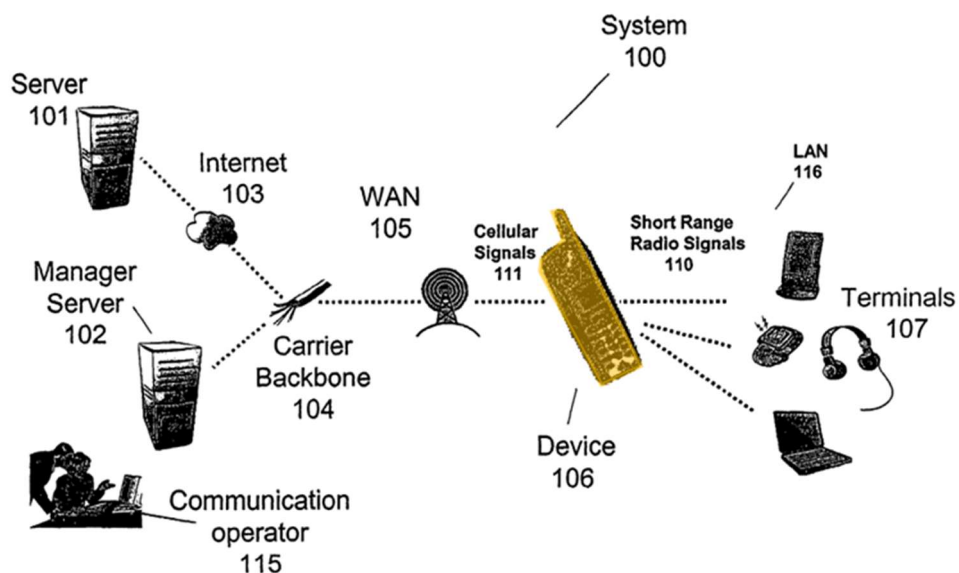


Fig. 1

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

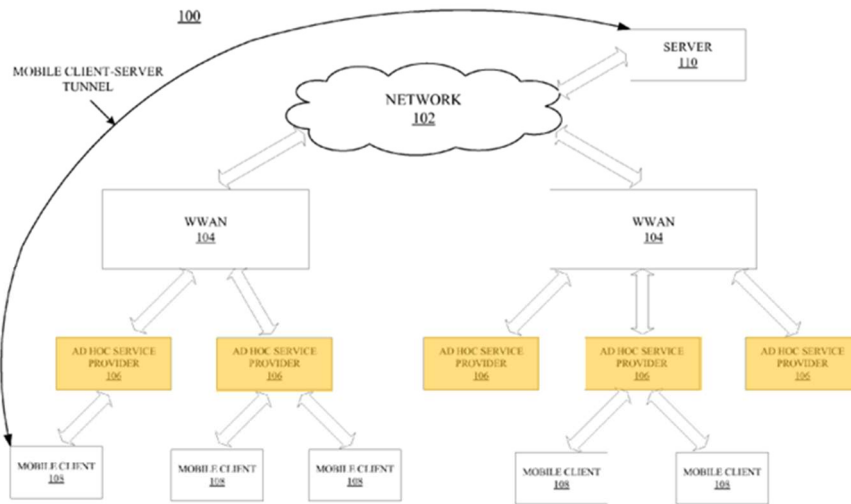
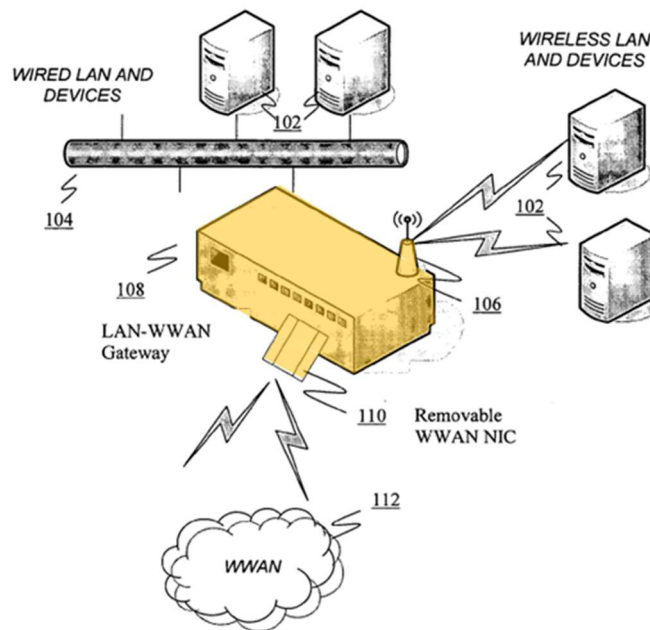


FIG. 1

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 '102 PATENT

1. Background

42. The '102 patent discloses a system for allowing an end user device to be used as an intermediate networking device. EX1001, 32:38-48, 35:24-33. Figure 15, as annotated below, reflects the purported invention:

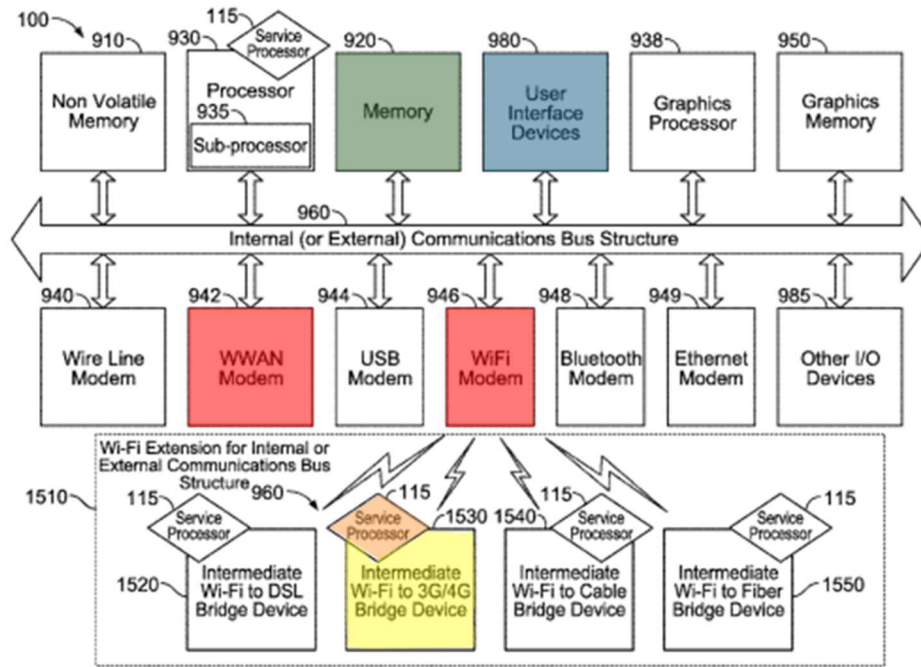


FIG. 15A

EX1001, Fig. 15A (annotated). The end user device of the '102 patent includes a **modem** that facilitates communication with one or more network elements and one or more other devices. The **memory** of the end user device stores service policy settings that authorize the end user device to provide a forwarding service. The **service processor** obtains configuration information and a user input through a **user interface**, and modifies a service policy setting to enable or disable the forwarding service.

2. Prosecution History

43. During prosecution, the Examiner did not issue any prior art-based rejections. The Examiner issued only an indefiniteness rejection based on the term “assisting the end-user device in communicating with one or more other devices.” EX1002, 193. The Applicant overcame the rejection, and the claims were allowed. EX1002, 187, 165.

VIII. PRIOR ART

1. *Thomas*

44. *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.

45. 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:

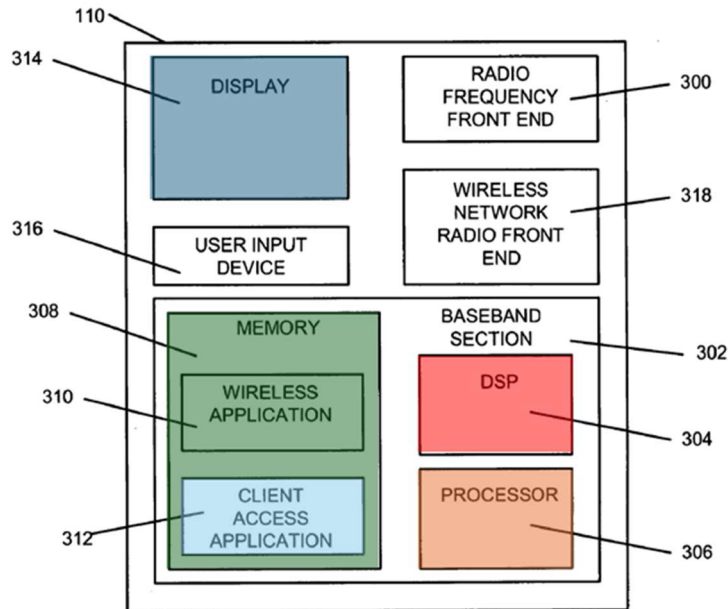
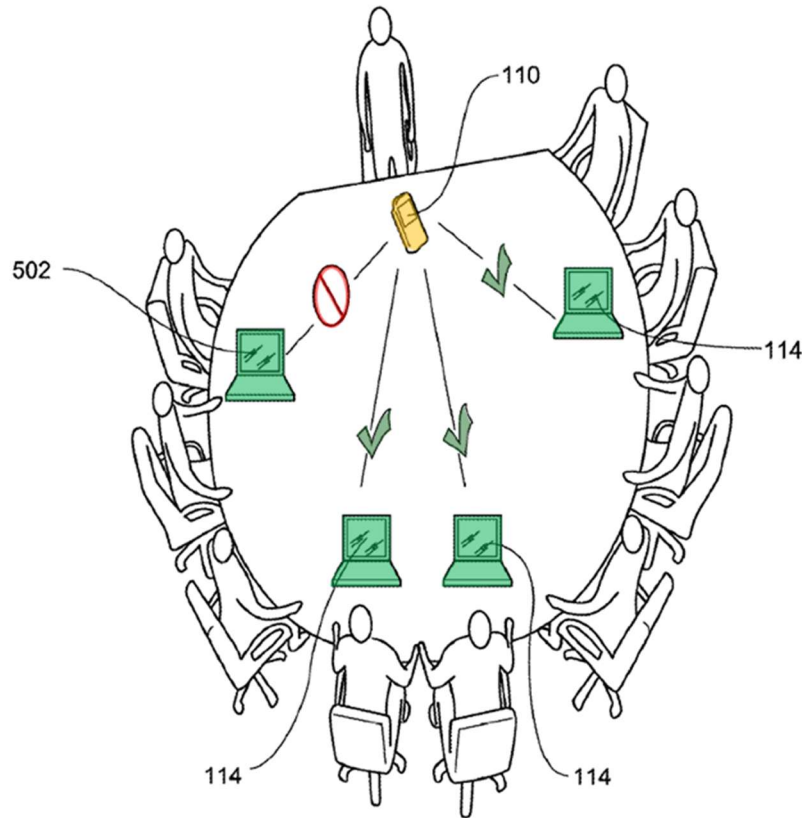


FIGURE 3

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.

46. 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.

2. *Sewall*

47. *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.

3. *Boudreau*

48. *Boudreau* discloses a mobile wireless server including parameters that may be used to configure a mobile wireless client. EX1007, Abstract. As explained by *Boudreau*, the wireless server can communicate with the mobile wireless clients over a secure wireless channel. EX1007, ¶49. For example, the wireless server may establish a “trust group” among mobile wireless clients to facilitate secured communications. EX1007, ¶52.

4. *Burnett*

49. *Burnett* discloses a wireless communications network that includes a wireless data device and mobile communications devices in communication with a radio access network. EX1008, 3:54-62. The wireless communication network provides a “dynamic subscription update feature.” EX1008, Abstract. The dynamic subscription update feature of *Burnett* includes an update offer sent as a formatted

message to a subscriber's device. EX1008, 7:54-67. Providing a dynamic subscription update can benefit a subscriber by, for example, identifying and presenting an appropriate service plan for the subscriber based on the subscriber's usage history to minimize the subscriber's overage fees. EX1008, 8:37-49.

5. *Pandya*

50. *Pandya* discloses a distributed network including servers and client devices that are connected over a network link. EX1009, ¶32. The distributed network of *Pandya* includes agent devices, such as computers, and other devices, such as cellular phones, that act as control points to manage network resources. EX1009, ¶¶28, 44. *Pandya*'s control-point devices monitor network events and congestion and provide a traffic control mechanism to dynamically allocate bandwidth within the distributed network. EX1009, ¶¶28, 77

6. *Sewall '327*

51. *Sewall '327* discloses a personal hotspot device that enables multiple devices to connect to the internet. EX1010, ¶2. The hotspot device collects and maintains usage statistics for each individual device that uses the hotspot traffic-forwarding service. EX1010, ¶¶25-28. The usage statistics are maintained in a "client usage table." EX1010, ¶26. Each entry in the client usage table is "unique to a particular client" and corresponds to "a monitored use of router device 10 by a

given client.” EX1010, ¶26. Network resources may be more efficiently allocated by monitoring usage of the hotspot traffic-forwarding service by individual devices. EX1010, ¶7.

7. *Trossen*

52. *Trossen* discloses establishing a service provisioning relationship between a user device and a bridging user device through a wireless network. EX1011, Abstract. A message including cost information is sent to the originating user to establish the service provisioning relationship. EX1011, ¶28. The originating user of *Trossen* can either accept or reject the identified cost. EX 1011, ¶30. An offer-counteroffer model of negotiation between the originating user and the bridging user may continue with user input. EX1011, ¶31.

IX. LEVEL OF ORDINARY SKILL IN THE ART

53. 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.

54. In my opinion, a person of ordinary skill in the art pertinent to the '102 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 '102 patent.

X. CLAIM CONSTRUCTION

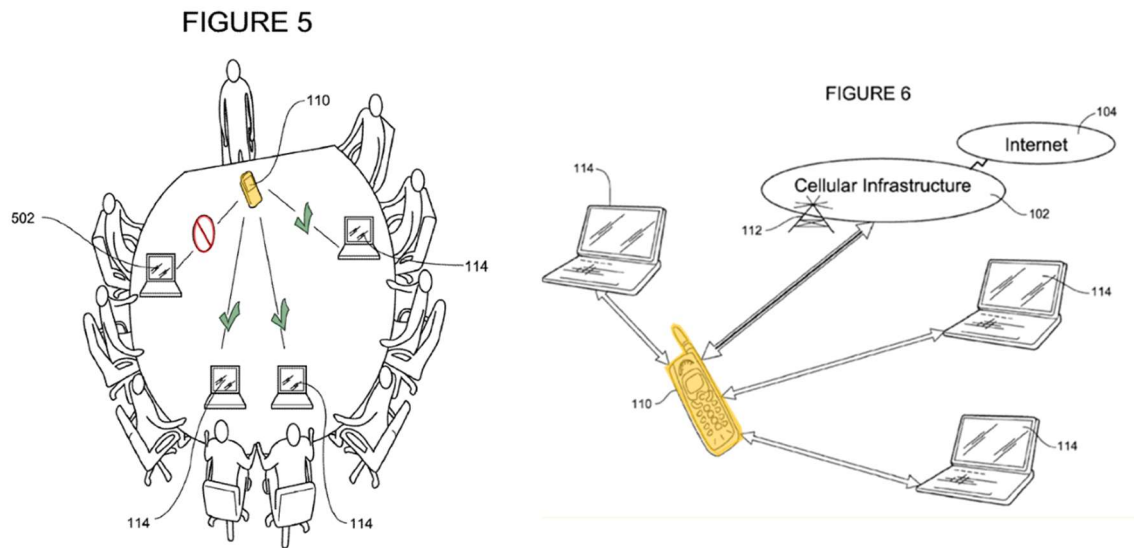
55. In my opinion, no claim terms need to be expressly construed.

XI. GROUND 1: CLAIMS 1, 2, 5, 7, 8, and 10-15 ARE ANTICIPATED BY THOMAS

1. Independent Claim 1

a. 1[pre]: “An end-user device, comprising:”

56. *Thomas* discloses 1[pre]. According to *Thomas*, a wireless device 110, such as a cell phone or a satellite phone, acts as an ad hoc point of presence on a wireless network to allow other computing devices to access the internet via the wireless device 110. EX1005, ¶¶2, 23, 25. Figures 5 and 6, as annotated below, further reflect wireless device 110, a cellular phone, providing such services. *Id.*, ¶¶44-46, 52.



Id., Figs. 5, 6 (annotated).

b. 1[a]: “one or more modems for;”

57. *Thomas* also discloses 1[a]. One of skill would understand from *Thomas* that, as was conventional for internet or WLAN enabled cellular or mobile device by 2009, *Thomas*’s wireless device includes a modem for wirelessly connecting to the internet (e.g., over a 2G, 3G, or 4G connection) and communicating with other computing devices over Wi-Fi or WLAN networks. EX1005, ¶33. For example, *Thomas*’s wireless device 110 shown in Figure 3, as annotated below, includes a **radio frequency front end component 300** that provides for bidirectional communication to the wireless device, as well as a **wireless network radio front end component 318** that enables the device’s other wireless communication capabilities (e.g., local Wi-Fi or WLAN connectivity). *Id.*,

¶¶33-34.

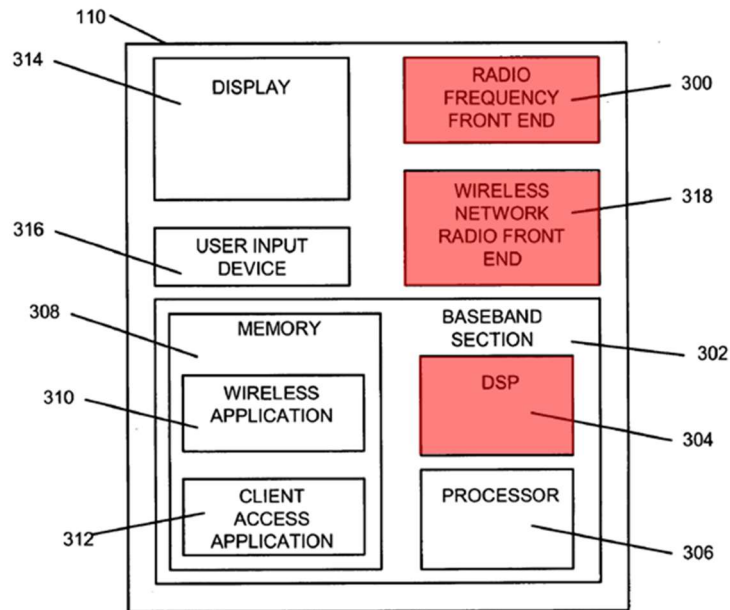
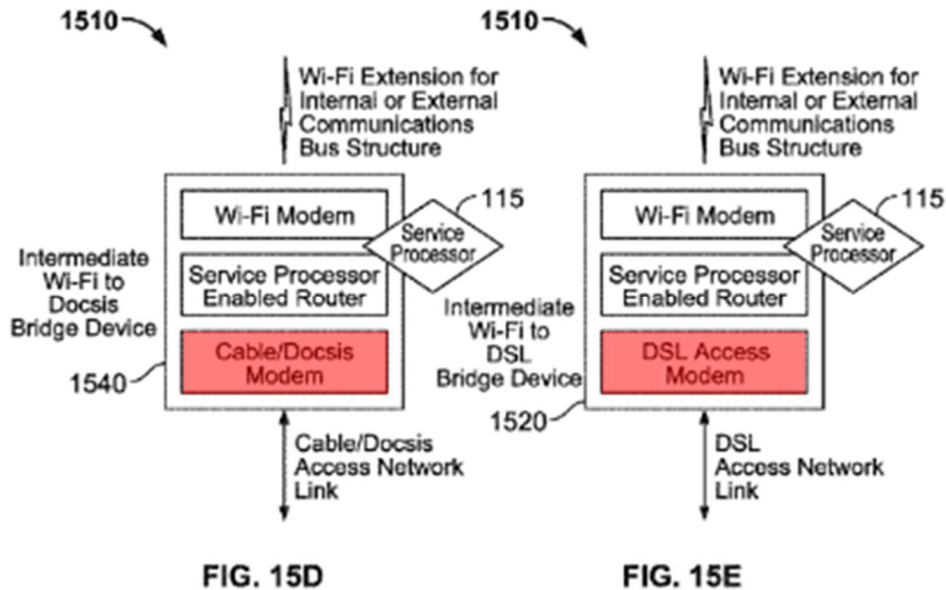


FIGURE 3

Id., Fig. 3 (annotated). In fact, it explicitly discloses that an **DSP 304** “**modulates** and **demodulates** data”—a modem—in processing data transmissions to and from the wireless device. *Id.* (emphases added).

58. *Thomas* further discloses that its wireless device 110 may be used to provide connectivity in place of a cable or ADSL modem by serving as the modem instead. EX1005, ¶¶[48, 51. I checked the '102 patent to confirm the relevance of such modems with respect to the claimed invention. In Figures 15D and 15E, for example, the '102 patent reflects that these types of modems may be used in the claimed invention:

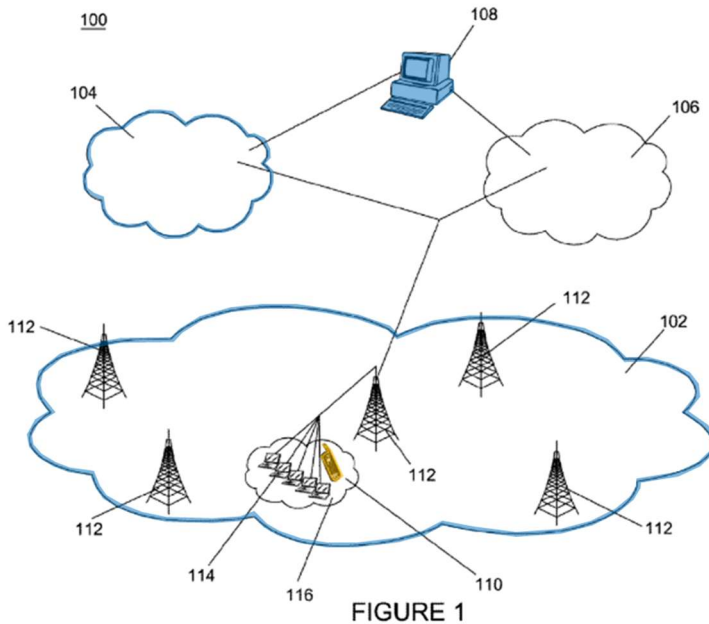


EX1001, Figs. 15D (“**Cable/Docsis Modem**”), 15E (“**DSL Access Modem**”) (annotated).

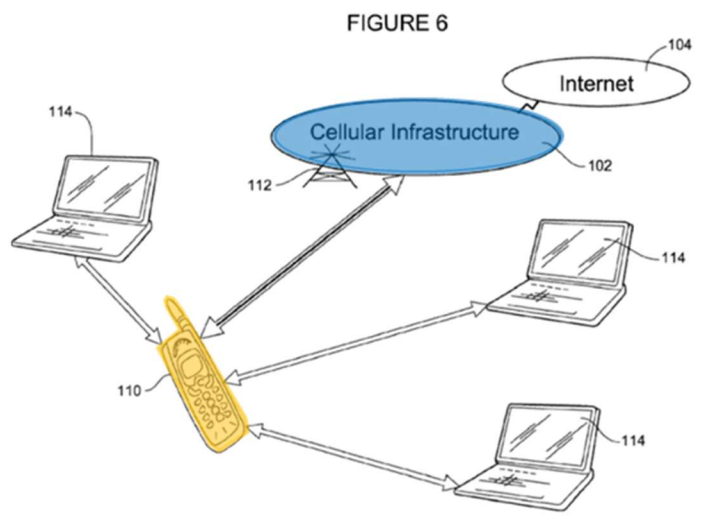
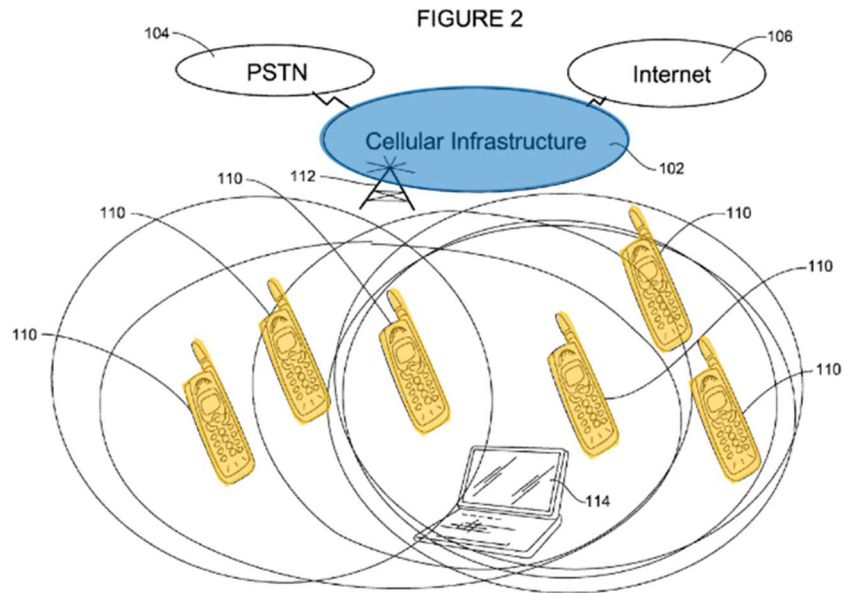
59. Accordingly, one of skill in the art would recognize *Thomas* discloses one or more modems as recited in 1[a].

- c. 1[a][i]: “**assisting the end-user device in communicating with a network system over a wireless access network, the network system comprising one or more network elements, and;**”

60. *Thomas* discloses 1[a][i]. The one or more modem(s) of *Thomas*’s wireless device assists with communicating with a network system over a wireless access network. Figure 1, for example, reflects **wireless device 110** connecting to a network system like a **cellular network 102** and the **internet 104**.



EX1005, ¶¶24-25, Fig 1 (annotated). That network system comprises one or more network elements, including a [server 108](#) and other wireless network elements, such as the cell towers in Figure 1. *Id.* Figures 2 and 6 also depict “[Cellular Infrastructure](#)” for connecting to the internet.

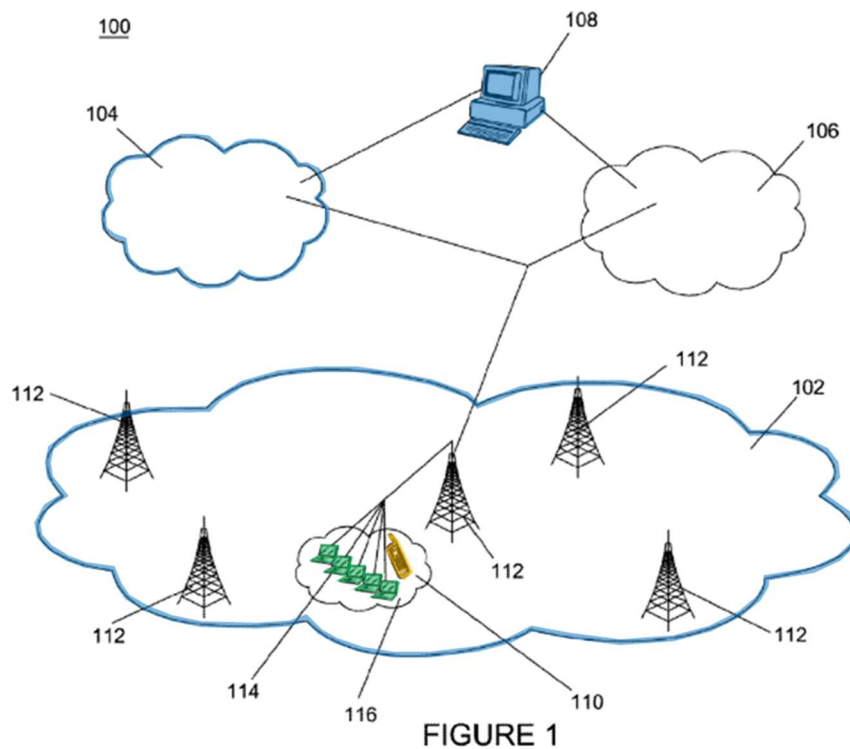


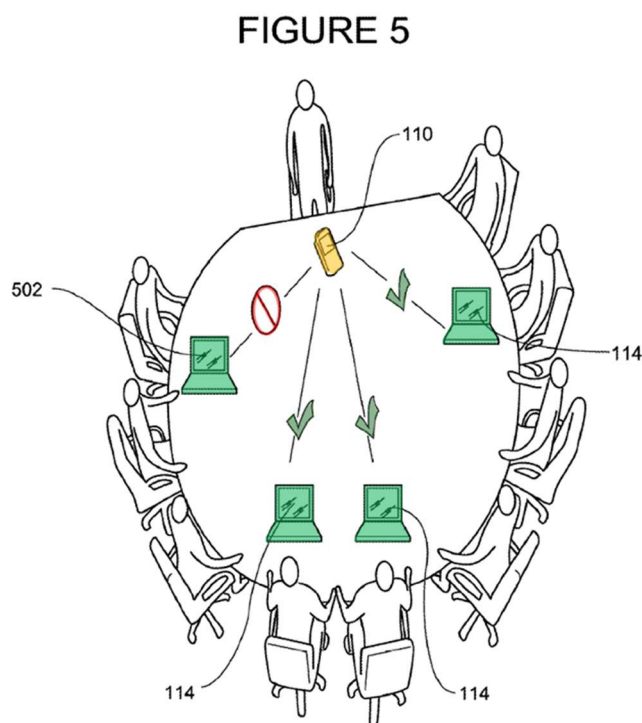
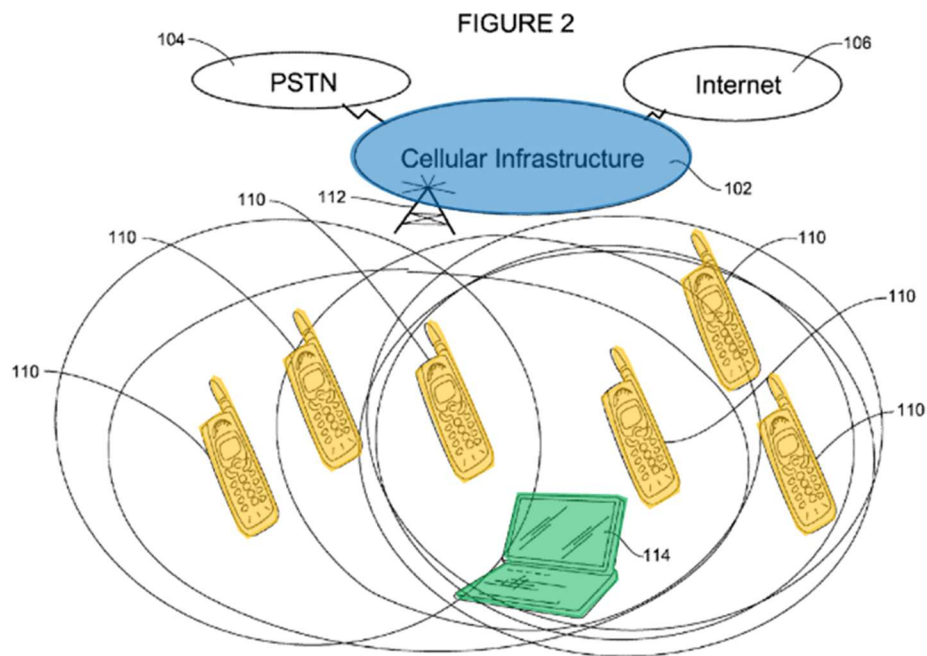
Id., Figs. 2, 6 (annotated).

