

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,

Petitioner,

v.

HEADWATER RESEARCH LLC,

Patent Owner.

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

PETITION FOR *INTER PARTES* REVIEW

TABLE OF CONTENTS

I.	Introduction.....	1
II.	Technology Background.....	2
	1. Overview of <i>Sewall</i>	3
	2. Overview of <i>Thomas</i>	3
	3. Overview of <i>Polson</i>	4
	4. Overview of <i>Krishnaswamy</i>	4
III.	The '451 Patent.....	6
	A. Overview	6
	B. Prosecution History	7
IV.	Level of Ordinary Skill.....	10
V.	Claim Construction.....	11
VI.	Statement of Precise Relief Requested.....	11
	A. Ground 1: Claims 1, 10, 19, 29-32, 34, 35, 37-39, 41, 47, and 48 Are Obvious over <i>Sewall</i>	13
	1. Claim 1	13
	a. 1[pre]: “A first end-user device capable of operating as an intermediate networking device, the first end-user device comprising:”	13
	b. 1[a]: “one or more modems enabling the first end- user device to communicate with a network system over a first network and with one or more other end-user devices over a second network, the first network comprising a wireless access network;”	14

c.	1[b]: “at least one processor configured to execute one or more instructions that, when executed by the at least one processor, cause the at least one processor to:”	15
d.	1[b][i]: “provide a forwarding service to the one or more other end-user devices, the forwarding service for forwarding first traffic between the one or more other end-user devices and the network system,”	15
e.	1[b][ii]: “implement a first service policy, the first service policy for assisting in control of the first traffic,”	16
f.	1[b][iii]: “implement a second service policy, the second service policy for assisting in control of second traffic, the second traffic associated with access by the first end-user device to one or more services over the first network, wherein the second service policy differs from the first service policy, and”	18
g.	1[b][iv]: “monitor or identify successful use or attempted use of the forwarding service; and”	20
h.	1[c]: “memory coupled to the at least one processor and configured to provide the at least one processor with the one or more instructions.”	21
2.	Claim 10	22
a.	10[a]: “wherein provide the forwarding service to the one or more other end-user devices comprises: a first device of the one or more other end-user devices or a particular user of the first device,”	22
b.	10[b]: “based on the identification of the first device or the particular user of the first device, provide the forwarding service with a first characteristic to the first device, and”	22

c.	10[c]: “provide the forwarding service with a second characteristic to a second device of the one or more other end-user devices.”	23
3.	Claim 19: “wherein the first service policy or the second service policy is based on a time of day or a time period.”	24
4.	Claim 29: “wherein implement the first service policy comprises throttle or restrict the first traffic.”	24
5.	Claim 30: “wherein implement the first service policy comprises impose a limit on the first traffic or establish an allowance for the first traffic.”	25
6.	Claim 31: “wherein the first service policy is based on a limit or allowance, the limit limiting at least an aspect of usage of the forwarding service, the allowance allowing a specified amount of the forwarding service.”	25
7.	Claim 32: “wherein the limit or allowance is based on a user preference.”	25
8.	Claim 34: “wherein the second service policy is not based on the limit or allowance.”	26
9.	Claim 35: “wherein the limit or allowance is a first limit or allowance, and wherein the second service policy is based on a second limit or allowance.”	27
10.	Claim 37: “wherein the first service policy comprises a first control policy, and wherein the second service policy comprises a second control policy.”	27
11.	Claim 38: “wherein: implement the first service policy comprises apply a first control to the first traffic, and implement the second service policy comprises apply a second control to the second traffic.”	28
12.	Claim 39: “wherein: implement the first service policy comprises apply a first control to the first traffic, and	

	implement the second service policy comprises do not apply the first control to the second traffic.”	28
13.	Claim 41	29
	a. 41[a]: “wherein: implement the first service policy comprises direct the first traffic to a first end-point or server, and”	29
	b. 41[b]: “implement the second service policy comprises direct the second traffic to a second end-point or server.”	31
14.	Claim 47: “wherein the first service policy or the second service policy is dependent on whether the first network is associated with a cost.”	31
15.	Claim 48: “wherein the first service policy is dependent on whether the second network is associated with a cost.”	32
B.	Ground 2: Claims 45, 49, and 51 Are Obvious over <i>Sewall</i> and <i>Thomas</i>	33
	1. Motivation to Combine <i>Sewall</i> and <i>Thomas</i> with a Reasonable Expectation of Success	33
	2. Claim 45: “wherein the first service policy or the second service policy is dependent on whether the first network comprises a roaming network.”	36
	3. Claim 49: “wherein the first network comprises a roaming network, and wherein implement the first service policy comprises restrict or block the first traffic.”	38
	4. Claim 51: “wherein an aspect of the second service policy differs from the aspect of the first service policy when the first network is associated with a cost.”	39
C.	Ground 3: Claims 18, 21, 40, and 42 Are Obvious over <i>Sewall</i> in view of <i>Krishnaswamy</i>	40

1.	Motivation to Combine <i>Sewall</i> and <i>Krishnaswamy</i> with a Reasonable Expectation of Success	40
2.	Claim 18: “wherein the first service policy or the second service policy is based on a geographic location of the first end-user device.”	42
3.	Claim 21: “wherein the first service policy or the second service policy is based on a quality of service.”	43
4.	Claim 40	44
a.	40[a]: “wherein: implement the first service policy comprises direct the first traffic to a first virtual or logical channel, and”	44
b.	40[b]: “implement the second service policy comprises direct the second traffic to a second virtual or logical channel.”	46
5.	Claim 42: “wherein implement the first service policy comprises send information to at least a portion of the one or more other end-user devices, the information for assisting the at least a portion of the one or more other end-user devices to control their usage of the forwarding service.”	47
D.	Ground 4: Claim 17 Is Obvious over <i>Sewall</i> in view of <i>Polson</i>	49
1.	Motivation to Combine <i>Sewall</i> and <i>Polson</i> with a Reasonable Expectation of Success	49
2.	Claim 17: “wherein, when executed by the at least one processor, the one or more instructions further cause the at least one processor to: detect a network connection change by the first end-user device, and in response to detecting the network connection change by the first end-user device, modify at least an aspect of the first service policy or at least an aspect of the second service policy.”	50

E.	Ground 5: Claim 46 Is Obvious over <i>Sewall</i> in view of <i>Thomas</i> and <i>Krishnaswamy</i>	52
1.	Motivation to Combine <i>Sewall</i> , <i>Thomas</i> , and <i>Krishnaswamy</i> with a Reasonable Expectation of Success	52
2.	Claim 46: “wherein the first service policy is dependent on whether the second network comprises a roaming network.” ..	53
VII.	Mandatory Notices.....	57
A.	Real Parties-in-Interest	57
B.	Related Matters.....	59
C.	Lead and Back-Up Counsel.....	60
D.	Service Information	65
VIII.	Grounds for Standing.....	65
IX.	Conclusion	65

TABLE OF AUTHORITIES

	Page(s)
Cases	
<i>Google LLC v. Headwater Research LLC</i> , IPR2026-00048, Paper 8, 2 (PTAB Jan. 7, 2026)	57
<i>Headwater Res. LLC v. DISH Network Corp.</i> , 2:25-cv-00921 (Dec. 1, 2025), ECF No. 52	57, 58
<i>KSR Int’l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007).....	36, 50
Statutes	
35 U.S.C. §102(a)	12
35 U.S.C. § 102(b)	12
35 U.S.C. § 102(e)	12
35 U.S.C. § 103	11
35 U.S.C. § 311	11
Other Authorities	
37 C.F.R. §1.145	8, 10
37 C.F.R. §42.100(b)	11
89 Fed. Reg. 91924	10

LIST OF EXHIBITS

<u>Exhibit</u>	<u>Description</u>
EX1001	U.S. Patent No. 8,799,451 to Raleigh (“the ’451 patent”).
EX1002	Prosecution History of U.S. Patent No. 8,799,451.
EX1003	Declaration of Bill Lin, Ph.D.
EX1004	Curriculum Vitae of Bill Lin, Ph.D.
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	Reserved
EX1008	Reserved
EX1009	U.S. Patent Appl. Publ. No. 2004/0103193 to Pandya et al. (“ <i>Pandya</i> ”).
EX1010	U.S. Patent Appl. Publ. No. 2008/0313327 to Sewall et al. (“ <i>Sewall</i> ’327”).
EX1011	Reserved
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> ”).
EX1016	Reserved

<u>Exhibit</u>	<u>Description</u>
EX1017	Reserved
EX1018	Reserved
EX1019	Reserved
EX1020	U.S. Patent No. 9,398,453 to Krishnaswamy et al. (“ <i>Krishnaswamy</i> ”).
EX1021	U.S. Patent Publication No. 2003/0088671 to Klinker et al. (“ <i>Klinker</i> ”).
EX1022	Reserved
EX1023	Reserved
EX1024	Reserved
EX1025	<i>Headwater Research LLC v. Google LLC</i> , C.A. No. 7:25-cv-00376, Joint Claim Construction Statement, ECF No. 78 (W.D. Tex., June 5, 2026) (transferred to the Northern District of California as case number 3:26-cv-06230).

I. Introduction

Petitioner Google LLC respectfully requests *inter partes* review of claims 1, 10, 17-19, 21, 29-32, 34, 35, 37-42, 45-49, and 51 of U.S. Patent No. 8,799,451. In view of the large number of '451 patent claims, this second petition against the '451 patent challenges dependent claims not included in the co-filed petition in IPR2026-00466. The only overlap involves the challenge to independent claim 1, which is identical in both petitions, as all dependent claims depend from claim 1.

The '451 patent claims an end-user device capable of operating as an intermediate-networking device that communicates with a network system (e.g., the internet) over a wireless access network and provides a “forwarding service” to other devices (e.g., laptops), permitting them to communicate with the network system via the end-user device. The claimed end-user device also implements conventional traffic-control service policies, as was known in the art by January 28, 2009 (i.e., the earliest possible priority date).

The prior art confirms that the claimed end-user device operating as an intermediate-networking device to provide a forwarding service was not merely known—by that time, such mobile-hotspot technology was already old and “conventional.” EX1005, ¶[0028]. During prosecution, however, Patent Owner misrepresented that the known prior art did not disclose an end-user device capable of operating as an intermediate-networking device. Patent Owner, despite being

aware of invalidating prior art (e.g., *Sewall* (EX1006)), did not seek to distinguish it during prosecution. Instead, Patent Owner buried *Sewall* among IDS submissions collectively listing over eight hundred references.

Patent Owner's actions resulted in clear Examiner error, as *Sewall* (EX1006) discloses every limitation of claim 1 and thus renders it obvious. The other claims, all depending directly or indirectly from claim 1, recite other conventional hotspot features (e.g., restricting or blocking traffic) that a person of skill would have known and found obvious based on *Sewall* alone or with *Thomas*, *Polson*, and/or *Krishnaswamy*.

As demonstrated in the grounds below, there is a reasonable likelihood that at least one claim—and indeed all challenged claims—of the '451 patent are unpatentable. Petitioner therefore respectfully requests that the Board institute *inter partes* review and cancel all challenged claims of the '451 patent.