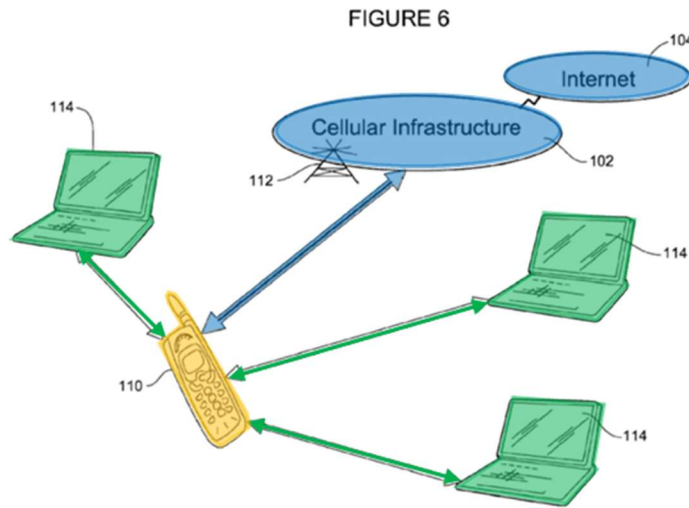
- d. 1[a][ii]: “assisting the end-user device in communicating with one or more other devices over a wireless local-area network, a personal-area network, a near-field network, or a combination of these;”

61. *Thomas* discloses 1[a][ii]. In *Thomas*, the one or more modem(s) of its

disclosed wireless device assists with communicating with one or more other devices over the recited networks, which may vary in terms of the distance over which they can provide connectivity for network communications. Figures 1, 2, 5, and 6, for example, reflect the **wireless device 110** communicating with one or more **laptop devices**.







EX1005, ¶26 (disclosing the other devices may be desktop computers, laptops, etc.); Figs. 1, 2, 5, and 6 (annotated). *Thomas* discloses that its wireless device 110 may communicate with such devices “via a shorter wireless local area network (WLAN) 116.” *Id.*, ¶25. *Thomas*’s wireless device 110 may also communicate with the other devices via local area networks and small area networks such as a home network (i.e., a personal-area network), replacing cable or ADSL modems, as well as near-field networks (e.g., Bluetooth or infrared). *Id.*, ¶¶28, 30, 48-51, 6.

- e. 1[b]: “memory configured to store a plurality of service policy settings, the plurality of service policy settings including a first service policy setting for authorizing the end-user device to provide a forwarding service to the one or more other devices, the forwarding service for forwarding traffic between the one or more other devices and the network system;”

62. *Thomas* discloses 1[b]. Figure 3 of *Thomas*, annotated below, shows that wireless device 110 includes memory 308.

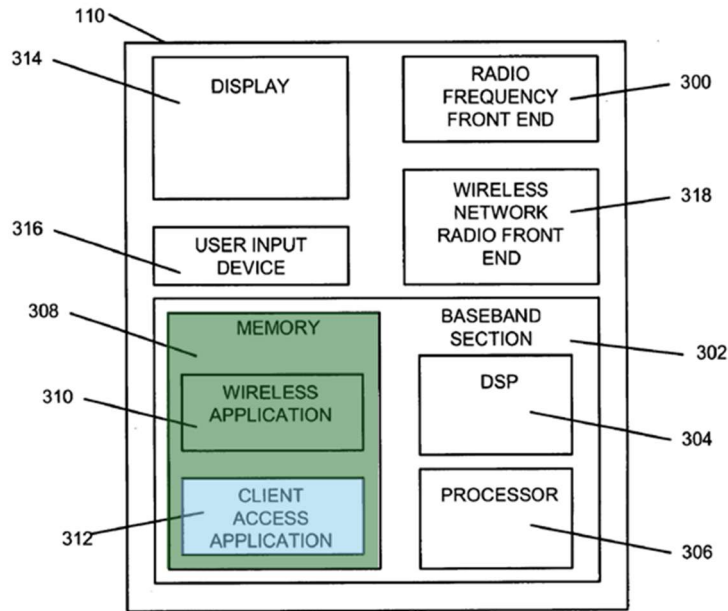


FIGURE 3

EX1005, ¶34, Fig. 3 (annotated). The **memory 308** of *Thomas* stores a **client access application 312**, which provides application-level point of presence capabilities for the **wireless device 110** to forward traffic to/from the other devices, such as **laptops**, and a network, such as the **internet**, as shown in Figures 5 and 6 below.

FIGURE 5

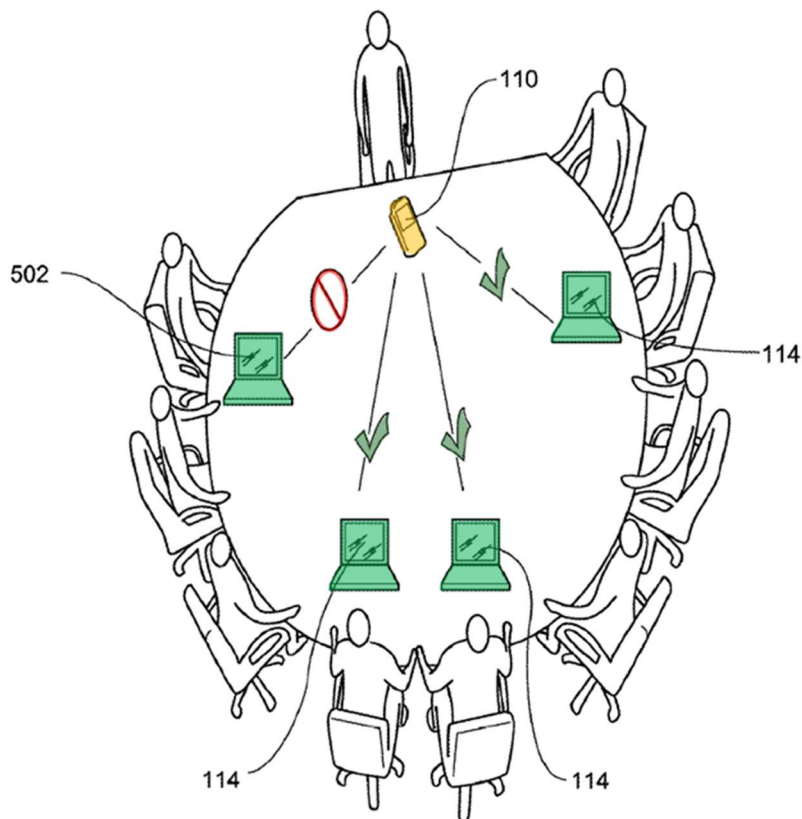
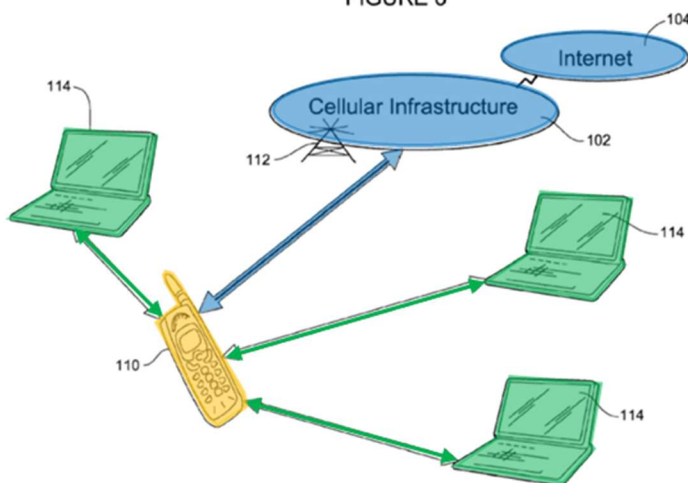


FIGURE 6



EX1005, ¶¶34, 44-46, 52, Figs. 3, 5, 6 (annotated). The memory 308 also stores a

plurality of service policy settings related to the forwarding service and the client access application 312. *Id.*

63. One of skill in the art would understand that the ad hoc point-of-presence feature controlled by the client access application 312 is a “forwarding service” as claimed because it forwards traffic between devices and a network system. *Id.* According to *Thomas*, a client computing device is “allowed to communicate normal traffic through the wireless device 110 to reach a network,” such as the internet, or to access information on a server. *Id.*, ¶47 (emphasis added). The wireless device 110 of *Thomas* may also “act as a bridge for traffic” between a client computing device (e.g., a laptop) and the internet, and may “route the packets for communication sessions between a laptop and internet.” *Id.*, ¶¶ 84, 86. One of skill in the art would also understand that *Thomas*’s disclosed features of *allowing*, *bridging*, and *routing* traffic are a “forwarding service.” My opinion is also confirmed by dependent claim 2 of the ’102 patent, which recites that “forwarding traffic comprises passing, *bridging*, *routing*, traffic shaping, or otherwise *allowing* the traffic” (emphases added). EX1001, 153:61-154:3.

64. The memory of *Thomas*’s end-user device stores a first service policy setting that authorizes the end-user device to provide a forwarding service to the one or more other devices. As shown in Figure 7 below, when the user of wireless

device 110 of *Thomas* starts application 312 to enable the forwarding service, the wireless device 110 first obtains authorization from a network element such as server 108.

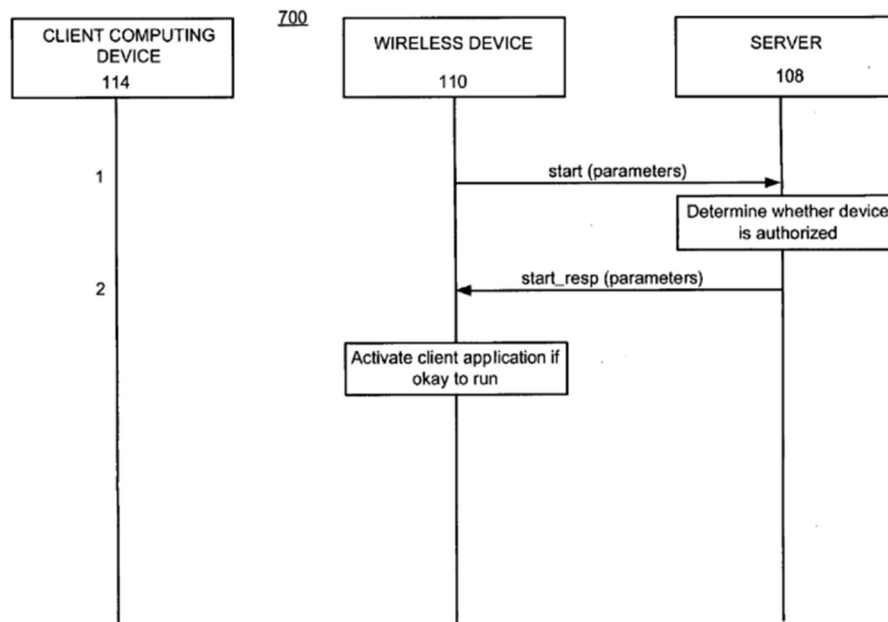


FIGURE 7

EX1005, ¶¶ 57-60, Fig. 7. One of skill in the art would understand that the end user device's initial or default policy service with respect to the forwarding service is *unauthorized*, as authorization is required before wireless device 110 can provide its forwarding service. *Id.*

65. According to *Thomas*, and as shown in Figure 7 above, the wireless device 110 may then send a start message to server 108 to determine whether authorization should be granted. If the server grants authorization, the server may

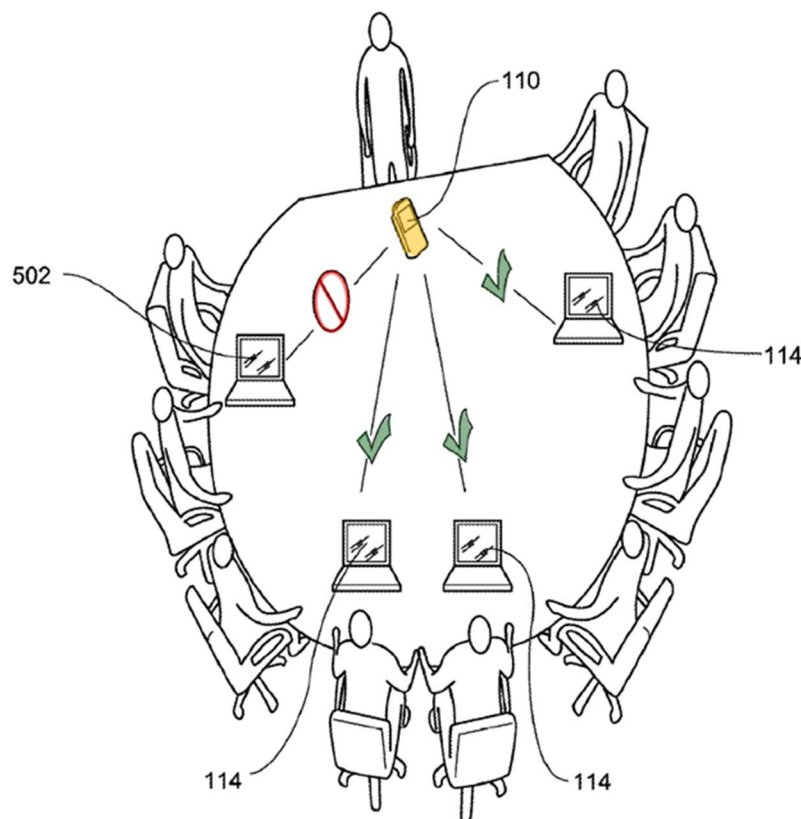
return a start message to the wireless device 110, which provides configuration information for providing the forwarding service. *Id.* This configuration information includes confirmation of authorization. *Id.* (“wireless device 110 will either start the client access application 312 or will stop its attempts depending on whether the parameter set indicated that it was *okay to run or whether it should never start*”), Fig. 7. The wireless device 110 may then change its first service policy setting to *authorized*, which permits the wireless device to initiate application 312 and provide the forwarding service to other computing devices. *Id.*

66. One of skill in the art would understand that *Thomas*’s authorization is a “setting” that would remain in place during the forwarding service session. *Id.* This is reflected, for example, by *Thomas*’s disclosure that the wireless device 110 may resend stored packets if it does not receive acknowledgements from upstream devices (e.g., laptops), so there is no need to obtain reauthorization. *Id.*, ¶85. It is also reflected by *Thomas*’s disclosure that once authorization is established, an active forwarding service session can accommodate multiple client devices, which can join and leave the service without wireless device 110 needing to obtain reauthorization to provide the forwarding service. *Id.*, ¶64 (also disclosing that the session may end when the last client device terminates its communications).

67. *Thomas* further discloses that wireless device 110 may change

authorization settings (i.e., another “first service policy setting”) to provide the forwarding service on an individual user-by-user basis. *Id.*, ¶¶44-46, 52, Fig. 5; *see also id.*, ¶85. For example, “wireless device 110 is provided with a user interface to allow or disallow access to a connection ... by computing devices that are within range of the wireless device 110.” *Id.*, ¶¶44-46. This is further demonstrated in Figure 5, as annotated below.

FIGURE 5



Id., Fig. 5 (annotated).

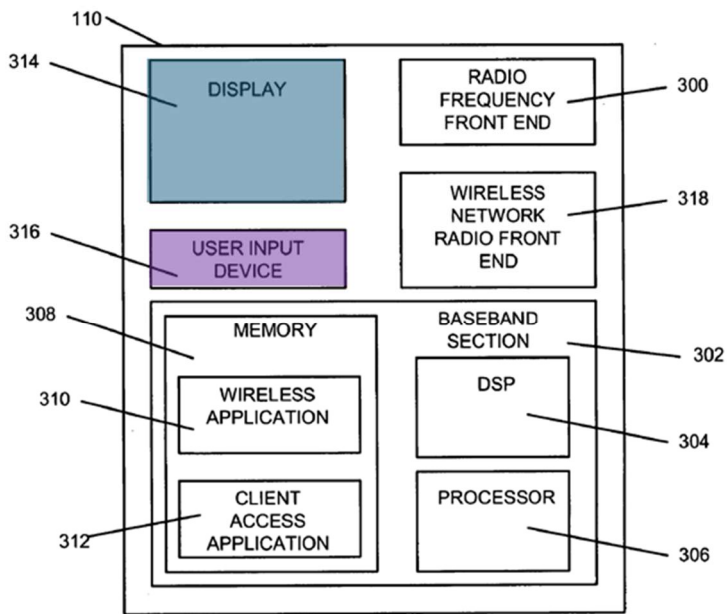
68. According to *Thomas*, the memory of its wireless device 110 stores a

“plurality of service policy settings.” As detailed above, and as reflected by Figure 7, *Thomas* discloses that the service policy for providing the forwarding service may have multiple settings, for example: *unauthorized* or *authorized*. EX1005, ¶¶57-60, Fig. 7. *Thomas* also discloses a variety of other service policy settings for the forwarding service, including message types, cell identifiers, software versions, service levels, random identifiers to match with a later stop message, number of available IP addresses, lease time, remaining data amounts, byte counts, and port restrictions, among other traffic-control features. *Id.* *Thomas* also discloses service policy settings for establishing billing arrangements with other users as well as usage metering and quality of service requirements. *Id.*, ¶¶53-56.

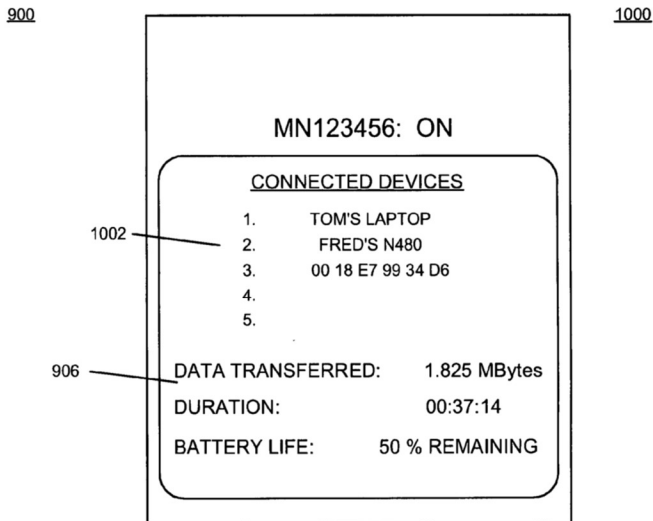
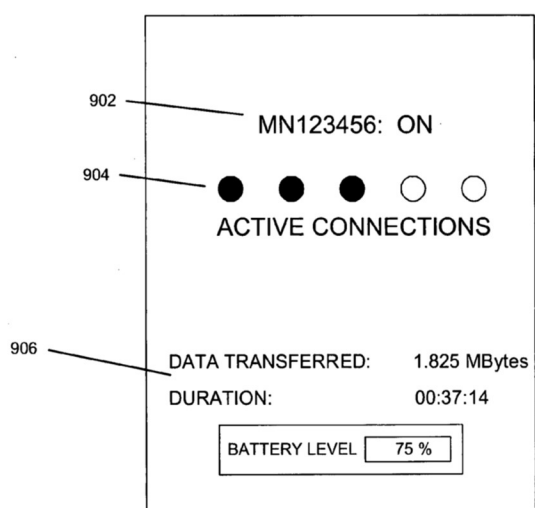
69. Accordingly, *Thomas* discloses all features of 1[b].

f. 1[c]: “a user interface; and”

70. *Thomas* discloses 1[c]. Figure 3 of *Thomas*, as annotated below, shows that wireless device 110 includes a **display 314** and a **user input device 316**.



EX1005, Fig. 3 (annotated), ¶ 34. *Thomas* also reflects exemplary user interfaces in Figures 9 and 10.



Id., Figs. 9, 10, ¶¶ 44-46, 52, 76-77.

- g. 1[d]: “one or more processors configured to execute one or more instructions that, when executed by the one or more processors, cause the one or more processors to:”

71. *Thomas* discloses 1[d]. As shown in Figure 3, annotated below, *Thomas*’s wireless device 110 includes a processor 306 that provides computational and processing capabilities for the wireless device 110.

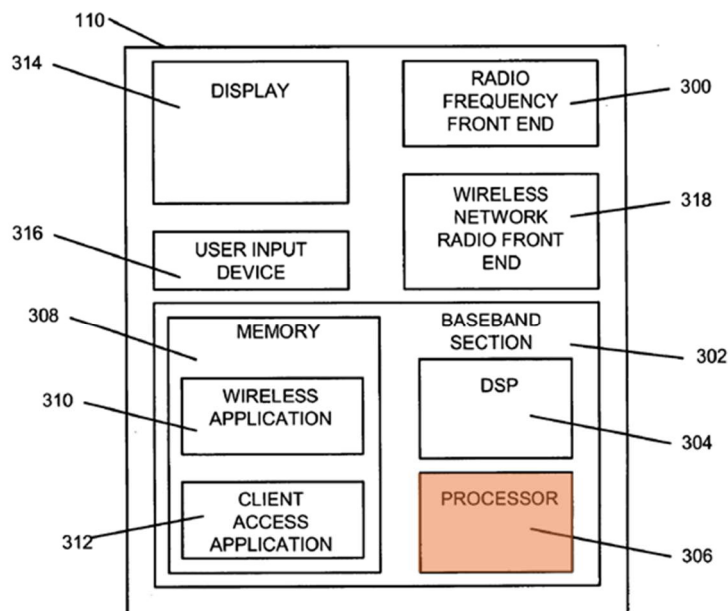


FIGURE 3

EX1005, ¶33, Fig. 3 (annotated).

- h. 1[d][i]: “at least assist to obtain configuration information from the one or more network elements, the configuration information instructing the one or more processors to modify or to allow modification of the first service policy setting,”

72. *Thomas* discloses 1[d][i]. *Thomas*’s wireless device 110 starts client application 312 and sends a start message to server 108, which corresponds to a

“network element,” in order to request authorization to provide a point-of-presence forwarding service. EX1005, ¶¶57-58. As depicted in Figure 7, the server 108 determines whether the wireless device 110 is authorized to provide the forwarding service.

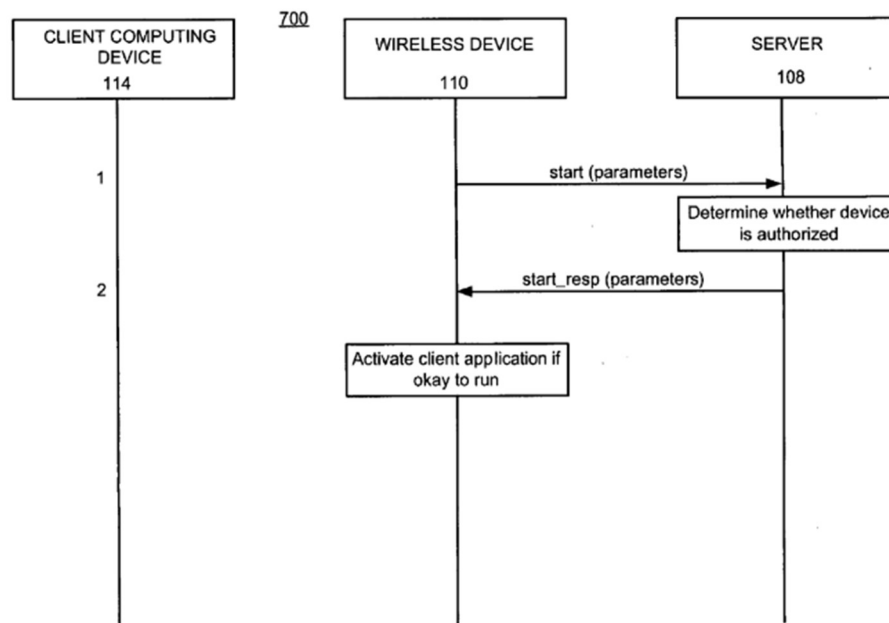


FIGURE 7

Id., ¶59, Fig. 7. If the wireless device 100 is authorized, then the server 108 sends a response to wireless 110 with configuration information:

The start response message includes parameters such as message type, response (e.g., okay to run or never start), service level, date, random identifier (e.g., to match with a subsequent stop message as discussed below), number of available IP addresses, base IP address, lease time, short lease time, new software version, data amount remaining, byte count on/off, port restriction on/off, and notes.

73. *Id.*, ¶59, Fig. 7. As further depicted in Figure 7 above, the server's response message contains information instructing the wireless device's processor to modify the first policy setting from *unauthorized* to *authorized* (i.e., "okay to run or never start") and start application 312. *Id.*, ¶¶59-60, Fig. 7. As discussed above, this authorization "setting" remains in place during the forwarding service session. *Id.*, ¶¶85, 64.

74. As further depicted in Figures 5 and 6, *Thomas* additionally discloses that configuration information may be obtained from network elements that authorize the wireless device 110 to provide its forwarding service on an individual user-by-user basis.

FIGURE 5

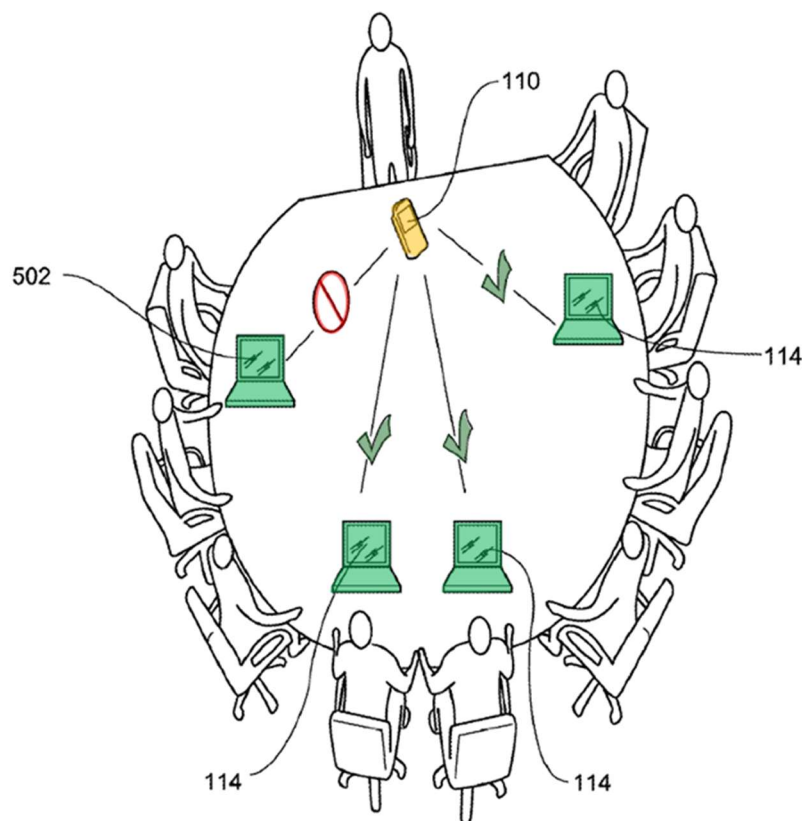
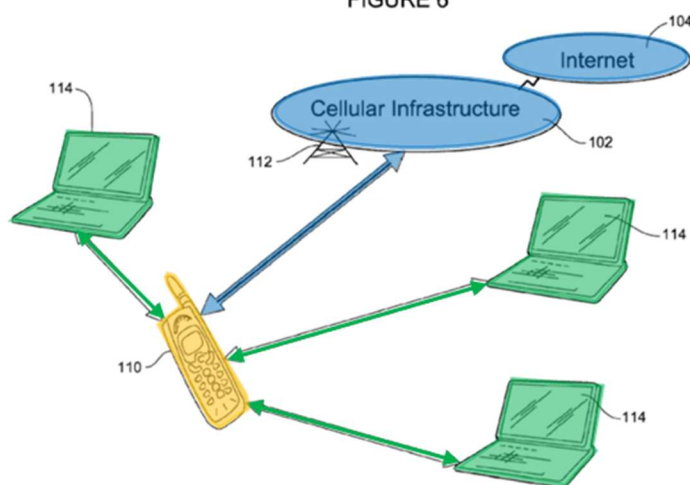


FIGURE 6



Id., ¶¶44-46, 52, Figs. 5, 6 (annotated).

75. For example, a stranger's **computing device** that seeks to access the **internet** through **wireless device 110** may initiate an authorization request, and the **wireless device 110** may pass that authorization request to a service provider that provides the wireless service. *Id.*, ¶52. Alternatively, the stranger may seek authorization directly from his or her own service provider. *Id.*, ¶52. In either case, the **wireless device 110** obtains configuration information from the service provider, which may allow modification of the service policy setting from *unauthorized* to *authorized* to provide the forwarding service to the stranger's **computing device**. *Id.* One of skill in the art would understand that this authorization "setting" remains in place during the forwarding-service session because there is no need to reauthorize if the **wireless device 110** does not receive packet acknowledgements—the wireless device can instead resend them. *Id.*, ¶85.

- i. **1[d][ii]: "at least assist to obtain, through the user interface, a user input associated with enabling or disabling the forwarding service, and"**

76. *Thomas* discloses 1[d][ii]. As shown in Figures 9 and 10, *Thomas*'s wireless device 110 includes a user interface 900 and 1000 to obtain user input to initiate startup and shutdown messages for providing the forwarding service, for example through application 312.

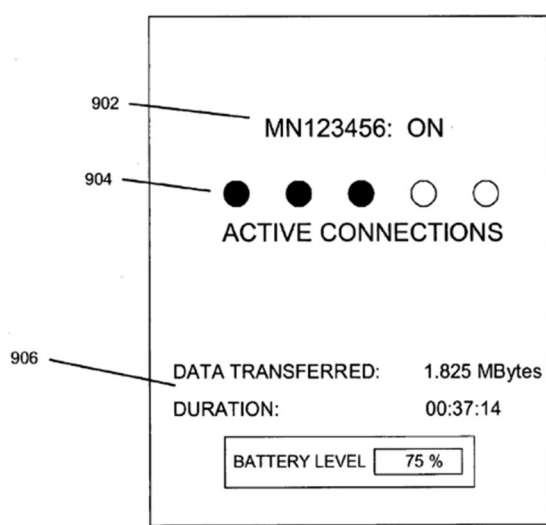


FIGURE 9

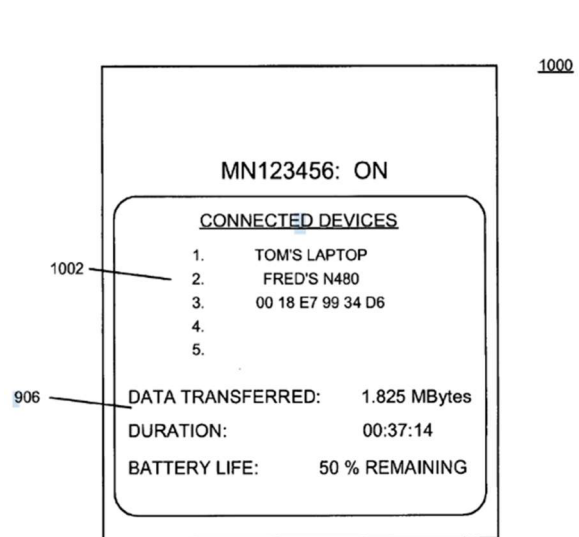


FIGURE 10

EX1005, ¶¶76-77, Figs. 9, 10. For example, “a startup or shutdown message display sequence ... [may] be presented on the user interface 1000.” *Id.* ¶¶76-77.

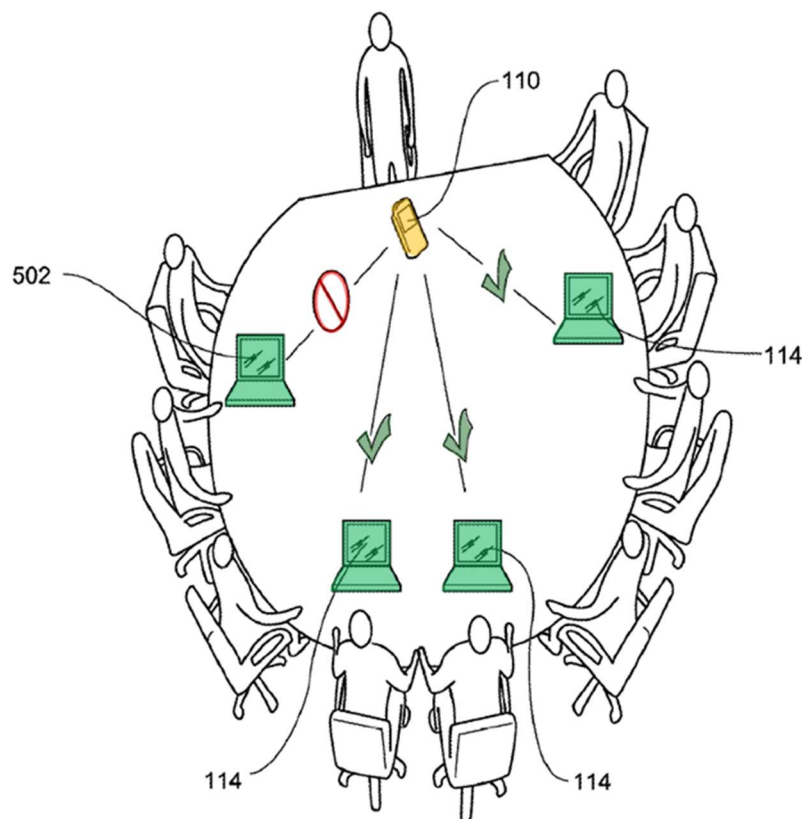
Figures 9 and 10 above reflect the forwarding service as “ON.”

77. Indeed, *Thomas* discloses that “user input device 316 provides the user of wireless device 110 with input capabilities for interaction with the wireless device,” and that the “user” of the wireless device 110 starts application 312 to turn on the forwarding service and initiate the authorization procedures discussed above with respect to the claimed first policy service setting. *Id.*, ¶¶34, 58. *Thomas* also discloses that the “user” of the wireless device 110 stops application 312 to turn the forwarding service off. *Id.*, ¶65. One of ordinary skill would understand that *Thomas* discloses that such direct action by the user occurs by obtaining user input

through the user interface that wireless device 110 provides.

78. *Thomas* also discloses that a user input through the interface can enable or disable the forwarding service on an individual user-by-user basis. For example, as shown in Figure 5, *Thomas* discloses that wireless device 110 has a user interface for obtaining user input to allow or disallow access to other computing devices.

FIGURE 5



Id., ¶¶44-46, Fig. 5 (annotated); *see also id.* ¶52. As shown in Figure 5, as annotated above, the wireless device 110 has a user interface that allows the user to

enable access for three laptops while denying access to a fourth laptop. *Id.*, ¶¶44-46, Fig. 5 (annotated).

- j. 1[d][iii]: “modify a second service policy setting of the plurality of service policy settings in accordance with the user input, the second service policy setting for at least assisting in enabling or disabling the forwarding service.”

79. *Thomas* discloses 1[d][iii]. *Thomas* discloses a second service policy setting for its forwarding service, for example, an on or off setting. As shown in Figures 9 and 10 of *Thomas*, this second service policy setting is reflected in the user interface of *Thomas*’s wireless device 110 which displays that the forwarding service is “ON.”

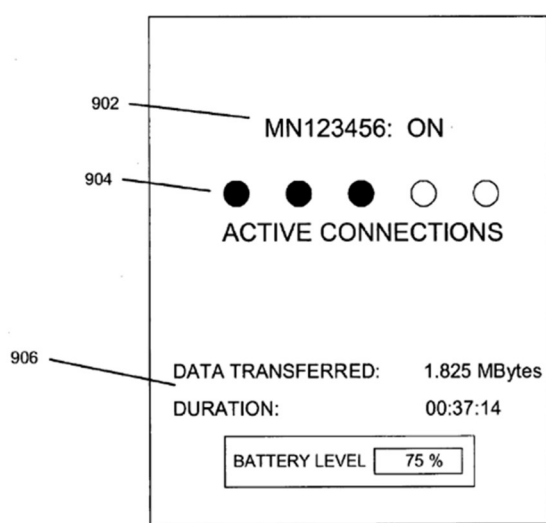


FIGURE 9

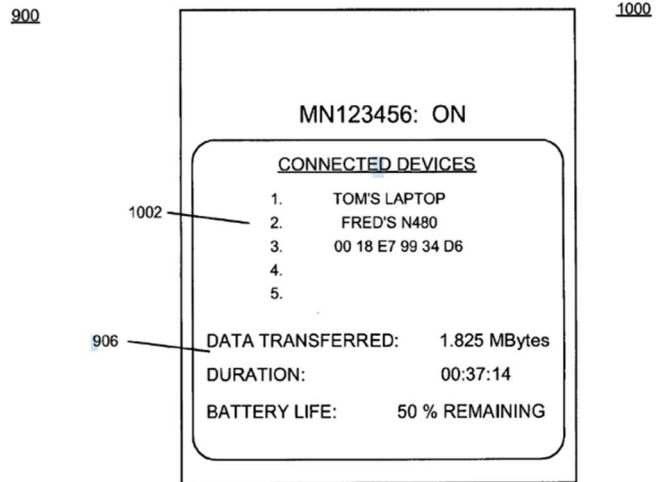


FIGURE 10

EX1005, ¶¶76-77, Figs. 9, 10.

80. In accordance with the user input addressed above, the user device

110 may modify the second policy setting to at least assist in enabling or disabling the forwarding service by turning the forwarding service on or off. For instance, *Thomas* discloses that to enable the forwarding service, “the user of the wireless device 110 starts the client access application 312” and to disable the forwarding service, the “user of the wireless device 110 stops the client access application 312.” EX1005, ¶¶58, 65. The wireless device then sends a stop message to server 108, which returns a stop response message to wireless device 110, which may then terminate the session (i.e., change the second service policy setting to *off*).

81. Accordingly, *Thomas* discloses all limitations of and anticipates claim 1.

2. Claim 2: “wherein forwarding traffic comprises passing, bridging, routing, traffic shaping, or otherwise allowing the traffic.”

82. In my opinion, *Thomas* discloses claim 2. *Thomas* discloses at least three of the forwarding-traffic features of claim 2. It discloses that a client computing device is “*allowed* to communicate normal traffic through the wireless device 110 to reach a network,” such as the internet, or to access information on a server. *Id.*, ¶47 (emphasis added). The wireless device 110 of *Thomas* may also “act as a *bridge* for traffic” between a client computing device (e.g., a laptop) and the internet, and may “*route* the packets for communication sessions between a laptop and internet.” *Id.*, ¶¶ 84, 86. Thus, *Thomas* discloses the *allowing, bridging,*

and *routing* features of claim 2.

3. Claim 5: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to at least assist to obtain a user request, and wherein obtain configuration information is based on the user request.”

83. In my opinion, *Thomas* discloses claim 5. As I explained above, *Thomas*’s wireless device 110 includes a user interface 1000. This user interface may provide options for obtaining a user request to initiate a startup message for providing the forwarding service (i.e., by running application 312). EX1006, ¶¶34, 58-59, 76-77, Figs. 9, 10. That user input is a “request” because the wireless device 110 requires authorization and configuration data from server 108 to establish the forwarding service. My opinion is further confirmed by *Thomas*’s disclosure that after the user request and the start message is received at server 108, the server “determines whether the *requesting* wireless device 110 is authorized to operate within the network” and, if so, returns configuration information to wireless device 110. EX1005, ¶59, Fig. 7. Accordingly, in my opinion, one of skill would recognize that *Thomas* discloses wireless device 110 obtaining configuration information based on the user request.

84. In my opinion, *Thomas* also discloses obtaining a request from a user of a computing device (rather than the owner of wireless device 110) that is requesting access to the forwarding service. EX1005, ¶¶46, 52. *Thomas* discloses

that the request “may appear on the display 314 on the wireless device 110 along with some identifier, such as the service set identifier (SSID) or MAC address of the client computing device 114 that is attempting to seek authorization to use the ad hoc point of presence capabilities of the wireless device 110.” EX1005, ¶46.

The wireless device may then obtain configuration information. EX1005, ¶¶46, 52.

This configuration information may include authorization to extend the forwarding service to the computing device. *Id.* For example, as *Thomas* discloses, after a computing device provides billing credentials to a service provider, authentication is provided to the wireless device 110 and the computing device 114 may gain the ability to send and receive normal traffic via the internet. EX1005, ¶53.

4. Claim 7: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to: at least assist to present, through the user interface, a notification associated with the first service policy setting.”

85. In my opinion, *Thomas* discloses claim 7. As I discussed above regarding 1[b], *Thomas* discloses a first policy setting for authorizing the forwarding service, as well as authorizing the forwarding service on an individual user-by-user basis. *Thomas*’s processors are also caused to present, through the user interface, notifications associated with those authorization policy settings. The exemplary user interface of Figure 10 provides notifications about the amount of data transferred and the duration of a forwarding-service session. EX1005, ¶77,

Fig. 10. So does the exemplary user interface of Figure 9. EX1005, ¶76, Fig. 9.

Figure 10 also provides notifications identifying the computing devices for which the forwarding service has been authorized on a user-by-user basis. *Id.* (“TOM’S LAPTOP”); *id.*, ¶¶44-46, Fig. 5. One of skill would recognize that these notifications are associated with the first service policy setting being set to *authorized*, because that is the necessary setting for the forwarding service to be activated and for the wireless device 110 to forward traffic for other devices. EX1005, ¶¶57-60.

86. The notifications further include “a startup or shutdown message display sequence.” EX1005, ¶76, Fig. 9. A startup message display sequence is associated with the authorization policy setting because the startup messages involve requesting authorization from server 108. EX1005, ¶¶58-59, Fig. 7. A forwarding service shutdown is also associated with the authorization policy setting because the shutdown would return the authorization setting for wireless device 110 to *unauthorized*, and the wireless device would need to again request authorization from server 108 whenever the user next seeks to establish the forwarding service. *See* EX1005, ¶¶59, 65.

5. Claim 8: “wherein the notification comprises information associated with activating the forwarding service.”

87. In my opinion, *Thomas* discloses claim 8. *Thomas* discloses multiple

notifications comprising information associated with activating the forwarding service. For example, *Thomas* discloses notifications that include a “startup ... message display sequence.” EX1005, ¶¶59, 77, Fig. 10. This notification is associated with activating the forwarding service because the startup messages involve requesting authorization from server 108 to run application 312. *Id.* Such notifications also include an “activation status” display to indicate whether the client access application 312 is on or off. EX1005, ¶76, Fig. 9. The notifications also identify the computing devices for which the forwarding service has been authorized on a user-by-user basis. *Id.* (“TOM’S LAPTOP”); *see also id.*, ¶¶44-46, Fig. 5. The session-duration and data-amount notifications are also associated with activating the forwarding service—once this information is communicated through the user interface, the user would recognize successful activation. EX1005, ¶¶76-77, Figs. 9, 10.

6. Claim 10: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to at least assist to present, through the user interface, a notification associated with the forwarding service.”

88. In my opinion, *Thomas* discloses claim 10. *Thomas* discloses that the processors of its wireless device 110 at least assist to present, through the user interface, a notification associated with the forwarding service. For example, an exemplary user interface of *Thomas*’s Figure 10 provides notifications associated

with the forwarding service. EX1005, ¶77, Fig. 10. The notifications include a “startup ... message display sequence.” This notification is associated with the forwarding service because startup messages involve requesting authorization from server 108 to start application 312 and provide the forwarding service. EX1005, ¶¶59, 77, Fig. 10. The notifications also include an “activation status” display to indicate whether the client access application 312 for providing the forwarding service is on or off. EX1005, ¶76, Fig. 9. They also include notifications identifying the computing devices for which the forwarding service has been authorized on a user-by-user basis. *Id.* (“TOM’S LAPTOP”); *see also id.*, ¶¶44-46, Fig. 5. The session-duration and data-amount notifications are also associated with the forwarding service. EX1005, ¶¶76-77, Figs. 9, 10.

7. Claim 11: “wherein the notification comprises information about a usage or cost associated with the forwarding service.”

89. In my opinion, *Thomas* discloses claim 11. *Thomas* discloses that the processors of its wireless device 110 at least assist to present, through the user interface, a notification comprising information about a usage or cost associated with the forwarding service. For example, *Thomas*’s exemplary user interface in Figure 10 provides notifications associated with the forwarding service, including at least information about usage associated with the forwarding service. EX1005, ¶77, Fig. 10. Such notifications include information identifying the amount of data

transferred or the duration of a forwarding service session. EX1005, ¶¶76-77, Figs. 9, 10. Since the user of wireless device 110 is not required to have an unlimited data plan, a skilled artisan would also reasonably expect the data counter to be associated with costs under their service subscription (and for which the user may desire incentives from the service provider). EX1005, ¶¶54-56. *Thomas* also discloses notifications identifying the computing devices for which usage of the forwarding service has been authorized on a user-by-user basis. *Id.* (“TOM’S LAPTOP”); *see also id.*, ¶¶44-46, 76-77, Figs. 5, 9, 10.

8. Claim 12: “wherein the notification comprises information about the forwarding service.”

90. In my opinion, *Thomas* discloses claim 12. *Thomas* discloses that the processors of its wireless device 110 at least assist to present, through the user interface, a notification comprising information about the forwarding service. For example, an exemplary user interface in Figure 10 provides notifications about the forwarding service. EX1005, ¶77, Fig. 10. The notifications include a “startup ... message display sequence,” which is about the forwarding service because the startup messages involve requesting authorization to provide the forwarding service. EX1005, ¶¶59, 77, Fig. 10. The notifications also include an “activation status” display to indicate whether the client access application 312 for providing the forwarding service is on or off. EX1005, ¶76, Fig. 9. They also include

notifications identifying the computing devices for which the forwarding service has been authorized on a user-by-user basis. *Id.*; *see also id.*, ¶¶44-46, Fig. 5. Other notifications are also about forwarding service, including those identifying the duration of a forwarding service session or an amount of data transfer. EX1005, ¶¶76-77, Figs. 9, 10.

9. Claim 13: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to at least assist to control at least an aspect of the forwarding service.”

91. In my opinion, *Thomas* discloses claim 13. *Thomas* discloses that the processor(s) of its wireless device 110 may control at least an aspect of the forwarding service. These features may include assisting a user to configure aspects of at least a service usage policy or a security aspect. Indeed, *Thomas* discloses that its user-configuration settings include aspects of service usage policies, including client auto-connection capabilities, automatic shutdown features, and restoration of settings upon reconnection or power up. EX1005, ¶68. *Thomas* further discloses that many other configuration options are possible, including “security features” that may be provided for the wireless device 110. EX1006, ¶¶68-70.

92. As other examples, the wireless device of *Thomas* may be programmed to accept computer traffic from a select number of computing devices

and allow or disallow access. EX1005, ¶¶46, 44. *Thomas* also discloses an auto-disconnect feature to control access to the forwarding service when the owner of wireless device 110 leaves the home. EX1005, ¶50. It further discloses an incentive plan where provision of the forwarding service is dependent on compensation to the owner of wireless device 110. EX1005, ¶¶54-56. It additionally discloses implementing service levels for controlling the number of concurrent users of the forwarding service and security features and access restrictions to permit only valid computing devices 114 from connecting to the wireless device 110's forwarding service. EX1005, ¶¶69-70.

10.Claim 14: “wherein control at least an aspect of the forwarding service comprises limit a number of devices comprising the one or more other devices.”

93. In my opinion, *Thomas* discloses claim 14. *Thomas* discloses that controlling an aspect of the forwarding service includes limiting the number of devices accessing the forwarding service. For example, it discloses implementing service levels for controlling the number of concurrent users of the forwarding service. EX1005, ¶69. The wireless device may also be programmed to accept computer traffic from a select number of computing devices, including allowing or disallowing other devices to use the forwarding service. EX1005, ¶¶46, 44.

11.Claim 15: “wherein control at least an aspect of the forwarding service comprises restrict, or assist at least one of the one or more other devices to restrict, usage of the forwarding service by the at least one of the one or more other devices.”

94. In my opinion, *Thomas* discloses claim 15. *Thomas* discloses that usage may be metered based on duration of a computing device’s connection to the forwarding service, number and size of packets transmitted, and other factors such as peak or off-peak usage. EX1005, ¶¶54. The wireless device may also be programmed to accept computer traffic from a select number of computing devices and either allow or disallow access. EX1005, ¶¶46. 44.

XII. GROUND 2: CLAIMS 1-2, 4-8 and 10-19 ARE OBVIOUS OVER THOMAS AND SEWALL

1. Motivation to Combine

95. One of skill would have recognized that *Thomas* and *Sewall* are analogous art to the ’102 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.

96. *Thomas* and *Sewall* also share a common goal with the ’102 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, 123:6-27, Fig. 15A-F.

97. In my opinion, one of skill would have been motivated to combine *Thomas*'s and *Sewall*'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.

98. 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.

99. 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 *Thomas* and *Sewall* provide flexible, on-demand internet access without requiring all users to have their own wireless plan subscriptions.

100. Third, *Thomas* and *Sewall* 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.

101. Fourth, *Thomas* and *Sewall* 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.

102. 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.

103. Fifth, *Thomas* and *Sewall* 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.

104. One of skill would have been motivated to implement a combination with both *Thomas's* and *Sewall'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 implementing *Sewall*'s user profiles in *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.

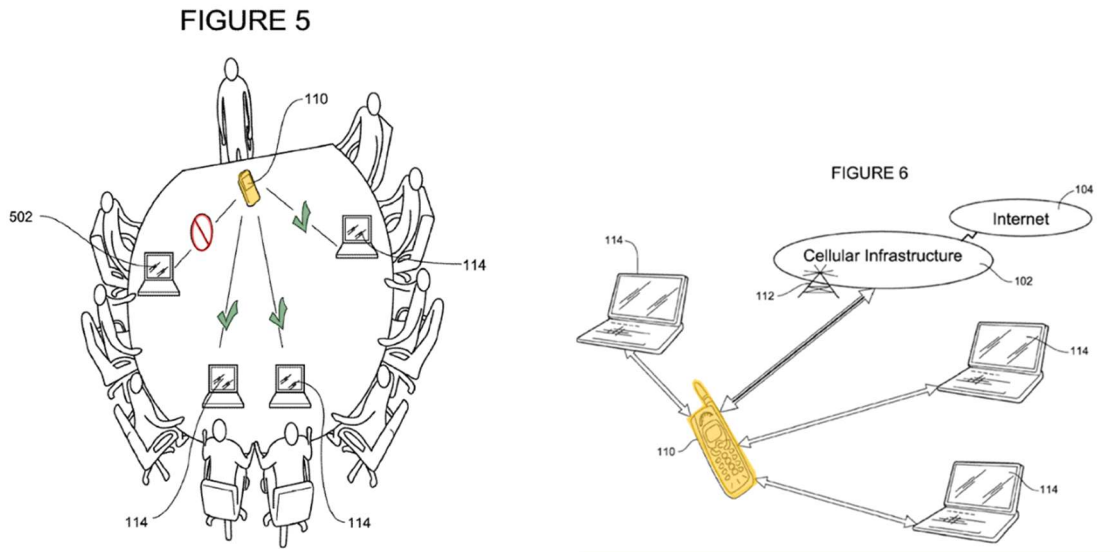
105. In my opinion, for any or all of the potential benefits detailed above that *Thomas* and *Sewall* individually and collectively disclose and suggest, one of skill would have been motivated to combine *Thomas* and *Sewall*. One of skill also would have had a reasonable expectation of success in doing 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. Independent Claim 1

a. 1[pre]: "An end-user device, comprising:"

106. *Thomas* discloses 1[pre]. According to *Thomas*, a wireless device 110, such as a cell phone or a satellite phone, acts as an ad hoc point of presence on a wireless network to allow other computing devices to access the internet via the

wireless device 110. EX1005, ¶¶2, 23, 25. Figures 5 and 6, as annotated below, further reflect **wireless device 110**, a cellular phone, providing such services. *Id.*, ¶¶44-46, 52.



Id., Figs. 5, 6 (annotated).

107. One of skill would recognize that *Sewall* also discloses 1[pre]. It discloses using an internet-enabled cellular telephone as a “personal hotspot” so that laptops, PDAs, and other computing devices can access the internet. EX1006, ¶¶7, 16, Figs. 1, 2.

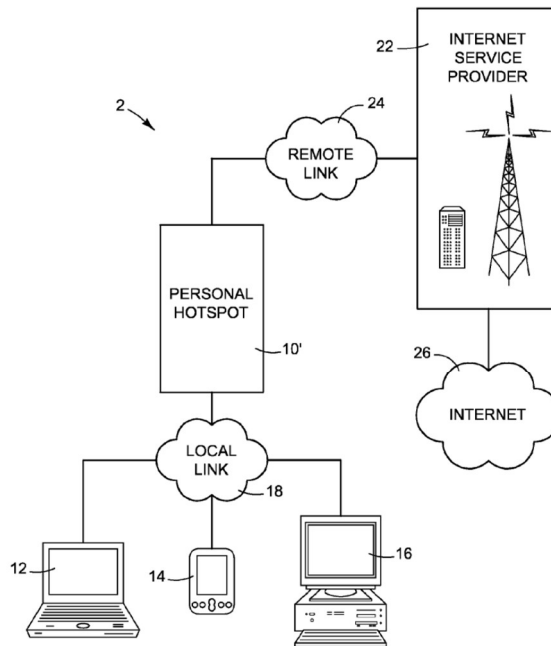


FIG. 2

Accordingly, one of skill in the art would recognize *Thomas* and *Sewall* disclose an end-user device as recited in 1[pre].

b. 1[a]: “one or more modems for;”

108. *Thomas* also discloses 1[a]. One of skill would understand from *Thomas* that, as was conventional for internet or WLAN enabled cellular or mobile device by 2009, *Thomas*’s wireless device includes a modem for wirelessly connecting to the internet (e.g., over a 2G, 3G, or 4G connection) and communicating with other computing devices over Wi-Fi or WLAN networks. EX1005, ¶33. For example, *Thomas*’s wireless device 110 shown in Figure 3, as annotated below, includes a **radio frequency front end component 300** that

provides for bidirectional communication to the wireless device, as well as a **wireless network radio front end component 318** that enables the device's other wireless communication capabilities (e.g., local Wi-Fi or WLAN connectivity). *Id.*, ¶¶33-34.

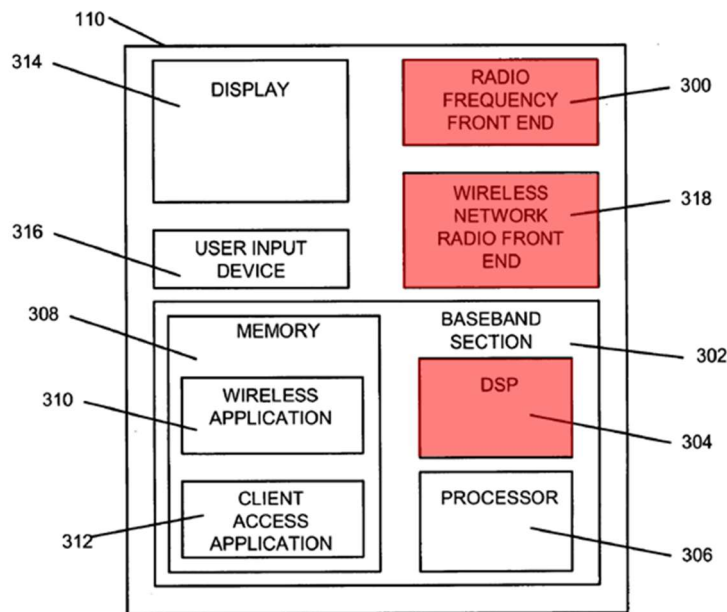
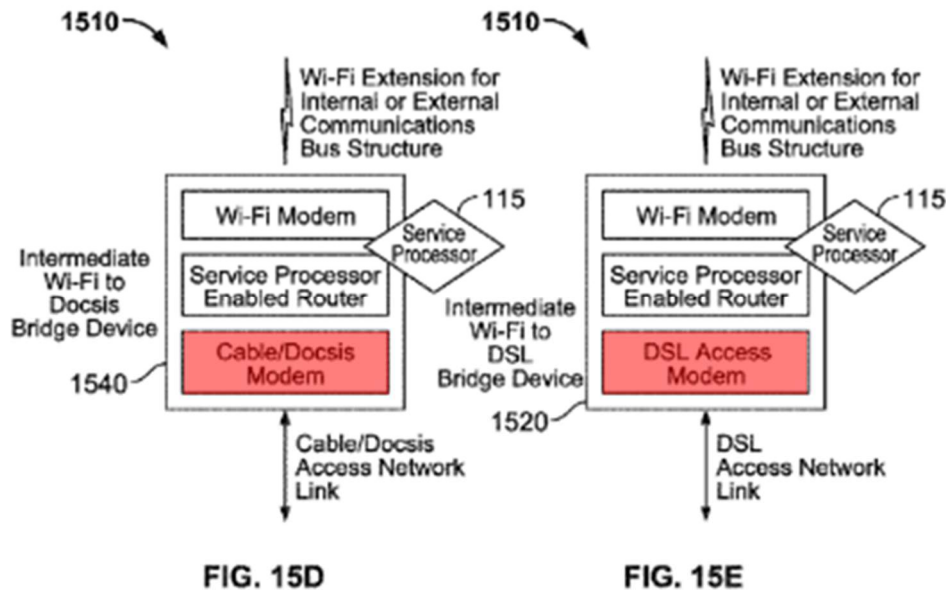


FIGURE 3

Id., Fig. 3 (annotated). In fact, it explicitly discloses that an **DSP 304** “**modulates** and **demodulates** data”—a modem—in processing data transmissions to and from the wireless device. *Id.* (emphases added).

109. *Thomas* further discloses that its wireless device 110 may be used to provide connectivity in place of a cable or ADSL modem by serving as the modem instead. EX1005, ¶¶[48, 51. I checked the '102 patent to confirm the relevance of such modems with respect to the claimed invention. In Figures 15D and 15E, for

example, the '102 patent reflects that these types of modems may be used in the claimed invention:



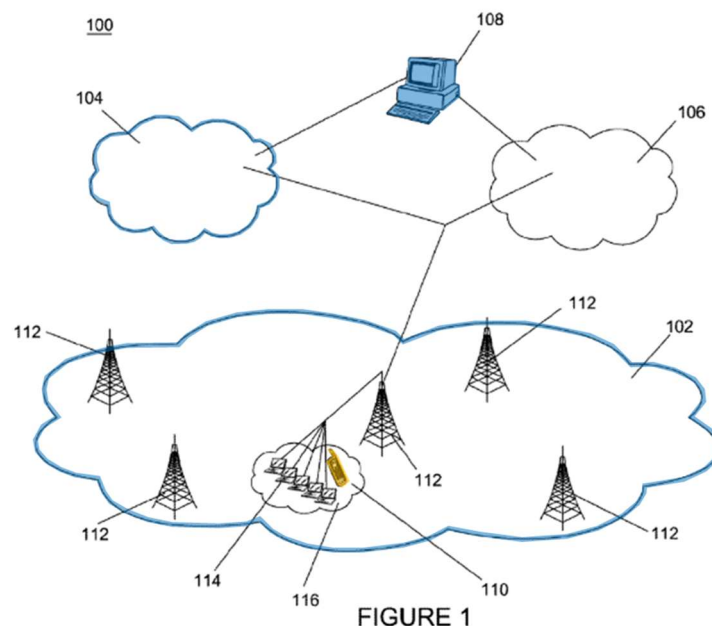
EX1001, Figs. 15D (“**Cable/Docsis Modem**”), 15E (“**DSL Access Modem**”) (annotated).

110. One of skill would recognize that *Sewall* also discloses modems in its hotspot devices. It refers to these modems as “data exchangers.” EX1006, ¶16 (data exchanger 20 and personal hotspot 10 can be incorporated in the same device). As *Sewall* discloses, a data exchanger is a combination of hardware and software that can be utilized to connect to a network such as the internet. In other words, the data exchanger is a modem. *Id.*, ¶10. My opinion is further confirmed by *Sewall*’s disclosure that DSL and cable modems are examples of such data exchangers. *Id.*

111. Accordingly, one of skill in the art would recognize *Thomas* and *Sewall* disclose one or more modems as recited in 1[a].

c. 1[a][i]: “assisting the end-user device in communicating with a network system over a wireless access network, the network system comprising one or more network elements, and;”

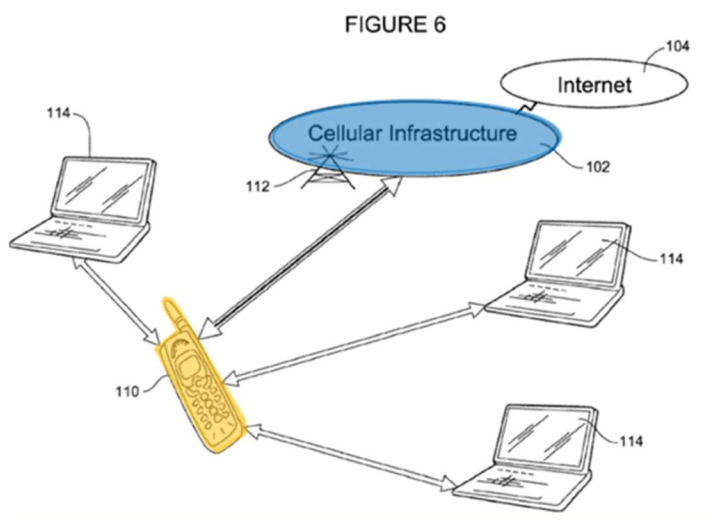
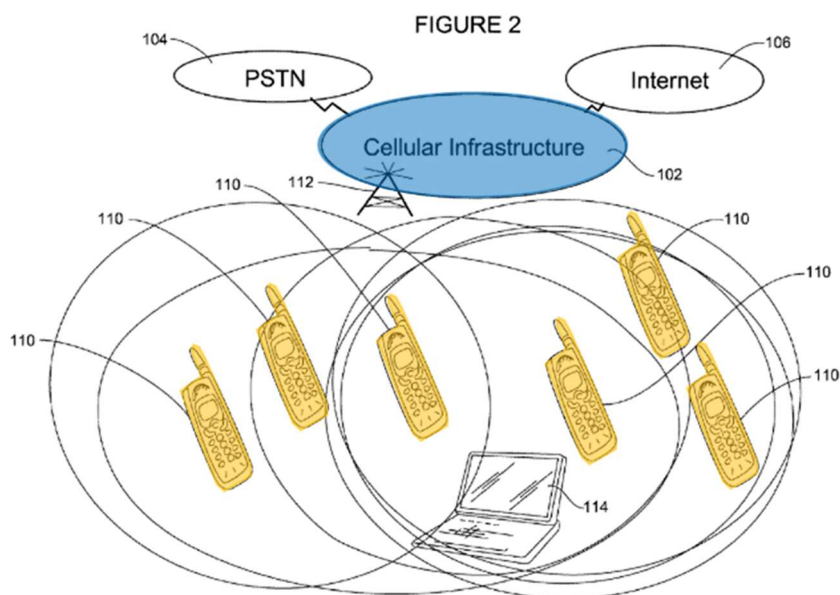
112. *Thomas* discloses 1[a][i]. The one or more modem(s) of *Thomas*’s wireless device assists with communicating with a network system over a wireless access network. Figure 1, for example, reflects **wireless device 110** connecting to a network system like a **cellular network 102** and the **internet 104**.