II. Technology Background

The following background discussion of the state of the prior art is based on Dr. Lin's testimony. EX1003, ¶¶48-55. Dr. Lin is a Professor of Electrical and Computer Engineering and the Associate Dean for Research at the University of California, San Diego (UCSD). EX1003, ¶¶8-17.

1. Overview of *Sewall*

Sewall discloses a device (e.g., a cellular phone) capable of routing communications between client devices and the internet. EX1006, Abstract. This device, functioning as a personal hotspot, may implement access rules that limit network access to its traffic-forwarding service. EX1006, ¶¶7-9. The hotspot device may apply different network-access rules based on profiles associated with different identified users or user types. EX1006, ¶22. The access rules and configuration data may restrict data usage or otherwise control network access provided by the personal hotspot. EX1006, ¶¶34-36; EX1003, ¶48.

2. Overview of *Thomas*

Thomas discloses a wireless device capable of providing access to the internet or other WAN for one or more other computing devices via wireless local-area networks. 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.

Thomas's wireless device 110 authorizes networking traffic by allowing a user, through a user interface, to accept or deny requests from client devices 114 seeking to access the internet. EX1005, Fig. 5, ¶44. The wireless device 110 may send start and stop messages to a server to enable or disable the forwarding service,

and the server may determine if the wireless device is authorized to provide the forwarding service. EX1005, ¶¶58-59, 65; EX1003, ¶¶49-51.

3. Overview of *Polson*

Polson discloses a gateway adapted to establish a connection between itself and a WWAN with an interface adapted to receive data from and transfer data to the WWAN on behalf of devices of a LAN. EX1015, Abstract. *Polson* further discloses strategies for managing WWAN access, including adapting its gateway to prioritize specific data over the WWAN to manage conflicts between end-user devices of LANs that are sharing limited WWAN capacity. EX1015, ¶46.

Polson also recognizes that the mobility of its gateway is important and that the ability to connect to multiple WWANs is necessary when one WWAN is not available due to the location of the user, issues with the service provider, or the features of a service agreement. EX1015, ¶¶52-53. *Polson* discloses that its gateway comprises a socket adapted to removably receive one or more WWAN interfaces 110 (e.g., a PC Card or Modem that plugs into the socket) adapted to send and receive data through one or more WWANs. EX1015, ¶¶20, 51; EX1003, ¶¶52-53.

4. Overview of *Krishnaswamy*

Krishnaswamy discloses an ad hoc service provider for a wireless network including a processing system configured to support (1) a first wireless access

protocol and (2) a wireless access point for one or more mobile clients using a second wireless access protocol. EX1020, Abstract, 1:47-52. The ad hoc service provider 106 includes a service provider application 208 that maintains a session with the server 110 over the network 102 to exchange messages. EX1020, 6:62-64, Figs. 1-2. The service provider application 208 controls the interconnection and session monitoring module 206, which monitors the amount of content to and from the mobile clients 108 as well as WWAN and WLAN network resource utilization. *Id.*, 7:1-12, Figs. 1-2.

Krishnaswamy further discloses that its ad hoc service provider 106 may be configured to alter the ad hoc service provider's ability to provide service for a wireless network in response to a resource-related event—e.g., an indication that an available bandwidth is below a bandwidth threshold. EX1020, 10:51-54, 11:3-25. Upon detecting a resource-related event, the ad hoc service provider may alter one or more attributes of its service such as the data rate or duration of the service and notify some or all of the mobile clients 108 of the alteration. EX1020, 11:26-44. It may also hand off mobile clients 108 to other ad hoc service providers based on, for example, quality of service factors. EX1020, 6:1-16; EX1003, ¶¶54-55.

III. The '451 Patent

The '451 patent was filed on March 2, 2009, and claims priority to a provisional application filed January 28, 2009.¹ EX1001, cover.

A. Overview

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

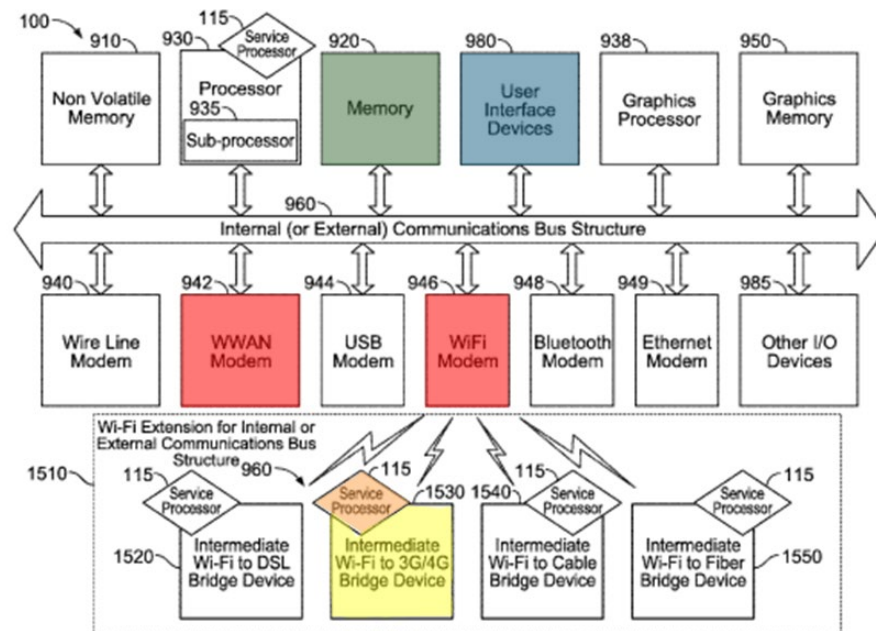


FIG. 15A

¹ Petitioner does not concede the claims are entitled to this priority date.

Petitioner reserves the right to challenge the priority date and to respond if Patent Owner attempts to antedate any of the prior art.

EX1001, Fig. 15A (annotated). The end-user device includes a **modem** for communicating with one or more networks and one or more other devices. The **service processor** executes instructions to provide a forwarding service to the other devices, implements service policies for controlling traffic, and monitors successful or attempted use of the forwarding service. The **memory** of the end-user device is configured to provide the instructions for the service processor. EX1003, ¶¶49-51.

B. Prosecution History

The '451 patent issued after a tortuous prosecution before the patent office involving misrepresentations about prior art, a change of Examiners, improper amendments reincorporating subject matter restricted early on in prosecution, and the burying of problematic prior art references among massive IDS filings.

EX1003, ¶¶44-47.

The original claims recited only an “intermediate networking device” acting as an intermediary between devices and a network. EX1002, 242. The Examiner rejected the independent claims as anticipated based on the prior art’s disclosure of a router. EX1002(pt. 1), 1501 (citing *Klinker*, EX1021), 508 (obviousness rejection based on *Klinker* and *Pandya*).

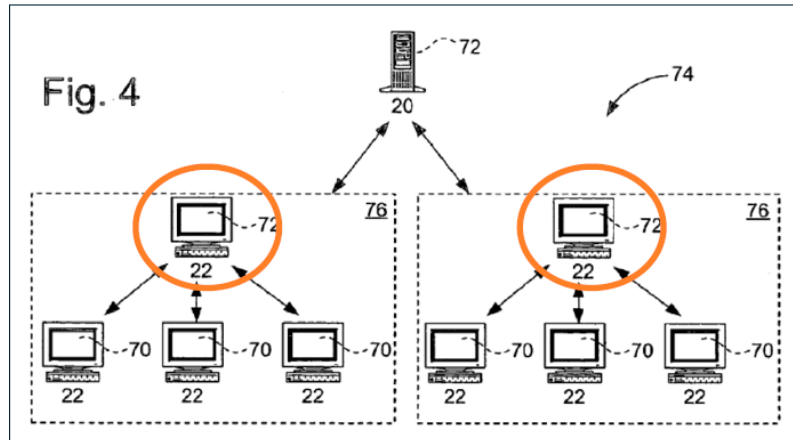
Patent Owner did not dispute the router-based-anticipation rejection. Instead, Patent Owner amended the claims to recite, among other things, a “first end user

device capable of operating” as an intermediate networking device and asserted that the prior art did not disclose such a device. EX1002 (pt. 2), 10, 24-25. Patent Owner also amended the claims to require providing a “forwarding service.” *Id.* In view of the extensive amendments, the Examiner issued a final office action withdrawing all claims because they were directed to subject matter distinct from the originally presented claims. EX1002 (pt. 2), 56 (“Election by Original Presentation”) (citing 37 C.F.R. §1.145).

Patent Owner filed an RCE, canceled all claims, and represented that their subject matter would be pursued in continuations or divisionals. EX1002, 67. Contrary to that representation, however, Patent Owner presented new claims that again expressly recited a “first end-user device capable of operating as an intermediate networking device.” *Id.* While Patent Owner acknowledged that the new claims had some “amendments” compared to the original claims, Patent Owner asserted that the “amendments do not meaningfully alter the focus of the amended claims, and thus maintain the claims within the scope of the invention elected by original presentation”—i.e., the same claimed invention undisputedly anticipated by disclosure of a router. EX1002, 67, 69.

Patent Owner’s arguments against the prior art, however, contradicted those representations about claim scope. Patent Owner expressly relied on the new features of the claims to assert distinctions for patentability, arguing again that

Klinker and *Pandya* do not disclose an end user-device capable of operating as an intermediate networking device. EX1002, 70. Notably, however, Patent Owner nowhere addressed *Pandya*'s disclosures and Figure 4 depicting such an intermediate networking device:



EX1009, Fig. 4 (annotated), ¶44 (disclosing that intermediate device 72 may be a cellular phone, palm computer, pager, or any other end user-device and function as a “control point” on a network).

The Office then transitioned the pending application to a new Examiner, who failed to reissue rejections based on *Pandya* and *Klinker* or withdraw the claims again based on Patent Owner's second attempt to claim beyond the originally presented subject matter. Instead, the new Examiner erroneously accepted Patent Owner's new claims and arguments at face value, issuing a weak anticipation rejection based on *Robinson*. EX1002 (pt. 2), 327.

The new Examiner's failure to cite stronger prior art, such as *Sewall*, is easily explainable. For example, Patent Owner buried *Sewall* in an IDS listing over 100 other references. EX1002 (pt. 1), 480. In total, Patent Owner submitted 860 total references in IDSes—a problematic practice that the Office has recognized hinders adequate examination—and, not surprisingly, the Examiners failed to cite any of those references in rejections. *See* 89 Fed. Reg. 91924 (recognizing that large IDSes are “onerous for examiners” and hinder evaluation of the prior art).

Patent Owner overcame the *Robinson*-based anticipation rejection. Taking advantage of the change in Examiners, Patent Owner also trampled the Office's previous requirement to hold Patent Owner to its originally presented subject matter, again presenting extensive amendments (including fifty-four new claims) that should have resulted in a second withdrawal of the claims. EX1002, 663-685; 37 C.F.R. §1.145. The Examiner instead erroneously issued a cursory notice of allowance lacking any reasoning for allowing the claims. EX1002, 837.