EX1005, ¶¶24-25, Fig 1 (annotated).

113. That network system comprises one or more network elements, including a **server 108** and other wireless network elements, such as the cell towers

in Figure 1. *Id.* Figures 2 and 6 also depict “Cellular Infrastructure” for connecting to the internet.



Id., Figs. 2, 6 (annotated).

114. One of skill would recognize that *Sewall* also discloses 1[a][i]. As I

described above, *Sewall* refers to the modem(s) incorporated in its devices as “data exchangers.” These modems assist with connecting to remote networks, such as the internet. EX1006, ¶¶11, 16. In Figures 1 and 2, *Sewall* shows its end-user devices connecting to the internet via internet service provider 22, which comprises or more network elements. *Sewall* discloses that internet service provider 22 “represents generally any infrastructure configured to provide internet related data services to subscribers.” EX1006, ¶12.

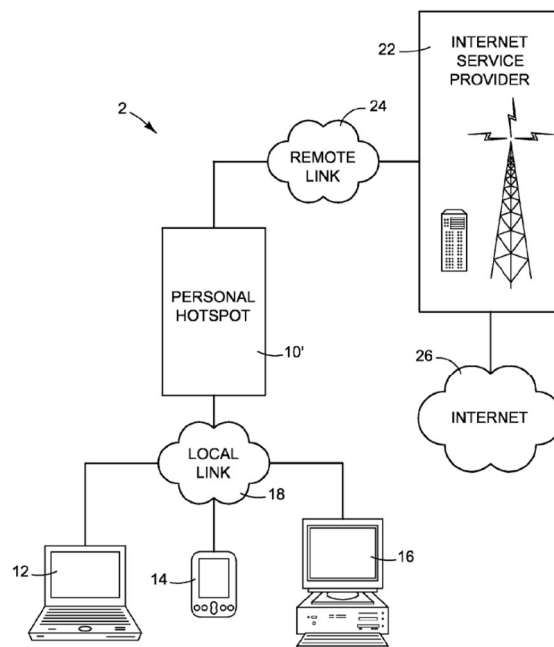
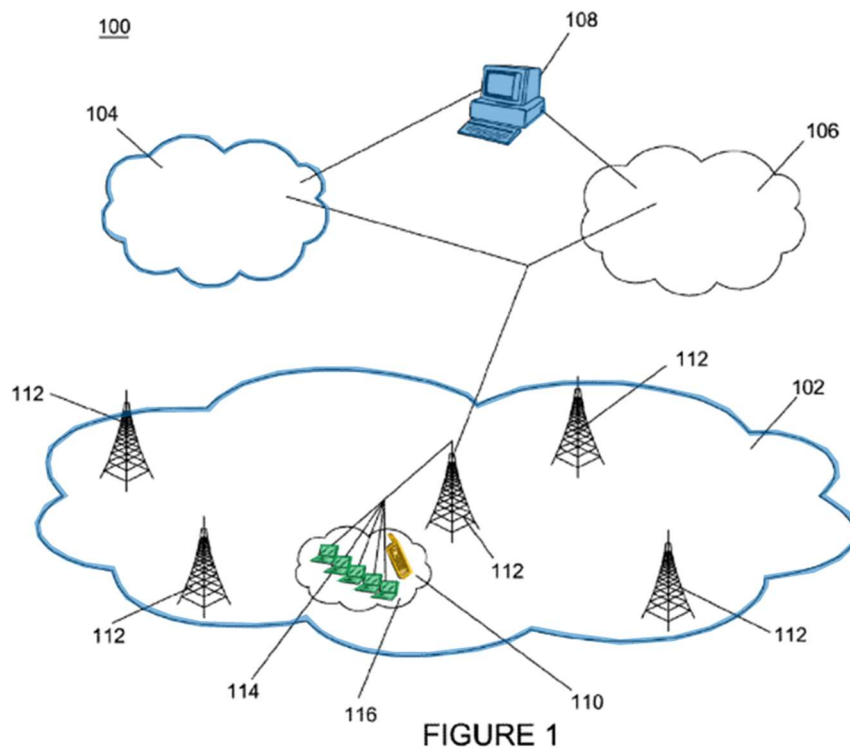


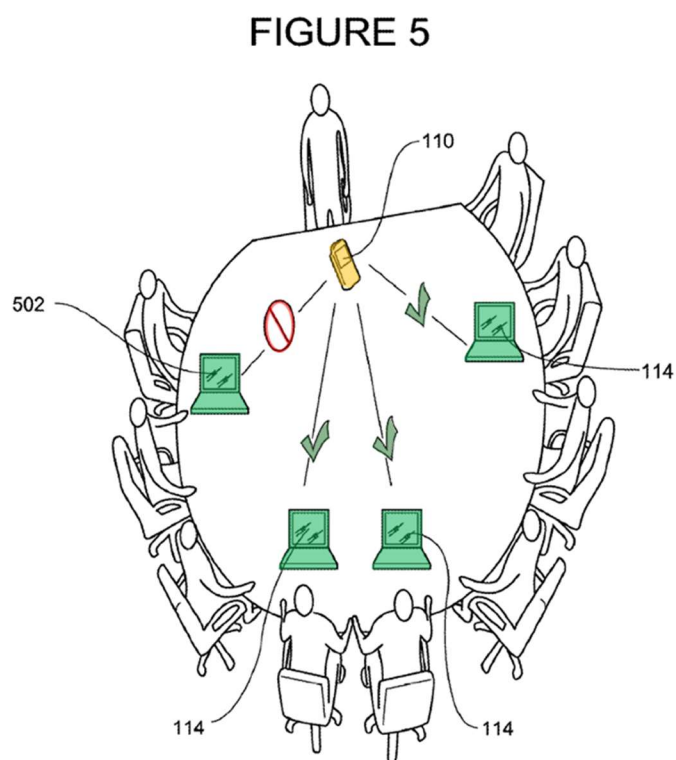
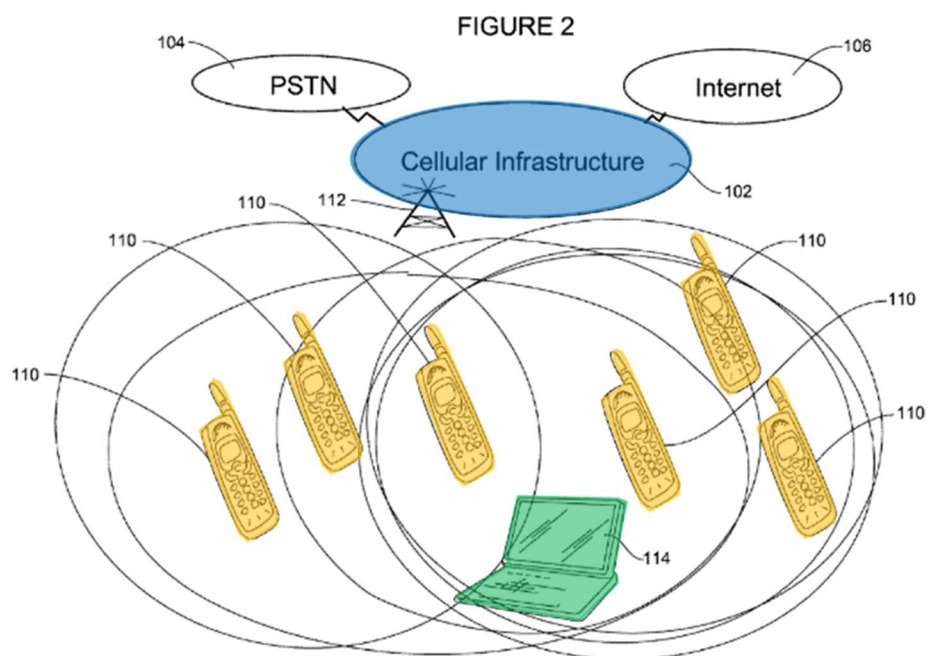
FIG. 2

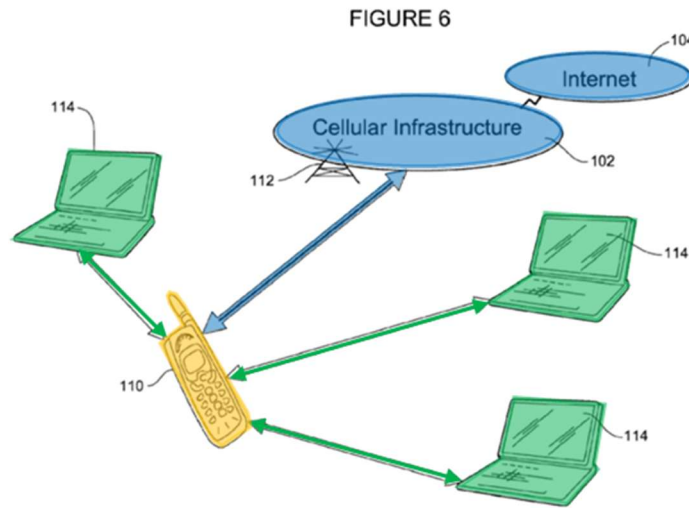
d. 1[a][ii]: “assisting the end-user device in communicating with one or more other devices over a wireless local-area

network, a personal-area network, a near-field network, or a combination of these;”

115. *Thomas* discloses 1[a][ii]. In *Thomas*, the one or more modem(s) of its disclosed wireless device assists with communicating with one or more other devices over the recited networks. Figures 1, 2, 5, and 6, for example, reflect the **wireless device 110** communicating with one or more **laptop devices**.







EX1005, ¶26 (disclosing the other devices may be desktop computers, laptops, etc.); Figs. 1, 2, 5, and 6 (annotated).

116. *Thomas* discloses that its wireless device 110 may communicate with such devices “via a shorter wireless local area network (WLAN) 116.” *Id.*, ¶25. *Thomas*’s wireless device 110 may also communicate with the other devices via local area networks and small area networks such as a home network (i.e., a personal-area network), replacing cable or ADSL modems, as well as near-field networks (e.g., Bluetooth or infrared). *Id.*, ¶¶28, 30, 48-50, 6.

117. One of skill would recognize that *Sewall* also discloses 1[a][ii]. *Sewall* discloses a local link 18, shown in Figures 1 and 2, that may be “a cable, wireless, or remote link via a telecommunication link, an infrared link, a radio frequency link, or any other connector or system that provides electronic communication”

between the personal hotspot device and other end-user devices. EX1006, ¶¶ 10, 16, Figs. 1, 2.

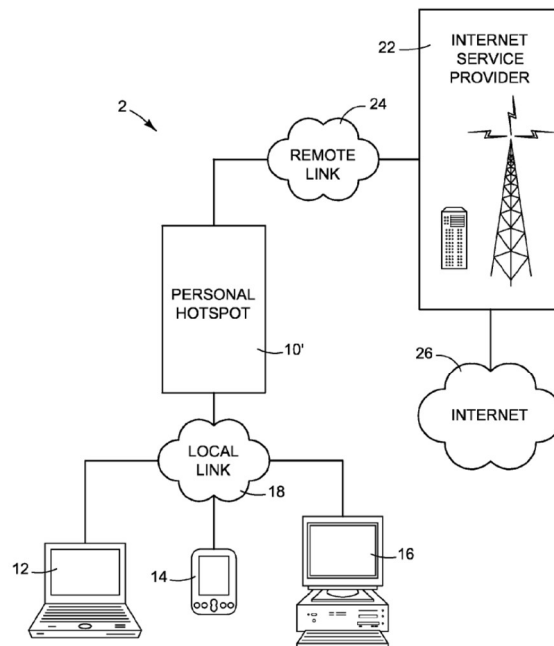


FIG. 2

- e. 1[b]: “memory configured to store a plurality of service policy settings, the plurality of service policy settings including a first service policy setting for authorizing the end-user device to provide a forwarding service to the one or more other devices, the forwarding service for forwarding traffic between the one or more other devices and the network system;”

118. *Thomas* discloses 1[b]. Figure 3 of *Thomas*, annotated below, shows that wireless device 110 includes memory 308.

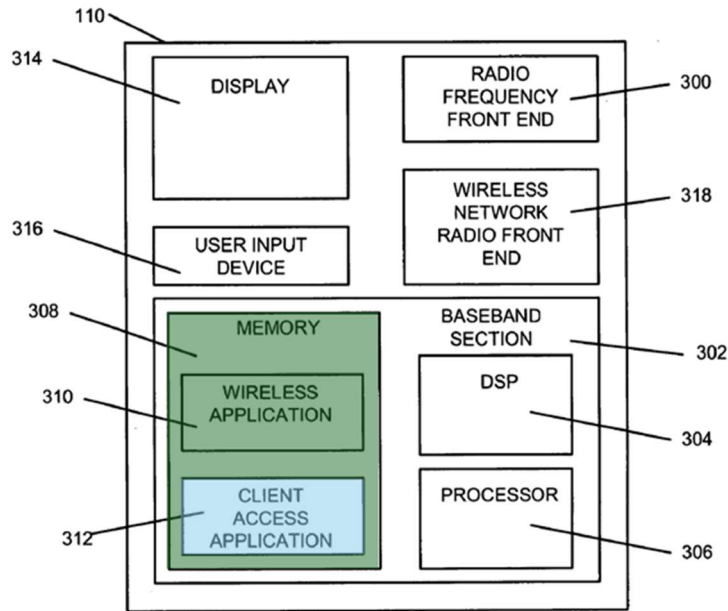


FIGURE 3

EX1005, ¶34, Fig. 3 (annotated). The **memory 308** of *Thomas* stores a **client access application 312**, which provides application-level point of presence capabilities for the **wireless device 110** to forward traffic to/from the other devices, such as **laptops**, and a network, such as the **internet**, as shown in Figures 5 and 6 below.

FIGURE 5

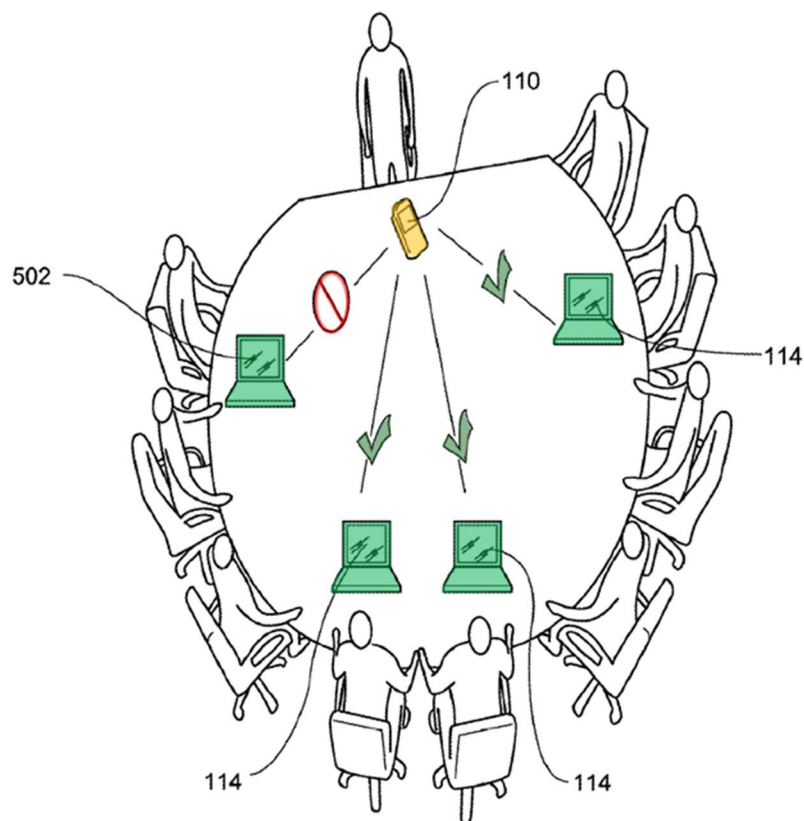
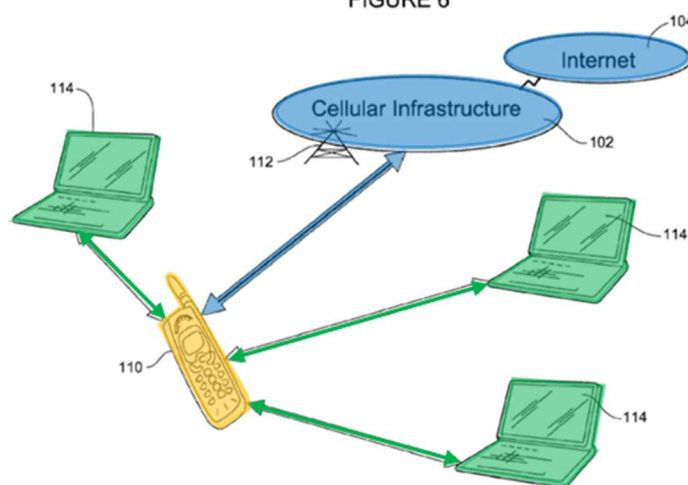


FIGURE 6



EX1005, ¶¶34, 44-46, 52, Figs. 3, 5, 6 (annotated). The memory 308 also stores a

plurality of service policy settings related to the forwarding service and the client access application 312.

119. One of skill in the art would understand that the ad hoc point-of-presence feature controlled by the client access application 312 is a “forwarding service” as claimed because it forwards traffic between devices and a network system. *Id.* According to *Thomas*, a client computing device is “allowed to communicate normal traffic *through the wireless device 110* to reach a network,” such as the internet, or to access information on a server. *Id.*, ¶47 (emphasis added). The wireless device 110 of *Thomas* may also “act as a bridge for traffic” between a client computing device (e.g., a laptop) and the internet, and may “route the packets for communication sessions between a laptop and internet.” *Id.*, ¶¶ 84, 86. One of skill in the art would also understand that *Thomas*’s disclosed features of *allowing, bridging, and routing* traffic are a “forwarding service.” My opinion is also confirmed by dependent claim 2 of the ’102 patent, which recites that “forwarding traffic comprises passing, *bridging, routing*, traffic shaping, or otherwise *allowing* the traffic” (emphases added).

120. The memory of *Thomas*’s end-user device stores a first service policy setting that authorizes the end-user device to provide a forwarding service to the one or more other devices. As shown in Figure 7 below, when the user of wireless

device 110 of *Thomas* starts application 312 to enable the forwarding service, the wireless device 110 first obtains authorization from a network element such as server 108.

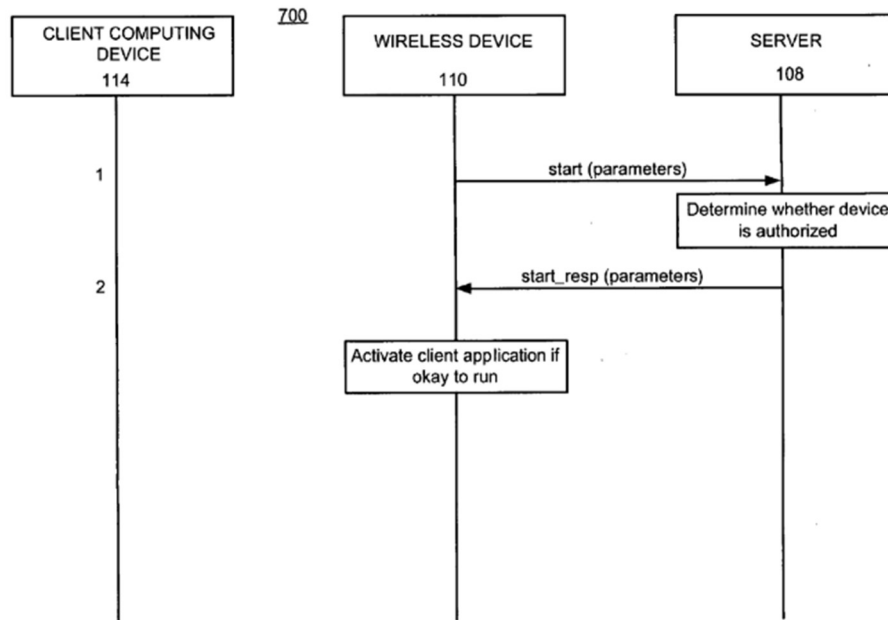


FIGURE 7

EX1005, ¶¶ 57-60, Fig. 7. One of skill in the art would understand that the end user device's initial or default policy service with respect to the forwarding service is *unauthorized*, as authorization is required before wireless device 110 can provide its forwarding service. *Id.*

121. According to *Thomas*, and as shown in Figure 7 above, the wireless device 110 may then send a start message to server 108 to determine whether authorization should be granted. If the server grants authorization, the server may

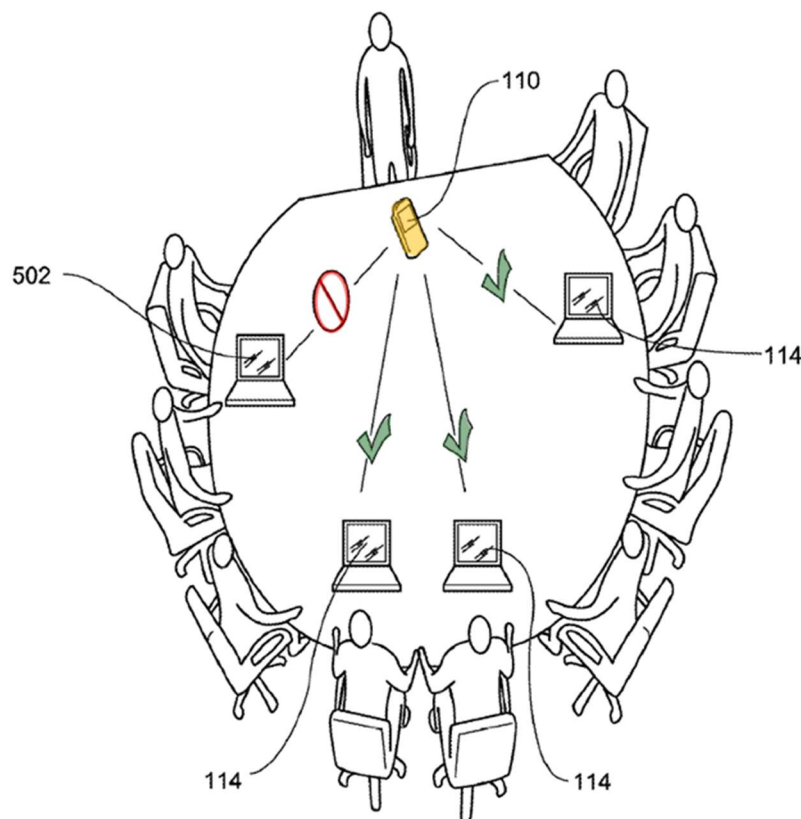
return a start message to the wireless device 110, which provides configuration information for providing the forwarding service. *Id.* This configuration information includes confirmation of authorization. *Id.* (“wireless device 110 will either start the client access application 312 or will stop its attempts depending on whether the parameter set indicated that it was *okay to run or whether it should never start*”), Fig. 7. The wireless device 110 may then change its first service policy setting to *authorized*, which permits the wireless device to initiate application 312 and provide the forwarding service to other computing devices. *Id.*

122. One of skill in the art would understand that *Thomas*’s authorization is a “setting” that would remain in place during the forwarding service session. *Id.* This is reflected, for example, by *Thomas*’s disclosure that the wireless device 110 may resend stored packets if it does not receive acknowledgements from upstream devices (e.g., laptops), so there is no need to obtain reauthorization. *Id.*, ¶85. It is also reflected by *Thomas*’s disclosure that once authorization is established, an active forwarding service session can accommodate multiple client devices, which can join and leave the service without wireless device 110 needing to obtain reauthorization to provide the forwarding service. *Id.*, ¶64 (also disclosing that the session may end when the last client device terminates its communications).

123. *Thomas* further discloses that wireless device 110 may change

authorization settings (i.e., another “first service policy setting”) to provide the forwarding service on an individual user-by-user basis. *Id.*, ¶¶44-46, 52, Fig. 5; *see also id.*, ¶85. For example, “wireless device 110 is provided with a user interface to allow or disallow access to a connection ... by computing devices that are within range of the wireless device 110.” *Id.*, ¶¶44-46. This is further demonstrated in Figure 5, as annotated below.

FIGURE 5



Id., Fig. 5 (annotated).

124. According to *Thomas*, the memory of its wireless device 110 stores a

“plurality of service policy settings.” As detailed above, and as reflected by Figure 7, *Thomas* discloses that the service policy for providing the forwarding service may have multiple settings, for example: *unauthorized* or *authorized*. EX1005, ¶¶57-60, Fig. 7. *Thomas* also discloses a variety of other service policy settings for the forwarding service, including message types, cell identifiers, software versions, service levels, random identifiers to match with a later stop message, number of available IP addresses, lease time, remaining data amounts, byte counts, and port restrictions, among other traffic-control features. *Id.* *Thomas* also discloses service policy settings for establishing billing arrangements with other users as well as usage metering and quality of service requirements. *Id.*, ¶¶53-56.

125. One of skill would recognize that *Sewall* also discloses 1[b]. *Sewall*’s end-user device has a memory storing a hotspot limiter, configuration data, user interface data, a profile engine, an access engine, and a billing engine. EX1006, ¶¶22-23, 58. With these features, *Sewall*’s end-user device stores a plurality of service policy settings. These may include internet access rules, user profiles for different types of users, access-blocking rules, other traffic-control features. EX1006, ¶¶22-27. Billing and payment service policy settings, implemented by the stored billing engine on the end-user device, are additional service policy settings that *Sewall* discloses. EX1006, ¶¶28-32.

126. *Sewall* discloses a first service policy setting for authorizing its end-user hotspot device to provide a forwarding service to one or more other devices. As *Sewall* discloses, the hotspot device may send a request containing identification information to a service provider. EX1006, ¶¶4343-44, 16. This request may seek configuration data for providing the forwarding service to other devices. *Id.* EX1006, ¶¶4343-44, 16. The service provider may then determine if granting authorization is warranted: “The service provider 22 processes this information to determine *if* and/or *what* configuration data is to be returned.” EX1006, ¶44. If authorization is granted, the hotspot device receives configuration data for providing the forwarding service, starts the forwarding service, and limits access to it according to the configuration data. *Id.*

127. In my opinion, *Sewall* also discloses that its hotspot device may change authorization settings for providing the forwarding service on an individual user-by-user basis. *Sewall*’s hotspot device includes a limiter 40, which *Sewall* describes as “any combination of hardware and/or programming capable of distinguishing among the users of devices such as client devices 12, 14, and 16, and applying different internet access rules for different users.” EX1006, ¶22. Certain access rules (i.e., service policy settings) imposed by the limiter may apply to devices owned by the hotspot owner. *Id.* Different access rules may apply to

“users authorized by the owner.” *Id.* Other users may be anonymous, who may be unauthorized and blocked from accessing the hotspot. *Id.* EX1006, ¶36. *Sewall* discloses that one way for anonymous users to change their authorization policy setting (i.e., from *unauthorized* to *authorized*) in the hotspot and gain access to its services is by submitting payment information. EX1006, ¶29 (“After the anonymous user submits payment information to the payment service, the payment service verifies the information and informs billing engine 50 that the anonymous user is now authorized.”).

128. In my opinion, the end-user’s hotspot service is a “forwarding service” as stated in claim 1. *Sewall*’s hotspot device is “a device through which communications can be *routed* between client devices and the internet.” EX1006, Abstract (emphasis added). As shown in Figures 2 and 3, *Sewall*’s end-user devices contain a router for routing inbound and outbound network traffic between other devices and a network system such as the internet. EX1006, ¶20, Fig. 3.

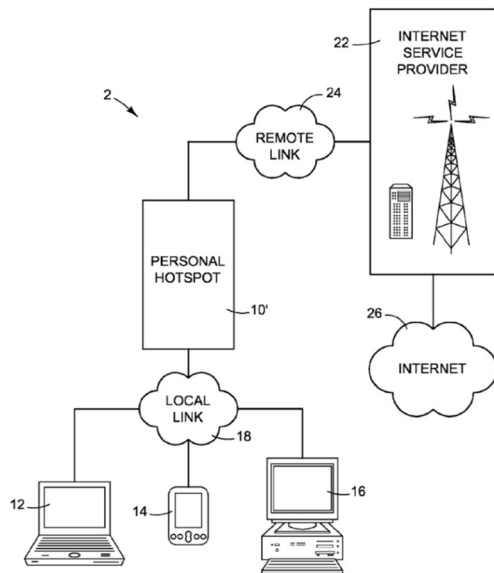


FIG. 2

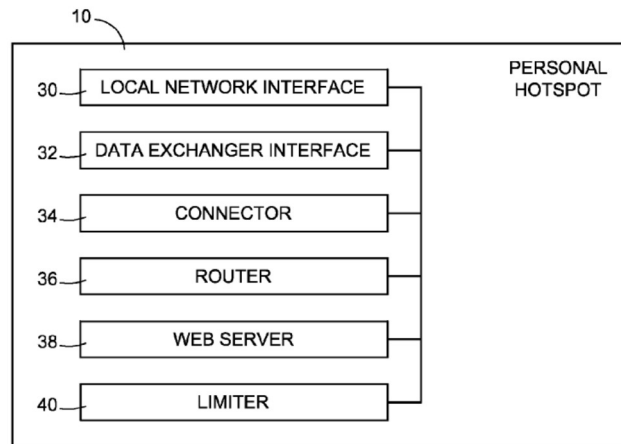


FIG. 3

129. One of skill in the art would also understand that *Sewall*'s disclosed feature of *routing* traffic is a “forwarding service.” My opinion is also confirmed by dependent claim 2 of the '102 patent, which recites that “forwarding traffic comprises passing, bridging, *routing*, traffic shaping, or otherwise allowing the traffic” (emphases added).

f. 1[c]: “a user interface; and”

130. *Thomas* discloses 1[c]. Figure 3 of *Thomas*, as annotated below, shows that wireless device 110 includes a [display 314](#) and a [user input device 316](#).

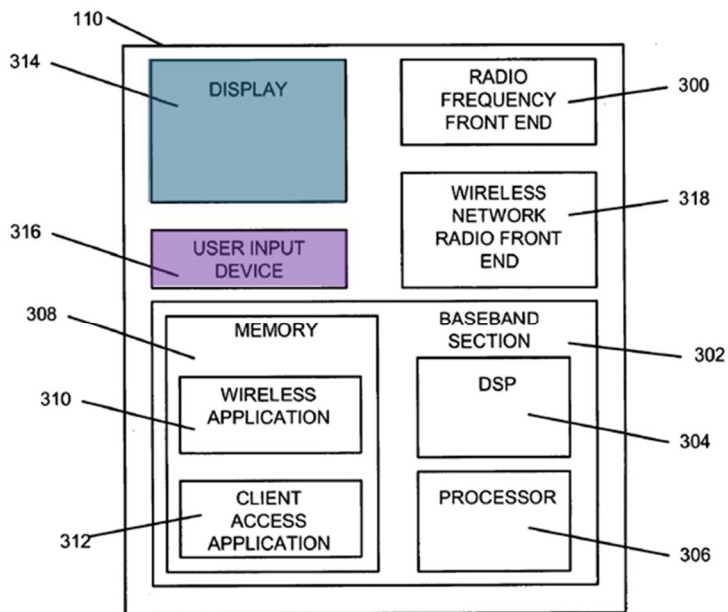


FIGURE 3

EX1005, Fig. 3 (annotated), ¶34. *Thomas* also reflects exemplary user interfaces in Figures 9 and 10.

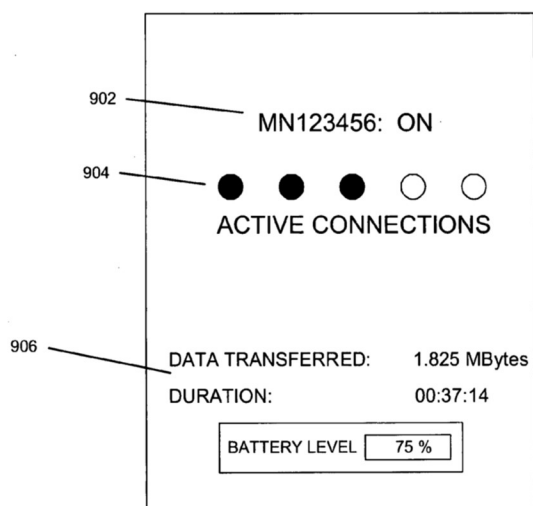


FIGURE 9

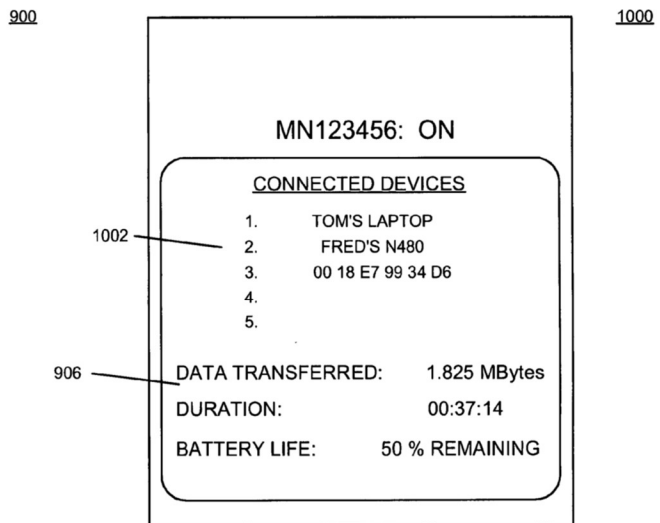


FIGURE 10

Id., Figs. 9, 10, ¶¶44-46, 52, 76-77.

131. One of skill would recognize that *Sewall* also discloses 1[c]. Figure 1, for example, shows a cellular phone with a user interface. This phone functions as a data exchanger (i.e., a modem) in providing a personal hotspot to other devices.

EX1006, ¶11. *Sewall* also discloses that the cellular phone/data exchanger and the personal hotspot may be incorporated as part of the same device, as Figure 2 also shows. EX1006, ¶16.

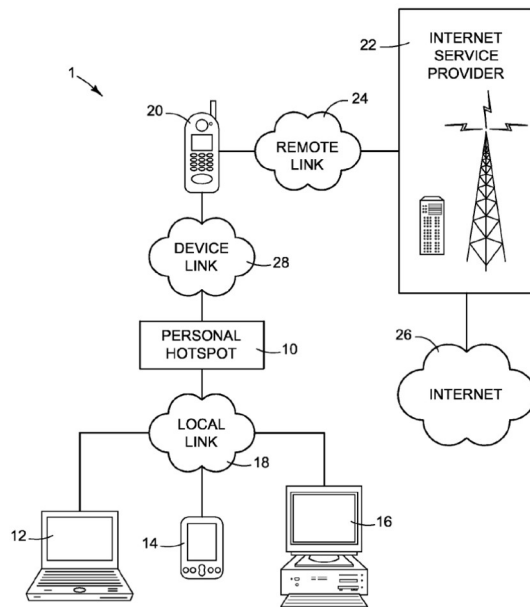


FIG. 1

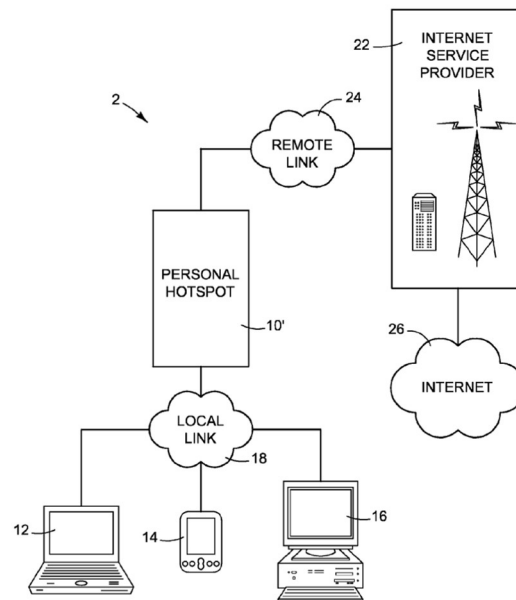


FIG. 2

g. 1[d]: “one or more processors configured to execute one or more instructions that, when executed by the one or more processors, cause the one or more processors to:”

132. *Thomas* discloses 1[d]. As shown in Figure 3, annotated below, *Thomas*’s wireless device 110 includes a **processor 306** that provides computational and

processing capabilities for the wireless device 110.

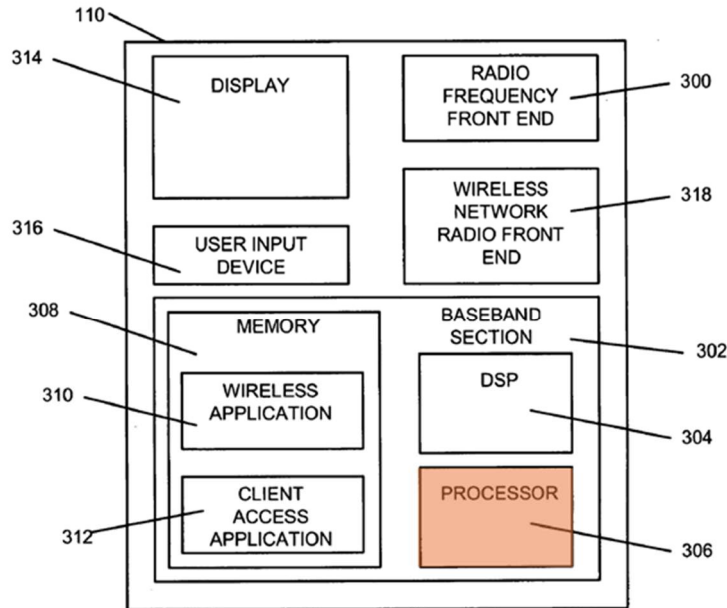


FIGURE 3

EX1005, ¶33, Fig. 3 (annotated).

133. One of skill would recognize that *Sewall* also discloses 1[d]. *Sewall* discloses that its personal hotspot features may be implemented on a processor-based system (e.g., such as a cellular phone). EX1006, ¶58, Figs. 1, 2.

h. 1[d][i]: “at least assist to obtain configuration information from the one or more network elements, the configuration information instructing the one or more processors to modify or to allow modification of the first service policy setting,”

134. *Thomas* discloses 1[d][i]. *Thomas*’s wireless device 110 starts client application 312 and sends a start message to server 108, which corresponds to a “network element,” in order to request authorization to provide a point-of-presence

forwarding service. EX1005, ¶¶57-58. As depicted in Figure 7, the server 108 determines whether the wireless device 110 is authorized to provide the forwarding service.

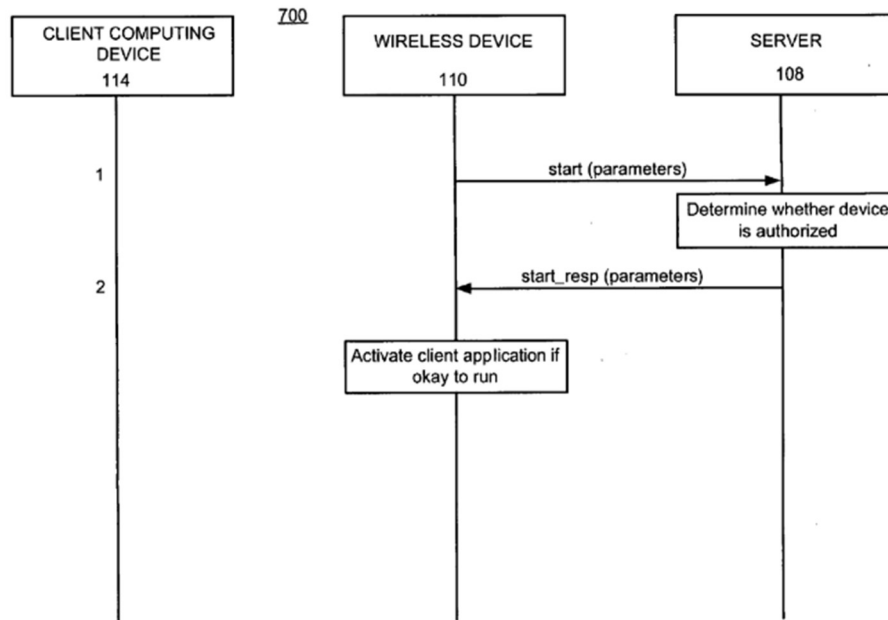


FIGURE 7

Id., ¶59, Fig. 7. If the wireless device 100 is authorized, then the server 108 sends a response to wireless 110 with configuration information:

The start response message includes parameters such as message type, response (e.g., okay to run or never start), service level, date, random identifier (e.g., to match with a subsequent stop message as discussed below), number of available IP addresses, base IP address, lease time, short lease time, new software version, data amount remaining, byte count on/off, port restriction on/off, and notes.

Id., ¶59, Fig. 7.

135. As further depicted in Figure 7 above, the server's response message contains information instructing the wireless device's processor to modify the first policy setting from *unauthorized* to *authorized* (i.e., "*okay to run* or never start") and start application 312. *Id.*, ¶¶59-60, Fig. 7. As discussed above, this authorization "setting" remains in place during the forwarding service session. *Id.*, ¶¶85, 64.

136. As further depicted in Figures 5 and 6, *Thomas* additionally discloses that configuration information may be obtained from network elements that authorize the wireless device 110 to provide its forwarding service on an individual user-by-user basis.

FIGURE 5

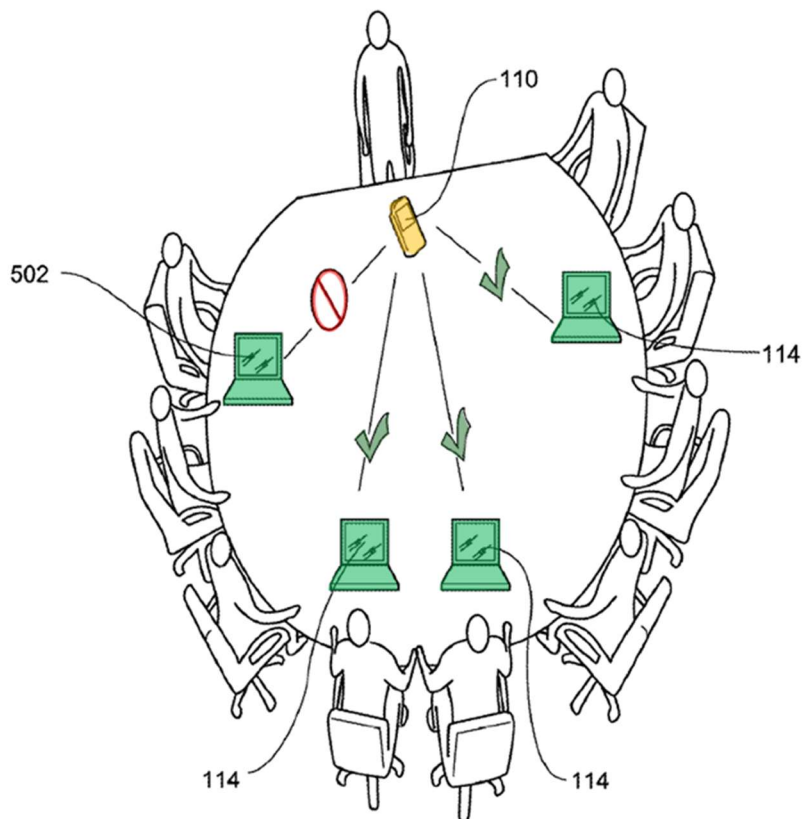
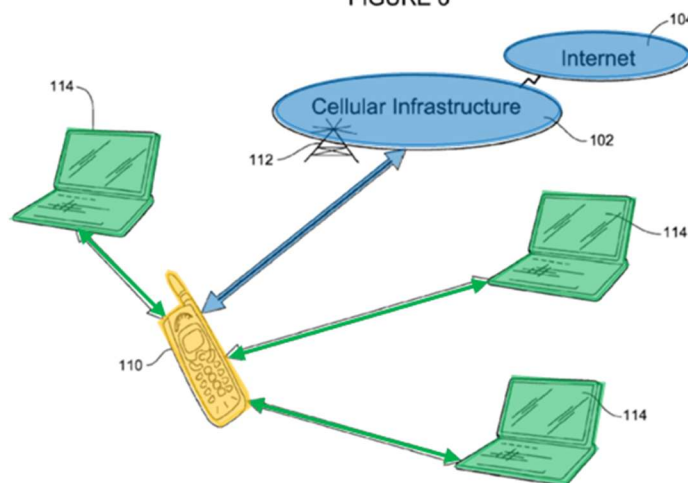


FIGURE 6



Id., ¶¶44-46, 52, Figs. 5, 6 (annotated).

137. For example, a stranger's **computing device** that seeks to access the **internet** through **wireless device 110** may initiate an authorization request, and the **wireless device 110** may pass that authorization request to a service provider that provides the wireless service. *Id.*, ¶52. Alternatively, the stranger may seek authorization directly from his or her own service provider. *Id.*, ¶52. In either case, the **wireless device 110** obtains configuration information from the service provider, which may allow modification of the service policy setting from *unauthorized* to *authorized* to provide the forwarding service to the stranger's **computing device**. *Id.* One of skill in the art would understand that this authorization "setting" remains in place during the forwarding-service session because there is no need to reauthorize if the **wireless device 110** does not receive packet acknowledgements—the wireless device can instead resend them. *Id.*, ¶85.

138. One of skill would recognize that *Sewall* also discloses 1[d][i]. The processors of *Sewall*'s hotspot device may send a request containing identification information to a service provider, seeking configuration data for providing the forwarding service to other devices. EX1006, ¶¶43-44, 16. Authorization is then performed by the service provider: "The service provider 22 processes this information to determine *if* and/or *what* configuration data is to be returned." EX1006, ¶44. If authorized, the hotspot device obtains configuration data from the

service provider for providing the forwarding service, can initiate the forwarding service, and limit access to it according to the configuration data. *Id.*

139. In my opinion, *Sewall* also discloses obtaining configuration information for instructing one or more processors to modify or to allow modification of its authorization policy setting for providing the forwarding service. on an individual user-by-user basis. *Sewall*'s hotspot device includes a limiter 40, which *Sewall* describes as "any combination of hardware and/or programming capable of distinguishing among the users of devices such as client devices 12, 14, and 16, and applying different internet access rules for different users." EX1006, ¶22. Certain access rules (i.e., service policy settings) imposed by the limiter may apply to devices owned by the hotspot owner. *Id.* Different access rules may apply to "users authorized by the owner." *Id.* Other users may be anonymous, who may be unauthorized and blocked from accessing the hotspot. *Id.* EX1006, ¶36.

140. *Sewall* discloses that one way for anonymous users to change their authorization policy setting (i.e., from *unauthorized* to *authorized*) in the hotspot and gain access to its services is by submitting payment information. EX1006, ¶29 ("After the anonymous user submits payment information to the payment service, the payment service verifies the information and informs billing engine 50 that the

anonymous user is now authorized.”).The billing engine of *Sewall*’s hotspot device may use this payment information to update the configuration data to provide authorized hotspot access to paying users. EX1006, ¶31.

i. 1[d][ii]: “at least assist to obtain, through the user interface, a user input associated with enabling or disabling the forwarding service, and”

141. *Thomas* discloses 1[d][ii]. As shown in Figures 9 and 10, *Thomas*’s wireless device 110 includes a user interface 900 and 1000 to obtain user input to initiate startup and shutdown messages for providing the forwarding service, for example through application 312.

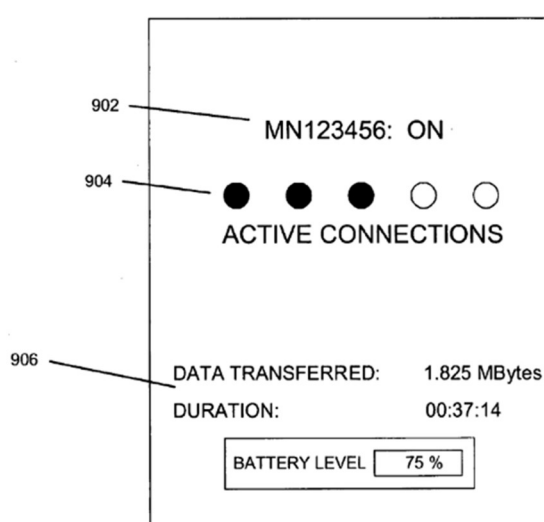


FIGURE 9

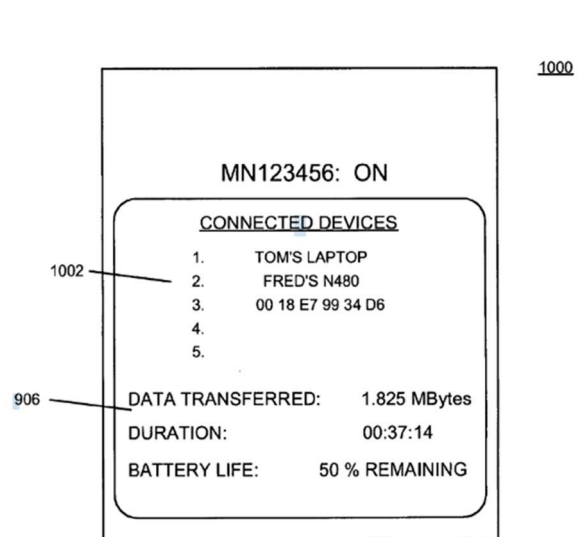


FIGURE 10

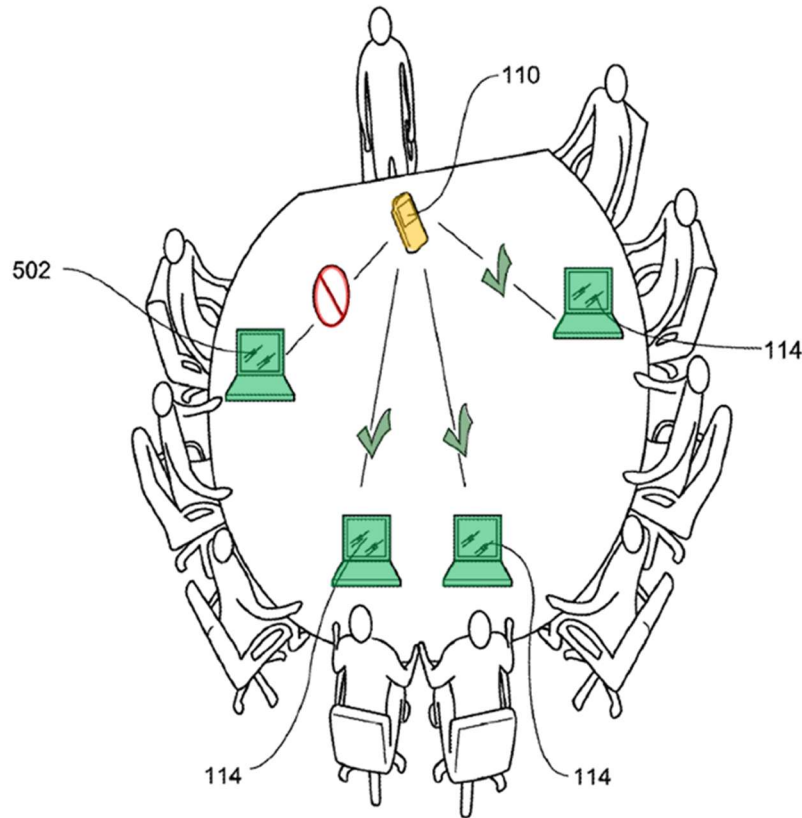
EX1005, ¶¶76-77, Figs. 9, 10. For example, “a startup or shutdown message display sequence ... [may] be presented on the user interface 1000.” *Id.* ¶¶76-77.

Figures 9 and 10 above reflect the forwarding service as “ON.”

142. Indeed, *Thomas* discloses that “user input device 316 provides the user of wireless device 110 with input capabilities for interaction with the wireless device,” and that the “user” of the wireless device 110 starts application 312 to turn on the forwarding service and initiate the authorization procedures discussed above with respect to the claimed first policy service setting. *Id.*, ¶¶34, 58. *Thomas* also discloses that the “user” of the wireless device 110 stops application 312 to turn the forwarding service off. *Id.*, ¶65. One of ordinary skill would understand that *Thomas* discloses that such direct action by the user occurs by obtaining user input through the user interface that wireless device 110 provides.

143. *Thomas* also discloses that a user input through the interface can enable or disable the forwarding service on an individual user-by-user basis. For example, as shown in Figure 5, *Thomas* discloses that wireless device 110 has a user interface for obtaining user input to allow or disallow access to other computing devices.

FIGURE 5



Id., ¶¶44-46, Fig. 5 (annotated); *see also id.* ¶52. As shown in Figure 5, as annotated above, the wireless device 110 has a user interface that allows the user to enable access for three laptops while denying access to a fourth laptop. *Id.*, ¶¶44-46, Fig. 5 (annotated).

144. One of skill would recognize that *Sewall* also discloses or suggests 1[d][ii]. *Sewall*'s end-user device for providing a personal hotspot may be a cellular phone with a user interface, as I described above. As shown in Figure 7, the owner of the personal hotspot may enable a hotspot session by establishing a

data connection with a service provider and obtaining configuration information.

EX1006, ¶¶42-45.

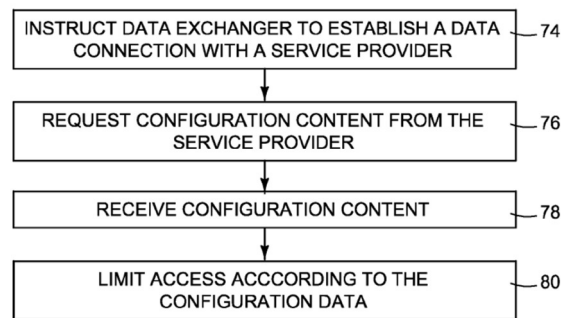


FIG. 7

145. *Sewall* further discloses that a hotspot owner may participate in configuring a hotspot session. For example, the owner can select settings for configuration data as desired. EX1006, ¶45. This includes selecting settings for “all” configuration data. *Id.* One of skill would reasonably expect such direct user interaction through a user interface in configuring *Sewall*’s personal hotspot forwarding service to include user-selectable options for the enabling or disabling of the forwarding service, just as *Thomas* discloses and suggests. *Id.*; EX1005, ¶¶76-77, 34 (“user input device 316 provides the user of wireless device 110 with input capabilities”), 58, 65 (the “user” starts and stops application 312). Otherwise, an owner would be deprived of a significant feature for limiting hotspot access, thwarting a principal purpose of *Sewall*. EX1005, ¶5.

146. Accordingly, in addition to being disclosed by *Thomas*, 1[d][ii] would

have been obvious to one of skill based on *Sewall*'s and *Thomas*'s combined disclosures.

- j. 1[d][iii]: “modify a second service policy setting of the plurality of service policy settings in accordance with the user input, the second service policy setting for at least assisting in enabling or disabling the forwarding service.”

147. *Thomas* discloses 1[d][iii]. *Thomas* discloses a second service policy setting for its forwarding service, for example, an on or off setting. As shown in Figures 9 and 10 of *Thomas*, this second service policy setting is reflected in the user interface of *Thomas*'s wireless device 110 which displays that the forwarding service is “ON.”

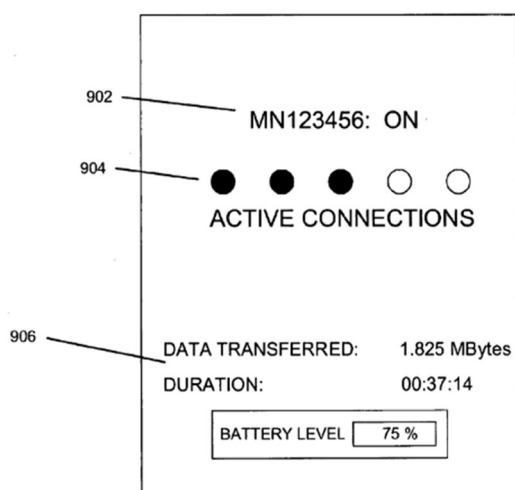


FIGURE 9

900

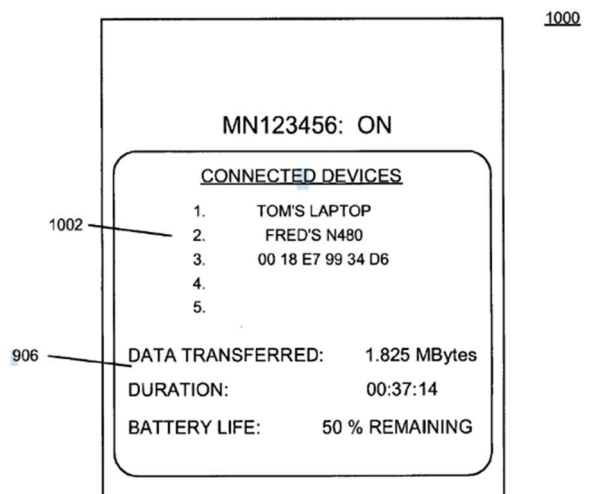


FIGURE 10

EX1005, ¶¶76-77, Figs. 9, 10.

148. In accordance with the user input addressed above (*supra* § XII.2.i),

the user device 110 may modify the second policy setting to at least assist in enabling or disabling the forwarding service by turning the forwarding service on or off. For instance, *Thomas* discloses that to enable the forwarding service, “the user of the wireless device 110 starts the client access application 312” and to disable the forwarding service, the “user of the wireless device 110 stops the client access application 312.” EX1005, ¶¶58, 65. The wireless device then sends a stop message to server 108, which returns a stop response message to wireless device 110, which may then terminate the session (i.e., change the second service policy setting to *off*).

149. One of skill would recognize that *Sewall* also suggests 1[d][iii]. As I explained above regarding above regarding 1[d][ii], it would have been obvious for *Sewall*’s personal hotspot device to include a user-selectable option to enable or disable the forwarding service, just as *Thomas* discloses and suggests. For a person of skill, it therefore also would have been obvious for the processors of *Sewall*’s device to modify a second service policy setting (i.e., turn the hotspot on or off), otherwise the user input would be ineffective. *Id.* Moreover, a skilled artisan would have had a particular motivation to have a personal hotspot that could be manually turned on and off via user input to provide a flexible networking system, and a reasonable expectation of success in implementing such a standard programming

feature.

150. Accordingly, in addition to being disclosed by *Thomas*, 1[d][iii] would have been obvious to one of skill based on *Sewall*'s and *Thomas*'s combined disclosures.

3. Claim 2: “wherein forwarding traffic comprises passing, bridging, routing, traffic shaping, or otherwise allowing the traffic.”

151. In my opinion, claim 2 would have been obvious to one of skill based on *Thomas* and *Sewall*.

152. *Thomas* discloses at least three of the forwarding-traffic features of claim 2. It discloses that a client computing device is “*allowed* to communicate normal traffic through the wireless device 110 to reach a network,” such as the internet, or to access information on a server. *Id.*, ¶47 (emphasis added). The wireless device 110 of *Thomas* may also “act as a *bridge* for traffic” between a client computing device (e.g., a laptop) and the internet, and may “*route* the packets for communication sessions between a laptop and internet.” *Id.*, ¶¶ 84, 86. Thus, *Thomas* discloses the *allowing*, *bridging*, and *routing* features of claim 2.

153. One of skill would also recognize that *Sewall* discloses claim 2. *Sewall*'s hotspot device is “a device through which communications can be *routed* between client devices and the internet.” EX1006, Abstract (emphasis added). As shown in Figures 2 and 3, *Sewall*'s end-user devices contain a router for routing

inbound and outbound network traffic between other devices and a network system such as the internet. EX1006, ¶20, Fig. 3.

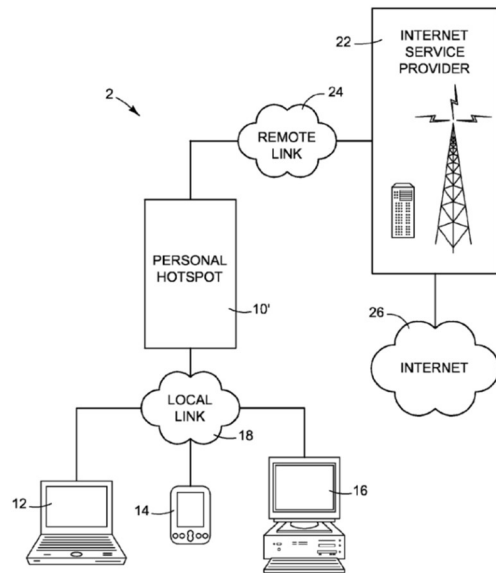


FIG. 2

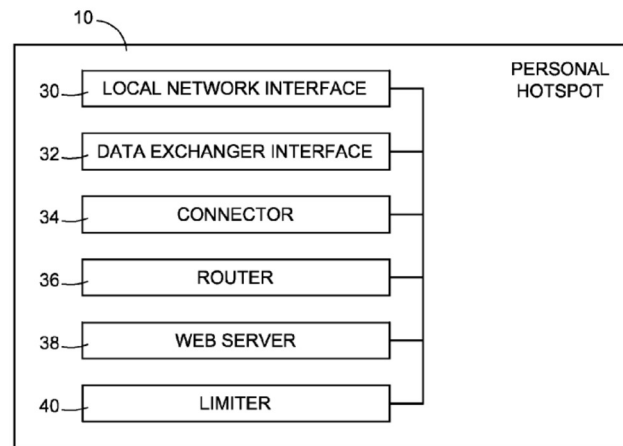


FIG. 3

4. Claim 4: “wherein the forwarding service is included in a service plan associated with the end-user device.”

154. In my opinion, claim 4 would have been obvious to one of skill based on *Thomas* and *Sewall*.

155. *Sewall* discloses that the personal hotspot forwarding service of its end-user device is included in a service plan. *Sewall* discloses that configuration data provided by a service provider for the forwarding service can provide access rules and also be customized based on a subscription plan paid for by the owner of data exchanger 20. EX1006, ¶¶25, 16 (disclosing that data exchanger 20 and

personal hotspot 10 are incorporated in the same device). As *Sewall* discloses, a “basic subscription package might then have more stringent access rules than a premium subscription package.” EX1006, ¶25. One of skill would thus recognize that the owner of *Sewall*’s personal hotspot devices would have a service plan that includes providing the forwarding service.