IV. Level of Ordinary Skill

A person of ordinary skill in the art (“POSITA”) at the '451 patent's effective filing date would have 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. EX1003

(“[Expert]”), ¶¶56-57. More related education would compensate for fewer years of work experience (and vice versa). *Id.*

V. Claim Construction

Claims in an IPR are construed under the *Phillips* standard. 37 C.F.R. §42.100(b). For purposes of this Petition, no terms need to be expressly construed. EX1003, ¶¶58-59. Petitioner reserves the right to respond to any claim-construction arguments Patent Owner raises.

VI. Statement of Precise Relief Requested

Petitioner requests review under 35 U.S.C. § 311 of claims 1, 10, 17-19, 21, 29-32, 34, 35, 37-42, 45-49, and 51 of the '451 patent and cancellation of those claims as obvious under pre-AIA 35 U.S.C. § 103 based on the following unpatentability grounds.

	References	Basis	Challenged Claims
1	<i>Sewall</i>	§103	Claims 1, 10, 19, 29-32, 34, 35, 37-39, 41, 47, and 48
2	<i>Sewall and Thomas</i>	§103	Claims 45, 49, and 51
3	<i>Sewall and Krishnaswamy</i>	§103	Claims 18, 21, 40, and 42
4	<i>Sewall and Polson</i>	§103	Claim 17
5	<i>Sewall, Thomas, and Krishnaswamy</i>	§103	Claim 46

All references asserted in this Petition qualify as prior art under pre-AIA 35 U.S.C. §102(a), (b), and/or (e) based on the earliest possible priority date of the '451 patent (January 28, 2009):

EX1005 §102(a), (e)	U.S. Patent Publication 2009/0017789 (" <i>Thomas</i> "), filed January 22, 2008, published January 15, 2009.
EX1006 §102(a), (e)	U.S. Patent Publication 2008/0039102 (" <i>Sewall</i> "), filed Feb. 12, 2007, published February 14, 2008.
EX1015 §102(b)	U.S. Patent Publication No. 2007/0104169 to Polson (" <i>Polson</i> "), filed November 10, 2006, published May 10, 2007.
EX1020 §102(e)	U.S. Patent No. 9,398,453 (" <i>Krishnaswamy</i> "), filed September 26, 2007.

**A. Ground 1: Claims 1, 10, 19, 29-32, 34, 35, 37-39, 41, 47, and 48
Are Obvious over *Sewall***

1. Claim 1

Claim 1 would have been obvious over *Sewall*, as it discloses all elements of claim 1.

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

Sewall discloses 1[pre]. EX1003, ¶¶61-62. It discloses a data exchanger 20 and personal hotspot 10 that may be incorporated into the same device, such as an internet-enabled cellular telephone (“mobile hotspot”), and this mobile hotspot routes network communications between client devices 12, 14, and 16 and the internet 26. EX1006, ¶¶7, 9, 16, Figs. 1-2. As such, *Sewall*’s mobile hotspot is a **first end-user device** capable of operating as an intermediate networking device. *Id.*

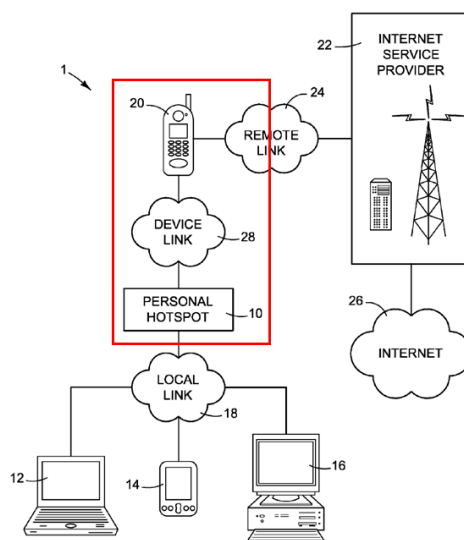


FIG. 1

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

Sewall discloses 1[a]. EX1003, ¶¶63-66. As with any mobile hotspot, *Sewall*'s mobile hotspot includes a modem for communicating with the internet (**network system**) via wireless remote link 24 (**first network**) and for communicating with the client devices 12, 14, and 16 (other end user devices) via local link 18 (**second network**). EX1006, ¶¶7, 10, 13 (explaining that remote link 24 may be wireless), 17.

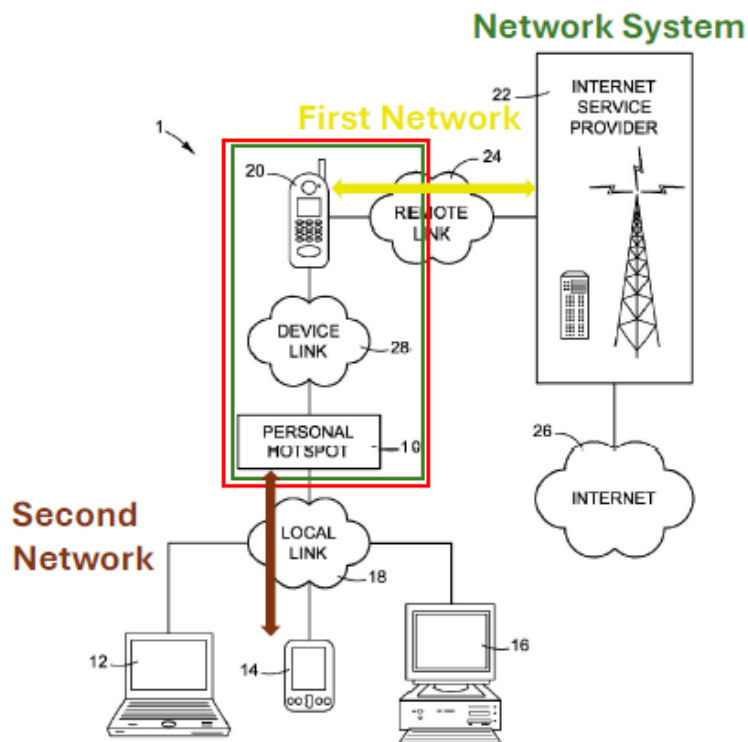


FIG. 1

Indeed, *Sewall* expressly discloses that the personal hotspot may be any combination of hardware and/or programming capable of functioning as a router for directing network communications between the client devices and the internet via a data exchanger such as a data capable cellular device, DSL modem, or cable modem. *Id.*, ¶17.

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

Sewall discloses 1[b]. EX1003, ¶¶67-68. As with any mobile hotspot, *Sewall*’s mobile hotspot includes a processor configured to execute one or more instructions. EX1006, ¶¶7, 58. Indeed, *Sewall* expressly discloses that the hotspot may be embodied in any computer-readable media for use by or in connection with an instruction execution system such as a computer/processor-based system or other system that can fetch or obtain the logic from computer-readable media and execute the instructions contained therein. *Id.*, ¶58.

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

Sewall discloses 1[b][i]. EX1003, ¶¶69-70. Communication between the client devices and the internet in *Sewall* depends on the forwarding service provided by the mobile hotspot. EX1006, ¶15, Figs. 1-2. As shown in Figure 1, the

mobile hotspot (data exchanger 20 and personal hotspot 10) forwards **first traffic** between the client devices 12, 14, and 16 (“the one or more other end-user devices”) and the internet 26 via local link 18 and remote link 24. *Id.*, Fig. 1.

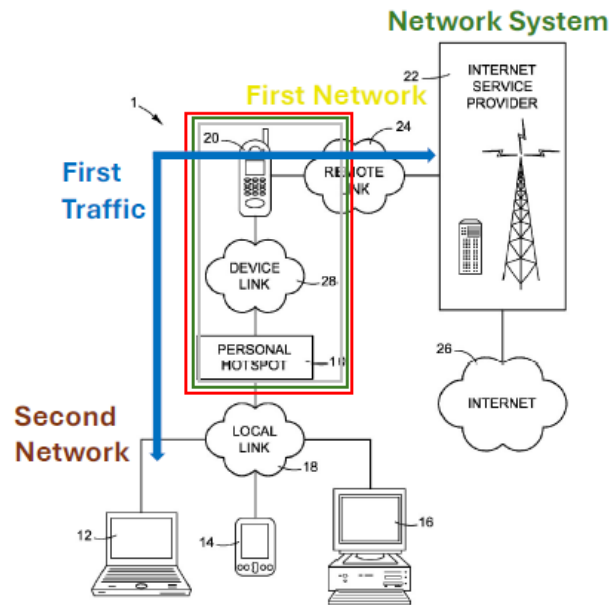


FIG. 1

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

Sewall discloses 1[b][ii]. EX1003, ¶¶71-77. As explained above, *Sewall*’s mobile hotspot combines the data exchanger 20 and personal hotspot 10. EX1006, ¶16. The personal hotspot contains a limiter 40 (*id.*, Fig. 3, ¶19), which includes configuration data 42. *Id.*, Fig. 4, ¶23. The configuration data 42 includes default profiles 54 (*id.*, Fig. 5, ¶33), including device profile 60, owner profile 62, authorized user profile 64, and anonymous user profile 66. *Id.*, ¶34.

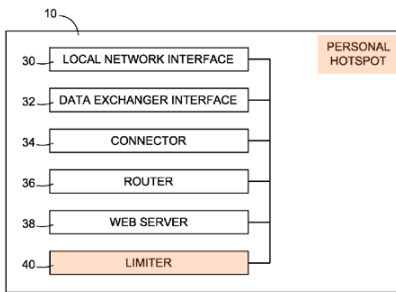


FIG. 3

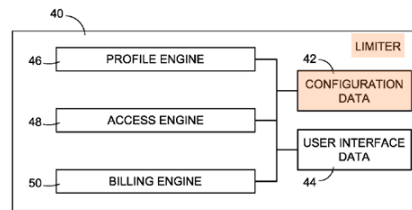


FIG. 4

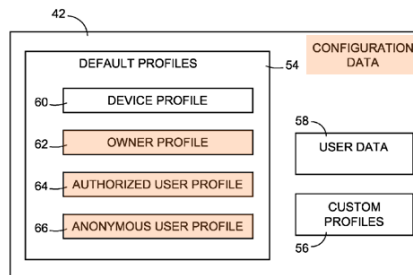


FIG. 5

Sewall thus distinguishes between the device profile 60, owner profile 62, authorized user profile 64, and anonymous user profile 66. *Id.*, ¶34.

To assist with controlling the first traffic between the client devices and the internet, *Sewall*'s mobile hotspot device implements first access rules (**first service policy**) based on the owner 62, authorized user 64, and anonymous user 66 profiles. *Id.*, ¶36. The first access rules may impose upload and download bandwidth limits for each user or limit the amount of data transfer allowed by each

user in a given time period. *Id.* For example, *Sewall* explains that anonymous user access rules will typically be more limiting than authorized user access rules, and authorized user access rules will be more limiting than owner access rules. *Id.*

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

Sewall discloses 1[b][iii]. EX1003, ¶¶78-82. As explained above, *Sewall*’s mobile hotspot is configured with a device, owner, authorized user, and anonymous user profiles. EX1006, ¶¶16, 19, 23, 33, 34, Figs. 3-5. To assist with controlling the **second traffic** between the mobile hotspot and the internet via remote link 24, *Sewall*’s mobile hotspot implements second access rules (second service policy) based on the device profile 60. *Id.*, ¶34.