156. *Thomas* also discloses or suggests that the owner of its wireless device 110 has a service plan that includes providing the forwarding service. *Thomas* discloses, for example, that a user of wireless device 110 “would have a financial relationship with the service provider.” EX1005, ¶¶54-55. *Thomas* discloses that the service provider may provide a plan to incentivize its subscriber to provide forwarding service to other devices, confirming to one of skill that the forwarding service is indeed included the wireless device 110 owner’s subscription (i.e., service plan) with the service provider. *Id.*

5. Claim 5: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to at least assist to obtain a user request, and wherein obtain configuration information is based on the user request.”

157. In my opinion, claim 5 would have been obvious to one of skill based on *Thomas* and *Sewall*.

158. As I described above, *Thomas*’s wireless device 110 includes a user interface 1000. This user interface may provide options for obtaining a user request

to initiate a startup message for providing the forwarding service (i.e., by running application 312). EX1006, ¶¶34, 58-59, 76-77, Figs. 9, 10. That user input is a “request” because the wireless device 110 requires authorization and configuration data from server 108 to establish the forwarding service. My opinion is further confirmed by *Thomas*’s disclosure that after the user request and the start message is received at server 108, the server “determines whether the *requesting* wireless device 110 is authorized to operate within the network” and, if so, returns configuration information to wireless device 110. EX1005, ¶59, Fig. 7.

Accordingly, in my opinion, one of skill would recognize that *Thomas* discloses wireless device 110 obtaining configuration information based on the user request.

159. In my opinion, *Thomas* also discloses obtaining a request from a user of a computing device (rather than the owner of wireless device 110) that is requesting access to the forwarding service. EX1005, ¶¶46, 52. *Thomas* discloses that the request “may appear on the display 314 on the wireless device 110 along with some identifier, such as the service set identifier (SSID) or MAC address of the client computing device 114 that is attempting to seek authorization to use the ad hoc point of presence capabilities of the wireless device 110.” EX1005, ¶46. The wireless device may then obtain configuration information. EX1005, ¶¶46, 52. This configuration information may include authorization to extend the forwarding

service to the computing device. *Id.* For example, as *Thomas* discloses, after a computing device provides billing credentials to a service provider, authentication is provided to the wireless device 110 and the computing device 114 may gain the ability to send and receive normal traffic via the internet. EX1005, ¶53.

160. One of skill would recognize that *Sewall* also discloses or suggests the features of claim 5. *Sewall*'s end-user device for providing a personal hotspot may be a cellular phone with a user interface, as I previously discussed regarding claim 1. A process for enabling a hotspot session is shown in Figure 7. The owner of the personal hotspot may establish a data connection with a service provider and request and then obtain configuration information that, among other things, may limit access to the forwarding service. EX1005, ¶¶42-45. An exemplary request message is *Sewall*'s "HTTP GET" request. EX1006, ¶44.

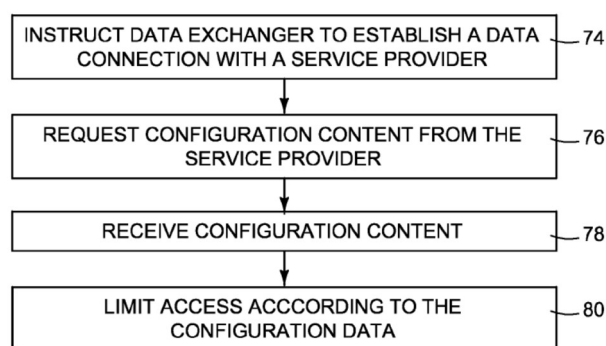


FIG. 7

161. As *Sewall* discloses, "personal hotspot 10 requests configuration data"

and “[s]ervice provider 22 returns configuration data 42 or a portion thereof for use by limiter 40.” EX1006, ¶25.

162. One of skill would also have recognized that *Sewall*’s hotspot owner may participate in the configuration of a hotspot session. As one example, an owner may select settings for configuration data, including for “all” configuration data. EX1006, ¶45. Such direct user interaction through a user interface in configuring a personal hotspot forwarding service would, at a minimum, reasonably be expected to include a user-selectable option to request initiation of the forwarding service, just as *Thomas* discloses and suggests. *Id.* Otherwise, an owner would be deprived of a significant feature for providing and limiting hotspot access, thwarting the principal purposes of *Sewall*. EX1005, ¶5.

6. Claim 6: “wherein the configuration information is based on a user preference.”

163. In my opinion, claim 6 would have been obvious to one of skill based on *Thomas* and *Sewall*.

164. *Sewall* discloses that the configuration information requested and received at the personal hotspot device may be based on user preferences in multiple ways. For example, configuration information can be modified to conform to the hotspot owner’s preferences given that “the owner may be allowed to select settings for all of configuration data 42.” EX1006, ¶45. As *Sewall* also discloses,

configuration data 42 from service provider 22 or portions thereof may be updateable by the hotspot owner. EX1006, ¶25. The owner may also prepare custom profiles for particular users of the personal hotspot. EX1006, ¶37. *Sewall* gives some specific examples of these custom profiles, as an owner may “provide a spouse or personal friend with less limited access than other authorized users. That same owner may desire to provide a child with more limited access.” *Id.* Thus, in my opinion, one of skill would recognize that *Sewall* discloses that configuration information received from a service provider may be based on the owner’s preferences.

7. Claim 7: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to: at least assist to present, through the user interface, a notification associated with the first service policy setting.”

165. In my opinion, claim 7 would have been obvious to one of skill based on *Thomas* and *Sewall*.

166. As I discussed above regarding 1[b], *Thomas* discloses a first policy setting for authorizing the forwarding service, as well as authorizing the forwarding service on an individual user-by-user basis. *Thomas*’s processors are also caused to present, through the user interface, notifications associated with those authorization policy settings. The exemplary user interface of Figure 10 provides notifications about the amount of data transferred and the duration of a

forwarding-service session. EX1005, ¶77, Fig. 10. So does the exemplary user interface of Figure 9. EX1005, ¶76, Fig. 9. Figure 10 also provides notifications identifying the computing devices for which the forwarding service has been authorized on a user-by-user basis. *Id.* (“TOM’S LAPTOP”); *id.*, ¶¶44-46, Fig. 5.. One of skill would recognize that these notifications are associated with the first service policy setting being set to *authorized*, because that is the necessary setting for the forwarding service to be activated and for the wireless device 110 to forward traffic for other devices. EX1005, ¶¶57-60.

167. The notifications further include “a startup or shutdown message display sequence.” EX1005, ¶76, Fig. 9. A startup message display sequence is associated with the authorization policy setting because the startup messages involve requesting authorization from server 108. EX1005, ¶¶58-59, Fig. 7. A forwarding service shutdown is also associated with the authorization policy setting because the shutdown would return the authorization setting for wireless device 110 to *unauthorized*, and the wireless device would need to again request authorization from server 108 whenever the user next seeks to establish the forwarding service. *See* EX1005, ¶¶59, 65.

168. As discussed above in Section XII.2.e (1[b]), *Sewall* also discloses a first policy setting for authorizing the forwarding service, as well as authorizing the

forwarding service on an individual user-by-user basis. *Sewall*'s hotspot device may send a request containing identification information to a service provider, seeking configuration data for providing the forwarding service to other devices. EX1006, ¶¶43-44, 16. The service provider may then determine if granting authorization is warranted: "The service provider 22 processes this information to determine *if* and/or *what* configuration data is to be returned." EX1006, ¶44. When the configuration data is received at the hotspot device, *Sewall* discloses at least a portion of it may be editable by the owner of the hotspot device. EX1006, ¶¶25, 33-37. So that the owner can avail himself or herself of the opportunity to edit the configuration data, it would have been obvious to provide a notification to the owner that the configuration data has been received and is available for editing. EX1006, ¶36.

8. Claim 8: "wherein the notification comprises information associated with activating the forwarding service."

169. In my opinion, claim 8 would have been obvious to one of skill based on *Thomas* and *Sewall*.

170. *Thomas* discloses multiple notifications comprising information associated with activating the forwarding service. For example, *Thomas* discloses notifications that include a "startup ... message display sequence." EX1005, ¶¶59, 77, Fig. 10. This notification is associated with activating the forwarding service

because the startup messages involve requesting authorization from server 108 to run application 312. *Id.* Such notifications also include an “activation status” display to indicate whether the client access application 312 is on or off. EX1005, ¶76, Fig. 9. The notifications also identify the computing devices for which the forwarding service has been authorized on a user-by-user basis. *Id.* (“TOM’S LAPTOP”); *see also id.*, ¶¶44-46, Fig. 5. The session-duration and data-amount notifications are also associated with activating the forwarding service—once this information is communicated through the user interface, the user would recognize successful activation. EX1005, ¶¶76-77, Figs. 9, 10.

171. In my opinion, it also would have been obvious based on *Sewall* to provide a notification associated with activating the forwarding service. A service provider may determine if granting authorization to provide a hotspot service is warranted: “The service provider 22 processes this information to determine *if* and/or *what* configuration data is to be returned.” EX1006, ¶44. When the configuration data is received at the hotspot device, at least a portion of it may be editable by the owner of the hotspot device. EX1006, ¶¶25, 33-37. So that the owner can avail himself or herself of the opportunity to edit the configuration data, it would have been obvious to provide a notification to the owner that the configuration data has been received and is available for editing. EX1006, ¶36.

Such a notification would also be associated with activating the hotspot service, as it would inform the owner that authorization has been successful and the hotspot session is being configured according to the configuration data.

9. Claim 10: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to at least assist to present, through the user interface, a notification associated with the forwarding service.”

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

173. *Thomas* discloses that the processors of its wireless device 110 at least assist to present, through the user interface, a notification associated with the forwarding service. For example, an exemplary user interface of *Thomas*’s Figure 10 provides notifications associated with the forwarding service. EX1005, ¶77, Fig. 10. The notifications include a “startup ... message display sequence.” This notification is associated with the forwarding service because startup messages involve requesting authorization from server 108 to start application 312 and provide the forwarding service. EX1005, ¶¶59, 77, Fig. 10. The notifications also include an “activation status” display to indicate whether the client access application 312 for providing the forwarding service is on or off. EX1005, ¶76, Fig. 9. They also include notifications identifying the computing devices for which the forwarding service has been authorized on a user-by-user basis. *Id.* (“TOM’S

LAPTOP”); *see also id.*, ¶¶44-46, Fig. 5. The session-duration and data-amount notifications are also associated with the forwarding service. EX1005, ¶¶76-77, Figs. 9, 10.

174. As discussed above regarding claim 7, *Sewall* discloses that when configuration data is received at the hotspot device from a service provider, at least a portion of it may be editable by the owner of the hotspot device. EX1006, ¶¶25, 33-37. So that the owner can avail himself or herself of the opportunity to edit the configuration data, it would have been obvious to provide a notification to the owner that the configuration data for establishing a hotspot session has been received and is available for editing. EX1006, ¶36. Such notifications would be associated with the forwarding service, as claimed.

10.Claim 11: “wherein the notification comprises information about a usage or cost associated with the forwarding service.”

175. In my opinion, claim 11 would have been obvious to one of skill based on *Thomas* and *Sewall*.

176. *Thomas* discloses that the processors of its wireless device 110 at least assist to present, through the user interface, a notification comprising information about a usage or cost associated with the forwarding service. For example, *Thomas*’s exemplary user interface in Figure 10 provides notifications associated with the forwarding service, including at least information about usage associated

with the forwarding service. EX1005, ¶77, Fig. 10. Such notifications include information identifying the amount of data transferred or the duration of a forwarding service session. EX1005, ¶¶76-77, Figs. 9, 10. Since the user of wireless device 110 is not required to have an unlimited data plan, a skilled artisan would also reasonably expect the data counter to be associated with costs under their service subscription (and for which the user may desire incentives from the service provider). EX1005, ¶¶54-56. *Thomas* also discloses notifications identifying the computing devices for which usage of the forwarding service has been authorized on a user-by-user basis. *Id.* (“TOM’S LAPTOP”); *see also id.* ¶¶44-46, 76-77, Figs. 5, 9, 10.

177. *Sewall* discloses that when the configuration data is received at the hotspot device, at least a portion of it may be editable by the owner of the hotspot device. EX1006, ¶¶25, 33-37. Such configuration data may also include user profiles with access rules limiting usage of the hotspot service, which a subscription plan would also likely govern. *See, e.g.*, EX1006, ¶34 (“Such device access rules may specify upload and download bandwidth limits. The device access rules may limit the amount of data transfer allowed in a given time period.”). Such configuration information would also comprise information about a cost associated with the forwarding service, as the forwarding-service would likely

be governed by a service subscription. *Id.* ¶25 (“[C]onfiguration data 42 can be customized based on a subscription plan A basic subscription package might then have more stringent access rules than a premium subscription package”). So that the owner can avail himself or herself of the opportunity to edit the configuration data regarding forwarding-service usage, it would have been obvious to provide a notification to the owner that such configuration data has been received and is available for editing. EX1006, ¶36.

11.Claim 12: “wherein the notification comprises information about the forwarding service.”

178. In my opinion, claim 12 would have been obvious to one of skill based on *Thomas* and *Sewall*.

179. *Thomas* discloses that the processors of its wireless device 110 at least assist to present, through the user interface, a notification comprising information about the forwarding service. For example, an exemplary user interface in Figure 10 provides notifications about the forwarding service. EX1005, ¶77, Fig. 10. The notifications include a “startup ... message display sequence,” which is about the forwarding service because the startup messages involve requesting authorization to provide the forwarding service. EX1005, ¶¶59, 77, Fig. 10. The notifications also include an “activation status” display to indicate whether the client access application 312 for providing the forwarding service is on or off. EX1005, ¶76,

Fig. 9. They also include notifications identifying the computing devices for which the forwarding service has been authorized on a user-by-user basis. *Id.*; *see also id.*, ¶¶44-46, Fig. 5. Other notifications are also about forwarding service, including those identifying the duration of a forwarding service session or an amount of data transfer. EX1005, ¶¶76-77, Figs. 9, 10.

180. *Sewall* also discloses or suggests providing notifications about the forwarding service. It states that when the configuration data is received at the hotspot device, at least a portion of it may be editable by the owner of the hotspot device. EX1006, ¶¶25, 33-37. As *Sewall* discloses, such configuration data may include user profiles with access rules limiting usage of the hotspot service. *See, e.g.*, EX1006, ¶34. So that the owner can avail himself or herself of the opportunity to edit the configuration data, including the usage restriction information about the hotspot service, it would have been obvious to provide a notification to the owner that the configuration data has been received and is available for editing. EX1006, ¶36. One of skill would recognize that such a notification would be “about the forwarding service” because such configuration information is used to limit access to the forwarding service.

12.Claim 13: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to at least assist to control at least an aspect of the forwarding service.”

181. In my opinion, claim 13 would have been obvious to one of skill based on *Thomas* and *Sewall*.

182. *Sewall* discloses a personal hotspot device that includes a hotspot limiter 40 component. The limiter is “a combination of hardware and/or programming capable of distinguishing among the users of devices such as client devices 12, 14, and 16, and applying different internet access rules for different users.” EX1006, ¶22. Those access rules may control aspects of the forwarding service, as claimed. For example, the access rules imposed by the hotspot limiter may specify upload and download bandwidth limits, may limit the amount of data transfer allowed in a given time period, or may limit the number of simultaneous users or sessions. *See, e.g.*, EX1006, ¶34.

183. *Thomas* also discloses that the processor(s) of its wireless device 110 may control at least an aspect of the forwarding service. These features may include assisting a user to configure aspects of at least a service usage policy or a security aspect. Indeed, *Thomas* discloses that its user-configuration settings include aspects of service usage policies, including client auto-connection capabilities, automatic shutdown features, and restoration of settings upon

reconnection or power up. EX1005, ¶68. *Thomas* further discloses that many other configuration options are possible, including “security features” that may be provided for the wireless device 110. EX1005, ¶¶68-70.

184. As other examples, the wireless device may be programmed to accept computer traffic from a select number of computing devices and allow or disallow access. EX1005, ¶¶46, 44. *Thomas* also discloses an auto-disconnect feature to control access to the forwarding service when the owner of wireless device 110 leaves the home. EX1005, ¶50. It further discloses an incentive plan where provision of the forwarding service is dependent on compensation to the owner of wireless device 110. EX1005, ¶¶54-56. It additionally discloses implementing service levels for controlling the number of concurrent users of the forwarding service and security features and access restrictions to permit only valid computing devices 114 from connecting to the wireless device 110’s forwarding service. EX1005, ¶¶69-70.

13.Claim 14: “wherein control at least an aspect of the forwarding service comprises limit a number of devices comprising the one or more other devices.”

185. In my opinion, claim 14 would have been obvious to one of skill based on *Thomas* and *Sewall*.

186. *Sewall* discloses a personal hotspot device that includes a hotspot

limiter 40 component. EX1006, ¶22. The access rules imposed by the limiter disclose limiting the number of devices that may access the forwarding service. For example, the access rules imposed by the hotspot limiter may “may limit the number of simultaneous users or sessions supported by personal hotspot.” *See, e.g.*, EX1006, ¶¶34, 49.

187. *Thomas* also discloses that controlling an aspect of the forwarding service includes limiting the number of devices accessing the forwarding service. For example, it discloses implementing service levels for controlling the number of concurrent users of the forwarding service. EX1005, ¶69. The wireless device may also be programmed to accept computer traffic from a select number of computing devices, including allowing or disallowing other devices to use the forwarding service. EX1005, ¶¶46, 44.

14.Claim 15: “wherein control at least an aspect of the forwarding service comprises restrict, or assist at least one of the one or more other devices to restrict, usage of the forwarding service by the at least one of the one or more other devices.”

188. In my opinion, claim 15 would have been obvious to one of skill based on *Thomas* and *Sewall*.

189. *Sewall* discloses a personal hotspot device that includes a hotspot limiter 40 component that may apply different internet access rules for different users. EX1006, ¶22. Those access rules may restrict usage of the forwarding

service by at least one of the other devices. For example, *Sewall* discloses that such “access rules may specify upload and download bandwidth limits” and “may limit the amount of data transfer allowed in a given time period.” EX1006, ¶¶34, 49.

Sewall also discloses that the access rules may restrict usage based on duration of use of the forwarding service. EX1006, ¶49.

190. *Thomas* also discloses that usage may be metered based on duration of a computing device’s connection to the forwarding service, number and size of packets transmitted, and other factors such as peak or off-peak usage. EX1005, ¶54. The wireless device may also be programmed to accept computer traffic from a select number of computing devices and either allow or disallow access. EX1005, ¶¶46, 44.

15.Claim 16: “wherein control at least an aspect of the forwarding service comprises restrict, or assist at least one of the one or more other devices to restrict, usage of the forwarding service by the at least one of the one or more other devices based on one or more of a device type, a modem type, a type of the wireless access network, a state of the wireless access network, an application, or a service activity.”

191. In my opinion, claim 16 would have been obvious to one of skill based on *Thomas* and *Sewall*.

192. Based on my review of the ’102 patent, it defines a “service activity” as including identifiers with which a computing device is communicating, as well

as any service usage or traffic usage associated with a network communication end point, and characterizations of device usage (among any other categories of activity that can be “identified, monitored, recorded, reported, controlled, or processed in accordance with a set of verifiable service control policies”). EX1001, 6:64-7:15.

193. *Sewall* discloses the features of claim 16. Its personal hotspot device includes a hotspot limiter 40 component. EX1006, ¶¶22, 26. Depending on the device type or identifier associated with a device (e.g., an owner device, authorized device, or anonymous device), the limiter of the personal hotspot may restrict usage. Such restrictions may include imposing upload and download bandwidth limits, limiting the amount of data transfer allowed in a given time period, and limiting the number of devices that can access the personal hotspot. EX1006, ¶¶26, 34, 49.

194. In my opinion, *Thomas* also discloses restricting usage of the forwarding service based on an address, identifiers associated with computing devices, or categories of activity that may be identified, monitored, and controlled (e.g., a “service activity”). For instance, the wireless device 110 may meter usage of the forwarding service based on duration of a computing device’s connection to the forwarding service, number and size of packets transmitted, and other factors

such as peak or off-peak usage. EX1005, ¶54. It may also restrict access based on a MAC address or by the number of available IP addresses. EX1005, ¶¶59, 62. 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, 76-77, Figs. 9, 10 (selectively granting access to particular computing devices, e.g., “TOM’S LAPTOP”).

16.Claim 17: “wherein control at least an aspect of the forwarding service comprises authorize or allow usage of the forwarding service by at least one of the one or more other devices based on one or more of a device type, a modem type, a type of the wireless access network, a state of the wireless access network, an application, or a service activity.”

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

196. *Sewall* discloses a personal hotspot device that includes a hotspot limiter 40 component. EX1006, ¶¶22, 26. Depending on the device type or identifier associated with a device (e.g., an owner device, authorized device, or anonymous device), the limiter of the personal hotspot may authorize or allow usage of the hotspot service, including by authorized or owner devices, whereas anonymous devices may have only limited usage (or none) of the hotspot service. EX1006, ¶¶26, 34, 49.

197. *Thomas* also discloses authorizing or allowing usage of the

forwarding service based on an address, identifiers associated with computing devices, or categories of activity that may be identified, monitored, and controlled. For instance, the wireless device 110 may allow metered usage of the forwarding service based on duration of a computing device's connection to the forwarding service, number and size of packets transmitted, and other factors such as peak or off-peak usage. EX1005, ¶54. It may also allow access based on a MAC address or up to the number of available IP addresses. EX1005, ¶¶59, 62; EX1001, 6:64-7:15 (defining "service activity" to include an "address"). The wireless device may also be programmed to accept computer traffic from a select number of computing devices and allow access. EX1005, ¶¶46, 44, 76-77, Figs. 9, 10 (selectively granting access to particular computing devices, e.g., "TOM'S LAPTOP").

17.Claim 18: "wherein at least assist to control the at least an aspect of the forwarding service comprises assist a user to configure one or more aspects of a service usage policy, a warning, or a security aspect."

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

199. As discussed above regarding claim 13, *Thomas* discloses that its wireless device 110 may at least assist to control an aspect of the forwarding service. *Thomas* discloses that "[s]everal user configuration settings are provided for the wireless device 110." EX1005, ¶68. Those user-configuration settings

include aspects of service usage policies, including client auto-connection capabilities, automatic shutdown features, and restoration of settings upon reconnection or power up. EX1005, ¶68. *Thomas* further discloses that many other configuration options are possible, including “security features” that may be provided for the wireless device 110. EX1005, ¶¶68-70. Those security features include ensuring that only valid devices connect to the wireless device 110, utilization of Wi-Fi security settings, MAC address restrictions, roaming management, and power management. EX1005, ¶70.

200. *Sewall* discloses a personal hotspot device that includes a hotspot limiter 40 component. EX1006, ¶22. The limiter’s access rules may establish service usage policies for the forwarding service. For example, the access rules imposed by the hotspot limiter may specify upload and download bandwidth limits, may limit the amount of data transfer allowed in a given time period, or may limit the number of simultaneous users or sessions. *See, e.g.*, EX1006, ¶34.

18.Claim 19: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to authorize or prevent usage of the forwarding service by at least one of the one or more other devices based on a credential.”

201. In my opinion, claim 19 would have been obvious to one of skill based on *Thomas* and *Sewall*.

202. *Sewall* discloses a personal hotspot device that includes a hotspot limiter 40 component. EX1006, ¶¶22, 26. The limiter may authorize or prevent usage of the hotspot service by another computing device based on a credential. For example, access engine of the personal hotspot device may provide an interface for a requesting device to supply credentials and then, based on the information in those credentials, determine whether to grant authorization or deny authorization to the hotspot service. EX1006, ¶39.

203. *Thomas* also discloses authorizing or preventing usage of the forwarding service based on authorization credentials. It discloses that a requesting computing device 114 may pass credentials to a service provider, which may then provide authentication to the wireless device 110. EX1005, ¶¶52-53. The wireless device 110 may then authorize the computing device to access the forwarding service, configuring it to have “the ability to send and receive normal traffic via the internet 104.” *Id.*

204. *Thomas*’s wireless device 110 may also be programmed to accept computer traffic from only a select number of computing devices. EX1005, ¶46. When a computing device seeks authorization to use the wireless device’s forwarding service, the processor may cause the user interface to provide options to the user to allow usage of the forwarding service, including by authorizing the

computing device with access to the forwarding service based on a credential such as device identification information. EX1005, ¶¶44, 46, 76-77, Figs. 9, 10; EX1001, 120:51-58 (“credentials” include device identifiers, including MAC addresses). Indeed, Figure 10 reflects that authorization has been granted to devices having the identified “device names, MAC addresses, or other identifying information for the connected client computing devices 114.” EX1005, ¶70, Fig. 10 (selectively granting access to particular computing devices, e.g., “TOM’S LAPTOP,” “FRED’S N480,” and “00 18 E7 99 34 D6”); *see also id.*, ¶46 (displaying a requesting computing device’s identifier, such as the service set identifier (SSID) or MAC address, for the wireless device’s owner to authorize or reject for forwarding service access).

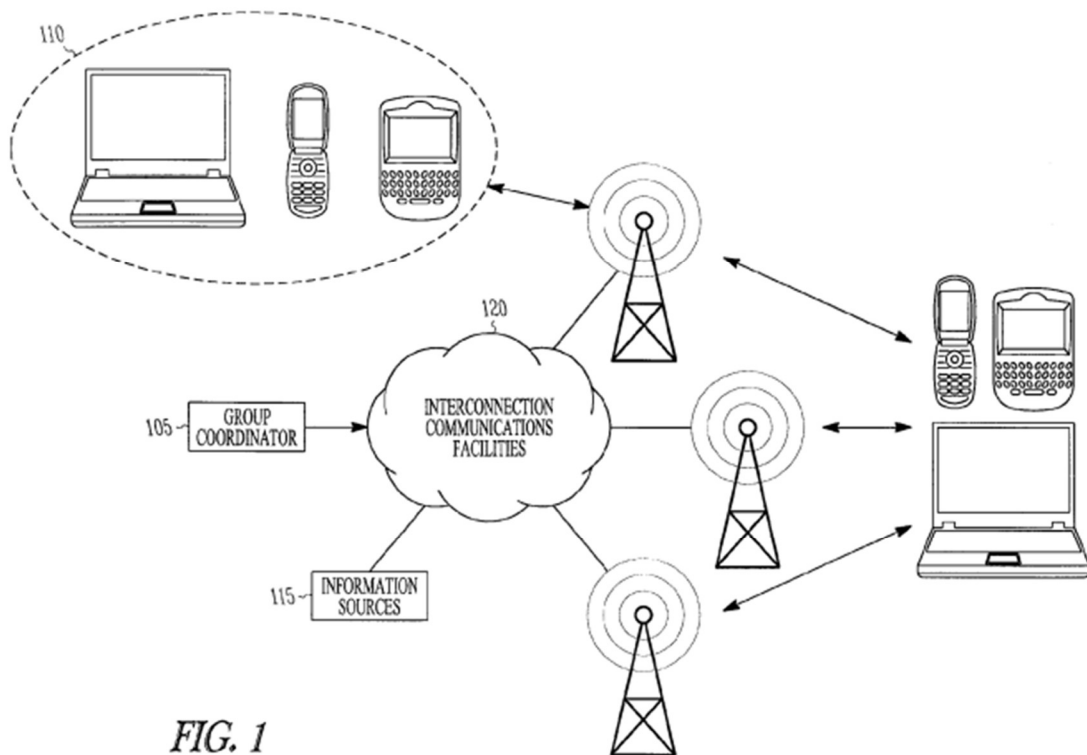
XIII. GROUND 3: CLAIM 3 IS OBVIOUS OVER *THOMAS* AND *SEWALL* IN VIEW OF *BOUDREAU*

1. Motivation to Combine

205. As detailed above, one of skill in the art would recognize *Thomas* and *Sewall* as analogous art to the ’102 patent because they are in the same field of endeavor: mobile devices and wireless access points for computer networking. *Supra* § XII.1. *Thomas* and *Sewall* each disclose end-user devices for providing a forwarding service, which can involve submitting and receiving sensitive information, such as identifying information, personal information, and other

configuration information, to and from a server. One of skill in the art would understand that the device user would desire to protect such sensitive information.

206. One of skill in the art would also recognize that *Boudreau* is analogous art and in the same field of endeavor as the '102 patent. As shown in Figures 1 and 2A, *Boudreau* discloses a wireless system architecture that, like *Thomas* and *Sewall*, includes servers and mobile wireless clients.



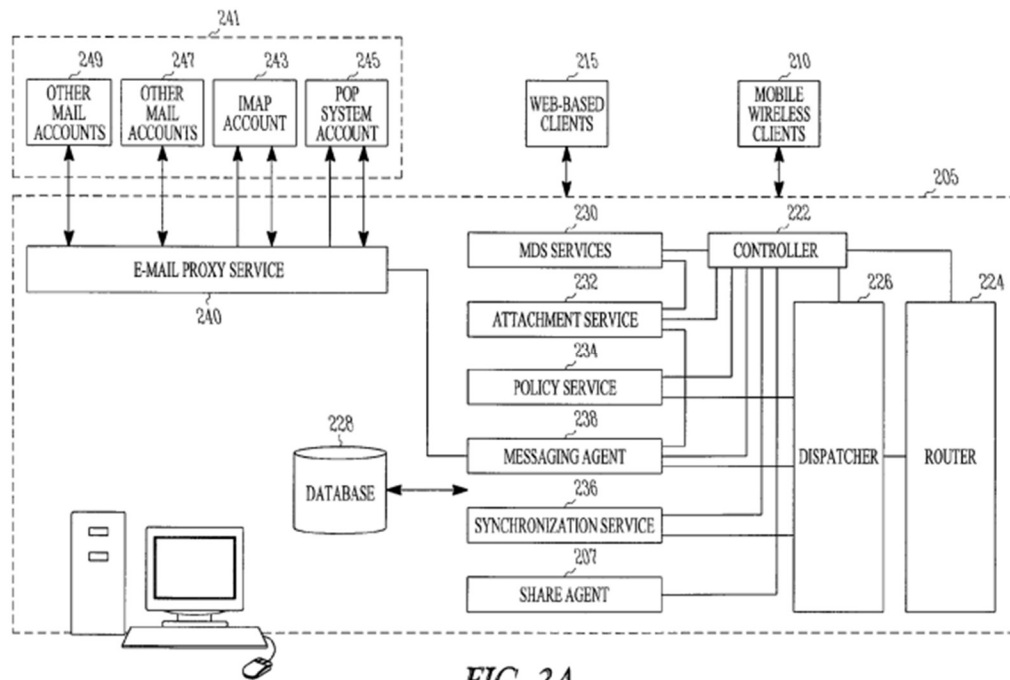


FIG. 2A

EX1007, Figs. 1, 2A. According to *Boudreau*, communications between a server and a mobile wireless client should be secured, for example by using data encryption, to protect sensitive information. EX1007, ¶¶49-52.

207. In my opinion, a skilled artisan would have been motivated to use a secure channel, as *Boudreau* discloses, to request and obtain configuration information from a network element, such as a server, as *Thomas* and/or *Sewall* disclose. Indeed, *Thomas* seeks to provide “a dynamic, *secure*, and flexible networking environment.” EX1005, ¶29. *Thomas* and *Sewall* each also disclose that their end-user devices send and receive identifiers, profiles, and other authorization information. A skilled artisan would have reasonably sought to

maintain such sensitive information as confidential and secure from interception.