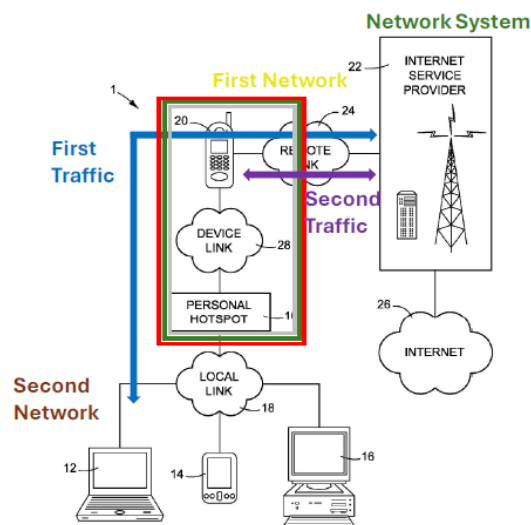


FIG. 1

In other words, whereas **first traffic** involves data that the hotspot forwards on behalf of the other devices, **second traffic** involves the hotspot's own network communication with the network system (over the first network). EX1003, ¶82. Thus, in contrast to the first access rules ("first service policy"), the second access rules involve device access rules applying to all users of the mobile hotspot. EX1006, ¶34. A POSITA would understand that the second access rules dictate the types of services (e.g., email, web browsing, multimedia) that are supported over the first network and available for the mobile hotspot itself as well as other connected devices. EX1003, ¶82. For example, the second access rules may specify upload and download bandwidth limits for the mobile hotspot, limiting the amount of data transfer allowed by the mobile hotspot in a given time period, the number of simultaneous users or sessions supported by the mobile hotspot, etc. EX1006, ¶34. *Sewall* explains that the nature of second access rules may depend on the nature of the data subscription package that the owner of the mobile hotspot has with internet service provider 22; for example, a premium package may have less stringent limitations than a basic subscription package. *Id.*; *see also id.*, ¶¶43-44. The nature of second access rules may also be customized or updated by the owner of the mobile hotspot. *Id.*, ¶25.

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

Sewall discloses 1[b][iv]. EX1003, ¶¶83-85. When a communication is received from a client device attempting to use the mobile hotspot’s forwarding service, the access engine 48 of *Sewall*’s mobile hotspot parses configuration data 42, monitors the source of the communication from user data 58, and identifies a profile (e.g., owner, authorized user, or anonymous user) associated with the source of the communication. EX1006, ¶¶16, 47, 48, Figs. 4-5, 8.

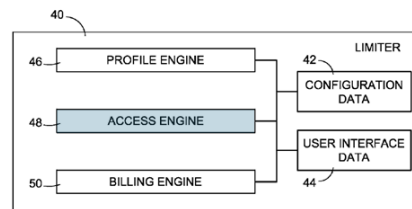


FIG. 4

From the identified profile, access engine 48 extrapolates the first access rules for the source of the communication and grants and/or limits access to the forwarding service according to those rules. *Id.*, ¶49, Fig. 8.

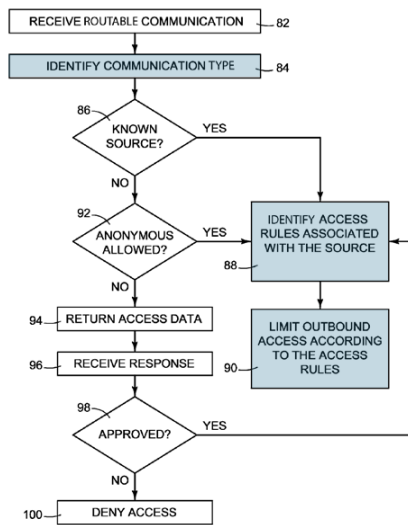


FIG. 8

As such, Sewall's mobile hotspot identifies and monitors successful use (or attempted use) of the forwarding service. EX1003, ¶¶83-85.

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

Sewall discloses 1[c]. EX1003, ¶¶86-87. *Sewall*'s mobile hotspot includes a memory coupled to the processor and configured to provide the processor with instructions. EX1006, ¶7. Indeed, *Sewall* discloses that the hotspot may be embodied in any computer-readable media for use by or in connection with an instruction execution system such as a computer/processor-based system or other system that can fetch or obtain the logic from computer-readable media and execute the instructions contained therein. *Id.*, ¶58. *Sewall* further specifies that examples of suitable computer-readable media include a portable magnetic

computer diskette such as floppy diskettes or hard drives, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory, or a portable compact disc.

Accordingly, *Sewall* discloses all elements of claim 1, and claim 1 would have been obvious over *Sewall*.

2. Claim 10

Claim 10 depends from claim 1, which would have been obvious as discussed above. *Supra* §VI.A.1. Claim 10 would have been obvious over *Sewall*, as *Sewall* discloses all elements of claim 10. EX1003, ¶¶88-92.

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

Sewall discloses 10[a]. EX1003, ¶89. It discloses that the mobile hotspot provides its forwarding service to client devices 12, 14, and 16, which are associated with a user profile such as an owner profile 62, authorized user profile 64, or anonymous user profile 66. EX1006, ¶¶7, 9, 16, 34, 36 Figs. 1-2.

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

Sewall discloses 10[b]. EX1003, ¶90. Its mobile hotspot device implements first access rules based on the owner 62, authorized user 64, and anonymous user

66 profiles to provide the forwarding service and limit first traffic between the client devices and the internet. EX1006, ¶¶34, 36. The first access rules vary based on profile and may implement different characteristics for forwarding-service usage. For example, the hotspot device may provide the forwarding service with specified upload and download bandwidth limits or limits on the amount of data transfer that may be allowed in a given time period. *Id.* *Sewall* explains that anonymous user access rules will typically be more limiting than authorized user access rules, and authorized user access rules will be more limiting than owner access rules. *Id.* As such, *Sewall* teaches that the owner's client device will typically have the largest upload and download bandwidth limits and the largest amount of data transfer allowed in a given time period. EX1003, ¶90.

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

Sewall discloses 10[c]. EX1003, ¶¶91-92. As explained above, *Sewall* discloses that its mobile hotspot device provides the forwarding service to multiple client devices with different characteristics depending on the first access rules associated with the user profiles of those devices (e.g., owner, authorized, or anonymous users). *Supra* §VI.A.2.b. For example, an anonymous user's client device will typically have the smallest upload and download bandwidth limits

and/or the smallest amount of data transfer allowed in a given time period, as compared to authorized devices or the hotspot owner's devices. EX1006, ¶¶34-36.

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

Sewall discloses claim 19. EX1003, ¶¶93-94. To assist with controlling traffic, *Sewall*'s mobile hotspot device implements access rules. *E.g.*, EX1006, ¶26. Among other things, these access rules limit the term or time period for which access is allowed. *Id.* For example, the first access rules may grant the user of a client device access for a fixed time frame of an hour, a day, a week, or some other period, or they may grant the user access during a particular time period each day. *Id.*

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

Sewall discloses claim 29. EX1003, ¶¶95-96. To assist with controlling the first traffic between the client devices and the internet, *Sewall*'s mobile hotspot device implements first access rules for the owner 62, authorized user 64, and anonymous user 66 profiles. EX1006, ¶36. Among other things, the access rules limit a user's duration of use, available bandwidth, or the amount of data that may be downloaded in a given time period. *Id.*, ¶¶26, 36. For example, *Sewall*'s mobile hotspot includes an access engine 48 for blocking communications to and from the

user once that user has reached the specified duration, bandwidth, or download limit. *Id.*, ¶26.

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

Sewall discloses claim 30 for the reasons discussed above for claim 29.

EX1006, ¶¶26, 36; EX1003, ¶97; *supra* §VI.A.4.

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

Sewall discloses claim 31 for the reasons discussed above for claim 29.

EX1006, ¶¶26, 36; EX1003, ¶98; *supra* §VI.A.4.

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

Sewall discloses claim 32, which depends from claim 31. EX1003, ¶99; *supra* §VI.A.4, 6. *Sewall* explains that the owner of the mobile hotspot selects settings for all of the configuration data 42, which includes the owner 62, authorized user 64, and anonymous user 66 profiles, as well as custom profiles. EX1006, ¶¶33-34, 37, 45, Fig. 5. *Sewall*’s mobile hotspot implements first access rules based on the user profiles, and among other things, the access rules limit a user’s duration of use, available bandwidth, or the amount of data that may be downloaded in a given time period. *Id.*, ¶¶26, 36-37 (“For example, the owner may

desire to 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.”).

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

Sewall discloses claim 34, which depends from claim 31. EX1003, ¶100; *supra* §VI.A.6. To assist with controlling the second traffic between the mobile hotspot and the internet, *Sewall* implements second access rules (“second service policy”) based on the device profile 60. EX1006, ¶34. Unlike the first access rules, which may impose user-specific restrictions based on the particular user profile accessing the mobile hotspot, the second access rules are device access rules setting limits that apply generally to use of the mobile hotspot regardless of the user (and their associated user profile)—for example, limits dictated by the data subscription package that the owner of the mobile hotspot has with internet service provider 22. *Id.*; *see also id.*, ¶¶34 (“The device access rules may limit the number of simultaneous users or sessions supported by personal hotspot”), 43-44; EX1003, ¶100. Thus, whereas the first access rules set limits for particular users of the forwarding service provided by mobile hotspot, *Sewall*’s second access rules are not based on those user-specific limits or allowances (the first service policy). EX1006, ¶¶26, 36; EX1003, ¶100.

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

Sewall discloses claim 35, which depends from claim 31. EX1003, ¶101; *supra* §VI.A.6. *Sewall*’s first access rules assist with controlling the first traffic between the client devices and the internet, and they apply to particular users (e.g., the owner 62, authorized users 64, and anonymous users 66) and set limits as to usage for the user (e.g., upload and download bandwidth for a user or the amount of data transfer allowed by a user in a given time period). EX1006, ¶36. *Sewall*’s second access rules assist with controlling the second traffic between the mobile hotspot and the internet, and they apply to the mobile hotspot and set limits as to operational capacity for the hotspot (e.g., upload and download bandwidth for the mobile hotspot, the amount of data transfer allowed by the mobile hotspot in a given time period, or the number of simultaneous users or sessions supported by the mobile hotspot). *Id.*, ¶34. As such, first access rules are based on different limits than the second access rules. EX1003, ¶101.

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

Sewall discloses claim 37 for the reasons discussed above for claim 35. EX1003, ¶102; *supra* §VI.A.9.