EX1005, ¶¶58-59; EX1006, ¶¶44-45. In my opinion, combining *Boudreau*'s disclosure with the disclosure of *Thomas* and *Sewall* was within a POSITA's skill and would predictably apply known techniques, such as secure communication channels, to known mobile client-server communications. This combination would reasonably provide a secure channel for *Thomas*'s and *Sewall*'s end-user devices to request and obtain configuration information to establish conventional hotspot services for allowing other computing devices to access the internet. Indeed, it would have been compatible and conventional to use unique identifiers and secure remote password keys to establish a secure channel, as *Boudreau* discloses, through which confidential or sensitive configuration information would be requested and obtained at the end-user device.

2. Claim 3: “wherein obtain configuration information from the one or more network elements comprises obtain the configuration information over a secure control link.”

208. Claim 3 depends from claim 1, which would have been obvious as discussed above. *Supra* §§ XI.1, XII.2. *Thomas*, *Sewall*, and *Boudreau* render claim 3 obvious. As discussed in more detail above for element 1[d][i], *Thomas* and *Sewall* each disclose receiving configuration information from the one or more network elements, such as a server. *See Supra* § XII.2.h. As detailed above, one of

skill in the art would have been motivated to provide the secure control link of *Boudreau* to the end-user device of *Thomas* and *Sewall* so that the end-user devices of *Thomas* and *Sewall* can securely request and obtain configuration information to establish “conventional” hotspot services. EX1007, ¶¶49-52. Such requests and responses for configuration information include identifiers, profiles, and other authorization information that one of skill in the art would have reasonably sought to maintain as confidential and secure from interception. *Supra* § XIII.1.

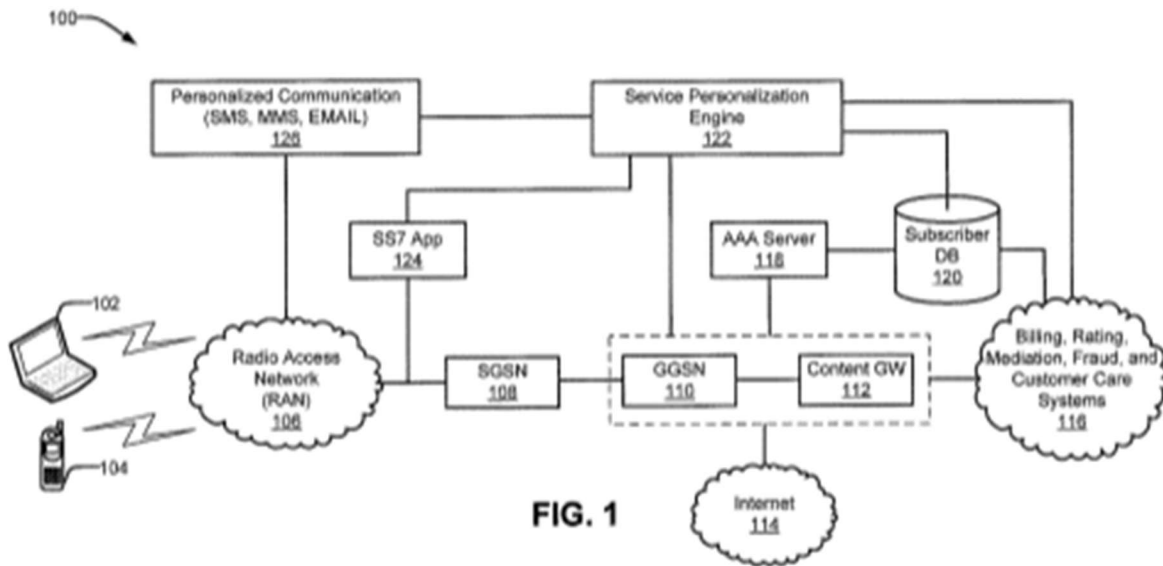
XIV. GROUND 4: CLAIMS 9, 29, and 30 ARE OBVIOUS OVER *THOMAS* AND *SEWALL* IN VIEW OF *BURNETT*

1. Motivation to Combine

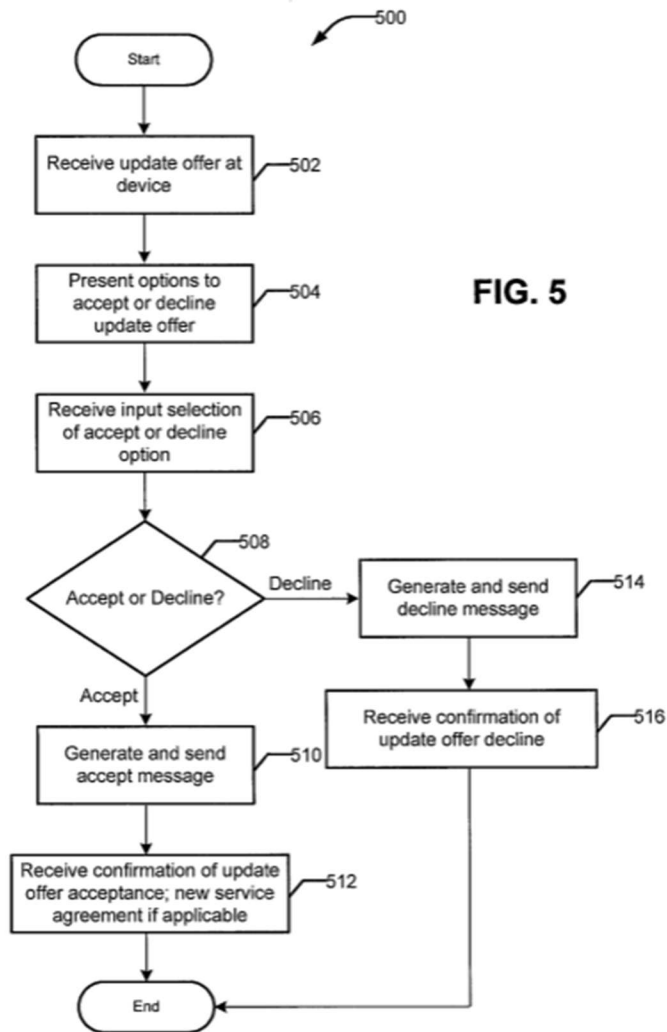
209. As detailed above, one of skill in the art would recognize that *Thomas* and *Sewall* are analogous art to the '102 patent because they are in the same field of endeavor: mobile devices and wireless access points for computer networking. *Supra* §XII.1. *Thomas* and *Sewall* also disclose customizing and monetizing mobile hot spot technology. For example, these references disclose financial relationships or subscription plans between the end user and the service provider and providing notifications via user interfaces. EX1005, ¶54; EX1006, ¶25.

210. One of skill in the art would also understand that *Burnett* is analogous art and in the same field of endeavor as the '102 patent. For example, as depicted in Figure 1, *Burnett* discloses a wireless data device configured to access a wireless

communications network.



EX1008, 3:54-4:2, Fig. 1. *Burnett* also discloses that the communications network includes a service personalization engine that facilitates update offers. EX1008, 4:42-57, 7:32-53. For example, as shown in the method depicted in Figure 5, the service personalization engine can provide an up-sell offer to persuade a subscriber to update services.



EX1008, 7:32-53, Fig. 5. The up-sell offer can be sent as a “formatted message to the subscriber’s device 102, 104.” EX1008, 7:63-67, 8:25-49.

211. A skilled artisan would have been motivated to send information about a service plan, which could include the forwarding service of *Thomas* and *Sewall* in a message with an update offer, as disclosed by *Burnett*. In my opinion, a skilled artisan would reasonably seek to notify the user of the end-user device

about the forwarding service that is provided as part of the financial relationship and/or subscription plan between the user and the service provider, including with updated offers when, for example, a data limit or cost limit is being approached.

EX1008, 8:25-49. Combining these disclosures would have been within a POSITA's skill and would predictably apply known techniques, such as notifications of update offers, to include information about a service plan including the forwarding service. In my opinion, it would have been compatible and conventional to include information about a service plan including the forwarding service in an update offer message to the end-user because such an update offer can suggest an appropriate service plan based on the subscriber's usage history to minimize overage fees, promote efficient use of the network resources, and ensure consistent network access to end user devices.

2. Claim 9: “wherein the notification provides information about a service plan that includes the forwarding service.”

212. Claim 9 depends from claim 1, which would have been obvious as discussed above. *Supra* §§ XI.1, XII.2. *Thomas* and *Sewall* each disclose an end-user device that provides a forwarding service and notifications. EX1005, ¶54; EX1006, ¶25. *Thomas* also discloses a financial relationship between a user and a service provider, including usage and incentive plans. EX1005, ¶¶54-55. Likewise, *Sewall* discloses a subscription plan, including a basic or premium subscription

package. EX1006, ¶25.

213. Burnett discloses “suggest[ing], via an update offer, that [the user] upgrade his plan to unlimited data.” EX1008, 8:37-49. Burnett discloses that the update offer can be sent as a “formatted message to the subscriber’s device 102, 104.” EX1008, 7:63-67, 5:33-47. As discussed above, one of skill in the art would find it desirable to provide an update offer because such an update offer can suggest an appropriate service plan based on the subscriber’s usage history which can minimize overage fees, promote efficient use of the network resources, and ensure consistent network access to end user devices. EX1008, 8:37-49.

214. Accordingly, the subject matter of claim 9 would have been obvious to one skilled in the art based on *Thomas, Sewell, and Burnett*.

3. Claim 29: “wherein the notification comprises information about a service plan that includes the forwarding service.”

215. Claim 29 depends from claim 10, which would have been obvious as discussed above. *Supra* §§ XI.6, XII.9. One of skill in the art would recognize that *Thomas, Sewall, and Burnett* disclose the additional features of claim 29 and thus render obvious claim 29 for the same reasons discussed above for claim 9. *See supra* § XIV.2.

4. Claim 30: “wherein the information about the service plan comprises an offer for the service plan.”

216. Claim 30 depends from claim 29, which would have been obvious to one of skill in the art as discussed above. Supra § XIV.3.

217. Thomas discloses a financial relationship between the user and the service provider, including usage and incentive plans. EX1005, ¶54. Likewise, Sewall discloses a subscription plan, including a basic or premium subscription package. EX1006, ¶25. Burnett discloses “suggest[ing], via an update offer, that [the user] upgrade his plan to unlimited data.” EX1008, 8:37-49. The update offer of *Burnett* can include an “up-sell offer whereby the service provider attempts to persuade the subscriber to purchase additional services, updates, or add-on services.” EX1008, 7:40-53. As detailed above, in my opinion, a skilled artisan would have been motivated to provide an offer for a service plan, as *Burnett* discloses, as part of the information about the service plan, as *Thomas* and *Sewall* disclose, because such an offer can suggest an appropriate service plan based on the subscriber’s usage history to minimize overage fees, promote efficient use of the network resources, and ensure consistent network access to end-user devices..

218. Accordingly, in my opinion, one of skill in the art would find that the subject matter of claim 30 would have been obvious based on *Thomas*, *Sewell*, and *Burnett*.

XV. GROUND 5: CLAIMS 20 and 21 ARE OBVIOUS OVER *THOMAS* AND *SEWALL* IN VIEW OF *PANDYA*

1. Motivation to Combine

219. As detailed above, one of skill in the art would recognize that *Thomas* and *Sewall* are analogous art to the '102 patent because they are in the same field of endeavor: mobile devices and wireless access points for computer networking. *Supra* § XII.1. *Thomas* and *Sewall* each disclose using end-user devices for bridging or routing traffic from other devices to a network system, such as the internet, which includes controlling traffic between the end user devices, the other devices, and the network system. See, e.g., EX1005, ¶¶49, 54; EX1006, ¶¶34, 36.

220. *Pandya* is also analogous art and in the same field of endeavor as the '102 patent. *Pandya* is directed to a distributed network, including servers and client devices. EX1009, ¶31. For example, as reflected in Figures 2 and 4 below, *Pandya* discloses control points 72 (an “end-user device”) and agent computers 70 associated with client computers deployed throughout distributed network 74.

Fig. 2

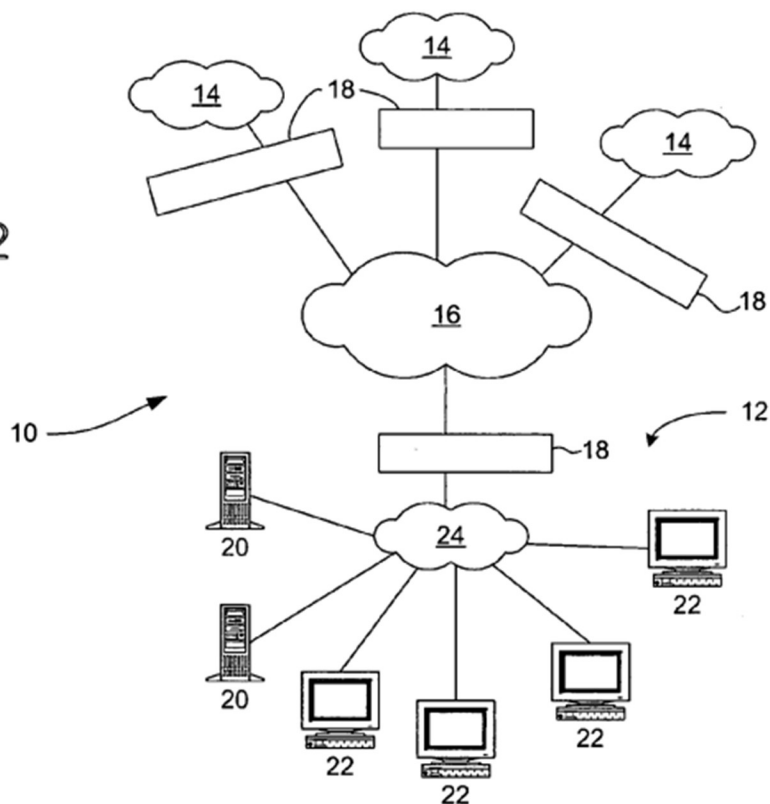
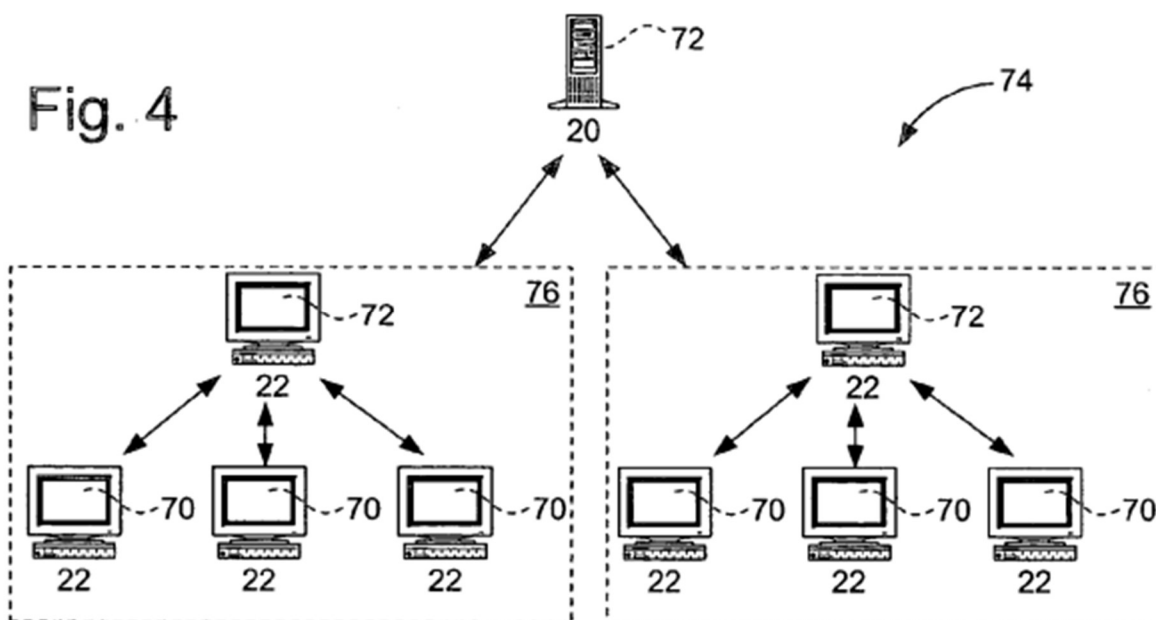


Fig. 4



EX1009, ¶¶40, 42-44, Fig. 2, 4. The control points of *Pandya*, which may be cellular phones, provide traffic controls to optimize distribution of network resources, including re-allocating bandwidth and blocking or restricting various activities within the network, including at the packet and QoS level. EX1009, ¶¶44, 47-51, 77-78.

221. A skilled artisan would have been motivated to use *Pandya*'s traffic control features implemented on the end-user devices of *Thomas* and *Sewall*. Combining these disclosures was within a POSITA's skill and would predictably apply known techniques, such as controlling traffic within a distributed network, as disclosed by *Pandya*, to known mobile client-server communications, as disclosed by *Thomas* and *Sewall*. Such a combination would optimize use of network resources for *Thomas*'s and *Sewall*'s end-user devices and hotspot users, for example, by dynamically adjusting bandwidth allocations based on changing network conditions to improve network services. In my opinion, it would have been compatible and conventional to use the traffic control methods of *Pandya* to manage network access through *Thomas*'s and *Sewall*'s end user devices to improve bandwidth management and maximize network performance.

2. Claim 20

222. Claim 20 depends from claim 1, which would have been obvious as

discussed above. *Supra* §§ XI.1, XII.2.

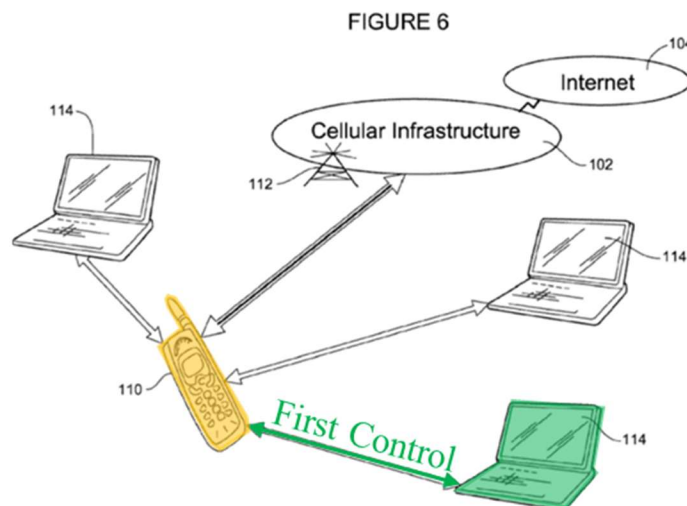
- a. **20[pre]: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to:”**

223. In my opinion, *Thomas* discloses 20[pre] for the same reasons discussed above for 1[d].

- b. **20[a]: “apply a first control to traffic between the end-user device and at least one of the one or more other devices, and”**

224. In my opinion, *Thomas*, *Sewall*, and *Pandya* render 20[a] obvious.

225. As reflected in annotated Figure 6 below, *Thomas* discloses controlling traffic between the wireless device 110 and a client computing device 114.



EX1005, Fig. 6 (annotated). For example, *Thomas* discloses metering traffic according to duration of connection, number and size of packets sent or received,

or other factors, such as peak or off-peak usage, or elevated quality of service requirements. EX1005, ¶54. *Thomas* also discloses preventing or accepting traffic to particular devices. EX1005, ¶¶46, 49. For example, according to *Thomas*, “unauthorized users could be prevented from communicating or receiving normal traffic across the wireless device 110.” EX1005, ¶49. Further, the “wireless device 110” of *Thomas* can “accept computer traffic from a select number of client computing devices 114.” EX1005, ¶46.

226. Likewise, as reflected in Figure 1, *Sewall* discloses controlling traffic between the client devices 12, 14, and 16 and personal hotspot 10.

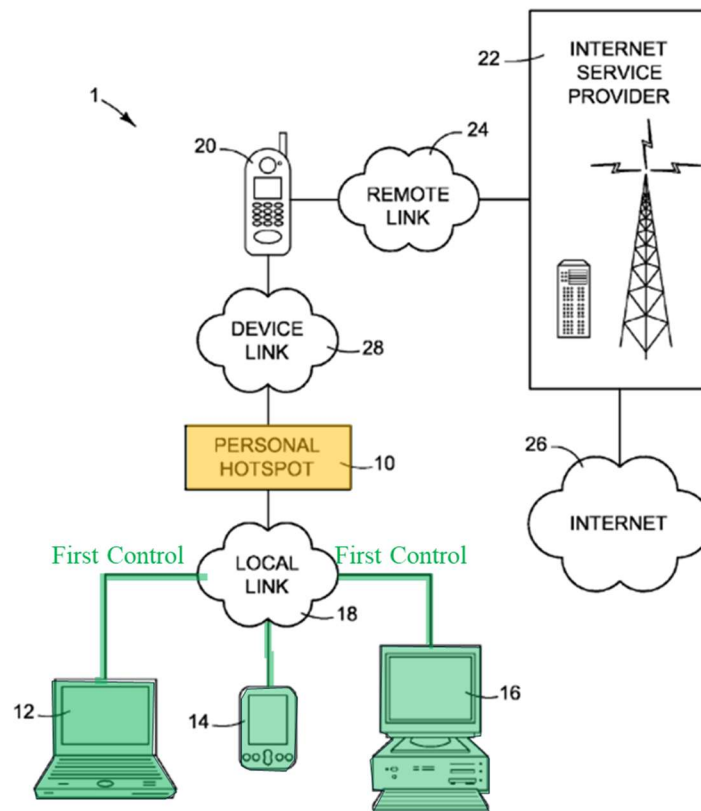


FIG. 1

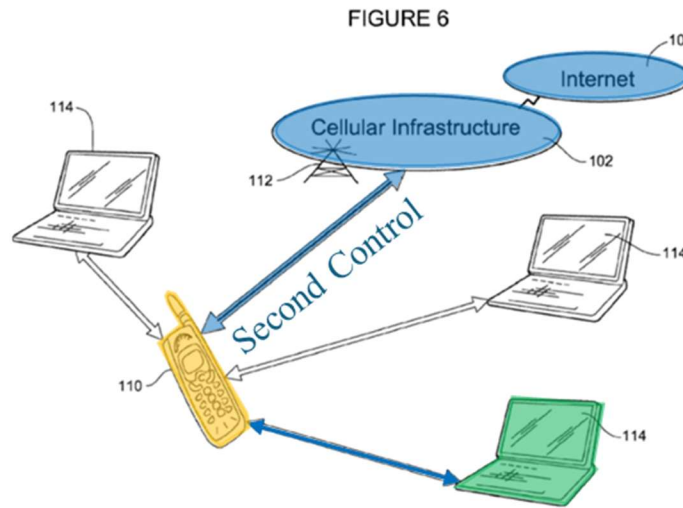
EX1006, Fig. 1 (annotated). *Sewall* discloses a limiter that imposes access rules that “specify upload and download bandwidth limits” and “limit the amount of data transfer allowed in a given time period.” EX1006, ¶¶22, 36. For example, “anonymous user access rules will be more limiting than authorized user access rules.” EX1006, ¶36. The limiter 40 of *Sewall* is “capable of distinguishing among . . . client devices 12, 14, and 16, and applying different internet access rules for different users.” EX1006, ¶22.

227. In my opinion, *Pandya* also discloses 20[a]. For example, *Pandya*

discloses control points 72, an “end-user device,” and agents 70 associated with distributed client computers, “one or more other devices, deployed throughout distributed network 74. According to *Pandya*, the “control points coordinate and control the activity of the distributed agents within their domains.” EX1009, ¶42. Specifically, “a traffic control mechanism of the control point dynamically allocates bandwidth among the agents.” EX1009, ¶77. The control points also implement policy-based QoS techniques, which may guarantee high levels of service. EX1009, ¶¶77-78, 47, 51. In my opinion, a skilled artisan would have been motivated to combine the traffic control mechanisms of *Pandya*, which coordinate and control the activity of client computing devices and dynamically allocate bandwidth and among them, with the end-user devices of *Thomas* and *Sewall*. One of skill in the art would have been motivated to make this combination to improve bandwidth management and maximize network performance.

c. 20[b]: “apply a second control to traffic between the at least one of the one or more other devices and the network system,”

228. In my opinion, *Thomas*, *Sewall*, and *Pandya* render 20[b] obvious. For example, as reflected in annotated Fig. 6 below, *Thomas* discloses applying a control to traffic between one or more other devices and the network system.



EX1005, Fig. 6 (annotated). For example, according to *Thomas*, a user of a client computing device 114 may be required to provide “authentication credentials” that wireless device 110 passes to the service provider. EX1005, ¶¶52-53. After the user is authenticated with the service provider, “the user of the client computing device 114 may be configured as a client computing device 114 with the ability to send and receive normal traffic via the Internet 104.” EX1005, ¶53. Authentication of the user device allows “communicat[ion] of normal traffic through the wireless device 110 to reach a network such as the Internet 104.” EX1005, ¶47.

229. Likewise, as reflected in Figure 1 below, *Sewall* discloses applying a second control to traffic between one or more other devices and the network system.

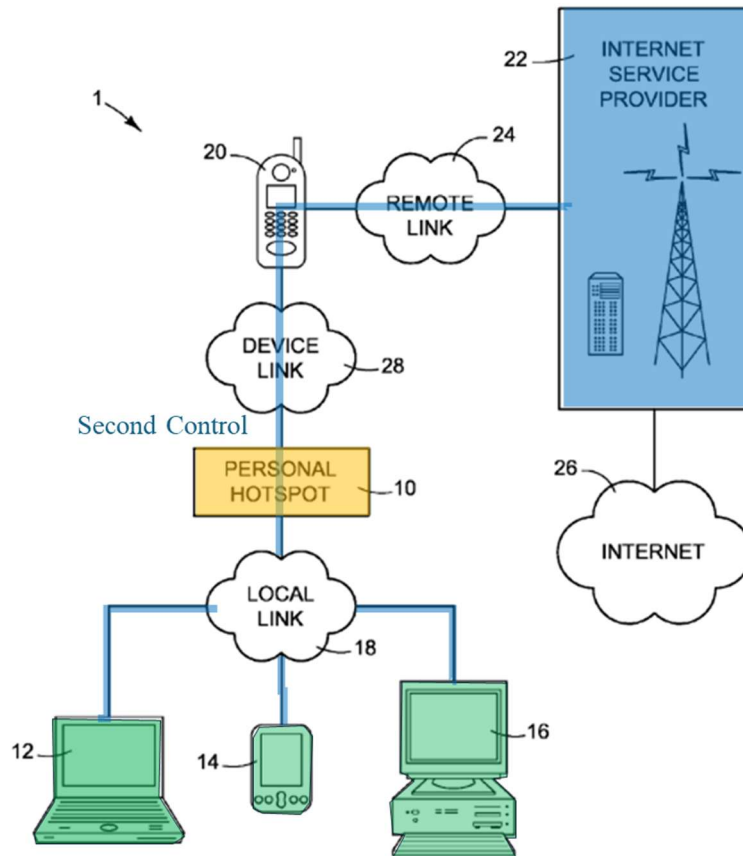


FIG. 1

EX1006, Fig. 1 (annotated). *Sewall* discloses limiting a “user’s duration of use,” “bandwidth available to a given user,” or “the amount of data a particular user or type of user can download in a given time period.” EX1006, ¶26. An “access engine 48” of *Sewall* “is responsible for blocking communications from and even to a user once that user[] has reach a duration, download, or bandwidth limit.” EX1006, ¶26. When communications are blocked, “access engine 48 prevents the communication from being routed to internet 26.” EX1006, ¶26.

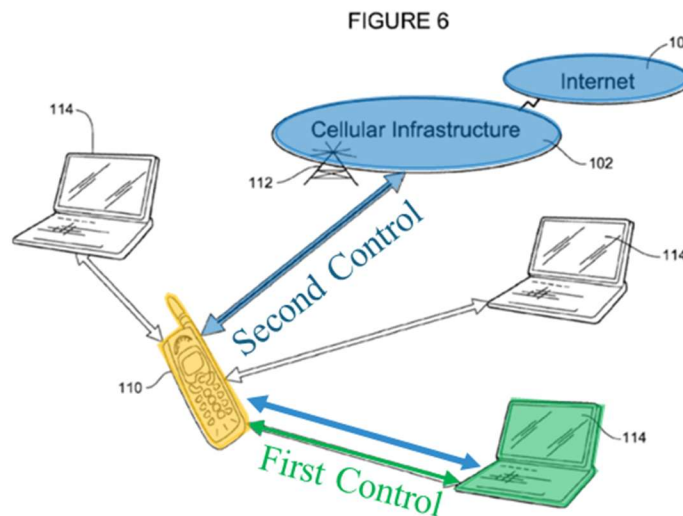
230. *Pandya* also discloses the additional features of 20[b]. For example, *Pandya* discloses “traffic control components.” EX1009, ¶62. According to *Pandya*, when “data is sent from the distributed device (e.g., a client computer) out to the network, or from the network to the distributed device, that data may be . . . placed in an appropriate queue.” EX1009, ¶62. The control points of *Pandya* “provide traffic control commands, which may include the QoS parameters and service specifications” to “control[] the passing of data into, through, or out of the queues.” EX1009, ¶62. These queues “release data for transmission to the network at regular intervals” based on the “traffic control commands issued by a control point,” thus applying a second control to traffic between the distributed client computers (the “one or more other devices”) and the network (the “network system”). EX1009, ¶64.

231. In my opinion, a skilled artisan would have been motivated to combine the traffic control components of *Pandya*, which coordinate and control the release of data between a client computer and a network, with the end-user devices of *Thomas* and *Sewall*. One of skill in the art would have been motivated to make this combination to improve bandwidth management and maximize network performance for example, by dynamically adjusting bandwidth allocations based on changing network conditions to improve network services.

d. 20[c]: “wherein the first control differs from the second control.”

232. In my opinion, *Thomas*, *Sewall*, and *Pandya* render element 20[c] obvious.

233. One of skill in the art would recognize that *Thomas*’s first control differs from *Thomas*’s second control, as reflected in Figure 6 below.



EX1005, Fig. 6 (annotated). *Thomas*’s first control includes allowing the wireless device 110 to “accept computer traffic from a select number of client computing devices 114.” EX1005, ¶46. *Thomas*’s second control includes authenticating the client computing device 114 with the service provider, such that the client computing device 114 has “the ability to send and receive normal traffic via the Internet 104.” EX1005, ¶53.

234. Similarly, one of skill in the art would recognize that *Sewall*’s first

control differs from *Sewall*'s second control, as reflected in Figure 1 of *Sewall* below.