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

Sewall discloses claim 38 for reasons discussed above for claim 35. EX1003, ¶103; *supra* §VI.A.9. For example, the first service policy may limit the upload and download bandwidth for the owner 62, an authorized user 64, and an anonymous user, and the second service policy may limit the amount of data transfer allowed by the mobile hotspot in a given time period or limit the number of simultaneous users of the forwarding service. EX1006, ¶¶34-36.

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

Sewall discloses claim 39 for the reasons discussed above for claim 35. EX1003, ¶104; *supra* §VI.A.9. For example, the first service policy may impose limits on the upload and download bandwidth for particular users based on whether they are an owner 62, authorized user 64, or anonymous user. The second service policy, in contrast, limits the total amount of data transfer allowed by the mobile hotspot in a given time period without applying any limits on the upload and download bandwidth of a given user. EX1006, ¶¶34-36. Thus, implementing the second service policy does not apply the individual-client-device limits to the

second traffic between the mobile hotspot device and the network system. EX1003, ¶104.

13. Claim 41

Claim 41 depends from claim 1, which would have been obvious as discussed above. *Supra* §VI.A.1. Claim 41 would have been obvious over *Sewall*, as it discloses all elements of claim 41. EX1003, ¶¶105-07.

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

Sewall discloses 41[a]. EX1003, ¶¶105-06. As shown in Figure 8 (annotated below), when a communication is received (step 82), the mobile hotspot identifies the communication type (step 84), i.e., whether the communication originated from the owner, an authorized user, or an anonymous user. EX1006, ¶47. If the source of the communication is unknown (i.e., it originated from an anonymous user) and anonymous communications are not allowed, access data is returned to the source of the communication (step 94), directing the traffic to an end-point or server. *Id.*, ¶¶50-51, Fig. 8.

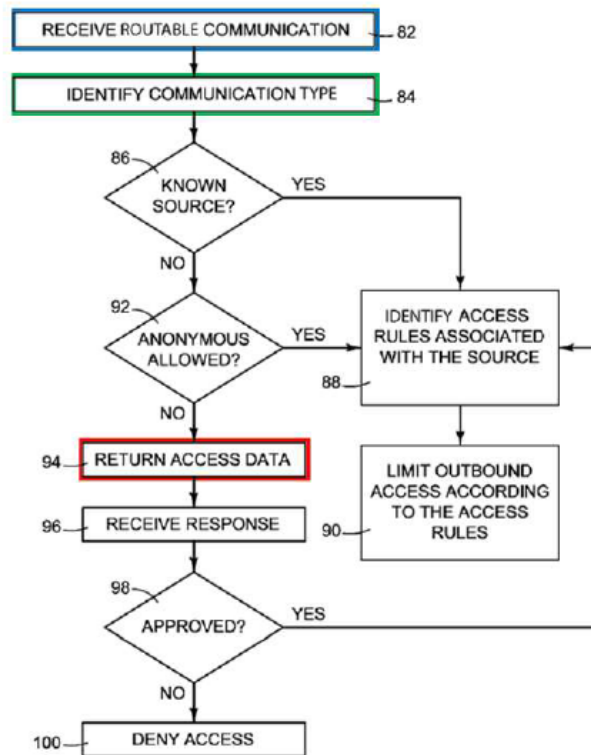


FIG. 8

Such access data may be a web page (an end-point) informing a user how to contact the owner of the mobile hotspot to request becoming an authorized user, a web page for providing payment information to a payment service (i.e., another end-point or server), instructions for manually approaching the owner of mobile hotspot and verbally requesting access, or a web page having instructions for sending an electronic request to the owner. *Id.*, ¶¶51-54, Fig. 8. *Sewall* also explains that identifying the communication type (step 94) includes access engine 48 causing web server 38 to access user interface data 44 and return an appropriate user interface to the source of the communication. *Id.*

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

Sewall discloses 41[b]. EX1003, ¶107. During the above steps, the mobile hotspot maintains its connection to the internet, or the second end-point or server. EX1006, ¶46. But for client devices having granted access, the mobile hotspot implements a policy routing communications between those client devices and the internet (i.e., second end-point or server). EX1006, ¶46.

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

Sewall discloses claim 47. EX1003, ¶¶108-09. *Sewall* discloses that configuration data 42 governs the first and second access rules. The configuration data 42 includes the device profile 60 with its associated second access rules to assist with controlling the second traffic between the mobile hotspot and the internet. EX1006, ¶34. The configuration data 42 also includes the owner 62, authorized user 64, and anonymous user 66 profiles with their associated first access rules to assist with controlling the first traffic between the client devices and the internet. *Id.*, ¶34.

Sewall discloses that the configuration data 42 may be provided by the internet service provider 22. *Id.*, ¶25. *Sewall* further discloses that the configuration data 42 is based on the subscription plan paid for by the owner of the mobile

hotspot, with basic subscription packages having more stringent access rules than a premium subscription package. *Id.* A POSITA would understand that a basic subscription package would be less expensive than a premium subscription package. EX1003, ¶109. As such, *Sewall* discloses that the first and/or second access rules are based on whether the first network is associated with a cost. EX1003, ¶¶108-09.

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

Sewall discloses claim 48. EX1003, ¶110. *Sewall* discloses that configuration data 42 on the mobile hotspot includes the owner 62, authorized user 64, and anonymous user 66 profiles. EX1006, ¶¶34, 36. *Sewall* implements first access rules for these user profiles to assist with controlling the first traffic between the client devices and the internet. *Id.*, ¶36. The owner of the mobile hotspot may update the first access rules. *Id.*, ¶25. For example, the owner may configure the first access rules for the anonymous user profile to indicate that payment is required for use of the forwarding service over the first (remote link 24) and second (local link 18) networks. *Id.*, ¶36. The anonymous user may pay for a time block or may be charged based on use. *Id.*, ¶29. As such, the first access rules for the anonymous user profile depend on whether the owner of the mobile hotspot is requiring payment for use of the first (and second) networks. EX1003, ¶110.

B. Ground 2: Claims 45, 49, and 51 Are Obvious over *Sewall* and *Thomas*

1. Motivation to Combine *Sewall* and *Thomas* with a Reasonable Expectation of Success

Sewall and *Thomas* are analogous art to the '451 patent. EX1003, ¶111.

They are in the same field of endeavor: mobile devices and wireless access points for computer networking. EX1006, ¶¶3, 7-8, 11, Figs. 1-9; EX1005, ¶¶2, 6, 9, 23, 28, 84-85, Figs. 1-11. They also share a common goal with the '451 patent: 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 the customizability and monetization of mobile-hotspot technology (e.g., usage control, user interactivity and notifications via graphical user interfaces, and billing features). EX1006, Abstract, ¶¶7-9, 17, 22, 25, 28-31; EX1005, ¶¶23, 28, 44-45, 54-55, 79-80; EX1001, 32:34-34:61, 65:31-67, 122:52-123:6, Fig. 15A-F; EX1003, ¶112.

A skilled artisan would have been motivated to combine *Sewall* and *Thomas* for several reasons. EX1003, ¶¶113-21. First, both references describe complementary features for controlling or limiting access to their personal-hotspot services. *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. *Thomas* provides a user interface so users can identify and select other computing devices (e.g., laptops) to access the service. EX1003, ¶114; EX1005, ¶¶44-46, Figs. 5, 6.

A POSITA would have been motivated to implement a combination with both *Sewall's* and *Thomas's* access-control features. EX1003, ¶¶115-16. 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). EX1003, ¶¶115-16; EX1005, ¶¶29, 54-56, Figs. 5, 6. A POSITA would have also recognized the benefits of implementing *Sewall's* user profiles with *Thomas's* wireless device 110 so that trusted devices (e.g., the wireless device 110 owner's other devices) could easily and quickly access the hotspot service without requiring manual approval from wireless device 110. EX1003, ¶¶115-16.

Second, *Sewall* and *Thomas* provide complementary billing and reward systems encouraging mobile-device users to provide hotspot services. EX1003, ¶117. *Sewall* describes a billing agent where other devices can directly compensate

the hotspot owner. EX1006, ¶¶28-32. *Thomas* describes a wireless-carrier “reward” plan for sharing internet access. EX1005, ¶¶55-56.

One of skill would have been motivated to implement a combination with both *Thomas*’s wireless carrier “reward” and *Sewall*’s billing agent features. EX1003, ¶¶118-20. These complementary reward systems incentivize mobile users to provide hotspot services without being responsible for any increased data or bandwidth costs. *Id.* Moreover, combining these features provides for increased flexibility and encouragement to extend hotspot services by potentially compensating the owner of *Thomas*’s wireless device 110 or *Sewall*’s hotspot owner with payments from either the wireless carrier, other hotspot users, or both. *Id.*

A skilled artisan would also have been motivated to combine the disclosures of *Sewall* and *Thomas* with a reasonable expectation of success in view of their several highly compatible features. EX1003, ¶121. Both references describe the same types of devices, such as internet-enabled cellular telephones, for providing internet access to other computing devices. EX1006, ¶7, Figs. 1, 2; EX1005, ¶¶2, 9, Figs. 5, 6; EX1003, ¶121. Both references also provide solutions for flexibly extending internet access without requiring all users to have their own wireless-plan subscriptions. EX1006, ¶¶2-3, 22; EX1005, ¶¶32, 54-56, 83; EX1003, ¶121. Both references also advantageously support using mobile devices’ WLAN

capabilities to provide hotspot services to a greater number of computing devices than was previously possible using Bluetooth or infrared connections, which may have greater range and/or number-of-user restrictions. EX1005, ¶¶27-28; EX1006, ¶¶14, 18; *see* EX1001, 33:41-64, Fig. 15A (depicting the claimed invention as encompassing use of Bluetooth); EX1003, ¶100.

For any or all of the potential benefits detailed above, a skilled artisan would have been motivated to combine *Thomas* and *Sewall* with a reasonable expectation of success. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 420 (2007) (“[A]ny need or problem known in the field . . . can provide a reason for combining the elements in the manner claimed.”). Indeed, combining their disclosures was within a POSITA’s capabilities and would predictably apply known techniques (e.g., hotspot access controls, billing services, etc.) to known mobile devices to provide “conventional” hotspot services allowing other computing devices to access the network systems such as the internet. EX1003, ¶¶111-21.

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

Claim 45 depends from claim 1, which would have been obvious as discussed above. *Supra* §VI.A.1. *Sewall* and *Thomas* render claim 45 obvious. EX1003, ¶¶122-24.

Sewall discloses first-access rules (e.g., user profiles) to assist with controlling first traffic between the client devices and the internet as well as second-access rules for controlling second traffic between the hotspot device and a network (e.g., internet). EX1006, ¶¶34, 36; *see* §VI.A.1.e-f. *Thomas* discloses security features for its wireless device 110 to promote roaming awareness and management and also discloses that data plans may include roaming within the plan coverage. EX1005, ¶¶70-71.

A POSITA would have been motivated to modify *Sewall*'s first and/or second access rules to accommodate modifications when on a roaming network in view of *Thomas*'s disclosure of roaming awareness, management, and data plans so that *Sewall*'s client devices may maintain access to the internet. *See* §VI.B.1; EX1003, ¶123. A POSITA would understand from *Thomas* that data transfer over a roaming network would typically be more costly and would therefore modify *Sewall*'s first and/or second access rules to reduce data transfer. *Id.* For example, a POSITA would also have been motivated to modify *Sewall*'s user and device profiles to implement more stringent upload and download bandwidth limits, limit data transfer, or block access for particular users (e.g., anonymous or even authorized users) depending on whether the combination's hotspot device is on a roaming network. EX1006, ¶¶47-50; EX1005, ¶¶70-71; EX1003, ¶123.

Accordingly, claim 45 as a whole would have been obvious.

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

Claim 49 depends from claim 1, which would have been obvious as discussed above. *Supra* §VI.A.1. *Sewall* and *Thomas* render claim 49 obvious. *See* §VI.B.2; EX1003, ¶¶125-27.

As detailed above regarding claim 45, the first network may comprise a roaming network. *Supra* §VI.B.2. A POSITA would understand from *Thomas* that data transfer over a roaming network would typically be more costly and would therefore modify *Sewall*’s first and/or second access rules to reduce or block data transfer. EX1003, ¶126.

Indeed, a POSITA would have been motivated to implement a combination having *Sewall*’s user profiles to impose restrictions on upload and download bandwidth limits, limit data transfer, or block access for particular users (e.g., anonymous users). EX1006, ¶¶47-50; EX1003, ¶127. *Thomas* also discloses restricting or blocking the first traffic, as 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 allow or disallow access. EX1005, ¶¶46, 44.

Accordingly, claim 49 as a whole would have been obvious.

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

Claim 51 depends from claim 1, which is obvious. *Supra* §VI.A.1. *Sewall* and *Thomas* render claim 51 obvious. EX1003, ¶¶128-29.

Sewall discloses first-access rules based on user profiles for the combination’s hotspot device and second-access rules for the device profile. EX1006, ¶¶34, 36; *see* §VI.A.1.e-f. *Sewall* discloses that user profiles may differ depending on the user, e.g., anonymous users may need to pay for access to the network (e.g., internet) over the forwarding service. EX1006, ¶¶22-23, 28, Fig. 4. *Sewall* also discloses that the second access rules (“second service policy”) based on a device profile, which are different than a first-service policy, may depend on subscription package the owner of the mobile hotspot has with internet service provider. *Id.*, ¶¶25 (a “basic subscription package might then have more stringent access rules than a premium subscription package”), 34, 43-44. *Thomas* also discloses a subscriber plan to incentivize the wireless device 110 owner to make access to the network over the forwarding service available to third-party client-computing devices 114. EX1005, ¶¶54-56. *Thomas* thus provides a solution to compensate the owner for costs they are accruing from a network service provider while providing the forwarding service to others. *Id.*

Accordingly, *Sewall* and *Thomas* disclose an end user-device having aspects of first- and second-service policies that differ when the first network is associated with a cost. As detailed above, a POSITA would have been motivated to implement a combination having *Sewall*'s and *Thomas*'s billing and reward systems encouraging mobile-device users to provide hotspot services notwithstanding the costs associated with the first network. EX1003, ¶128; *supra* §VI.B.1.

Accordingly, claim 51 as a whole would have been obvious.

C. Ground 3: Claims 18, 21, 40, and 42 Are Obvious over *Sewall* in view of *Krishnaswamy*

1. Motivation to Combine *Sewall* and *Krishnaswamy* with a Reasonable Expectation of Success

Like *Sewall*, *Krishnaswamy* is also analogous art to the '451 patent. EX1003, ¶¶130. It is in the same field of endeavor: mobile devices and wireless access points for computer networking. *Id.*; EX1020, Abstract, 3:51-4:21, Figs. 1-2. Like *Sewall*, *Krishnaswamy* also shares a common goal with the '451 patent: 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 the customizability and monetization of mobile-hotspot technology (e.g., usage control, user interactivity and notifications via graphical user

interfaces, and billing features). EX1020, Abstract, 3:51-4:21, 6:1-16, 7:61-8:15, 9:54-63, 11:26-44, Figs. 1-2; EX1003, ¶130.

A POSITA would have been motivated to implement a combination of *Sewall's* and *Krishnaswamy's* access-limitation and access-enabling features for providing forwarding services over a mobile hotspot. For example, a POSITA would have been motivated to modify *Sewall's* user and/or device profiles to incorporate additional features for the limiter of the mobile hotspot device to limit access, including geographic restrictions and usage restrictions (e.g., based on quality of service parameters). EX1020, 3:66-4:5, 4:49-5:2, 5:21-28. As detailed below, a POSITA also would have been motivated to implement secure channel features in user and/or device profiles to enhance security and privacy of using the forwarding service. Combining these references' disclosures was within a POSITA's skill and would predictably apply known access-limiting techniques to known mobile hotspot devices and profiles to further *Sewall's* purpose of providing forwarding services with access limitations using mobile hotspots. EX1003, ¶¶131-32; EX1006, ¶8.

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

Claim 18 depends from claim 1, which would have been obvious as discussed above. *Supra* §VI.A.1. *Sewall* and *Krishnaswamy* render claim 18 obvious. EX1003, ¶¶133-36.

Sewall discloses second access rules (e.g., device profile) for controlling the second traffic between its mobile hotspot and the internet. EX1006, ¶34; *see* §VI.A.1.f. *Sewall*’s mobile hotspot may send a request to a service provider, seeking configuration data for providing the forwarding service to other devices. EX1006, ¶¶43-44, 16. The service provider then determines if authorization is warranted. EX1006, ¶44 (determining “*if* and/or *what* configuration data is to be returned”).

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

As detailed above, a POSITA would have been motivated to modify *Sewall*’s mobile hotspot and its device profile in view of *Krishnaswamy* to account

for geographic location as part of authorizing the mobile hotspot to provide the forwarding service, as the geographic location may result in adverse effects on performance. *Id.*; EX1003, ¶136. If so, the second-access rules (“second service policy”) of the device profile may be configured to restrict or deny access to the forwarding service. *See* §VI.C.1

Accordingly, claim 18 as a whole would have been obvious.

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

Claim 21 depends from claim 1, which would have been obvious as discussed above. *Supra* §VI.A.1. *Sewall* and *Krishnaswamy* render claim 21 obvious. EX1003, ¶¶137-39.

Sewall discloses first access rules for the user profiles to assist with controlling the first traffic between other devices and the internet. EX1006, ¶36; *see* §VI.A.1.f. These profiles may provide for different access and usage restrictions depending on the user (e.g., owner, authorized, or anonymous user). EX1006, ¶¶8, 22, 26, 28-29, 47-50.

Krishnaswamy further discloses quality-of-service restrictions for its hotspot users that a POSITA would have been motivated to implement in *Sewall*’s user profiles. EX1003, ¶¶131-132, 139, 148. For example, depending on the QoS required for a particular device accessing the hotspot, *Krishnaswamy*’s device may

use the hotspot's forwarding service or be transferred to a different hotspot.

EX1020, 6:1-16. One of skill would understand that, by implementing *Krishnaswamy*'s QoS requirements into *Sewall*'s profiles, the combination's hotspot device would provide for improved on-the-fly access configurations, including during conditions that are less than optimal (e.g., during data-restricted roaming sessions, if network bandwidth is low, or based on needs of a given hotspot session). EX1003, ¶139. It further would have been obvious based on *Sewall* to apply different QoS requirements for different users (e.g., anonymous devices may have their forwarding-service sessions terminated and/or be transferred to a different hotspot before an owner's device). *See supra* §VI.C.1.

Accordingly, claim 21 as a whole would have been obvious.

4. Claim 40

Claim 40 depends from claim 1, which would have been obvious as discussed above. *Supra* §VI.A.1. *Sewall* and *Krishnaswamy* render claim 40 obvious. EX1003, ¶¶140-45.

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

Sewall and *Krishnaswamy* render 40[a] obvious. EX1003, ¶¶140-43.

Sewall discloses first access rules based on user profiles to assist with controlling first traffic between other devices and a network (e.g., the internet).

EX1006, ¶36; *see* §VI.A.1.e. These profiles may provide for different access and usage restrictions depending on the user (e.g., owner, authorized, or anonymous user). EX1006, ¶¶8, 22, 26, 28-29, 47-50.

Krishnaswamy discloses establishing a secure session channel (e.g., a VPN tunnel) between a user of a device accessing the forwarding service and a server 110 through which services and content may be provided (e.g., audio, video, advertising, and internet-routing). EX1020, 5:10-20, 5:32-67, Fig. 1. A POSITA would have recognized that a secure session channel, such as a virtual-private-network tunnel, is a virtual or logical channel, as claimed. EX1003, ¶142.

A POSITA would have been motivated to modify *Sewall*'s user profiles to include default options for implementing *Krishnaswamy*'s privacy-enhancing secure session channels for traffic between hotspot users and a network. Indeed, *Sewall* recognizes that hotspot users may submit and receive sensitive information (e.g., identifying information, usernames and passwords, personal information, and payment information) that the device user would desire to protect. EX1003, ¶143 (citing EX1006, ¶¶23, 37-39, 51-54); *see also* EX1020, 5:10-20, 5:52-67 (disclosing use of encryption to “provide increased privacy for a mobile client 108”).

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

Sewall and *Krishnaswamy* render 40[b] obvious. EX1003, ¶¶144-45.

Sewall discloses second access rules for its mobile hotspot’s device profile to assist with controlling the second traffic between the mobile hotspot and the internet. EX1006, ¶34; *see* §VI.A.1.f. Unlike the first access rules, which may impose user-specific restrictions based on the particular user profile accessing the mobile hotspot, the second access rules are device access rules setting limits that apply generally to use of the mobile hotspot, including by its owner. In this regard, *Krishnaswamy* discloses establishing a second secure session channel between the server 110 and an ad hoc service provider 106, which would have been understood by a POSITA to enhance privacy for second traffic between the mobile hotspot device and a network. EX1020, 10:10-20, 10:52-67. A POSITA would have been motivated to modify *Sewall*’s device profiles to include default options for implementing *Krishnaswamy*’s secure session channels for such traffic between the mobile hotspot device and a network. EX1003, ¶144. Indeed, *Sewall* recognizes that mobile-hotspot device owners may submit and receive sensitive information that the device user would desire to protect, including passing identification and payment information associated with potential users of the forwarding service. EX1006, ¶¶33-35, 43-45 37-39, 51-54; *see also* EX1020, 5:10-20, 5:32-67.

Accordingly, claim 40 as a whole would have been obvious.

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

Claim 42 depends from claim 1, which would have been obvious as discussed above. *Supra* §VI.A.1. *Sewall* and *Krishnaswamy* render claim 42 obvious. EX1003, ¶¶146-50.

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

Sewall and *Krishnaswamy* both disclose providing information to other client devices for assisting them to control their usage of the hotspot device’s forwarding service. *Sewall*, for example, discloses that the hotspot device may supply a user interface to anonymous devices to submit payment to use the forwarding service for either a specified amount of time or a specified amount of use. EX1006, ¶¶28-29. Anonymous devices are thus assisted in controlling their usage (and associated costs) of the forwarding service. *Id.*; EX1003, ¶147.