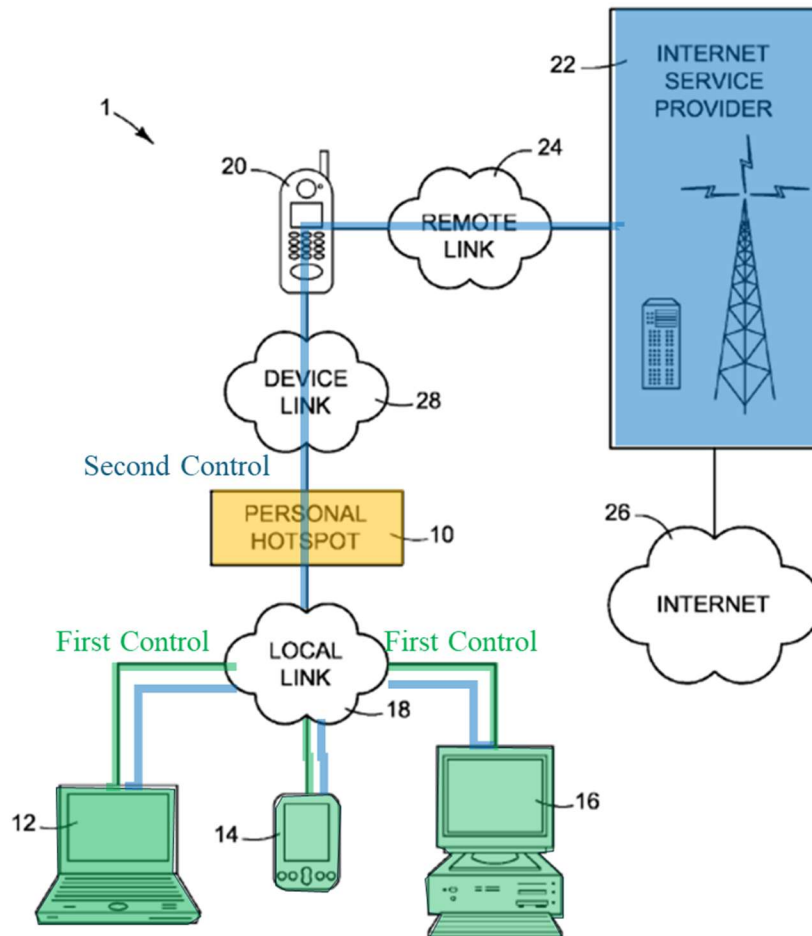


FIG. 1

EX1006, Fig. 1 (annotated). *Sewall*'s first control includes "distinguishing among . . . client devices 12, 14, and 16, and applying different internet access rules for different users" using a limiter 40. EX1006, ¶22. *Sewall*'s second control includes an "access engine 48" that "prevents the communication from being

routed to internet 26” when a user[] has reached a duration, download, or bandwidth limit.” EX1006, ¶26.

235. One of skill in the art would further recognize that *Pandya*’s first control differs from *Pandya*’s second control. For example, *Pandya*’s first control includes “restrict[ing] bandwidth usage by . . . associated devices (e.g., distributed client computers) to the allocated amount.” EX1009, ¶77. *Pandya*’s second control includes placing data from distributed client computers (the “one or more other devices”) to the network (the “network system”) in “an appropriate queue” that “release[s] data for transmission to the network at regular intervals” based on “parameters specified in traffic control commands issued by a control point.” EX1009, ¶¶62, 64.

3. Claim 21

236. Claim 21 depends from claim 1, which would have been obvious as discussed above. *Supra* §§ XI.1, XII.2.

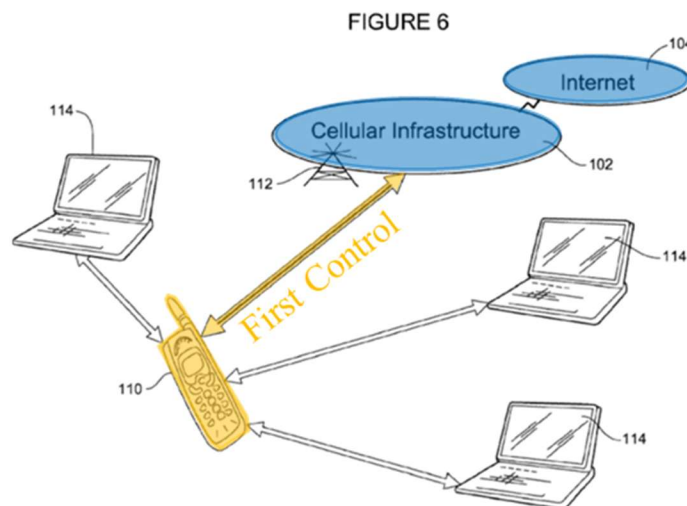
- a. **21[pre]: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to:”**

237. In my opinion, *Thomas* discloses 21[pre] for the same reasons discussed above for 1[d].

b. 21[a]: “apply a first control to first traffic, the first traffic being between the end-user device and the network system, and”

238. In my opinion, *Thomas*, *Sewall*, and *Pandya* render 21[a] obvious.

239. *Thomas* discloses applying a first control to first traffic between a wireless device 110, the “end-user device,” and a network, the “network system,” as reflected below in Figure 6.



EX1005, Fig. 6 (annotated). For example, the system of *Thomas* “determines whether the requesting wireless device 110 is authorized to operate within the network.” EX1005, ¶59. According to *Thomas*, if the wireless device 110 is authorized to operate within the network, then a message may be sent to wireless device 110 that can include “number of available IP addresses, base IP address, lease time, short lease time, new software version, [and] data amount remaining” for the end-user device’s communications with the network system (e.g., including

traffic forwarding). EX1005, ¶59.

240. Similarly, *Sewall* discloses applying a first control to first traffic between an end user device and a network system, as reflected in Figure 1 below.

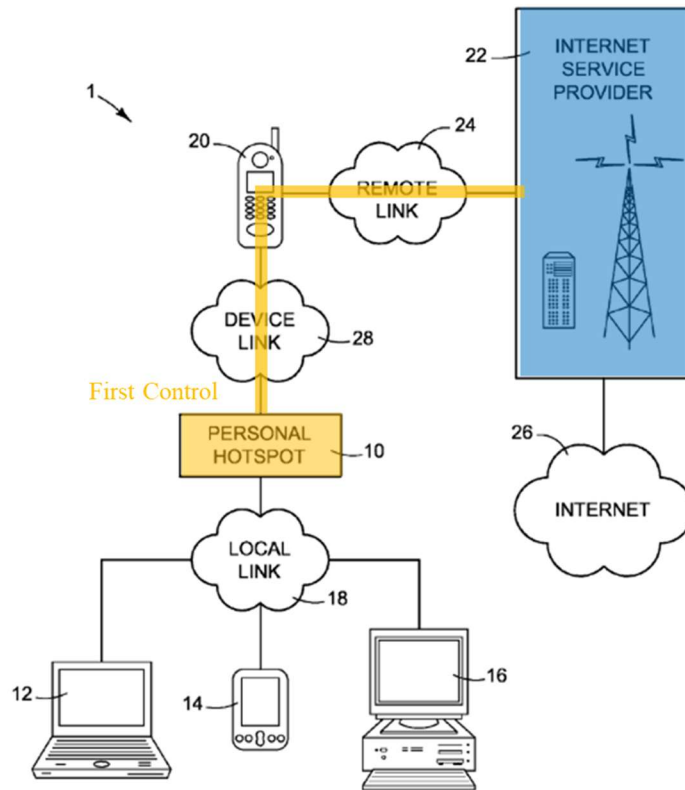


FIG. 1

EX1006, Fig. 1 (annotated). *Sewall* discloses a first control where “personal hotspot 10 and data exchanger 20 negotiate a link” that includes “a connection to internet 26 via service provider 22.” EX1006, ¶¶43, 16 (the hotspot 10 and data exchanger 20 may be incorporated into a single device). According to *Sewall*, the “service provider 22 can identify a data subscription plan paid for by the owner”

and “limit[] access according to the configuration data” associated with the subscription plan. EX1006, ¶43.

241. *Pandya* also discloses the additional features of 21[a]. For example, *Pandya* discloses control points 72, an “end-user device,” deployed throughout distributed network 74, a “network system.” *Pandya*’s control points “implement policy based, QoS techniques by coordinating [] service level enforcement activities.” EX1009, ¶77. The control points of *Pandya* allocate bandwidth according to “network load, network population, and virtually any other parameter concerning network resources,” consistent with *Sewall*’s access limitations and *Thomas*’s recognition of data limits associated with the network system. EX1009, ¶78; EX1006, ¶43; EX1005, ¶59. In my opinion, a skilled artisan would reasonably have sought to use the QoS techniques and bandwidth allocation, as disclosed by *Pandya*, in the communications between *Thomas*’s and *Sewall*’s end-user devices and service providers to ensure high levels of service and to optimize network resource allocation.

- c. **21[b]: “apply a second control to second traffic, the second traffic being between at least one of the one or more other devices and the network system,”**

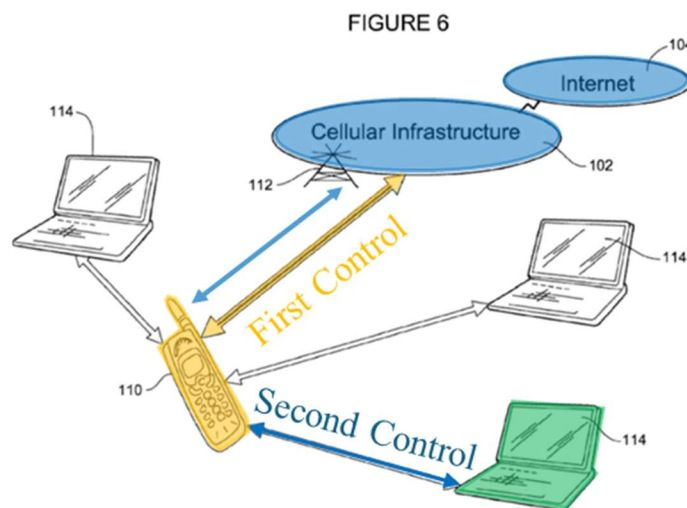
242. In my opinion, one of skill in the art would recognize that *Thomas*, *Sewall*, and *Pandya* render obvious element 21[b] for the same reasons

discussed above for element 20[b].

d. 21[c]: “wherein the first control differs from the second control.”

243. In my opinion, one of ordinary skill would find that *Thomas, Sewall*, and *Pandya* render element 21[c] obvious.

244. As reflected in Figure 6, the first control of *Thomas* differs from the second control.



EX1005, Fig. 6 (annotated). For example, the first control of *Thomas* “determines whether the requesting wireless device 110 is authorized to operate within the network.” EX1005, ¶59. The second control of *Thomas* includes authenticating the client computing device 114 with the service provider, such that the client computing device 114 has “the ability to send and receive normal traffic via the Internet 104.” EX1005, ¶53.

245. Similarly, as reflected in Figure 1 below, the first control of *Sewall* differs from the second control.

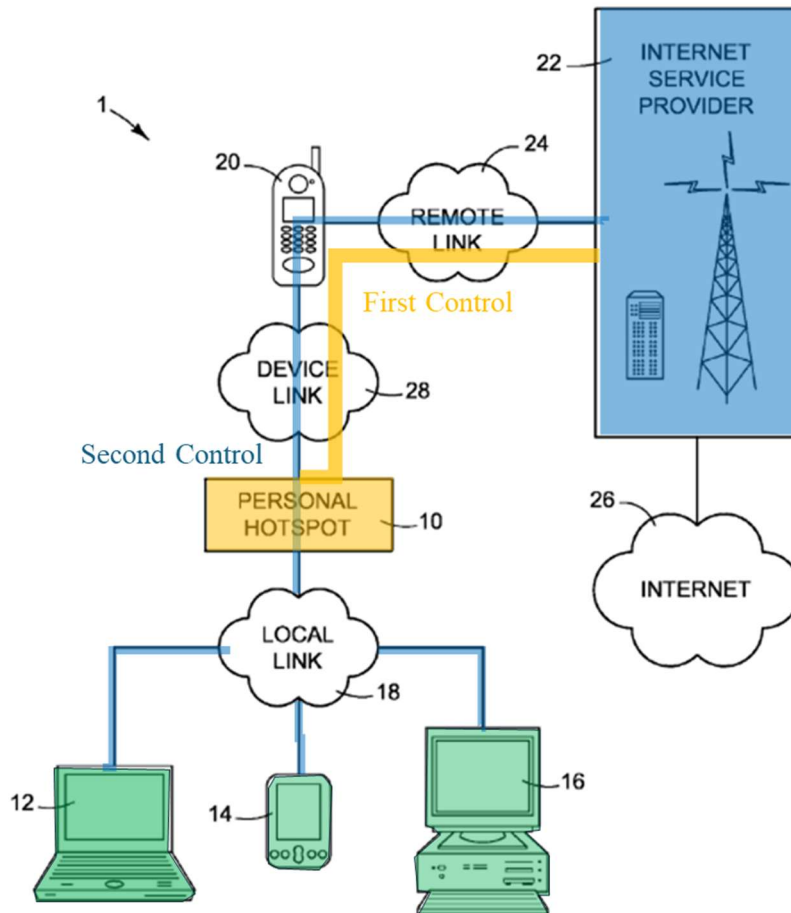


FIG. 1

EX1006, Fig. 1 (annotated). The first control of *Sewall* includes negotiating a link between a “personal hotspot 10 and data exchanger 20” that includes “a connection to internet 26 via service provider 22.” EX1006, ¶43. The second control of *Sewall* includes an “access engine 48” that “prevents the communication from being

routed to internet 26” when a user[] has reach a duration, download, or bandwidth limit.” EX1006, ¶26.

246. Additionally, one of skill in the art would find that the first control of *Pandya* also differs from the second control. The first control of *Pandya* is applied by control points that “implement policy based, QoS techniques by coordinating [] service level enforcement activities.” EX1009, ¶77. *Pandya*’s second control includes placing data from distributed client computers to the network in “an appropriate queue” that “release[s] data for transmission to the network at regular intervals” based on “parameters specified in traffic control commands issued by a control point.” EX1009, ¶¶62, 64.

XVI. GROUND 6: CLAIMS 22-25 ARE OBVIOUS OVER *THOMAS* AND *SEWALL* IN VIEW OF *SEWALL* ’327

1. Motivation to Combine

247. One of skill in the art would recognize *Thomas* and *Sewall* as analogous art to the ’102 patent since they are in the same field of endeavor: mobile devices and wireless access points for computer networking. *Supra* § XII.1. Both *Thomas* and *Sewall* disclose end-user devices used for setting up forwarding services, which can involve metering and tracking usage of a forwarding service to, for example, track usage costs under a service plan or provide incentives to a forwarding-service provider. EX1005, ¶¶54-55, 76-77, Figs. 9, 10.

248. One of skill in the art would also find that *Sewall* '327 is analogous art and in the same field of endeavor as the '102 patent. Like *Thomas*, *Sewall*, and the '102 patent, *Sewall* '327 is directed to a network environment including a router that “rout[es] network communications between clients 12, 14, and 16 and internet 26.” EX1010, ¶8. Furthermore, *Sewall* '327 discloses “collect[ing] individualized usage information from multiple users accessing the Internet via a single data plan.” EX1010, ¶7, 31.

249. In my opinion, a skilled artisan would have been motivated to combine *Sewall* '327's disclosure with *Sewall* and *Thomas*. Indeed, *Sewall* '327 incorporates *Sewall*'s disclosure by reference. EX1010, ¶1 (incorporating 11/673,956). Moreover, *Thomas* and *Sewall* disclose end-user devices that can simultaneously provide hotspot connections to multiple other user devices . EX1005, ¶9; EX1006, ¶34. One skilled in the art would reasonably seek to collect individualized usage information of each of the users accessing the network through the end-user device's forwarding service to track usage costs and provide user-by-user incentives, and otherwise monetize the forwarding service. Combining these disclosures would have been within a POSITA's skill and would predictably apply known techniques, such as monitoring individual usage by a plurality of client devices, to known mobile hotspot services. In my opinion, using

individualized monitoring to track usage of specific users of a forwarding service provided through an end-user device would have been both compatible and conventional.

2. Claim 22: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to account for usage of the forwarding service.”

250. Claim 22 depends from claim 1, which would have been obvious as discussed above. *Supra* §§ XI.1, XII.2. In my opinion, *Thomas*, *Sewall*, and *Sewall* '327 render claim 22 obvious. *Thomas* discloses metering usage based on time of a connection, packets sent/received, or other factors. EX1005, ¶54.

Additionally, *Sewall* discloses user data that includes “a table having a series of records, one for the owner and one for each authorized user.” EX1006, ¶38. According to *Sewall*, “[e]ach record may also contain usage data . . . for a particular user.” EX1006, ¶38.

251. *Sewall* '327 discloses that “a data service provider [can] collect individualized usage information from multiple users accessing the internet via a single data plan.” EX1010, ¶38. According to *Sewall* '327, “a collection of statistics reflecting, for each client, the characteristics monitored by analyzer 40” may be provided and said statistics can “be reflective of the amount or quantity of data routed with respect that client and with respect to each port number opened by

that client.” EX1010, ¶23. In my opinion, a skilled artisan would reasonably seek to collect the individualized usage information of *Sewall* '327 to provide individual usage data for *Thomas*'s and *Sewall*'s end-user devices in order to track and appropriately monetize usage of specific users of a forwarding service provided through *Thomas*'s and *Sewall*'s end-user device.

252. Accordingly, the subject matter of claim 22 would have been obvious to one skilled in the art.

3. Claim 23: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to determine a separate accounting for usage of the forwarding service.”

253. Claim 23 depends from claim 1, which would have been obvious as discussed above. *Supra* §§ XI.1, XII.2. In my opinion, *Thomas*, *Sewall*, and *Sewall* '327 render claim 23 obvious. *Thomas* and *Sewall* both disclose end-user devices that can provide hotspot connections to multiple other user devices simultaneously. EX1005, ¶9; EX1006, ¶34. *Thomas* discloses metering usage based on time of a connection, packets sent/received, or other factors. EX1005, ¶54. *Sewall* also discloses user data that includes “a table having a series of records, one for the owner and one for each authorized user.” EX1006, ¶38. According to *Sewall*, “[e]ach record may also contain usage data . . . for a particular user.” EX1006, ¶38.

254. *Sewall* '327 discloses that “a data service provider [can] collect individualized usage information from multiple users accessing the internet via a single data plan.” EX1010, ¶38. *Sewall* '327 also discloses that “a collection of statistics reflecting, for each client, the characteristics monitored by analyzer 40” may be provided and said statistics can “be reflective of the amount or quantity of data routed with respect that client and with respect to each port number opened by that client.” EX1010, ¶23. Thus, a skilled artisan would be motivated to collect the individualized usage information disclosed in *Sewall* '327 to determine a separate accounting of individual user's usage of the forwarding service disclosed in *Thomas* and *Sewall* to track and monetize such individual usage of the forwarding service.

255. Accordingly, the subject matter of claim 23 would have been obvious to one skilled in the art.

4. Claim 24: “wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to determine a separate accounting for usage of the forwarding service by a subset of one or more devices of the one or more other devices.”

256. Claim 24 depends from claim 1, which would have been obvious as discussed above. *Supra* §§ XI.1, XII.2. In my opinion, for reasons similar to those discussed above regarding claim 23, *Thomas*, *Sewall*, and *Sewall* '327 render claim

24 obvious. Thomas and Sewall both disclose end-user devices that can provide hotspot connections to multiple other user devices simultaneously. EX1005, ¶9; EX1006, ¶34. Thomas discloses metering usage based on time of a connection, packets sent/received, or other factors. EX1005, ¶54. Sewall also discloses user data that includes “a table having a series of records, one for the owner and one for each authorized user.” EX1006, ¶38 According to Sewall, “[e]ach record may also contain usage data . . . for a particular user.” EX1006, ¶38.

257. *Sewall* '327 discloses that “a data service provider [can] collect individualized usage information from multiple users accessing the internet via a single data plan.” EX1010, ¶38. *Sewall* '327 also discloses that “a collection of statistics reflecting, for each client, the characteristics monitored by analyzer 40” may be provided and said statistics can “be reflective of the amount or quantity of data routed with respect that client and with respect to each port number opened by that client.” EX1010, ¶23 Thus, a skilled artisan would be motivated to collect the individualized usage information disclosed in *Sewall* '327 to determine a separate accounting of individual user’s usage of the forwarding service disclosed in *Thomas* and *Sewall*, which a skilled artisan would find useful for tracking usage and allocating costs and payments for the service.

258. Accordingly, the subject matter of claim 24 would have been obvious

to one skilled in the art.

5. Claim 25

259. Claim 25 depends from claim 1, which would have been obvious as discussed above. *Supra* §§ XI.1, XII.2.

a. 25[a]: “obtain first information associated with usage of the wireless access network associated with traffic communicated between the end-user device and the network system or”

260. In my opinion, *Thomas*, *Sewall*, and *Sewall* '327 render 25[a] obvious. *Sewall* teaches user data that “may be a table having a series of records, *one for the owner* and one for each authorized user.” EX1006, ¶38 (added emphasis on “one for the owner”). *Thomas* discloses obtaining and displaying information associated with the wireless device 110’s traffic with the network system, as shown in Figures 9 and 10 below, which, in these examples, reflects data usage and duration.

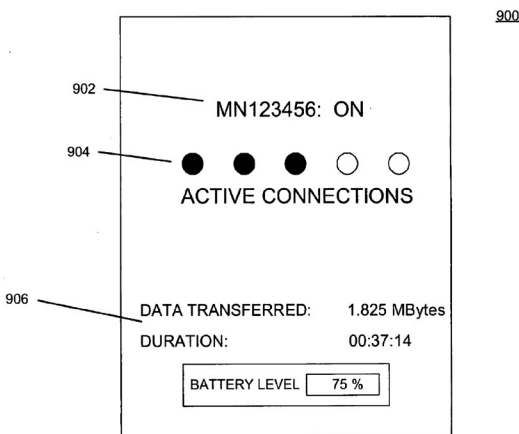


FIGURE 9

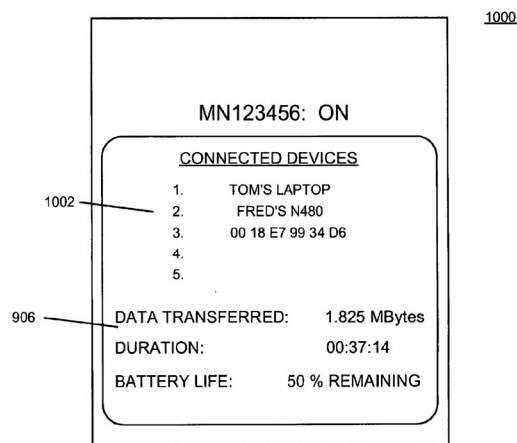


FIGURE 10

EX1005, ¶¶76-77, Figs. 9, 10 (showing data usage and duration); *see also* EX1010, ¶¶38, 26.

b. 25[b]: “second information associated with usage of the wireless access network associated with forwarding service traffic between at least one of the one or more other devices and the network system.”

261. In my opinion, *Thomas*, *Sewall*, and *Sewall* '327 also render 25[b] obvious. *Thomas* discloses that the “metered use of time and/or data passing through the wireless device 110” between client computing device 114 and internet 104 may be monitored as part of an incentive plan. EX1005, ¶¶55. Additionally, *Sewall* discloses user data that “may be a table having a series of records, one for the owner *and one for each authorized user*.” EX1006, ¶38 (added emphasis on “one for each authorized user”). According to *Sewall*, “[e]ach record may also contain usage data . . . for a particular user.” EX1006, ¶38. Further, *Sewall* discloses that a “user's session with personal hotspot 10 is monitored . . . [and] user data 58 for the particular user may be present in configuration data 42.” EX1006, ¶¶ 55-56.

262. *Sewall* '327 discloses that “a data service provider [can] collect individualized usage information from multiple users accessing the internet via a single data plan.” EX1010, ¶38. According to *Sewall* '327, “a collection of statistics reflecting, for each client, the characteristics monitored by analyzer 40”

may be provided and these statistics can “be reflective of the amount or quantity of data routed with respect that client and with respect to each port number opened by that client.” EX1010, ¶23. *Sewall* ’327 discloses a table with entries that “correspond[] to a unique client that is utilizing router device 10 to access internet 26.” EX1010, ¶26. In my opinion, a skilled artisan would have been motivated to collect the type of usage information disclosed in *Thomas* and *Sewall* on an individual user-by-user basis, as *Sewall* ’327 discloses. A skilled artisan would be motivated to make this combination to individually account for forwarding-service user’s usage of the WAN, as a skilled artisan would find it useful for tracking usage data and allocating costs and payments associated with usage of the WAN.

263. Accordingly, the subject matter of claim 25 would have been obvious to one skilled in the art.

XVII.GROUND 7: CLAIMS 26-28 ARE OBVIOUS OVER *THOMAS* AND *SEWALL* IN VIEW OF *TROSSEN*

1. Motivation to Combine

264. One of skill in the art would recognize *Thomas* and *Sewall* as analogous art to the ’102 patent since they are in the same field of endeavor: mobile devices and wireless access points for computer networking. *Supra* § IV.A.1. *Thomas* and *Sewall* also disclose providing a forwarding service to end user devices and provisions for associating financial considerations with this

service. Some examples include financial relationships or subscription plans between the end user and the service provider and end users on the receiving end of the service paying to access the service. EX1005, ¶54; EX1006, ¶53.

265. One of skill in the art would also find that Trossen is analogous art and in the same field of endeavor as the ‘102 patent. *Trossen* teaches managing access to wireless networks with mobile wireless clients. EX1011, ¶14. Furthermore, *Trossen* is also directed to associating costs with accessing the network. EX1011, ¶¶28-32. *Trossen* teaches a system in which the cost for using the network bridging service is provided to the user of the service, negotiated via user input, and used to determine provisioning of the service. EX1011, ¶¶28-32. For example, *Trossen* discloses that after a service request is accepted, a response message with the usage costs determined by units of code for the bridging user (“TS_B”) is sent back to the originating user 10. EX1011, ¶29. Additionally, this cost can be obtained from user input. EX1011, ¶29. *Trossen* further discloses that the development of an agreed-upon cost drives the provisioning of the requested service. EX1011, ¶¶32-34.

266. In my opinion, a skilled artisan would have been motivated to take the cost of a wireless access network from *Thomas* and/or *Sewall* and share information related to that cost to the users receiving access to the network, as

Trossen discloses. A skilled artisan would also reasonably seek to utilize user input to obtain this cost and use this cost as a way to control usage of the forwarding service, as *Trossen* also discloses. In my opinion, combining these disclosures was within a POSITA's skill and would predictably apply known techniques, like providing service costs, obtaining service costs based on user input, and using cost as a means for control, to known mobile device-driven wireless network forwarding services that require payment, resulting in a service that informs users on the costs associated with the service they wish or plan to utilize.

2. Claim 26: “wherein the wireless access network is associated with a cost, and wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to at least assist to provide information associated with the cost to at least one of the one or more other devices.”

267. Claim 26 depends from claim 1, which would have been obvious as discussed above. *Supra* §§ XI.1, XII.2. In my opinion, *Thomas*, *Sewall*, and *Trossen* render claim 26 obvious. *Thomas* and *Sewall* both disclose processes that connect end user devices to a wireless access network and associate a financial component to accessing that network. EX1005, Abstr., ¶54; EX1006, Abstr., ¶53. *Thomas* also discloses providing a user with data-usage and connection-time information related to the wireless access network, as depicted in Figures 9 and 10 below, that a skilled artisan would reasonably expect to be included with a

subscription plan with a service provider.

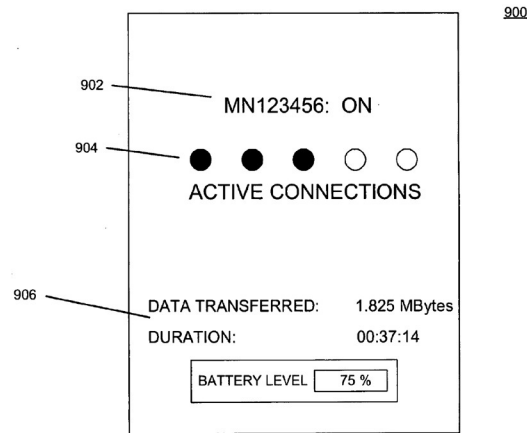


FIGURE 9

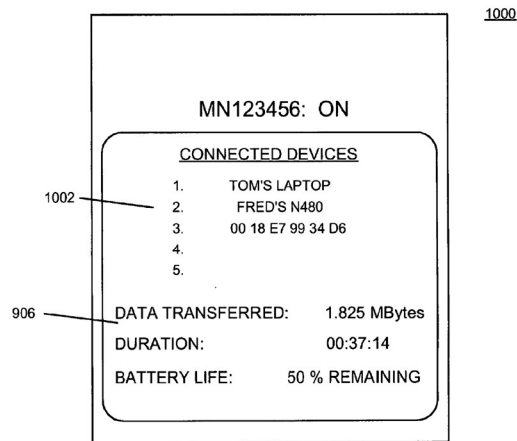


FIGURE 10

EX1005, ¶¶76-77, Figs. 9, 10. *Trossen* discloses “determin[ing] usage costs for the particular requested metric and send[ing] a response...back to [units of code for the originating user] TS_o of the originating user 10.” EX1011, ¶29. In my opinion, a skilled artisan would reasonably seek to improve the combination of *Thomas* and *Sewall* and the transparency of costs by including costs associated with connecting to the WAN in the type of information provided to potential forwarding-service users. Providing this information would also allow for the owner of an end-user device to negotiate or decide whether to accept payment(s) from other computing devices seeking to use a forwarding service, increasing flexibility and use of the WAN via the forwarding service.

268. Accordingly, the subject matter of claim 26 would have been obvious to one skilled in the art.

3. Claim 27: “wherein the wireless access network is associated with a cost, and wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to at least assist to control usage of the forwarding service based on the cost.”

269. Claim 27 depends from claim 1, which would have been obvious as discussed above. *Supra* §§ XI.1, XII.2. In my opinion, *Thomas*, *Sewall*, and *Trossen* render claim 26 obvious. *Thomas* and *Sewall* disclose a cost associated with a wireless access network and utilizing a service to connect to a network. EX1005, ¶54; EX1006, ¶53. Additionally, *Sewall* teaches controlling forwarding-service usage by first requiring a user to provide payment information. EX1006, ¶¶53-54. *Trossen* discloses the additional principle of allowing or rejecting access to the forwarding service based on a cost agreed upon by the end users on either end of the service. EX1011, ¶¶29-32. In my opinion, a skilled artisan would have been motivated to combine the cost-based decision-making principles of *Sewall* and *Trossen* and use them to further develop a system of using cost to control usage of the forwarding service disclosed in *Thomas* and *Sewall*. This combination would lead to the reasonable expectations of efficient use of the network resources and consistent network access to end user devices within the service. EX1005, ¶¶54-56.

270. Accordingly, the subject matter of claim 27 would have been obvious to one skilled in the art.

4. Claim 28: “wherein the wireless access network is associated with a cost, and wherein, when executed by the one or more processors, the one or more instructions further cause the one or more processors to obtain the cost based on a user input.”

271. Claim 28 depends from claim 1, which would have been obvious as discussed above. *Supra* §§ XI.1, XII.2. In my opinion, *Thomas*, *Sewall*, and *Trossen* render claim 28 obvious. *Thomas* and *Sewall* both disclose costs associated with a wireless access network. EX1005, ¶54; EX1006, ¶¶12, 22. *Trossen* discloses a process of arriving at a cost that usually “depend[s] on the actual costs for provisioning the service at the bridging user 12, e.g., the cost for transfer of bytes within Access Technology B,” and is driven by a series of user inputs. EX1011, ¶¶27-32. *Trossen* further discloses that the process is “initiated by TS_o of the originating user 10 send[ing] a message (message₁) to TS_B of the bridging user 12.” EX1011, ¶27. In my opinion, one skilled in the art would have been motivated to include providing cost information associated with the wireless access network in response to a user input, like a request, as *Trossen* discusses, in the end-user device of *Thomas* and *Sewall*. Such information would allow for the owner of an end-user device to negotiate or decide whether to accept payment(s) from other computing devices seeking to use a forwarding service to access the

WAN, increasing user flexibility and use of the WAN via the forwarding service.

272. Accordingly, the subject matter of claim 28 would have been obvious to one skilled in the art.

XVIII. CONCLUSION

273. For the reasons set forth above, it is my opinion that claims 1-30 of the '102 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.

274. 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: 10/30/2025

By: 
Bill Lin, Ph.D