Krishnaswamy also discloses providing information during a forwarding-service session for assisting other devices to control their usage. It discloses that

hotspot devices may experience “resource related events,” such as reduced available bandwidth or higher loads. EX1020, 11:3-44. The hotspot device may notify other devices using the forwarding service of the resource related event and any response that the hotspot device may be preparing to take. EX1020, 11:40 (“notify some or all of the mobile clients 108”). The other devices thus may be assisted by that information to control their usage of the forwarding traffic by adjusting their data usage (e.g., using audio instead of video) or time using the forwarding service, including by potentially electing to cease usage altogether and switching to a different hotspot device’s forwarding service. EX1020, 5:59-6:8 (disclosing mobile client 108 switching from one hotspot device to another based on, e.g., quality of service and loading factors).

A POSITA would have been motivated to combine these usage-control features of *Sewall* and *Krishnaswamy* to provide for increased flexibility and transparency, including to provide information to users at multiple time points during a forwarding-service session about usage limitations, costs, and resource-related events that users may rely upon to optimize and control their forwarding-service usage. EX1003, ¶149.

Accordingly, claim 42 as a whole would have been obvious.

D. Ground 4: Claim 17 Is Obvious over *Sewall* in view of *Polson*

1. Motivation to Combine *Sewall* and *Polson* with a Reasonable Expectation of Success

Like *Sewall*, *Polson* is also analogous art to the '451 patent. EX1003, ¶151. It is in the same field of endeavor: mobile devices and wireless access points for computer networking. *Id.*; EX1015, Abstract, ¶¶2, 16, 20-23, 26, 56, Figs. 1, 2, 9-15. Like *Sewall*, *Polson* also shares a common goal with the '451 patent: using devices to bridge or route traffic from other devices to a network system (e.g., the internet). EX1015, Abstract, ¶¶2, 16, 20-23, 26, 29-35, 38-39, 44-46, 52-53, 56, 78-79, Figs. 1, 2, 9-15; EX1003, ¶151.

A POSITA would have been motivated to implement a combination of *Sewall*'s profiles for implementing access rules on its end-user hotspot device with *Polson*'s features for managing WWAN access. *Polson* discloses that its hotspot ("gateway 108") device may be capable of accessing multiple WWANs via different service providers. EX1015, ¶¶38-39. A POSITA would have recognized that having multiple WWANs available would improve the flexibility and reliability of the combination's end-user hotspot services (e.g., allowing for WWAN switching and avoiding loss of internet access). EX1003, ¶152. Indeed, *Polson* recognizes that the mobility of its gateway is important and that the ability to connect to multiple WWANs is necessary when one WWAN is not available

due to the location of the user, issues with the service provider, or the features of a service agreement. EX1015, ¶¶52-53. Combining these references' disclosures was within a POSITA's skill and would predictably apply known techniques (e.g., implementing multiple WWAN interfaces to provide access to different WWANs) to obtain predictable results (e.g., continued access across different WWANs). *KSR*, 550 U.S. at 420.

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

Claim 17 depends from claim 1, which would have been obvious as discussed above. *Supra* §§VI.A.1. *Sewall* and *Polson* render claim 17 obvious. EX1003, ¶¶153-56.

Sewall discloses second access rules for its device profile to assist with controlling the second traffic between the mobile hotspot and the internet via remote link 24. EX1006, ¶34; *see* §VI.A.1.f. As detailed above, *Polson* discloses that the hotspot device may access WWANs via different service providers. EX1015, ¶¶38-39. Indeed, *Polson* discloses that the combination's hotspot device may have multiple sockets to receive multiple WWAN interfaces 110. EX1015, ¶53. Thus, if one WWAN 112 is not available because of the location of the user,

issues with the service provider of the WWAN 112, or the features of a service agreement, WWAN access may be provided via another WWAN connection. *Id.*

It therefore would have been obvious to implement a combination of *Sewall* and *Polson* with an end-user hotspot device that detects a network change (e.g., recognizing WWAN unavailability and switching to another WWAN) and, in response, modifying an aspect of the first or second service policies. EX1003, ¶155. Indeed, *Polson* discloses that features of combination's hotspot device may vary depending on the WWAN being accessed and the terms of any subscription plan with that WWAN service provider. EX1015, ¶¶38-39. A POSITA thus would have recognized that different aspects of the first and second service policies may be modified based on a WWAN change, as different access and/or upload and download bandwidth limits for each owner, authorized, or anonymous user may apply. EX1006, ¶36. Different limitations on the amount of data transfer allowed by each user in a given time period may also apply when connected to a different WWAN. *Id.* Likewise, different access and bandwidth limits may apply to the mobile hotspot device, including limiting the number of simultaneous users or sessions. EX1006, ¶34. *Sewall* explains that the nature of these access rules may depend on the nature of the data subscription package with internet service provider 22; for example, a premium package may have less stringent limitations than a basic subscription package. *Id.* Accordingly, changing from one WWAN

associated with one data subscription plan to another would reasonably be expected to result in modifying and applying different access rules. EX1003, ¶155.

Accordingly, claim 17 as a whole would have been obvious.

E. Ground 5: Claim 46 Is Obvious over *Sewall* in view of *Thomas* and *Krishnaswamy*

1. Motivation to Combine *Sewall*, *Thomas*, and *Krishnaswamy* with a Reasonable Expectation of Success

As detailed above, a POSITA would have been motivated to combine *Sewall* and *Thomas*. *Supra* § VI.B.1.

A POSITA would also have been motivated to combine *Sewall*, *Thomas*, and *Krishnaswamy*. *Krishnaswamy* is analogous art to the '451 patent. *Supra* §§VI.B.1, VI.C.1; EX1003, ¶157. *Sewall*, *Thomas*, and *Krishnaswamy* also share common goals with the '451 patent, including using end-user devices for bridging or routing traffic from other devices to a network system, including the provisioning of services to improve customizability and reliability of mobile-hotspot technology. *Supra* §§VI.B.1, VI.C.1; EX1003, ¶157.

A POSITA would have been motivated to implement a combination of *Sewall*'s, *Thomas*'s, and *Krishnaswamy*'s access-limitation and access-enabling features for providing forwarding services over a mobile hotspot. For example, a POSITA would have been motivated to modify *Sewall*'s first access rules based on user profiles to incorporate additional limits that depend on the type of network

connection between a client device and the mobile hotspot device. EX1003, ¶158. Indeed, *Thomas* proposes using farther-reaching wireless (e.g., Wi-Fi) networks to provide forwarding services to multiple client devices and with greater bandwidth, as compared to range-limited and point-to-point connections Bluetooth or infrared connections. EX1005, ¶¶6, 28, 32. *Krishnaswamy* further proposes quality-of-service-based handoffs of client devices from one mobile hotspot connection to another. EX1020, 6:1-16. Combining these references' disclosures was within a POSITA's skill and would predictably apply known techniques for improving forwarding-service access and performance using known networking-connection technologies and known mobile hotspot devices, furthering *Sewall*'s purpose of providing forwarding services with access limitations using mobile hotspots. EX1003, ¶158; EX1006, ¶8.

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

Claim 46 depends from claim 1, which would have been obvious as discussed above. *Supra* §VI.A.1. *Sewall*, *Thomas*, and *Krishnaswamy* render claim 46 obvious. EX1003, ¶¶159-65.

Sewall discloses that the combination's mobile hotspot device communicates with client devices via local link 18 (second network). EX1006, ¶¶7, 10, 17, Figs. 1, 3. The local links may include a cable, wireless, or remote link via a

telecommunication link, an infrared link, a Bluetooth link, a radio frequency link, or any other connector or system that provides electronic communication between client devices and the hotspot device. *Id.* *Sewall* further discloses user profiles having first access rules to assist with controlling the first traffic between the client devices and the internet, including through local link 18. EX1006, ¶¶34-36; *see* §VI.A.1.e. Such profiles may include profiles for the owner of the hotspot, authorized users, or anonymous users. EX1006, ¶¶34-36.

It would have been obvious based on *Sewall* and *Thomas* for the combination's user profiles and access rules to depend on whether a client device is accessing the mobile hotspot via a roaming network (e.g., as compared to a short-distance local connection). EX1003, ¶1610. *Thomas* discloses that conventional hotspot solutions involve a laptop user connecting to an internet-enabled cellular device over "short range" networks, such as Bluetooth or infrared. EX1005, ¶6. Several shortcomings with such local links were recognized, however, including limited transmission distances and insufficient bandwidth:

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

EX1005, ¶6. *Thomas* discloses that the tight coupling of these conventional hotspot links typically prohibited the use of the hotspot device “by a laptop that was previously unknown to the cellular device.” EX1005, ¶28; *see also* EX1006, ¶¶22-23, 33-34. Similarly, conventional hotspot links also precluded the concurrent use of a hotspot by more than one client device at a time, as Bluetooth and infrared are typically point-to-point connections. EX1005, ¶¶6, 28.

Based on *Sewall* and *Thomas*, it would have been obvious for user profiles and access rules to depend on the type of local network connection to a client device. If a non-roaming, short-distance connection were used, first-access rules based on anonymous-user profiles would most likely deny access. EX1006, ¶36 (anonymous user profiles will be more limiting than other profiles, including blocking access); EX1005, ¶28 (Bluetooth connections may preclude use of the forwarding service by “unknown” devices). For example, in such situations, the hotspot owner would likely be using the hotspot for his or her own laptop or client device, and would be disinclined to allow anonymous user access over the point-to-point connection. EX1005, ¶28; EX1003, ¶161.

On the other hand, where the second network is a roaming network, expanding access across greater distances and to a greater number of potential client devices, a POSITA would understand that the same limitations of short-range networks would not apply. EX1003, ¶162. Over farther-reaching wireless

networks, for example, authorized and anonymous client devices may use the combination's mobile hotspot forwarding service and access the internet in accordance with the access rules of their user profiles. EX1006, ¶¶34-36, 39, 50-54.

To the extent Patent Owner disputes that *Sewall* and *Thomas* render claim 46 obvious, the claim is additionally obvious based on *Sewall*, *Thomas*, and *Krishnaswamy*. *Krishnaswamy* discloses that client devices may choose from available hotspot devices and that a client device may be handed off from one ad hoc service provider to another based on, e.g., the quality of service required by the mobile client. EX1020, 6:1-16, 9:54-10:4. A POSITA would have understood that a client device may access the mobile hotspot via a network (local link 18) that was not their home or default network but a roaming network to connect to a different mobile hotspot device. *Id.*; EX1003, ¶163.

A POSITA would have modified *Sewall*'s first access rules such that a session for a user may be terminated and the client device may be handed off onto roaming network to access a different mobile hotspot if the quality of service dropped below a certain threshold, as *Krishnaswamy* discloses. *Id.* This would allow anonymous users—who otherwise have no connection to the mobile hotspot and cannot control its movement—to maintain internet access even when the mobile hotspot moves out of range. EX1003, ¶164. It would also allow the owner

of the mobile hotspot to ensure a certain quality of service, which *Krishnaswamy* recognizes is an important metric. EX1020, 6:1-16, 8:6-15, 9:54-63; EX1003, ¶164; *See* §VI.C.1.

Accordingly, claim 46 as a whole would have been obvious.

VII. Mandatory Notices

A. Real Parties-in-Interest

Google LLC² is a real party-in-interest.

Out of an abundance of caution, Google identifies Apple Inc. (“Apple”) as a real party-in-interest. Apple and Headwater have recently entered into “a worldwide settlement whereby Headwater licensed its patents to Apple.” Patent Owner’s Request for Discretionary Denial of Institution, *Google LLC v. Headwater Research LLC*, IPR2026-00048, Paper 8, 2 (PTAB Jan. 7, 2026).

As identified in the related matters below, the ’451 patent is being asserted against multiple Carriers in 2:25-cv-00914, 2:25-cv-00919, and 2:25-cv-00921. On December 1, 2025, the Carriers in those cases filed a joint opposed motion to stay the litigations under, among other things, the customer-suit exception. *See*

² Google LLC is a subsidiary of XXVI Holdings Inc., which is a subsidiary of Alphabet Inc.

Defendants' Joint Opposed Motion to Stay, *Headwater Res. LLC v. DISH Network Corp.*, 2:25-cv-00921 (Dec. 1, 2025), ECF No. 52. On December 8, 2025, a redacted version of that motion was made publicly available. *See id.* ECF No. 63. On December 19, 2025, Headwater filed a sealed response to the motion. *See id.* ECF No. 73. On January 9, 2026, the Carriers filed a sealed reply. *See id.* ECF No. 82. In light of these filings, Google names the following Carriers (the named defendants in these cases) as real parties-in-interest to this proceeding:

- DISH Network Corporation f/k/a EchoStar Communications Corporation
- DISH Network LLC
- Dish Wireless, LLC d/b/a Boost Mobile
- Charter Communications, Inc.
- Charter Communications, LLC
- Charter Communications Operating, LLC
- Comcast Cable Communications, LLC d/b/a Xfinity
- Comcast Cable Communications Management, LLC
- Comcast Corporation
- Comcast of Houston, LLC d/b/a Xfinity
- Spectrum Gulf Coast, LLC
- Spectrum Management Holding Company, LLC

Charter Communications, Inc., Charter Communications, LLC, Charter Communications Operating, LLC, Spectrum Gulf Coast, LLC, Spectrum Management Holding Company, LLC and Headwater Research LLC filed a Joint Motion to Stay All Deadlines and Notice of Settlement on August 5, 2026. *See id.* ECF No. 110.

Comcast Cable Communications, LLC d/b/a Xfinity, Comcast Cable Communications Management, LLC, Comcast of Houston, LLC, and Headwater Research LLC filed a Joint Motion to Stay All Deadlines and Notice of Settlement on August 7, 2026. *See id.* ECF No. 112.

To be clear, none of these Carriers funded, directed, or controlled the filing or preparation of this petition, nor did Google prepare or file the petition at the Carriers' behest. Instead, Google makes this identification out of an abundance of caution and in the interest of over-disclosure.

B. Related Matters

The '451 patent is or has been involved in the following proceedings:

Name	Number	Forum	Filed
<i>Google LLC v. Headwater Research LLC</i>	IPR2026-00466	PTAB	Aug. 28, 2026
<i>Headwater Research LLC v. Comcast Cable Communications, LLC d/b/a Xfinity et al</i>	2:25-cv-00914	E.D. Tex.	Aug. 29, 2025

<i>Headwater Research LLC v. Charter Communications, Inc. et al</i>	2:25-cv-00919	E.D. Tex.	Aug. 29, 2025
<i>Headwater Research LLC v. DISH Network Corporation et al</i>	2:25-cv-00921	E.D. Tex.	Aug. 29, 2025
<i>Headwater Research LLC v. Apple Inc.</i>	7:25-cv-00375	W.D. Tex.	Aug. 27, 2025
<i>Headwater Research LLC v. Google LLC</i>	7:25-cv-00376	W.D. Tex.	Aug. 27, 2025
<i>Headwater Research LLC v. AT&T Inc. et al</i>	2:25-cv-00428	E.D. Tex.	Apr. 23, 2025
<i>Headwater Research LLC v. Cellco Partnership, d/b/a Verizon Wireless et al</i>	2:25-cv-00391	E.D. Tex.	Apr. 15, 2025
<i>Headwater Research LLC v. Sprint LLC et al</i>	2:25-cv-00359	E.D. Tex.	Apr. 8, 2025

C. Lead and Back-Up Counsel

Lead Counsel	Back-Up Counsel
Erika H. Arner, Reg. No. 57,540 erika.arners@finnegan.com Finnegan, Henderson, Farabow, Garrett, & Dunner LLP 1875 Explorer Street, Suite 800 Reston, VA 20190-6023 Tel: 571-203-2754 Fax: 202-408-4400	Joshua L. Goldberg, Reg. No. 59,369 joshua.goldberg@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 901 New York Avenue NW Washington, DC 20001-4413 Phone: 202-408-6092 Fax: 202-408-4400 Daniel C. Tucker, Reg. No. 62,781 daniel.tucker@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 1875 Explorer St, Suite 800 Reston, VA 20190-6023 Tel: 571-203-2793 Fax: 202-408-4400

Lead Counsel	Back-Up Counsel
	Benjamin A. Saidman, Reg. No. 69,325 benjamin.saidman@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 271 17th Street NW, Suite 1400 Atlanta, GA 30363-6209 Phone: 404-653-6510 Fax: 404-653-6444 Daniel F. Klodowski, Reg. No. 72,693 daniel.klodowski@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 901 New York Avenue NW Washington, DC 20001-4413 Phone: 202-408-4216 Fax: 202-408-4400 Elliot Cook, Reg No. 61,769 elliott.cook@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 1875 Explorer St, Suite 800 Reston, VA 20190-6023 Tel: 571-203-2738 Fax: 202-408-4400 Michael V. Young (Reg. No. 61,180) michael.young@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 1875 Explorer Street, Suite 800 Reston, VA 20190-6023 Phone: 571-203-2788 Fax: 202-408-4400 Alexander M. Boyer, Reg. No. 66,599

Lead Counsel	Back-Up Counsel
	alexander.boyer@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 1875 Explorer Street, Suite 800 Reston, VA 20190-6023 Phone: 571-203-2759 Fax: 202-408-4400 Pier D. DeRoo, Reg. No. 69,340 pier.deroo@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 901 New York Avenue NW Washington, DC 20001-4413 Phone: 202-408-4418 Fax: 202-408-4400 Christopher C. Johns, Reg. No. 68,664 Christopher.Johns@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 901 New York Avenue NW, Washington, DC 20001-4413 Tel: 202-408-4155 Fax: 202-408-4400 Kassandra M. Officer, Reg. No. 74,083 kassandra.officer@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 901 New York Avenue NW, Washington, DC 20001-4413 Tel: 202-408-4270 Fax: 202-408-4400 Bradford C. Schulz, Reg. No. 75,006 bradford.schulz@finnegan.com Finnegan, Henderson, Farabow,

Lead Counsel	Back-Up Counsel
	Garrett & Dunner, LLP 1875 Explorer Street, Suite 800 Reston, VA 20190-6023 Tel: 571-203-2739 Fax: 202-408-4400 William C. Neer, Reg. No. 78,874 william.neer@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 901 New York Avenue NW Washington, DC 20001-4413 Phone: 202-408-4054 Fax: 202-408-4400 Christopher B. Anderson, Reg. No. 77,898 christopher.anderson@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 1875 Explorer St, Suite 800 Reston, VA 20190-6023 Tel: 571-203-2765 Fax: 202-408-4400 Kai Rajan, Reg. No. 70,110 kai.rajan@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 901 New York Avenue NW Washington, DC 20001-4413 Phone: 202-408-4363 Fax: 202-408-4400 Umber Aggarwal, Reg. No. 76,098 umber.aggarwal@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 1875 Explorer Street, Suite 800

Lead Counsel	Back-Up Counsel
	Reston, VA 20190-6023 Tel: 571-203-2423 Fax: 202-408-4400 Abhay A. Watwe, Reg. No. 59,461 abhay.watwe@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 1875 Explorer Street, Suite 800 Reston, VA 20190-6023 Tel: 571-203-2716 Fax: 202-408-4400 Kathleen C. Galleher, Reg. No. 80,837 kathleen.galleher@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 1875 Explorer Street, Suite 800 Reston, VA 20190-6023 Tel: 571-203-2448 Fax: 202-408-4400 Connor M. McGregor, Reg. No. 79,634 connor.mcgregor@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 901 New York Avenue NW Washington, DC 20001-4413 Phone: 202-408-4363 Fax: 202-408-4400 Heather J. Ren, Reg. No. 82,089 heather.ren@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 901 New York Avenue NW Washington, DC 20001-4413 Phone: 202-408-4024

Lead Counsel	Back-Up Counsel
	Fax: 202-408-4400 Yi Yang, <i>pro hac vice</i> to be filed yi.yang@finnegan.com Finnegan, Henderson, Farabow, Garrett & Dunner, LLP 2 Seaport Lane, 6 th Floor Boston, MA 02210 Phone: 617-646-1642 Fax: 202-408-4400

D. Service Information

Petitioner consents to being served electronically at the e-mail addresses provided above and at HeadwaterIPRTeam@finnegan.com.

VIII. Grounds for Standing

Petitioner certifies that the '451 patent is available for IPR and that Petitioner is not barred or estopped from requesting IPR challenging the patent claims on the grounds in this Petition.

IX. Conclusion

Petitioner requests IPR and cancellation of claims 1, 10, 17-19, 21, 29-32, 34, 35, 37-42, 45-49, and 51. The Office may charge any required fees to Deposit Account No. 06-0916.

Date: August 28, 2026

Respectfully submitted,

By: /Erika H. Arner/
Erika H. Arner, Lead Counsel
Reg. No. 57,540

CERTIFICATION OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24, Petitioner certifies that the word count of Petitioner's Petition for *Inter Partes* Review (exclusive of any table of contents, table of authorities, mandatory notices under § 42.8, certificates of service and word count, and list of exhibits or claim listing) as measured by Microsoft Word is 11,057.

By: /Erika H. Arner/
Erika H. Arner, Lead Counsel
Reg. No. 57,540

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(a), the undersigned certifies that on August 28, 2026, a copy of the foregoing Petition for *Inter Partes* Review, the associated power of attorney, and Exhibits 1001-1006, 1009-1010, 1012-1015, 1020-1021, 1025 were served by FedEx Priority Overnight on the correspondence address of record indicated in the Patent Office's Patent Center website for U.S. Patent No. 8,799,451:

James Harris
Headwater Research LLC - Outside Firm 1
110 North College Avenue
Suite 1116
Tyler, TX 75702
UNITED STATES

Date: August 28, 2026

By: /Lisa C. Hines/
Lisa C. Hines
Case Manager
FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP