

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Microsoft Corporation, Dell Technologies Inc., and Dell Inc.
Petitioners

v.

Ozmo Licensing LLC
Patent Owner

U.S. Patent No. 8,599,814

Filing Date: July 27, 2012

Issue Date: December 3, 2013

Title: Apparatus and Method for Integrating Short-Range Wireless Personal Area
Networks for a Wireless Local Area Network Infrastructure

Inter Partes Review No.: IPR2023-01060

**PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. §§311-319 AND 37 C.F.R. §§42.1-100, ET SEQ.**

TABLE OF CONTENTS

	Page
I. Introduction.....	1
II. Compliance with Formal Requirements.....	1
A. Mandatory Notices Under 37 C.F.R. §§42.8(b)(1)-(4).....	1
1. Real Party-In-Interest.....	1
2. Related Matters	1
3. Lead and Backup Counsel	1
4. Service Information.....	2
B. Proof of Service on the Patent Owner.....	2
C. Power of Attorney	2
D. Standing.....	2
E. Fees.....	3
III. Statement of Precise Relief Requested.....	3
A. Prior Art.....	3
B. Grounds	5
IV. The 814 Patent	6
A. Overview	6
B. Prosecution History	6
C. Level of Ordinary Skill in the Art.....	7
V. Claim Construction Under 37 C.F.R. §42.104(b)(3).....	8
A. “wireless personal area network (WPAN)”	8
B. “802.11x”	8
C. “overlay protocol”	8
D. “logic for processing data received via the wireless radio circuit”	9
E. “logic for generating data to be transmitted by the wireless radio circuit”	9
F. “logic for initiating and maintaining...”	9
G. “logic to coordinate a mutually agreeable inactivity period”	10

H.	“routing module for...”	10
I.	“logic for uniquely identifying...”	10
VI.	Ground 1: Claims 1, 3, 5-7, 9-13 Are Obvious Over Sugar, Shin and Bluetooth.....	11
A.	Sugar (EX1004).....	11
B.	Shin (EX1005).....	11
C.	Bluetooth Specification (EX1006)	12
D.	Combination Rationale.....	12
E.	Analysis	14
1.	Claim 1	14
a.	1.pre	14
b.	1.a.....	16
c.	1.b	19
d.	1.c.....	20
e.	1.d	21
f.	1.e.....	25
2.	Claim 3	26
3.	Claim 5	27
4.	Claim 6.....	29
5.	Claim 7.....	29
6.	Claim 9.....	30
7.	Claim 10	30
8.	Claim 11	30
9.	Claim 12	31
10.	Claim 13	31
VII.	Ground 2: Claim 2 is Obvious over Sugar, Bluetooth, Shin and Cromer.....	31
A.	Cromer (EX1022).....	31
B.	Combination Rationale.....	32
C.	Claim 2	34

VIII.	Ground 3: Claims 1, 4, 7-8 Are Obvious Over The Combination of Giaimo and Sinivaara	35
A.	Giaimo	35
B.	Sinivaara.....	36
C.	Combination Rationale.....	36
D.	Analysis	39
1.	Claim 1	39
a.	1.pre	39
b.	1.a.....	41
c.	1.b	43
d.	1.c.....	44
e.	1.d	45
f.	1.e.....	51
2.	Claim 4.....	53
3.	Claim 7.....	54
4.	Claim 8.....	54
IX.	Ground 4: Claim 1 is Obvious Over Gurevich, Hansen, and 802.11/b/g.....	55
A.	Gurevich (EX1010)	55
B.	Hansen (EX1009).....	55
C.	IEEE 802.11/b/g Overview	56
1.	IEEE 802.11-1999 (EX1017) Overview.....	56
2.	IEEE 802.11b-1999 (EX1018) Overview.....	56
3.	IEEE 802.11g-2003 (EX1019) Overview.....	57
D.	Rationale for Combining Hansen, Gurevich, and 802.11-1999, 802.11b and 802.11g.	57
1.	Rationale for Combining 802.11-1999, 802.11b and 802.11g (collectively, 802.11/b/g).....	57
2.	Rationale for Combining Hansen, Gurevich, and 802.11/b/g.	58
E.	Analysis	61
1.	Claim 1	61

a.	1.pre	61
b.	1.a.....	62
c.	1.b	64
d.	1.c.....	65
e.	1.d	67
f.	1.e.....	74
X.	This Petition is Proper Under 35 U.S.C. §§314(A) and 325(D)	75
A.	The <i>Fintiv</i> Factors Favor Institution under §314(A).....	75
B.	Stay	75
C.	Trial Date.....	75
D.	Parallel Proceeding.....	76
E.	Same Party	76
F.	Issue Overlap	77
G.	Other Considerations	77
H.	Compelling Merits.....	78
I.	The <i>Becton Dickinson</i> Factors Favor Institution Under §325(d).....	78
XI.	Conclusion	78

EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 8,599,814 (“ the 814 patent ”)
1002	Declaration of Dr. Zhi Ding
1003	Prosecution history of the 814 patent
1004	U.S. Patent Pub. 2002/0061031 A1 (“ Sugar ”)
1005	U.S. Patent Pub. 2004/0071123 A1 (“ Shin ”)
1006	Specification of the Bluetooth System, Version 1.1, February 22, 2001 (“ Bluetooth Specification ”)
1007	WO2005/006659 (“ Sinivaara ”)
1008	U.S. Patent Pub. 2004/0090924 (“ Giaimo ”)
1009	U.S. Pat. Pub. No. 2005/0180368 (“ Hansen ”)
1010	U.S. Pat. Pub. No. 2005/0174962 (“ Gurevich ”)
1011	WDTX District Court Trial Times
1012	US2006/0227753 (“ Vleugels I ”)
1013	Joint Claim Construction Statement
1014	Excerpts from the File History of 14/990,203
1015	Markman Order (Dkt. 36), <i>Ozmo Licensing LLC v. Acer Inc.</i> , 6:21-cv-1225-ADA (W.D. Tex. Sept. 20, 2022)
1016	U.S. Pat. No. 10,045,290
1017	IEEE 802.11-1999
1018	IEEE 802.11b-1999
1019	IEEE 802.11g-2003
1020	DMI 2.0s Specification
1021	IEEE 802.15.1-2002
1022	U.S. Patent Pub. No. 2005/0165909 (“ Cromer ”)
1023	U.S. Patent No. 7,340,015

Exhibit No.	Description
1024	2023.06.28 <i>Markman</i> Hearing Transcript, <i>Ozmo Licensing v. Dell Technologies Inc.</i> , 6:22-cv-642-ADA
1025	U.S. Patent No. 6,255,800
1026	April 1, 2002 WaybackMachine Archive of www.Bluetooth.com (visited June 20, 2023)
1027	April 7, 2002 WaybackMachine Archive of http://Bluetooth.com/dev/specifications.asp (visited June 20, 2023)
1028	IEEE Xplore, 802.11-1999 (reaffirmed 2003) Specification, https://ieeexplore.ieee.org/document/1389197 (visited June 13, 2023)
1029	IEEE Xplore, 802.11b-1999 Specification, https://ieeexplore.ieee.org/document/817038 (visited June 13, 2023)
1030	IEEE Xplore, 802.11g-2003 Specification, https://ieeexplore.ieee.org/document/1210624 (visited June 12, 2023)
1031	Feb. 12, 2004 WaybackMachine Archive of http://standards.ieee.org/getieee802/802.11.html
1032	Declaration of James Proctor (“Proctor Decl.”)
1033	U.S. Patent No. 7,990,904
1034	Patent Owner’s Sur-Reply Claim Construction Brief (Dkt. 38), <i>Ozmo Licensing v. Dell Technologies Inc.</i> , 6:22-cv-642-ADA
1035	Email Correspondence in Dell Litigation re the Court’s Preliminary Constructions
1036	Claim Construction Order (Dkt. 60), <i>Ozmo Licensing v. Dell Technologies Inc.</i> , 6:22-cv-642-ADA

I. INTRODUCTION

Petitioners seek *inter partes* review of claims 1-13 of the 814 patent.

II. COMPLIANCE WITH FORMAL REQUIREMENTS

A. Mandatory Notices Under 37 C.F.R. §§42.8(b)(1)-(4)

1. Real Party-In-Interest

Each of the Petitioners is a real party-in-interest (“RPI”).

According to the USPTO’s assignment records, the 814 patent is currently owned by Ozmo Licensing LLC (“Patent Owner” or “PO”).

2. Related Matters

The 814 patent is currently asserted in *Ozmo Licensing LLC v. Dell Technologies Inc.*, W.D. Tex. Case No. 6:22-cv-00642 (W.D. Tex.) (the “Dell Litigation”) and *Ozmo Licensing LLC v. TCL Electronics Holdings Ltd.*, W.D. Tex. Case No. 6:23-cv-00249) (W.D. Tex.) (the “TCL Litigation”).

The 814 patent was previously asserted in the now dismissed litigations *Ozmo Licensing LLC v. Acer Inc.*, W.D. Tex. Case No. 6:21-cv-01225) (W.D. Tex.) (the “Acer Litigation”) and *Ozmo Licensing LLC v. HP Inc.*, W.D. Tex. Case No. 6:21-cv-00383) (W.D. Tex.) (the “HP Litigation”).

3. Lead and Backup Counsel

Lead counsel is Brian Erickson, Reg. No. 48,895, of DLA Piper LLP (US), 303 Colorado St., Suite 3000, Austin, TX 78701; brian.erickson@dlapiper.com, 512-457-7059 (phone), 512-457-7001 (fax).

Backup counsel is Chris Katsantonis, Reg. No. 78,388, of DLA Piper LLP (US), 444 West Lake Street, Suite 900, Chicago, IL 60606-0089; chris.katsantonis@us.dlapiper.com, 312-368-2184 (phone), 312-251-2884 (fax).

4. Service Information

Service information for lead and back-up counsel is provided in the designation of lead and back-up counsel above. Petitioner consents to electronic service to lead and back-up counsel and to:

Ozmo-IPR@us.dlapiper.com

B. Proof of Service on the Patent Owner

As identified in the attached Certificate of Service, a copy of this Petition and supporting evidence is being served electronically by agreement of the parties and pursuant to 37 C.F.R. §§42.6 & 42.105(b).

C. Power of Attorney

Powers of attorney are being filed, with designation of counsel, in accordance with 37 C.F.R. §42.10(b).

D. Standing

In accordance with 37 C.F.R. §42.104(a), Petitioner certifies that the 814 patent is available for *inter partes* review and that Petitioner is not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

E. Fees

The undersigned authorizes the Director to charge the fee specified by 37 C.F.R. §42.15(a) and any additional fees that might be due in connection with this Petition to Deposit Account No. 50-3266.

III. STATEMENT OF PRECISE RELIEF REQUESTED

A. Prior Art

The Petition relies on the following references under pre-AIA law, even if the claims are entitled to the earliest listed priority date, which is not conceded:

Under Section 102(b):

- U.S. Patent Pub. No. 2002/0061031 to Sugar *et al.* (“Sugar”), published May 23, 2002.
- Specification of the Bluetooth System (“Bluetooth Specification”), Version 1.1, published February 22, 2001.
- IEEE 802.11-1999 (reaffirmed 2003) (“802.11-1999”), published in 2003
- IEEE 802.11b-1999 (“802.11b”), published on January 20, 2000.
- IEEE 802.11g-2003 (“802.11g”), published on June 27, 2003.

Under Sections 102(a) and (e)(2):

- U.S. Patent Pub. 2004/0071123 (“Shin”), filed June 10, 2003, published April 15, 2004.

- International Patent Publication WO2005/006659 to Sinivaara *et al.* (“Sinivaara”), filed July 11, 2003 in English and designating the U.S. and published January 20, 2005.
- U.S. Patent Pub. 2004/0090924 to Giaimo *et al.* (“Giaimo”), filed November 4, 2003, published May 13, 2004.

Under Section 102(e)(2):

- U.S. Pat. Pub. No. 2005/0180368 to Hansen *et al.* (“Hansen”), filed May 28, 2004, published August 18, 2005.
- U.S. Pat. Pub. No. 2005/0174962 to Gurevich (“Gurevich”), filed December 16, 2004, published August 11, 2005.
- U.S. Pat. Pub. No. 2005/0165909 to Cromer *et al.* (“Cromer”), filed December 19, 2003, published July 28, 2005.

The Bluetooth Specification is admitted prior art. EX1001, 2:25-27. The Bluetooth Specification was published on February 22, 2001, was indexed and available on the Bluetooth website, and was well-known to a POSITA by early 2002. EX1032, ¶¶25-28. The 802.11-1999, 802.11b and 802.11g standards (“802.11/b/g”) are admitted prior art. EX1001, 2:23-27. 802.11/b/g were published by the IEEE, were indexed and available on the IEEE website, and were well-known to a POSITA more than a year before March 14, 2005. EX1032, ¶¶29-35. Further, each of these standards has a copyright and/or publication date. EX1006,

pp. 3, EX1017-19 (at ii, Cover, ii, respectively); EX1028-30; *Ford Motor Co. v. Cruise Control Techs. LLC*, IPR2014-00291, Paper 44 at 7-8 (PTAB Sept. 5, 2014) (using copyright notice for publication); *Ericsson, Inc. v. Intellectual Ventures I LLC*, IPR2014-00527, Paper 41 at 11 (PTAB May 18, 2015) (Official Notice that POSITAs rely on the copyright line of IEEE publications). The public availability of these printed publications is also confirmed by contemporaneous prior art and the timestamps of pre-March 14, 2004 versions of the IEEE and Bluetooth website provided by the WaybackMachine. *Valve Corp. v. Ironburg Inventions Ltd.*, 8 F.4th 1364, 1374 (Fed. Cir. 2021); EX1010, [0076] (URL to 802.11 standards); EX1031 (same); EX1025, 6:28-29 (same re Bluetooth); EX1028-30; EX1032, ¶¶25-35.

B. Grounds

This Petition, which relies on and copies substantial portions of the declaration of Dr. Zhi Ding (EX1002), requests cancellation of the Challenged Claims on the following grounds:

- **Ground 1:** Claims 1, 3, 5-7, 9-13 are obvious over the combination of Sugar, Bluetooth and Shin.
- **Ground 2:** Claim 2 is obvious over the combination of Sugar, Bluetooth, Shin and Cromer.

- **Ground 3:** Claims 1, 4, 7-8 are obvious over the combination of Giaimo and Sinivaara.
- **Ground 4:** Claim 1 is obvious over the combination of Gurevich, Hansen, 802.11-1999, 802.11b and 802.11g.

IV. THE 814 PATENT

A. Overview

The 814 patent describes a computing device that communicates over a primary wireless network (“PWN,” *e.g.*, a WLAN) and a secondary wireless network (“SWN,” *e.g.*, a WPAN). EX1001, 9:60-65. The computing device purportedly “coordinates the usage of the wireless medium” to “reduce interference.” *Id.*, 9:65-10:1. The 814 patent states that coordination may be achieved by using a secondary network protocol that is an “overlay protocol” that is “partially” compliant with the first network protocol. *Id.*, 10:1-7. The only “coordination” disclosed in the 814 patent is a signal sent to the devices using the first network to “defer” to devices using the secondary network. *Id.*, 10:8-10. EX1002, ¶23.

B. Prosecution History

The 814 patent was filed on January 27, 2012 with an incorporation by reference of application 11/376,753, which published as US2006/0227753 (“Vleugels I”). EX1012.

On December 6, 2012, the examiner rejected certain claims over Eng (6,771,933) and Quinn (2006/0015621), finding that Bluetooth was an overlay protocol of, and is partially consistent with, 802.11. EX1003, 180-182.

On May 7, 2013, the applicant amended the claims to additionally require that “at least some of the communications using the second wireless network protocol impinge on at least some antennae used for the first wireless network.” EX1003, 100-108. Applicant argued that the art did not disclose this limitation because the networks in the art could be in “separate spaces not in common.” *Id.*, 110. Applicant argued that the references did not discuss any interference issues, implying the networks were in different spaces. *Id.* The Examiner then allowed the amended claims. EX1003, 49-51. EX1002, ¶¶24-26.

C. Level of Ordinary Skill in the Art

A person of ordinary skill in the art (“POSITA”) as of March 14, 2005 (earliest listed filing date) or July 27, 2012 (actual filing date), would have had a Bachelor’s degree in electrical engineering, computer engineering, computer science, or a related field, with at least two years of experience in the field of wireless communication systems and protocols, with an allowance for additional education or experience that might substitute for those requirements. A POSITA would have been skilled at working with the Bluetooth Specification and 802.11/a/b/g standards. EX1001, 1:25-3:33; EX1002, ¶¶27-28.

V. CLAIM CONSTRUCTION UNDER 37 C.F.R. §42.104(B)(3)

The Challenged Claims are interpreted using the same claim construction standard used to construe the claim in a civil action in federal district court. 37 C.F.R. §42.100(b). *See, e.g.*, 83 FR 51340 at 47-48, 55, 65-71. “[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.” *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

The Court in the Dell Litigation construed certain terms, which constructions are also applied. EX1035.

A. “wireless personal area network (WPAN)”

This term means “a wireless network with a typical coverage range on the order of 30 feet” based on the express definition in the intrinsic record and ordinary meaning in the context of this patent. EX1001, Fig. 1, 1:33-39, 9:36-37; EX1012 (Vleugels I), [0007]-[0009]; EX1002, ¶¶29-32.

B. “802.11x”

This term encompasses each of 802.11a, 802.11b and 802.11g. EX1001, 1:41 (“802.11x (x=a, b, g, n, etc.)”).

C. “overlay protocol”

This term means “a protocol governing a second network, which protocol has aspects in common with a first network protocol to provide one or more advantages” based on the express definition in the intrinsic record. EX1012

(Vleugels I), [0057]. An “overlay protocol” allows, for example, “the ability to use some common hardware components for both networks.” *Id.*

Petitioners’ construction properly encompasses disclosed embodiments. *Id.*, [0119] (802.11g is an overlay protocol that is partially compliant with 802.11b); EX1016 (290 patent), claims 1, 12 (claiming 802.15/Bluetooth is an overlay protocol that is partially compliant with 802.11).

Petitioners’ construction is consistent with the file history of the 814 patent. *See* Section IV.B. And with the file history of related application 14/990/203. EX1014, 86-87 (rejection over Bluetooth/802.11), 1-4 (abandoning the rejected claims after briefing of appeal to the Board was complete).

D. “logic for processing data received via the wireless radio circuit”

The parties agree this term is subject to Section 112f, the function is as recited in the limitation, and the structure is “processing unit 28.” EX1013, 2.

E. “logic for generating data to be transmitted by the wireless radio circuit”

The parties agree this term is subject to Section 112f, the function is as recited in the limitation, and the structure is “processing unit 28.” EX1013, 2.

F. “logic for initiating and maintaining...”

The parties agree this term is subject to Section 112f, the function is as recited in the limitation, and the structure is “wireless circuit 27, processing unit 28, and software platform 36.” EX1013, 2-3. The 814 patent states that software

platform 36 enables the circuit to connect to both networks simultaneously as described in Vleugels I. EX1001, 7:3-10. Vleugels I discloses software supports this capability by simultaneously managing the PHY, MAC, and Networking layers. EX1012, [0070]-[0074], [0098]-[0101].

G. “logic to coordinate a mutually agreeable inactivity period”

PO asserts and the Court in the Dell Litigation held this limitation subject to Section 112f, the function is as recited in the claim, and the structure is processing unit 28 executing algorithms at 12:13-13:14 and equivalents. EX1013, 5.

H. “routing module for...”

The parties agree that this term is subject to Section 112f, the function is as recited in the limitation, and the structure is “processing unit 28 executing the algorithm at 7:66-8:7 and 8:11-14.” EX1013, 3.

I. “logic for uniquely identifying...”

The parties agree this limitation is subject to Section 112f, the function is as recited in the limitation, and the structure encompasses processing unit 28 routing based on IP addresses. EX1032 (PO Sur-Reply Brief), 10 (agreeing and including additional algorithms).

VI. GROUND 1: CLAIMS 1, 3, 5-7, 9-13 ARE OBVIOUS OVER SUGAR, SHIN AND BLUETOOTH

A. Sugar (EX1004)

Sugar discloses “systems and methods for preventing the collisions or interference” between an 802.11/WLAN and Bluetooth/WPAN. EX1004, [0002], [0066]-[0067]. Sugar discloses modifications to the protocols, e.g., new rules related to CTS/RTS and DIFS, to promote coexistence. *Id.*, [0084]-[0107]. Sugar’s disclosure that the multi-protocol device is a “hub” that distributes and receives information from the terminals on two networks renders obvious that the device would include “data forwarding logic” to serve as a “hub” between those networks. *Id.*, [0038]-[0039]; EX1002, ¶33.

B. Shin (EX1005)

Shin discloses an apparatus and method for forwarding data between 802.11/WLAN and Bluetooth/WPAN networks. EX1005, Title, Abstract. Specifically, Shin discloses that devices on one network communicate with devices on the other network indirectly through a hub using IP addresses, and the hub includes data forwarding logic to route those messages based on those IP addresses. *Id.*, Fig. 3, [0007]-[0011], [0050]; EX1002, ¶34.

C. Bluetooth Specification (EX1006)

The Bluetooth Specification discloses the details of the Bluetooth protocol, which Sugar explicitly teaches should be used. EX1004, [0078]-[0083]; EX1002, ¶35.

D. Combination Rationale

It would have been obvious for a POSITA to combine Sugar's techniques for co-existence of WLAN and WPAN networks with Shin's techniques for IP addressing and routing between WLAN and WPAN networks. And it would have been obvious to implement the details in the Bluetooth Specification in the combination based on the explicit teachings in Sugar and Shin. EX1004, [0078]-[0083]; EX1005, [0022]-[0032]; EX1002, ¶¶36-42.

These references are analogous art because each is directed to the field of wireless networks. Additionally, Sugar is reasonably pertinent to the co-existence problems (EX1001, 2:39-44; EX1004, Abstract), Shin is reasonably pertinent to IP-addressability and data forwarding problems (EX1001, 4:1-15; EX1005, Abstract), and the Bluetooth Specification is reasonably pertinent to power management problems addressed by the inventor. EX1001, 12:19-13:15; EX1006, §§10.8-10.10.; EX1002, ¶38.

A POSITA would have been motivated to combine the teachings of Sugar, Bluetooth and Shin to have an improved WLAN/WPAN hub. A POSITA

implementing the hub disclosed in Shin would have been motivated by the express teaching of Sugar to use Sugar's techniques to improve the co-existence of those networks. Similarly, a POSITA implementing the hub disclosed in Sugar would have been motivated by the express teaching of Shin to use Shin's techniques to provide the ability to address and route data between the networks. Thus, it would have been obvious to combine the teachings of Sugar, Bluetooth and Shin, with either serving as the base reference. EX1002, ¶39.

A POSITA would have combined the references using known methods to yield predictable results. Shin discloses that IP addressing and routing techniques may be implemented in the OSI software stack stored on a computer readable medium, which would have been executed on a processor. EX1005, [0077]-[0078]. Shin teaches a POSITA how to implement the stack. *Id.*, Figs. 1-3, [0022]-[0051]. Thus, Shin's techniques can be implemented in any hub with a processor running networking software, like the processor in Sugar, using known programming methods to yield predictable results. Similarly, Sugar discloses its protocol modifications are implemented in software executed on a processor. EX1004, Fig. 2, [0046], [0148], claims 68-73. Thus, Sugar's techniques can also be implemented in Shin's hub, using known programming methods to yield predictable results. In the combination, Sugar/Bluetooth's co-existence techniques, and Shin's IP routing techniques, execute on the same processor and perform the same functions as they

do separately. A hub running software is ready for improvement through additional programming using the combination of the techniques taught by these references to yield the predictable results taught by them. EX1002, ¶40.

Design incentives and market forces would have motivated a POSITA to combine the references to support IP routing, which was a basic networking functionality at the time, and to improve co-existence, which was a known goal in the art. EX1002, ¶41.

A POSITA would have had a reasonable expectation of success in making the combination of Sugar, Bluetooth and Shin through the use of known programming techniques, because a POSITA would have been skilled in working with the standard wireless technologies and implementing them as executable software running on a processor, and for the reasons given above. EX1002, ¶42.

E. Analysis

1. Claim 1

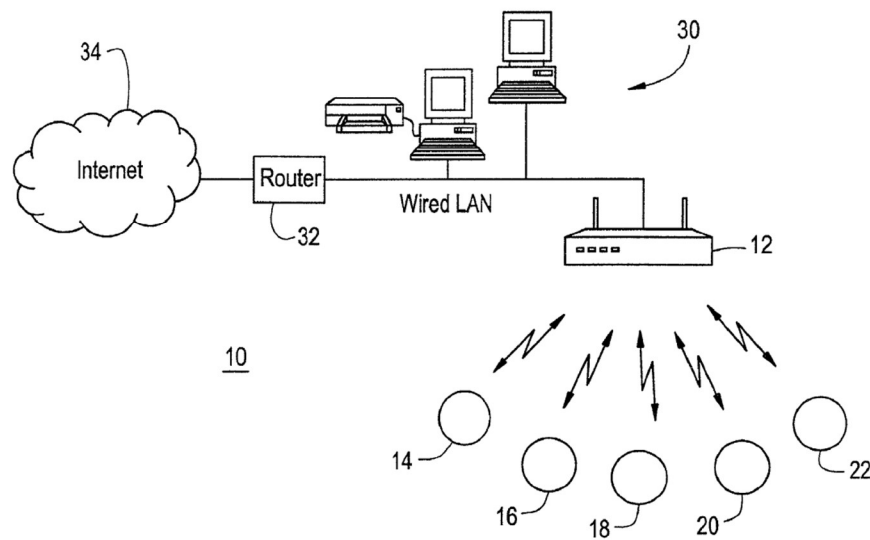
a. 1.pre

The combination discloses 1.pre “A network-enabled hub [laptop], usable for facilitating data communications between two or more wireless devices [WLAN device and WPAN device] that are configured to communicate indirectly with each other via the network-enabled hub [using IP addresses routed through

the hub], comprising [see subsequent limitations].”¹ See Section VI.D; EX1002, ¶¶43-46.

Sugar discloses a network enabled “hub” that it refers to as a multi-protocol device (“MPD”), with an example being a laptop. EX1004, [0039]. Sugar discloses the hub facilitates data communications with 802.11/WLAN wireless terminals and Bluetooth/WPAN wireless terminals. EX1004, Figs. 1-2, [0038]-[0047]; EX1002, ¶44.

FIG. 1



¹ The analysis of each limitation begins with a synopsis that includes the text of the limitation and in [brackets] provides a non-limiting example of disclosure in the prior art. The example in the synopsis is not limiting and Petitioner relies on all of the evidence and argument in the discussion of a limitation.

EX1004, Fig. 1 (hub 12, 802.11 nodes 14, 22, Bluetooth nodes 16, 20), [0042].

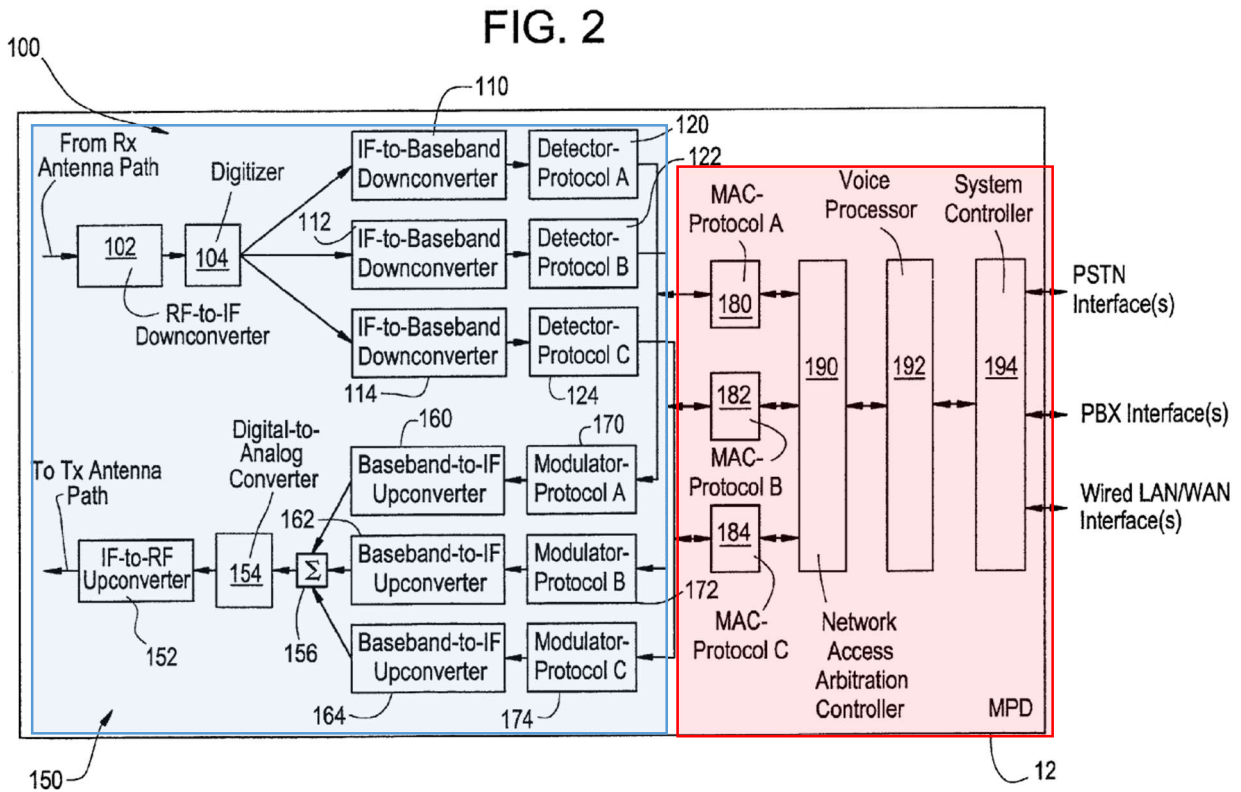
Sugar discloses that the MPD is a “hub” to receive and send simultaneous communications with the terminals (EX1004, [0038]-[0039], [0064]) and discloses techniques to improve co-existence. EX1004, Figs. 3-19, [0048]-[0107]; EX1002, ¶44.

Shin also discloses a network enabled hub (61, “Bluetooth wireless LAN compound terminal”) that facilitates data communications between 802.11/WLAN and Bluetooth/WPAN devices. EX1005, Figs. 3, 6, [0040]-[0051], [0060]-[0065], [0077]-[0080], claims 1-32. Shin discloses that the devices are configured to communicate indirectly with each other via the hub using IP addresses. EX1005, Figs. 4-5, 7-9, [0052]-[0059], [0066]-[0076], claims 1-32; EX1002, ¶¶45-46. *See* Ground 1, 1.e.

b. 1.a

The combination discloses 1.a “an interface [interface between processor/circuit] to a wireless radio circuit [circuit with transmit and receive channels] that can send and receive data wirelessly, providing the hub with bi-directional wireless data communication capability [bi-directional WLAN/WPAN].” *See* Section VI.D; EX1002, ¶¶47-52.

Sugar discloses the claimed “interface” as the interface between the wireless radio circuit (circuit with receive and transmit channels annotated in blue) and the processor (processor executing processing blocks annotated in red).



EX1004, Fig. 2 (annotated). Notably, in the 814 patent, the disclosed “interface” is a ‘black box’ communication path between a processor and a wireless radio circuit. EX1001, Fig. 6, 6:61-63; EX1002, ¶48.

Sugar discloses the hub (e.g., laptop) comprises a wireless radio circuit comprising circuitry for receive and transmit channels 100 and 150. EX1004, Fig. 2, [0044]-[0045]. Sugar discloses that circuitry sends and receives data wirelessly, providing the hub with bi-directional WLAN and WPAN communications. *Id.* A

POSITA would have understood that the blocks annotated in blue (up and down converters, modulators, digitizer, D-to-A converters) are circuitry and collectively comprise the claimed “a” wireless radio circuit. This is consistent with the 814 patent, wherein the wireless radio circuit 27 is implemented using multiple devices. EX1001, Fig. 6, 6:58-64; EX1012 (Vleugels I), [0082]-[0085]. A POSITA would have known that the “wireless radio circuit” as claimed and disclosed in Sugar would have been implemented as either discrete components or a SoC, and each choice would have been obvious, consistent with the passing reference to those known choices in Vleugels I, without further explanation. EX1002, ¶49; Ground 4, 1.a.

Sugar discloses processing blocks 180, 182, 184, 190, 192, 194 (highlighted in red) are implemented as code executing on a processor. EX1004, Fig. 2, [0046], [0148], claims 68-73, 95, 103, 121. The processor processes data received from, and generates data for transmission over, the wireless radio circuit. *Id.*; *see* 1.b-1.c; EX1002, ¶50.

Shin discloses wireless radio protocol stacks executed on a processor. EX1005, [0077]-[0078], claims 15-28, 32; 1.b-1.c. Shin discloses an interface between each layer of the stack through which the bi-directional communications are passed. *See* Ground 1, 1.e; EX1002, ¶51.

c. 1.b

The combination discloses “logic [processor] for processing [Sugar and Shin processing] data received via the wireless radio circuit.” *See* Section VI.D; EX1002, ¶¶53-58.

Sugar discloses a processor executes software stored in memory to perform the following processing of data received via the circuit: MAC processing (180, 182, 184), network/arbitration (190), digital voice data processing (192), activity data processing (194) or other application processing (e.g., video). EX1004, Fig. 2, [0046]-[0047], [0148], claims 68-73. A POSITA would have understood this disclosure means the processor executes whatever application processing is required on the received data. EX1002, ¶54.

Shin discloses its processing is implemented as a computer program, which inherently discloses (or at least renders obvious to a POSITA) a processor for executing that computer program. EX1005, [0077]-[0078], claims 15-28, 32. Shin discloses that the networking layer (IP) processes the received data to route it to the proper network and destination. *See* 1.e; EX1002, ¶¶55-56.

The processor in the combination is identical to, or at least equivalent to, processing unit 28 under the agreed construction. EX1002, ¶57.

d. 1.c

The combination discloses “logic [processor] for generating [Sugar and Shin generating] data to be transmitted by the wireless radio circuit.” *See* Section VI.D; EX1002, ¶¶59-63.

Sugar discloses its processor (1.a) generates data to be transmitted by the circuit: MAC processing (180, 182, 184) (e.g., generates MAC headers), network/arbitration (190), digital voice data processing (192), activity data processing (194) or other application processing (e.g., video). EX1004, Fig. 2 [0046]-[0047]. A POSITA would have understood this disclosure means the processor executes whatever application is required to generate the data for transmission. EX1002, ¶60.

Shin discloses its processor (see 1.a) generates and sends the IP address data. EX1005, [0062]-[0063]. Shin discloses the networking layer forwards data and lower layers generate data for transmission based on the destination network protocol. *Id.*, [0047] (forward), [0055] (“conversion” and “generates”); EX1002, ¶61.

The processor in the combination is identical to, or at least equivalent to, processing unit 28 under the agree construction. EX1002, ¶¶60-63.

e. 1.d

The combination discloses 1.d.1 “logic [1.a-1.c] for initiating and maintaining wireless network connections [802.11/WLAN and Bluetooth/WPAN connections] with nodes [14-22] of a wireless network external to the network-enabled hub [laptop], maintaining at least a first wireless network connection using a first wireless network protocol [802.11/WLAN] and a second wireless network connection using a second wireless network protocol [Bluetooth/WPAN], that can be maintained, at times, simultaneously with each other in a common wireless space [same time and common wireless space around laptop to forward data between connections].” *See* Section VI.D; EX1002, ¶¶64-75.

Sugar discloses a wireless radio circuit and processor that executes a protocol stack that initiates and maintains simultaneous 802.11/WLAN and Bluetooth/WPAN connections using the same RF front end. *See* 1.pre-1.c. Sugar discloses the hub is augmented with the appropriate software such that 802.11/WLAN and Bluetooth/WPAN connections are initiated and maintained simultaneously according to their respective standards. EX1004, [0038]-[0039], [0068]-[0073], [0078]-[0082]. Sugar teaches its processor executes an augmented interference avoidance algorithm to simultaneously maintain the connections. EX1004, Fig. 2, [0038]-[0046], [0066]-[0067]; EX1002, ¶65.

Shin discloses the processor executes a protocol stack that initiates and maintains simultaneous 802.11/WLAN and Bluetooth/WPAN connections for data forwarding between the networks. *See* 1.a-1.c, 1.e; EX1002, ¶66.

The structure in the combination is identical, or at least equivalent to, wireless circuit 27, processing unit 28, and software platform 36 under the agreed construction of 1.d.1. The wireless circuit of the combination is a combined WLAN/WPAN transceiver that corresponds to wireless circuit 27. *See* 1.a. The processor of the combination corresponds to processing unit 28. *See* 1.b-1.c. The combination discloses a software protocol stack that supports initiation and maintenance of simultaneous WLAN/WPAN connections, including augmented processing for co-existence, MAC addressing, and IP addressing and forwarding, which corresponds to software platform 36. EX1001, 3:7-10; EX1012, [0070]-[0074], [0098]-[0101]; EX1002, ¶¶66-67.

The combination discloses 1.d.2 “wherein the second wireless network protocol [Bluetooth] is an overlay protocol with respect to the first wireless protocol [802.11] in that communications using the second wireless network protocol are partially consistent with the first wireless network protocol [DIFS].” *See* Section VI.D; EX1002, ¶68.

The Bluetooth protocol in the combination is an overlay protocol with respect to 802.11 in that communications using the Bluetooth protocol are partially consistent, but not entirely consistent, with the 802.11 protocol. EX1002, ¶69.

The communications and protocols are partially consistent for at least four reasons. First, Sugar discloses the Bluetooth protocol is modified by adding a rule that DIFS from 802.11 should be used to reduce collisions. EX1004, Figs. 17(420), 19(530), [0095], [0107]. Sugar teaches that a device intending to send a Bluetooth transmission that might collide with an 802.11 transmission should wait one DIFS period to decrease the risk of a collision. *Id.* This is consistent with the 802.11 protocol that also requires waiting one DIFS period to reduce the risk of collision in these circumstances. EX1017 (802.11), §§9.2.3-5 *et seq.* This consistency provides the advantage of reducing interference and enhancing co-existence by reducing the risk of collision. EX1002, ¶69.

Second, Sugar discloses that the Bluetooth protocol is modified by adding CTS/RTS “guard packets” from 802.11 to reduce collisions. EX1004, Figs. 15-16, [0074], [0091]-[0092]. Sugar teaches CTS/RTS guard packets should be used to reserve the wireless medium to prevent collisions. *Id.* This is consistent with the use of guard packets in the 802.11 protocol to prevent collisions. EX1017 (802.11), §§7.2.1-2, 9.1-9.2.1. This consistency provides the advantage of reducing

interference and enhancing co-existence by reducing collisions. EX1001, 10:8-10; EX1002, ¶70.

Third, a POSITA would have known that 802.11 and Bluetooth use a 48-bit address. EX1004, [0073], [0083]; EX1005, [0037], [0049]; EX1017 (802.11), §§5.3.3, 7.1.3.3.1-3; EX1006, §13.1. The consistent use of a 48-bit address reduces interference and enhances co-existence by avoiding the overhead associated with dynamically assigning and processing different types of level 2 addresses. EX1002, ¶71.

Fourth, Bluetooth and 802.11 operate in consistent RF frequencies, which allows both networks to use the same transmit and receive antennae and portions of the RF front end. *See* 1.a; EX1004, Figs. 1-8, [0042]-[0051]; Section IV.B; EX1002, ¶72.

Bluetooth and 802.11 are not entirely consistent because they use different coverage ranges, data rates, modulation schemes, channel sizes, frequency hopping schemes, etc. EX1004, [0002], [0066]-[0073], [0078]-[0083]. The 814 patent and PO admit Bluetooth and 802.11 are not entirely consistent. EX1001, 2:39-44, EX1003, 146; EX1002, ¶73.

The combination discloses 1.d.3 “and at least some of the communications using the second wireless network protocol impinge on at least some antennae used for the first wireless network [signals use same antenna].” Sugar discloses the

Bluetooth and 802.11 networks are in the same physical area and that their communications impinge on the same transmit and receive antennae and RF front end, necessitating Sugar's co-existence techniques to avoid collisions or filter certain frequencies. EX1004, Figs. 1-8, [0042]-[0051]; EX1002, ¶74.

f. 1.e

The combination discloses 1.e “data forwarding logic, implemented in the network-enabled hub using hardware and/or software [laptop with processor IP addressing and routing], that forwards data between an originating node [WLAN or WPAN device] and a destination node [other of WLAN or WPAN device], wherein the originating node is a node in one of the first and second wireless networks [WLAN or WPAN] and the destination node is a node in the other of the first and second wireless network [other of the WLAN or WPAN].” *See* Section VI.D; EX1002, ¶¶76-80.

Sugar discloses that the multi-protocol device is a “hub” for communications with devices in the WLAN and WPAN (EX1004, [0038]-[0039], [0064]) and discloses modifications to the protocols to improve co-existence. EX1004, Figs. 3-19, [0048]-[0107]. Sugar's teaching that the device is a “hub” between these networks would have been understood by a POSITA to mean the hub included data forwarding logic to forward data between nodes of the networks, as claimed. EX1002, ¶77.

Shin discloses that the hub (61, “Bluetooth wireless LAN compound terminal”) includes a protocol stack that includes a shared portion (network layer and above) that includes the ability to allocate IP addresses and forward packets between WLAN and WPAN devices based on their IP addresses. EX1005, Figs. 3, 6, [0040]-[0051], [0060]-[0065], [0077]-[0080], claims 1-32; EX1002, ¶78.

Shin discloses a software protocol stack that supports data forwarding for indirect communication between WLAN and WPAN devices via the hub. EX1005, Fig. 3, [0050] (“communications between the terminals are enabled.”), [0040]-[0051], [0077]-[0078], claims 15-28, 32. Shin discloses how IP addresses are allocated to devices. *Id.*, Figs. 6, 9, [0060]-[0063], [0072]-[0076]. Shin discloses that the hub will forward data from Bluetooth/WPAN devices to 802.11/WLAN devices based on the IP address. *Id.*, Figs. 4, 6, 7, 9 [0052]-[0055], [0064], [0066]-[0068], [0074]. Shin discloses that the hub will forward data from the 802.11/WLAN devices to Bluetooth/WPAN devices based on the IP address. *Id.*, Figs., 5-6, 8-9, [0056]-[0059], [0065], [0069]-[0071], [0076]; EX1002, ¶79.

2. Claim 3

The combination discloses the hub of claim 1 “wherein the first wireless network connection [802.11] provides a link via an access point of a wireless local area network (“LAN”) [the 802.11/WLAN AP] and the second wireless network connection [Bluetooth] provides a link to a personal area network (“PAN”) serving

PAN devices [Bluetooth/WPAN], such that network nodes that have access to the wireless LAN can address packets to PAN devices that are nodes in the PAN [IP addressing].” *See* Section VI.D-E.1; EX1002, ¶¶81-84.

Sugar discloses the first, 802.11 connection provides a link via an access point (AP) of the 802.11/WLAN. EX1004, [0002], [0039]-[0041] (laptop with 802.11 connection via AP). Sugar discloses the second, Bluetooth connection provides a link to a WPAN serving Bluetooth/WPAN devices. *Id.* Sugar discloses the coverage ranges of 100m and 10m for WLAN/WPAN, respectively, and that the WPAN can connect peripherals. *Id.*, [0002]; EX1006, Section 7.1 (printer), pp. 921 (peripherals); EX1002, ¶82.

Shin discloses the WLAN nodes can address packets to WPAN devices using IP addresses via the hub. *See* 1.pre and 1.e; EX1002, ¶¶43-45, 76-79, 83.

3. Claim 5

The combination discloses “[w]herein the network-enabled hub [laptop] includes logic to coordinate a mutually agreeable inactivity period [Bluetooth power saving intervals] between the network-enabled hub and devices such that the WPAN devices can enter a sleep mode and occasionally wake up to transmit or receive data and/or control signals, [Bluetooth power saving states], with the network-enabled hub and WPAN devices synchronized so that the network-enabled hub is able to communicate with WPAN devices when WPAN devices

wake up [communications after the power saving interval].” *See* Section VI.D-E.1; EX1002, ¶¶85-87.

The Bluetooth Specification discloses (and Sugar discloses via incorporation by reference) Active, Sniff, Hold, and Park modes. In Active Mode, unaddressed slaves can sleep until the next master transmission. *Id.*, §10.8.1. In Sniff Mode, a slave can sleep until the next “sniff slot determined by the master and the slave.” *Id.*, §§10.8.2, IX.6.1. In Hold Mode, the “master and slave agree on the time duration” and the slave can sleep until the agreed timer expires. *Id.*, §§10.8.3, IX.6.2. In Park Mode, the slave can sleep until the next beacon interval. *Id.*, §§10.8.4, IX.6.3. These periods are jointly determined because they include proposals (sometimes ranges) that can be accepted or rejected. And the devices remain synchronized on the channel so that they can communicate after the designated interval. EX1002, ¶86.

It would have been obvious that the algorithms for these modes would have been executed by Sugar’s processor (i.e., processing unit 28) because this is the level (MAC and network/arbitration processing) that Sugar discloses is performed by the processor. *See* 1.a-1.c. The Active mode is identical to, or at least an equivalent of, the algorithm disclosed in the 814 patent at 12:39-48 where the unaddressed slaves can sleep. The Sniff, Hold, and Park modes are at least the

equivalent of the algorithms disclosed in the 814 patent at 12:20-13:15 that allow slaves to sleep until a determined time. EX1002, ¶87.

4. Claim 6

The combination discloses “further comprising the wireless radio circuit interfaced to the logic for processing data [*see* 1.a-1.e], wherein the wireless radio circuit supports communications on both the first wireless network and the second wireless network [802.11/WLAN and Bluetooth/WPAN].” *See* 1.a-e; EX1002, ¶88.

5. Claim 7

The combination discloses “wherein the wireless radio circuit and the logic for processing data [*see* 1.a-1.e] are configured to allow the network-enabled hub to transmit on more than one radio band [multiple Bluetooth/802.11 bands].” *See* Section VI.D-E.1; EX1002, ¶¶89-92.

Sugar discloses the circuit and logic (*see* 1.a-1.e) are configured to allow the hub to transmit on different 1MHz Bluetooth radio bands and 22Mhz 802.11 radio bands within the overall 2.4GHz ISM band. EX1004, Figs. 11A-11D, 12B-12C, [0003]-[004], [0108], [0145]. When a Bluetooth hop frequency is not in the “802.11 band,” it can proceed independently. EX1004, Fig. 4, 14A-14B, 19A, [0084], [0090], [0107]; EX1002, ¶90.

Shin discloses the circuit and logic (*see* 1.a-1.e) are configured to allow the hub to transmit on the 2.4GHz and 5GHz bands to support 802.11a, b and g. EX1005, [0035]-[0036]; EX1002, ¶91.

In the combination, it would have been obvious to implement the multi-band support of Sugar and Shin to support the Bluetooth and 802.11b radio frequency bands, as well as the 5GHz 802.11a frequencies of Shin in order to support all of these most common standards. EX1002, ¶92.

6. Claim 9

The combination discloses “wherein the network-enabled hub is embedded into a personal computer [laptop], a cellular phone, or a home entertainment equipment.” EX1004, [0039] (laptop computer); Section VI.E.1; EX1002, ¶93.

7. Claim 10

The combination discloses “wherein the first wireless network connection is for a wireless network [802.11/WLAN] having a first operating range [100m] and the second wireless network [Bluetooth/WPAN] is for a wireless network having a second operating range [10m], where the first operating range is larger than the second operating range [100m > 10m].” EX1004, [0002]; EX1002, ¶94.

8. Claim 11

The combination discloses the hub [laptop] “wherein the data forwarding logic [processor executing IP stack] further comprises logic for uniquely identifying the destination node from data received from the originating node such

that the network enabled hub can use that data to transmit data into the second wireless network [identify IP address and forward packets based on that IP address].” *See* Ground 1, 1 & 1.e; EX1002, ¶95.

9. Claim 12

The combination discloses the hub [laptop] “wherein the data identifying the destination node is a network address of the destination node [IP address].” *See* Section VI.E.1; Ground 1, 1.e; EX1002, ¶96.

10. Claim 13

The combination discloses the hub [laptop] “wherein the data identifying the destination node is an Internet Protocol (IP) address of the destination node [IP address].” *See* Section VI.E.1; Ground 1, 1.e; EX1002, ¶97.

VII. GROUND 2: CLAIM 2 IS OBVIOUS OVER SUGAR, BLUETOOTH, SHIN AND CROMER

A. Cromer (EX1022)

Cromer discloses “data processing networks that employ remote management to gather asset information from clients on the network.” EX1022, [0001]. Cromer discloses how to implement the industry standard Desktop Management Interface (DMI) Specification (EX1020) and still support low power wireless clients. EX1022, [0007]-[0009]. Cromer explains that a device (access point or “AP”) can cache information from a mobile system “in anticipation of a forthcoming asset information request from server 102.” *Id.*, [0027], [0021]. In

response to an asset request from a server the AP provides the information if it is in the cache, or it coordinates its retrieval from the mobile station at the next opportunity. *Id.*, [0010], [0021], [0025], [0031]-[0034]. This allows the mobile station to support low power modes. *Id.*; EX1002, ¶98.

B. Combination Rationale

It would have been obvious to a POSITA to combine the combination of Ground 1 with Cromer's technique to use data caching in the hub to support poll requests for data (e.g., to support the DMI Specification) while still supporting Bluetooth low power modes. EX1002, ¶99; Section VI.D.

Cromer is analogous art because it relates to wireless networks, EX1022, [0023] ("Bluetooth") and is reasonably pertinent to data forwarding and power management problems addressed by the inventor. EX1002, ¶100.

A POSITA would have been motivated to make the combination to improve the WLAN/Bluetooth hub for the reasons expressly taught by Cromer. The hub in the combination is what Cromer refers to as an "access point" because it provides the gateway to Bluetooth nodes. *See* EX1022, [0010], [0025]; Ground 1, claim 1. It would have been obvious for the combination to implement the Bluetooth low power/inactivity states. *See* Ground 1, claim 5. Cromer expressly teaches that its caching and retrieval algorithm should be used when nodes may be in low power/inactive states. EX1022, [0009], [0019]-[0020], [0026]-[0029], [0034].

Cromer's express motivations are focused on supporting the industry standard DMI, but Cromer teaches requests for other types of information may be implemented in a similar fashion. *Id.*, [0005]-[0006], [0018], [0034]. A POSITA would have understood from Cromer that caching in the hub, allowing the hub to respond to poll requests where possible while low power nodes slept, would be beneficial in other applications as well. EX1002, ¶101.

A POSITA would have combined the references using known methods to yield predictable results. Cromer teaches a POSITA could implement Cromer's teachings in software using standard caching and retrieval techniques. EX1022, [0025]-[0027], claims 7-13. Thus, Cromer's techniques can be implemented by augmenting the software executing on the processor in the combination, where Cromer's techniques would perform the same function as it does separately. EX1002, ¶102.

Design incentives and market forces would have motivated a POSITA to combine the references, for example, to support the industry standard DMI Specification while still implementing the Bluetooth low power modes. EX1022, [0004]-[0005], [0009], [0019]-[0021]; EX1002, ¶103.

A POSITA would have had a reasonable expectation of success in making the combination through the use of known programming techniques, because a POSITA would have been skilled in working with the standard wireless

technologies, as well as the caching and retrieval techniques taught by Cromer.

EX1002, ¶104.

C. Claim 2

The combination discloses the hub of claim 1 “comprising a routing module [processor executing algorithm] for receiving a poll request [poll request for asset information] that contains information required to unambiguously identify a station [IP address] that is a node in the second wireless network [node in Bluetooth network], wherein the routing module coordinates retrieval of information from the station [if cached, the hub sends the information, if not cached, the hub coordinates its retrieval by forwarding the request to the node].” *See* Sections VI.D, VII.B; EX1002, ¶¶105-107.

Cromer discloses that a remote device, such as a DMI server, may send requests over the internet to a hub (AP) to retrieve information from a mobile system (node in the second network). EX1022, [0018], [0022], [0029], [0031], [0034]. This request is a poll request because it requests information that may or may not exist at the hub (*Id.*, [0031]-[0033]) and because it implicitly requests a Bluetooth poll. *Id.*, [0034]. Additionally, it would have been obvious to a POSITA that the server was making the request as part of polling all managed devices for updates, which would be a common reason to make a request under the DMI specification. The request unambiguously identifies the mobile system using its

MAC (or IP) address. *Id.*, [0010], [0025], [0027], [0030]-[0032]. Upon receiving the request, the hub determines whether it has the requested information cached and, if so, provides the information. EX1022, [0021], [0027], [0031]-[0032]. If not, the hub coordinates its retrieval from the node when it wakes. *Id.*, Fig. 5, [0010], [0021], [0034]. Bluetooth requires that the master poll the slave once it wakes for the information, thus, the request for information to the hub is a request for a poll. EX1006 §§4.4.1.3, 10.8.4; EX1002, ¶106. In the combination, the processor in the hub would execute Cromer's algorithm. EX1022, [0025]-[0027], claims 7-13.

The combination includes identical, or at least equivalent, to processing unit 28 executing the algorithms at 7:66-8:7 and 8:11-14 because the processor in the hub executes the same caching and retrieval algorithm. EX1002, ¶107.

VIII. GROUND 3: CLAIMS 1, 4, 7-8 ARE OBVIOUS OVER THE COMBINATION OF GIAIMO AND SINIVAARA

A. Giaimo

Giaimo discloses the operation and management of multiple mobile devices on different wireless networks, including the routing of data through intermediate hubs. EX1008, Fig. 1b, [0002], [0014]-[0027]. Specifically, Giaimo discloses hubs that optimize bandwidth usage for forwarding data between a first, infrastructure network and a second, ad-hoc network. *Id.*; EX1002, ¶109.

B. Sinivaara

Sinivaara discloses enhanced power-saving capabilities for nodes in a multi-network wireless system. EX1007, 1:4-7, 3:12-27. Specifically, Sinivaara discloses for ad-hoc networks enhanced MAC layer functionality that decreases power consumption at the expense of shorter range. *Id.*; EX1002, ¶108.

C. Combination Rationale

It would have been obvious for a POSITA to combine Giaimo's techniques for co-existence and data forwarding between infrastructure and ad-hoc networks with Sinivaara's techniques for enhanced power-saving capabilities for ad-hoc networks. EX1002, ¶110.

The 814 patent, Sinivaara, and Giaimo are analogous art because each is directed to the field of wireless networks. Additionally, Giaimo is reasonably pertinent to the co-existence and data-forwarding problems, and Sinivaara is reasonably pertinent to the power problems addressed by the inventor. EX1001, 2:39-44 (co-existence), 4:1-15 (data forwarding); EX1007, 5:18-24, 7:31-8:7, Fig. 1; EX1008, [0014]-[0027] (co-existence and data forwarding); EX1002, ¶111.

A POSITA would have been motivated to combine the teachings of Sinivaara and Giaimo to have an improved infrastructure and ad-hoc network system. A POSITA implementing the infrastructure/ad-hoc hub disclosed in Giaimo would have been motivated by the express teachings of Sinivaara to

modify the ad-hoc protocol to reduce power consumption. EX1008, [0014]-[0027]; EX1007, 7:31-8:7. Sinivaara teaches the following modifications to the ad-hoc protocol: transmitting at a lower power at the expense of range (6:21-7:21), transmitting PLCP headers at a non-standard, higher rate (7:25-8:7), changing the beacon broadcasts using non-standard assignments and adaptive intervals (Fig. 5, 8:32-9:30), avoiding certain headers (Fig. 7, 10:35-11:29), and using dynamic power control (11:30-12:9). Sinivaara teaches that each of these modifications permits one or more of the ad-hoc devices to save power. A POSITA implementing the infrastructure/ad-hoc hub disclosed in Giaimo would have been motivated to include each of Sinivaara's modifications (individually and collectively) to save power in the ad-hoc connection. This would have been particularly useful in times of reduced or no media streaming between Giaimo's devices, e.g., when a device is not in use or when sufficient media has been buffered. EX1008, [0053]; EX1002, ¶112-114.

Giaimo teaches that the utilization of forwarding nodes can act to route data packets from a first wireless network to nodes on a second wireless network – thereby effectively extending the range of wireless network coverage without negatively affecting battery life of mobile nodes on the second network. *Id.* EX1002, ¶109.

In the combination, the co-existence and data-forwarding techniques of Giaimo perform the same function as it does separately, and the power saving methods of Sinivaara perform the same function as they do separately. EX1002, ¶117.

The techniques of Sinivaara and Giaimo were known and, in the combination, would have improved the hub in similar ways. A hub running software (as disclosed in Sinivaara and Giaimo) is ready for improvement through additional programming using the combination of the techniques taught by Sinivaara and Giaimo to yield the predictable results taught by Sinivaara and Giaimo. EX1002, ¶118.

Design incentives and market forces would have motivated a POSITA to combine Sinivaara and Giaimo. Battery life is always a focus in the market for the mobile devices in Giaimo and Sinivaara. Thus, a POSITA would have been motivated to seek ways to extend that life. EX1002, ¶119.

A POSITA would have had a reasonable expectation of success in making the combination through the use of known programming techniques and for the reasons given above. EX1002, ¶120.

D. Analysis

1. Claim 1

a. 1.pre

The combination discloses 1.pre “A network-enabled hub [22], usable for facilitating data communications between two or more wireless devices [12, 40] that are configured to communicate indirectly with each other via the network-enabled hub [*see* 1.e], comprising [*see* subsequent limitations].” EX1008, [0014]-[0027], Fig. 1b, Figs.5-7; EX1002, ¶121.

Giaimo discloses a network enabled “hub,” with an example being a PC or laptop, that Giaimo refers to as media servers/clients or access points (“AP”) when it is serving in that role for other clients. EX1008, [0048], Fig. 5. Giaimo discloses the hub facilitates data communications with 802.11a/b/g infrastructure and ad-hoc networks. *Id.*, [0014]-[0027], Fig. 1b, Figs. 5-7.

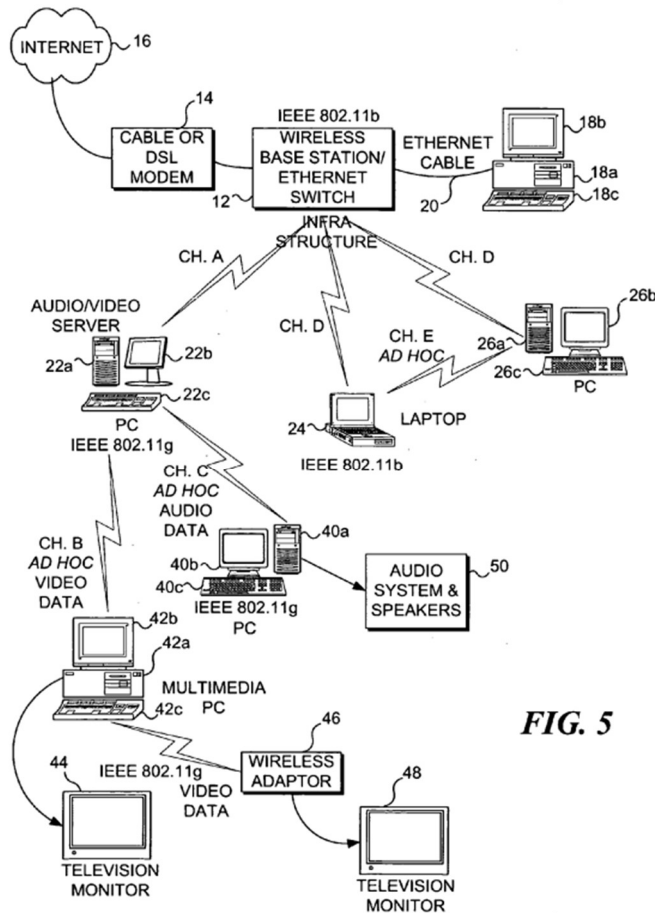


FIG. 5

EX1008, Fig. 5 (e.g., hub 22 with 802.11 infrastructure connection to AP 12 and ad-hoc connection to 40), Fig. 1b, [0015]-[0027]. Giaimo explains additional wireless devices may be either out of range of the AP, or incapable of communicating with the AP at an acceptable data rate. *Id.*, [0018]. In this case, the first wireless connection (infrastructure) links the hub to a first wireless device (AP and other nodes on that network), and the second wireless connection (ad-hoc) links the hub to wireless nodes on that network. *Id.*, [0015]-[0027], Fig. 5. (“[T]he present invention enables the second wireless client device to communicate with

the wireless AP indirectly through the first wireless client device.”). *See* 1.e; EX1002, ¶122-123.

b. 1.a

The combination discloses 1.a “an interface [buses/controller 69] to a wireless radio circuit [transceiver 71/controller 69] that can send and receive data wirelessly [infrastructure and ad-hoc], providing the hub with bi-directional wireless data communication capability.” EX1002, ¶124.

Giaimo discloses in Figure 7 a bus that is an interface to transceiver 71 that is a wireless radio circuit “for transmitting and receiving signals via one or more antenna(e) 73.” EX1008, Fig. 7, [0037], [0054].

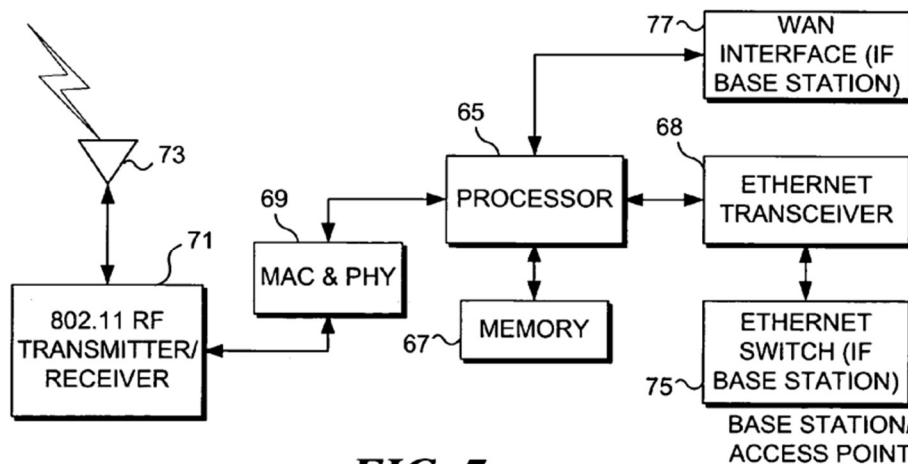


FIG. 7

EX1008, Fig. 7. Additionally, Giaimo discloses a “media access controller (MAC) and physical (PHY) layer transceiver 69” that is also a wireless radio circuit. *Id.*, Figs. 5-7, [0025]-[0027], [0048], [0058]. The hub (e.g., laptop) could have multiple wireless devices (e.g., internal PC cards connected via PCI bus). *Id.*, [0052]-

[0054], claim 14. The (1) transceiver 71 and (2) transceiver 69, individually or collectively, (whether or not in a “card”) satisfies the claimed “wireless radio circuit” because they comprise circuitry for bi-directional radio communications. The “interface” for transceiver 71 comprises the bus between transceiver 71 and transceiver 69 (individually or collectively) because they interface transceiver 71 to the rest of the logic in the hub. The “interface” for transceiver 69 is the bus between it and the rest of the logic in the hub (e.g., PCI bus in the case of a “card”). Whether the hub includes one or more wireless circuits, the hub’s processor executes and stores Giaimo’s smart routing logic to control the radios and forward data between the wireless circuits as described throughout Giaimo. *Id.*, Figs. 6-10, [0058]-[0069]; EX1002, ¶125-126.

Like Giaimo, Sinivaara discloses a hub (e.g., “portable computer[.]”) (EX1007, Fig. 1, 6:3-4) that includes a wireless radio circuit (transceiver 801), “at least one antenna” (antenna 802), and an interface to a processor (CPU 803) running the other system functions. *Id.*, Figs. 4 & 9 (interface between system and circuit functions), 6:3-13, 12:10-26; EX1002, ¶127.

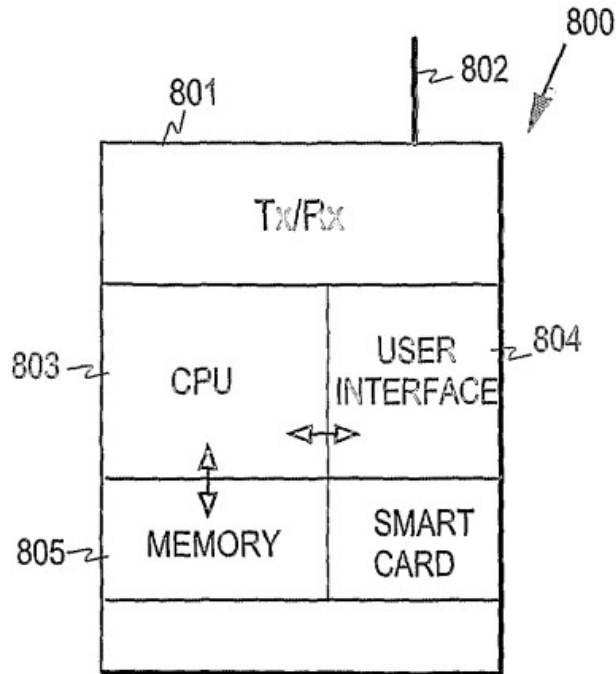


FIG. 8

EX.1007, Fig. 8.

c. 1.b

The combination discloses “logic [processor] for processing data received via the wireless radio circuit [transmitter].” EX1008, [0024], [0054], [0060], Figs. 5-7; EX1002, ¶¶129-31.

Giaimo discloses a processor (e.g., processor 65) for executing its smart routing logic from memory to control the radios and forward data between the wireless circuits as described throughout Giaimo. *Id.*, Figs. 6-10, [0058]-[0079]. Giaimo discloses the processor executes software stored in memory to perform processing of received data, as well as control the media client’s usage of the

infrastructure and ad-hoc networks. *Id.*, [0027], [0054], claims 4-6, 23-24. Giaimo discloses that the processing of data can include, for example, determining the type of data received, strength of signal, and data transfer rate, identifying routing information, and determining whether to operate in ad-hoc or infrastructure mode. EX1008, [0024], [0054], [0060], Figs. 5-7, claims 4-6, 23-24. Giaimo discloses that the invention may be implemented in code stored in memory. *Id.*, Fig. 7, [0023]-[0024]. Giaimo also discloses the hub can be a conventional PC/laptop which renders obvious to a POSITA that the processor could process data received via the disclosed standard networks (e.g., http responses) to, for example, browse the web. *Id.*, Fig. 5, [0035], [0045]-[0048]; EX1002, ¶130-131.

Thus, Giaimo's processor is identical to, or at least equivalent to, processing unit 28. EX1002, ¶131.

d. 1.c

The combination discloses "logic for generating data to be transmitted by the wireless radio circuit [transmitter]." EX1008, [0024], [0054], [0060], Figs. 5-7; EX1002, ¶132-134.

Giaimo discloses a processor (e.g., processor 65) for executing its smart routing logic from memory to control the radios and forward data between the wireless circuits as described throughout Giaimo. *Id.*, Figs. 6-10, [0058]-[0079]. See 1.b. Giaimo discloses the processing includes generating data to be

transmitted, for example, in its capacity as a media server, using the appropriate protocols to generate video data for transmission based on a stored video. *Id.*, [0046] (compressing video data before transmission), [0050]-[0053]. Other examples include generating VoIP data packets and TCP/IP headers for transmission. *Id.*, [0046]-[0047]. Giaimo also discloses the hub can be a conventional PC/laptop which renders obvious to a POSITA that the processor could generate data for transmission over the disclosed standard networks (e.g., http GET requests) to, for example, browse the web. *Id.*, Fig. 5, [0035], [0045]-[0048]; EX1002, ¶133.

Thus, Giaimo's processor is identical to, or at least equivalent to, processing unit 28. EX1002, ¶133.

e. 1.d

The combination discloses 1.d.1 "logic for initiating and maintaining wireless network connections [infrastructure and ad-hoc network] with nodes [media clients/APs] of a wireless network external to the network-enabled hub [media client], maintaining at least a first wireless network connection using a first wireless network protocol [infrastructure network] and a second wireless network connection using a second wireless network protocol [ad-hoc], that can be maintained, at times, simultaneously with each other in a common wireless space

[same time and overlapping space around laptop].” EX1008, [0014]-[0027], [0047]-[0050], Fig. 1b, Fig. 5; EX1002, ¶¶135-38.

Giaimo discloses a processor (e.g., processor 65) for executing its smart routing logic from memory to control the radios and forward data between the wireless circuits as described throughout Giaimo. *Id.*, Figs. 6-10, [0058]-[0079]. *See* 1.b. Giaimo discloses the hub facilitates data communications with a first wireless network (e.g., infrastructure network) and a second wireless network (ad-hoc network). *Id.*, [0014]-[0027], [0047]-[0050], Fig. 1b, Fig. 5.

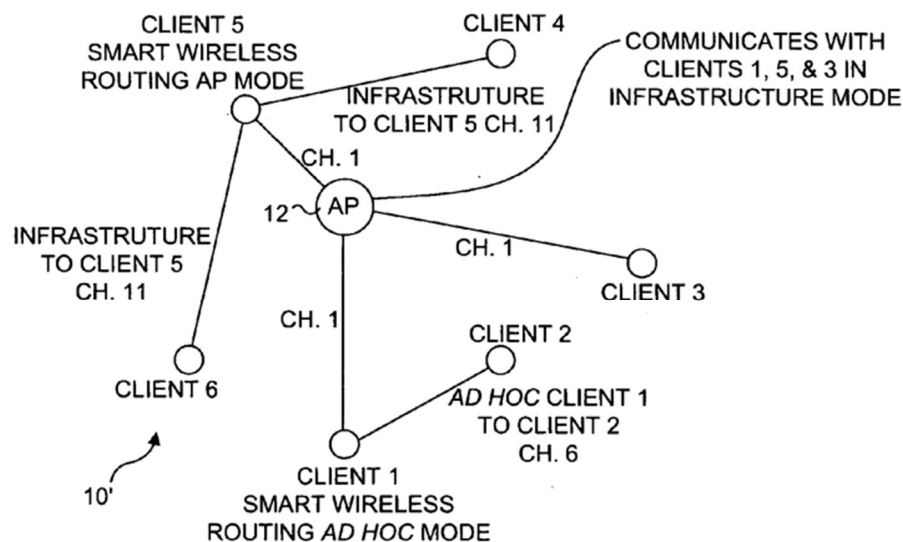


FIG. 1B

EX1008, Fig. 1b. Giaimo discloses that the hub [media client] initiates and maintains the connection to *both* wireless networks at the same time over the same wireless space. *Id.*, [0008], [0016] (“remain associated with the [AP]...while

creating either a new independent ad-hoc connection...”), [0017] (same), [0052] (“simultaneous maintenance of two wireless connections”). EX1002, ¶136-138.

Thus, Giaimo’s structure is identical, or at least equivalent to, wireless circuit 27 (*see* 1.a), processing unit 28 (*see* 1.b, 1.c), and software platform 36. EX1002, ¶136.

The combination discloses 1.d.2 “wherein the second wireless network protocol [ad-hoc] is an overlay protocol with respect to the first wireless protocol [infrastructure] in that communications using the second wireless network protocol are partially consistent with the first wireless network protocol.” EX1002, ¶¶139-44.

Giaimo discloses second (ad-hoc) is an overlay of the first (infrastructure) network in that ad-hoc communications are partially consistent with infrastructure communications. EX1002, ¶¶141-142.

Giaimo discloses the ad-hoc and infrastructure networks can each operate pursuant to a different 802.11 standard, but all falling under the 802.11 specification that generally defines how wireless networks operate. EX1008, [0005]-[0007], [00013]-[0014], [0018], [0045]-[0047]. Each of these networks is consistent in part with the other because they reuse the common elements in the original 802.11 specification. *See* Section IX.E.1.e; EX1002, ¶140. These common elements also allow for a reduction in interference. EX1002, ¶141 (common

addressing and RF aspects). Giaimo’s “smart logic” enhances 802.11 to reduce interference and permit co-existence by utilizing common aspects of the protocols, such as beacon frames, to assign channels and prevent overlapping transmissions. EX1007, 8:32-9:35; EX1008, Figs. 6-14, [0058]-[0079]; EX1002, ¶142.

Giaimo discloses the different 802.11 standards utilized to facilitate infrastructure and ad-hoc connections are not entirely consistent with each other, for example, because they can utilize different coverage ranges, data transfer rates, and modulation schemes. EX1008, [0005]-[0007], [00013]-[0014], [0018], [0045]-[0047]. Giaimo further discloses these networks operate on distinct channels so as to maximize their efficiency. *Id.* [0045]-[0050]. Giaimo discloses that these channels can be tailored to operate at different data transfer rates according to the limitations of the devices utilizing the network. *Id.* For example, Giaimo discloses that one channel can be high latency – low throughput for devices accessing webpages (802.11b), and the other can be low latency – high throughput for video file transfer (802.11a/g). *Id.* [0046]. A POSITA would understand that these wireless networks are therefore operating under different protocols with different max data transfer rates and are therefore partially consistent. EX1002, ¶¶141-143.

Giaimo further discloses that ad-hoc and infrastructure networks are not consistent in the manner in which they transmit data between nodes in the network. EX1008, [0009]-[0011], Figs. 1a-1b. Wireless traffic on an infrastructure network

must travel first to an AP before being sent back to a different node in the network. *Id.* Direct node-to-node data transfers are not possible. *Id.* Ad-hoc networks on the other hand, are peer-to-peer, and facilitate the transmission of data between nodes without the need for an intermediate AP. *Id.* In this way infrastructure and ad-hoc networks are not consistent with each other. EX1002, ¶140.

Giaimo further discloses that the first and second wireless networks are not entirely consistent because they can operate with different Quality of Service (QoS) properties. EX1008, [0012], [0016], [0019]. QoS provides differentiated handling and capacity allocation to specific flows in network traffic, assigning the order in which packets are handled and the amount of bandwidth afforded to that application or traffic flow. By disclosing the operation of the first and second wireless networks pursuant to different QoS properties, Giaimo discloses at least that the first and second networks operate with different capacity allocations and are therefore not entirely consistent. EX1002, ¶143.

In the combination, the ad-hoc and infrastructure networks have additional inconsistencies, because the ad-hoc network implements Sinivaara's modifications as follows: transmitting at a non-standard lower power at the expense of range (6:21-7:21), transmitting PLCP headers at a non-standard higher rate (7:25-8:7), changing the beacon broadcasts using non-standard assignments and adaptive intervals (Fig. 5, 8:32-9:30), avoiding certain standard headers (Fig. 7, 10:35-

11:29), and using non-standard dynamic power control (11:30-12:9). Thus, the ad-hoc network in the combination is partially compliant with the 802.11 standard.

EX1002, ¶144.

Giaimo discloses 1.d.3 “and at least some of the communications using the second wireless network protocol impinge on at least some antennae used for the first wireless network.” EX1002, ¶¶145-47.

Giaimo discloses that the wireless transmitters and antennae are 802.11 RF “frequency agile” and can operate on every possible 802.11 RF channel within the utilized frequency bands (e.g. 2.4Ghz and 5Ghz). EX1008, [0048], [0054] (“one or more antenna(e)”), [0058], [0068], [0071], [0077]-[0079], Figs. 4-5. A POSITA would have understood that a frequency agile antenna is an antenna that operates on all 802.11-RF frequencies and uses channel filters to isolate the desired channel. Giaimo discloses scanning every possible 802.11 RF channel and then dynamically assigning different channels in Table 4 and/or Table 5 for the first and second wireless networks to reduce interference. *Id.*, [0058]-[0079]. As such, it would have been obvious to a POSITA that communications on all 802.11 RF channels, including those sent via the second wireless network protocol, would impinge on at least some frequency agile antennae used for the first wireless network. EX1002, ¶146.

f. 1.e

Giaimo discloses 1.e “data forwarding logic, implemented in the network-enabled hub using hardware and/or software [computer], that forwards data between an originating node and a destination node [nodes in infrastructure and ad-hoc networks], wherein the originating node is a node in one of the first and second wireless networks [node in infrastructure or ad-hoc network] and the destination node is a node in the other of the first and second wireless network [node in the other of the infrastructure or ad-hoc network].” EX1008, [0015]-[0018], Fig. 1b, Fig. 5; EX1002, ¶¶148-52.

Giaimo discloses an infrastructure network wherein computers are connected via an AP. EX1008, [0015]-[0027], Fig. 1b, Fig. 5. In some situations, there are additional wireless devices either out of range of the AP, or which are incapable of directly communicating with the AP at an acceptable data rate. *Id.* [0018]. In this case, the hub is a computer communicating with the AP. *Id.* Giaimo discloses the second wireless connection provides a link to the computer via either an ad-hoc network or distinct infrastructure network. *Id.*, [0015]-[0027], Fig. 5.

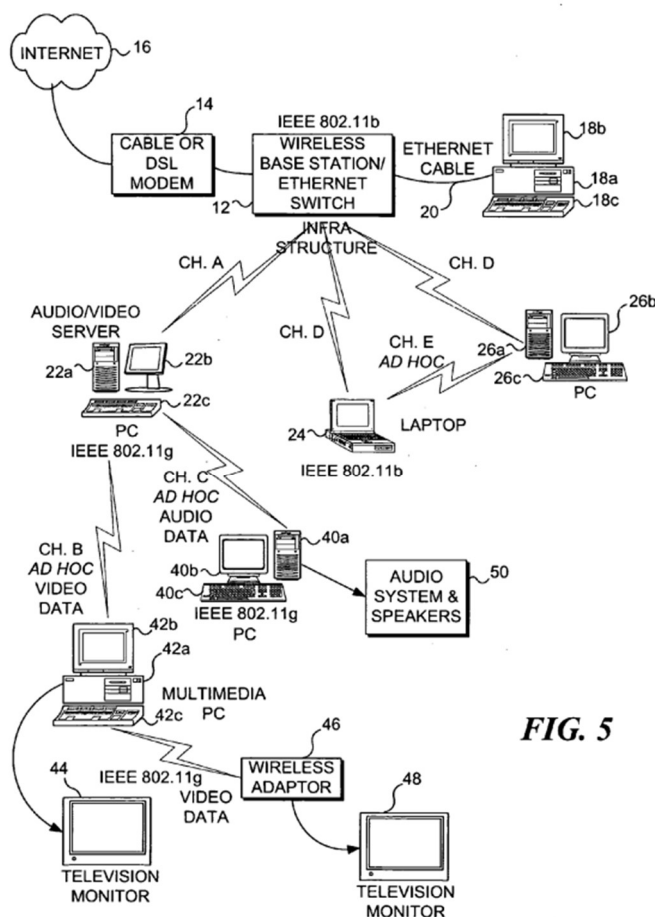


FIG. 5

EX1008, Fig. 5 (hub 22a, infrastructure network AP 12, second wireless device 40a). Giaimo discloses that the computer can route data from one wireless network to the other. EX1008, [0015]-[0018] (“[T]he second wireless client device [] communicate[s] with the wireless AP indirectly through the first wireless client device.”). Giaimo discloses the identification and recording of MAC addresses to identify nodes on the first and second wireless networks. *Id.*, [0058], [0067].

Giaimo discloses the use of 802.11 standards for the protocols of the first and second wireless network. *See* VIII.D.1.e. The 802.11 standards utilize MAC data

frames containing multiple address fields to identify origination and destination nodes. *See* IX.E.1.e; EX1002, ¶149.

Giaimo further discloses the use of IP addressing for identifying nodes in the first and second networks. EX1002, ¶149. Giaimo discloses that a channel can be used for conveying “TCP/IP” packets, and envisions nodes on the first and second networks that “communicate[] over the internet using VOIP.” EX1008, [0046]-[0047]. A POSITA would understand that TCP/IP packets and VOIP communication utilize IP addressing for node identification. EX1002, ¶149. Thus, Giaimo discloses this claim limitation. EX1002, ¶150.

Sinivaara also discloses that IP addressing is generally utilized in situations where data packets are being routed from one network to another. EX1007, 5:13-6:20, 11:12-16. Sinivaara further discloses embodiments wherein node identification for data forwarding is performed with “terminal-specific MAC addresses.” *Id.*, 11:12-13. EX1002, ¶151.

It would have been obvious to combine the teachings of Giaimo and Sinivaara to utilize IP addresses for purposes of identifying nodes in the first and second networks when routing data packets through the hub. EX1002, ¶151-152.

2. Claim 4

The combination discloses “wherein the first wireless network protocol is an 802.11x wireless protocol [802.11a/b/g, infrastructure] and the second wireless

network protocol is a modification of the 802.11x wireless protocol [802.11 ad-hoc network with Sinivaara modifications] that is not entirely compliant with the 802.11x wireless protocol of the first wireless network but can be maintained in a common wireless space as the 802.11x wireless protocol.” *See* Section VIII.D.1; EX1002, ¶157.

3. Claim 7

The combination discloses “wherein the wireless radio circuit [see 1.a] and the logic for processing data [see 1.b] are configured to allow the network-enabled hub to transmit on more than one radio band [see 1.d.3 – any 802.11 RF frequency in Tables 4 and/or 5].” Section VIII.D.1; EX1002, ¶158.

4. Claim 8

The combination discloses “wherein the wireless radio circuit [see 1.a] and the logic for processing data [see 1.b] are configured to allow the network-enabled hub to alternate connectivity between the first wireless network connection and the second wireless network connection.” EX1008, Fig. 8, [0014], [0021]. Giaimo discloses that the hub can alternate between infrastructure and ad-hoc networks automatically. *Id.*, Fig. 8 [0014], [0021] (“The devices are allowed to directly connect to each other in either ad-hoc or infrastructure modes...because the present invention automatically facilitates the communication protocol between two wireless devices when needed.”), [0055]-[0057]. Giaimo discloses that the

invention may be implemented in code and performed by an internal CPU of the hub. Section VIII.D.1; EX1002, ¶¶159-160.

IX. GROUND 4: CLAIM 1 IS OBVIOUS OVER GUREVICH, HANSEN, AND 802.11/b/g.

A. Gurevich (EX1010)

Gurevich discloses a Generic Client (GC) that “operates multiple virtual network interfaces that communicate simultaneously to different networks,” such as 802.11 or proprietary networks. EX1010, Abstract, [0013]. Gurevich’s GC techniques provide the ability for information to be sent to “any type of AP or client” in the various networks. *Id.*, [0012], [0053], [0075]; EX1002, ¶167.

B. Hansen (EX1009)

Hansen is directed to “wireless communication systems and more particularly to supporting multiple wireless communication protocols within a wireless local area network.” EX1009, [0003]. Hansen teaches a wireless device compliant with one 802.11 protocol communicating indirectly with a wireless device compliant with a different 802.11 protocol through an AP, wherein the AP reformats the transmitted data to comply with the receiving wireless device’s protocol. EX1009, [0014]-[0017], [0030], [0048], [0055]-[0057], [0067]-[0071]; EX1002, ¶168.

C. IEEE 802.11/b/g Overview

802.11g defines itself as including 802.11-1999 and 802.11b. EX1019, pp. 1 (802.11g “define[s] how to merge the material contained [t]herein into the existing base standard [(802.11-1999)] and its amendments [(i.e., 802.11b)] to form the comprehensive standard.”). Therefore, 802.11-1999, 802.11b, and 802.11g is a single reference (collectively referred to as “802.11/b/g”). Alternatively, to the extent the Board disagrees, Petitioner has set forth the rationale for combining these references below. EX1002, ¶169.

1. IEEE 802.11-1999 (EX1017) Overview

802.11-1999 generally “defines the protocol and compatible interconnection of data communication equipment via the ‘air,’ radio or infrared, in a local area network” and provides a medium access control (“MAC”) which “supports operation under control of an [AP].” EX1017 at iii. In particular, this standard provides wireless connectivity to various devices within a wireless local area network (“WLAN”). EX1017, pp. 1. Clause (“Section”) 15 of 802.11-1999 specifies the protocol for Direct Sequence Spread Spectrum (“DSSS”) systems operating in the 2.4GHz radio frequency band. *See* EX1017 §15 *et seq.*; EX1002, ¶170.

2. IEEE 802.11b-1999 (EX1018) Overview

802.11b is a supplement to the 802.11-1999 standard for WLANs. EX1018, pp. 1. Specifically, 802.11b (Section 18) discloses a protocol for implementing a

higher-speed physical layer extension based on DSSS-2.4GHz transmissions as taught by 802.11-1999. EX1018, Cover, §18.1. 802.11b also ensures coexistence. *Id.* §18.1; EX1002, ¶171.

3. IEEE 802.11g-2003 (EX1019) Overview

802.11g is an amendment to the 802.11-1999 standard as amended by 802.11b. EX1019, pp. 1. Specifically, 802.11g (Section 19) discloses a protocol for a further rate extension beyond the DSSS systems (802.11-1999/802.11b (NonERP systems)) in the 2.4GHz RF band—the Extended Rate PHY (“ERP”). *See* EX1019, Cover, §§19.1, 19.1.2. 802.11g further discloses mechanisms to facilitate interoperability and coexistence between ERP stations and NonERP stations. *Id.* §§19.1.2-19.1.4; EX1002, ¶172.

D. Rationale for Combining Hansen, Gurevich, and 802.11-1999, 802.11b and 802.11g.

1. Rationale for Combining 802.11-1999, 802.11b and 802.11g (collectively, 802.11/b/g).

First, a POSITA would have found it obvious to combine 802.11-1999, 802.11b, and 802.11g based at least on the explicit statements in 802.11g. For example, each is directed to wireless systems operating in the 2.4GhZ band. EX1017 §15, EX1018, Cover; EX1019, Cover. 802.11b is described as a supplement to 802.11-1999, and 802.11g states that it is an amendment based on 802.11-1999, as amended by, in part, 802.11b. EX1018, pp. 1; EX1019, pp. 1. 802.11g provides express instructions that define how to merge 802.11-1999,

802.11b, and 802.11g to form a more comprehensive standard with multiple sets of data rates. EX1019, pp. 1. Therefore, a POSITA would have been motivated to combine these protocols, and would have enjoyed a reasonable expectation of success in doing so. EX1002, ¶¶173-74.

2. Rationale for Combining Hansen, Gurevich, and 802.11/b/g.

It would have been obvious for a POSITA to combine Gurevich's techniques for data-forwarding between networks with 802.11/b/g's techniques for generating protocol-specific data frames and coexistence, and 802.11/b/g's coexistence techniques. Indeed, like the 814 patent, Gurevich and Hansen each discloses implementing 802.11 protocols. EX1009, [0009] (disclosing 802.11b and 802.11g), [0033], [0043], [0067]-[0071] & Fig. 3, 6, 8, 10; EX1010, Abstract, [0003]-[0010], [0028], [0076] (incorporating Wi-Fi standards); EX1002, ¶¶175-76.

These references are analogous art because each is directed to the field of wireless networks. Additionally, Hansen is reasonably pertinent to the co-existence problems (EX1001, 2:39-44; EX1009, [0009]-[0013], [0045], [0051], [0057]-[0058]), Gurevich is reasonably pertinent to IP-addressability and data forwarding problems (EX1001, 4:1-15; EX1010, [0003]-[0010] (data forwarding), [0040] (IP routing), [0063] (same)) and coverage range problems (EX1001, 4:1-15; EX1010 [0032], [0054]), and 802.11/b/g is reasonably pertinent to data forwarding problems (EX1001, 4:1-15; EX1017 §§7.2.2, 7.1.3.3.4-6), power management

problems (EX1001, 12:19-13:15; EX1017 §§7.2.1.4, 9.2.5.3, 11.2.1.1) and co-existence problems (EX1001, 2:39-44; EX1017, §§9.2-9.2.2) addressed by the inventor. EX1002, ¶177.

A POSITA would have been motivated to combine the teachings of Gurevich, Hansen and 802.11/b/g to design an improved multi-protocol and multi-network wireless device. For example, a POSITA implementing the General Client-Wireless Device (“GC-WD”) disclosed in Gurevich would have been motivated by the express teachings of Hansen and 802.11/b/g that facilitate coexistence. Indeed, although Gurevich discloses that its GC-WD simultaneously communicates with different wireless devices, which operate according to different protocols, in different networks, Gurevich does not expressly teach coexistence techniques. EX1002, ¶178.

Further, a POSITA would have been motivated to combine the teachings of Gurevich, Hansen, and 802.11/b/g to have an improved GC-WD that is able to facilitate higher data rate communications while maintaining interoperability and coexistence between different protocol devices. For example, as the 814 patent explains, including slower data rate devices in a network of higher data rate devices will slow down the entire network. EX1001, 3:7-15. Hansen, understanding this drawback in the art (EX1009, [0009]-[0012]), accordingly teaches transmitting frames comprising “set-up” information to facilitate

coexistence and interoperability but also comprising reformatted protocol-specific data portions for higher throughput to capable devices. EX1009, [0042]-[0046].

Therefore, a POSITA would have understood that implementing Hansen's protocol conversion techniques in known 802.11 systems (i.e., GC-WD) would ensure interoperability and coexistence while facilitating higher data rates as discussed in the 814 patent. EX1009, claim 6; EX1002, ¶179.

A POSITA would have combined the references using known methods to yield predictable results. Gurevich discloses the IP addressing and routing techniques of its GC-WD may be implemented by routing software. EX1010, [0040], [0056], [0063], [0065]-[0070], [0075], Fig. 11. Similarly, Hansen teaches that its co-existence techniques are implemented as operational instructions stored in memory. EX1009, [0042]. Thus, Hansen and Gurevich's techniques may be implemented in any hub running networking software using known programming methods to yield predictable results. EX1002, ¶180. Gurevich discloses an exemplary AP that may serve as a platform for implementing its GC techniques (EX1010, [0075], [0077]-[0078]) that is substantially similar to the Hansen's AP. *Compare* EX1010, Fig. 12, *with* EX1009, Fig. 3. Thus, Hansen's techniques can be implemented in Gurevich's GC-WD using known programming methods to yield predictable results. In the combination, Hansen's co-existence techniques and interoperability, Gurevich's data forwarding and IP routing techniques, and

802.11/b/g's coexistence techniques perform the same functions as they do separately. A GC-WD running software is ready for improvement through additional programming using the combination of the techniques taught by these references to yield the predictable results taught by them. EX1002, ¶181.

Design incentives and market forces would have motivated a POSITA to combine the references to support IP routing, which was a basic networking functionality at the time, and to ensure co-existence and interoperability with different-protocol device, which were known goals in the art. EX1002, ¶182.

A POSITA would have had a reasonable expectation of success in making the combination of Hansen, Gurevich, and 802.11/b/g through the use of known programming techniques, because a POSITA would have been skilled in working with the standard wireless technologies, and for the reasons given above. EX1002, ¶183; *see* Section X.D.2.

E. Analysis

1. Claim 1

a. 1.pre

Gurevich discloses 1.pre “A network-enabled hub [General Client-wireless device (“GC-WD”)], usable for facilitating data communications between two or more wireless devices [devices utilizing one or more of the infrastructure, ad-hoc, 802.11b, 802.11g, and proprietary protocols] that are configured to communicate

indirectly with each other via the network-enabled hub, comprising [see subsequent limitations].” EX1002, ¶¶184-86.

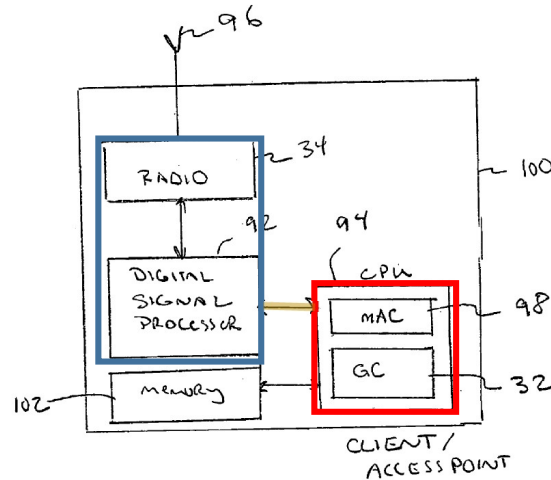
Gurevich discloses a GC-WD which facilitates data communications between various devices in different networks. EX1010, Abstract, [0013], [0049], [0075] (transferring data), claims 8-11, 17, 23 (same). For example, Gurevich discloses a situation where a station in a first network communicates with an AP in a second network by way of an intermediary GC-WD. *Id.*, [0053], [0034], [0074]-[0075]. EX1002, ¶185.

b. 1.a

The combination discloses 1.a “an interface to a wireless radio circuit [physical and virtual interfaces to radio transceiver 34 and optional DSP 92] that can send and receive data wirelessly, providing the hub with bi-directional wireless data communication capability [bi-directional infrastructure, ad-hoc, 802.11b, 802.11g, proprietary].” EX1010, Figs. 3, 12, [0013], [0034], [0074]-[0075]; EX1002, ¶¶187-92; Section X.D.2.

To simultaneously receive and transmit data communications between devices in different networks as discussed above in limitation 1.pre, Gurevich teaches that the GC-WD includes a radio transceiver 34. EX1010, Fig. 12, [0013], [0034] (“803.11 transceiver”), [0037], [0055], [0065], [0073]. Radio transceiver 34 can be coupled to optional DSP 92, which if present would be considered part of

the wireless radio circuit. EX1010, [0078]. Gurevich discloses the radio transceiver 34 (alone or via optional DSP 92) has a physical interface to the CPU 94. *Id.*



EX1010, Fig. 12 (physical interface (yellow annotation) between a wireless circuit (blue annotation) and CPU (red annotation)); *see also id.*, Fig. 3 (radio 34 without DSP has physical interface to the CPU executing the virtual interfaces); EX1002, ¶188.

Gurevich also discloses virtual interfaces (36, 38, 40, 47) to radio transceiver 34 (with or without optional DSP 92), which also satisfy this limitation. EX1010, Fig. 3, Fig. 10 (MAC 98), [0034]-[0038], [0063], [0074] (MAC integrated into CPU). The virtual interfaces are implemented as software drivers executing on the CPU and include the layer 2 MAC processing. *Id.* These virtual interfaces provide an interface to the radio circuit 34 so it can be used by higher levels of processing, such as IP routing, TCP/IP and Gurevich's smart routing logic. EX1002, ¶189.

Hansen also discloses radio transceiver 19 having an interface to processing module 15. EX1009, Fig. 3, [0042]. Radio transceiver 19 has a plurality of antennae and transceiver paths, but is otherwise similar to radio transceiver of wireless radio 60. *Id.* Radio 60 also has an interface to a host system/processor (i.e., elements 18-32/50). EX1009, Fig. 2, [0007], [0034]-[0038], [0042]. Hansen confirms that “one of average skill” would appreciate that a radio can be implemented as a single IC with an interface to the host system/processor. EX1009, Figs. 2-3, [0034]-[0038], [0041]-[0042]; *see also* EX1010. [0077]-[0078]; EX1002, ¶190-91.

c. 1.b

The combination discloses “logic [CPU] for processing data received via the wireless radio circuit [see 1.a].” EX1002, ¶¶193-95.

Gurevich discloses its CPU executes software that processes data received via the wireless radio circuit 34 (and optional DSP 92). EX1010, Figs. 3, 10, 12, 13, [0034]-[0038], [0063]-[0071], [0073]-[0075]. Gurevich discloses the CPU processes received data to implement the virtual interfaces and provide layer 2 MAC functionality, including processing the MAC header and then stripping it off. *Id.*, *see also* Fig. 11, [0064]-[0070]. The CPU processes received data to perform layer 3 IP routing, TCP/IP and TBRF routing. *Id.*, Fig. 8, Fig. 10, [0059]-[0061], [0063]. Gurevich also discloses the GC can be a laptop executing “conventional

applications 80,” rendering obvious to a POSITA that conventional applications would also process received data, such as web browsers or media players displaying content. *Id.*, Figs. 10, 13, [0063], [0075]; EX1002, ¶193.

Thus, the CPU is identical to, or at least equivalent to, processing unit 28. EX1002, ¶195.

d. 1.c

The combination discloses “logic [CPU] for generating data to be transmitted by the wireless radio circuit [see 1.a].” EX1002, ¶¶196-201.

Gurevich discloses CPU 94 generates data to be transmitted by the radio circuit 34 (and optional DSP 92). EX1010, Figs. 3, 10, 12, 13, [0034]-[0038], [0063]-[0071], [0073]-[0075]. The CPU implements the virtual interfaces and provides layer 2 MAC functionality, including generating data with new MAC headers for outgoing packets to replace the headers that may have been stripped off during receipt. *Id.*, *see also*, Figs. 9-11, [0062]-[0071]. Gurevich’s disclosure that the CPU performs the layer 2 MAC processing (e.g., 802.11) explicitly discloses to a POSITA that data for the MAC header is generated by the CPU because a POSITA would know that is part of MAC processing and that MAC processing cannot be completed without it. EX1002, ¶197. Generated data must include the correct addressing frames with the correct addresses for the GC-WD as the transmitter and the correct BSSID (for infrastructure) or IBSSID (for ad-hoc)

transmission. *Id.*, [0004]-[0012], [0038] (virtual interfaces use BSSIDs to identify different sessions). Failure to generate data for the appropriate MAC header would preclude a successful transmission, such as the disclosed 802.11 transmissions. EX1010, [0010]; EX1002, ¶197.

Alternatively, it would have been obvious to a POSITA that the CPU would generate data for the MAC header as part of the MAC processing for all of the reasons given above. Additionally, Gurevich teaches that traditional networking devices had difficulties communicating simultaneously with different networks since different wireless networks may require distinct frame headers. EX1010, [0066]. Gurevich discloses the transmission logic was known in the art, which is why it is not explicitly disclosed in more detail. *Id.*, [0071]. EX1002, ¶198.

Thus, the CPU is identical to, or at least equivalent to, processing unit 28. EX1002, ¶199.

Alternatively, Hansen discloses receiving data frames from a first wireless device compliant with one 802.11 protocol and subsequently generating frames for transmission that are compliant with a different 802.11 standard used by a second wireless device. EX1009, [0007], [0042]-[0047], [0069]-[0071]. As taught by Hansen, this facilitates coexistence and interoperability while providing higher data rates. *See* Section X.D.2. Hansen teaches that its processing unit includes

digital and/or analog logic for generating the appropriate 802.11 protocol frames. EX1009, [0036], [0042], [0046], [0071]; EX1002, ¶200.

Accordingly, Gurevich alone, or in combination with Hansen's teachings (*see* Section X.D.2), satisfies this limitation. EX1002, ¶201.

e. 1.d

The combination discloses 1.d.1 "logic [1.a-1.c] for initiating and maintaining wireless network connections [infrastructure, ad-hoc, 802.11b/g, proprietary] with nodes [wireless devices] of a wireless network external to the network-enabled hub [GC-WD], maintaining at least a first wireless network connection using a first wireless network protocol [infrastructure and/or 802.11b] and a second wireless network connection using a second wireless network protocol [ad-hoc and/or 802.11g, or proprietary], that can be maintained, at times, simultaneously with each other in a common wireless space [same time and common wireless space around the GC-WD]." EX1002, ¶¶202-05.

Gurevich discloses its GC-WD includes a CPU executing software to "simultaneously" initiate and maintain communications on different networks. EX1010, Abstract, [0013] ("simultaneously"), [0016], [0018], [0028], [0032], [0036]- [0037], [0049], [0065] ("simultaneously communicat[ing] with ... any other networks."), [0070]. Gurevich further discloses this functionality is provided

by software drivers and other software executing on the CPU. *See* 1.b-1.c, *see also id.*, [0073]-[0074], [0077]-[0078]; EX1002, ¶203.

Gurevich discloses infrastructure, ad-hoc and WDS networks overlapping in a common wireless space around the GC-WD. EX1010, Figs. 4-5, 7A. Gurevich discloses the GC-WD can be a laptop, PC or PDA, which discloses to a POSITA that each of the wireless networks would necessarily operate in a common wireless space around that small device. *Id.*, Figs. 3, 13, [0075]. Gurevich discloses the GC-WD is in the common wireless space to be able to forward data to devices in only one space. *Id.*, [0051]-[0054]; EX1002, ¶204.

A POSITA would have understood that this structure is identical, or at least equivalent to, wireless circuit 27, processing unit 28, and software platform 36. Transceiver 34 (and optionally DSP 92) corresponds to wireless circuit 27. *See* 1.a. The CPU corresponds to processing unit 28. *See* 1.b-1.c. The combination discloses software that supports initiation and maintenance of simultaneous connections with different networks, including virtual MAC interfaces for co-existence and data forwarding, which corresponds to software platform 36. EX1012 (Vleugels I), [0070]-[0074] (a protocol stack that includes a MAC layer to support multiple protocols); EX1002, ¶205.

The combination discloses 1.d.2 “wherein the second wireless network protocol [802.11g, proprietary, ad-hoc] is an overlay protocol with respect to the

first wireless protocol [802.11b, 802.11, infrastructure] in that communications using the second wireless network protocol are partially consistent with the first wireless network protocol.” EX1002, ¶¶206-217.

Two of the disclosed permutations are addressed below (802.11g with 802.11b and 802.11 with proprietary) but Gurevich teaches any of the disclosed networks could be used with any other. EX1002, ¶207.

With respect to 802.11 networks, Gurevich teaches that its GC-WD can be used with “all current and future versions of IEEE 802.11” and incorporates all of 802.11 by reference which, as of Gurevich’s 2004 filing date, included each of 802.11-1999, 802.11b and 802.11g (collectively, 802.11/b/g). EX1010, [0076]. A POSITA would have therefore understood, for example, that the first network protocol may be 802.11b and that the second network protocol may be 802.11g. 802.11g is partially consistent with 802.11b as explained below. Gurevich teaches this partial consistency allows reuse of the same physical radio 34 for both connections. EX1002, ¶208.

In the combination, 802.11/b/g teaches that 802.11g is an overlay protocol of 802.11b in that 802.11g is partially, but not entirely, consistent with 802.11b. EX1002, ¶¶208-216.

A first example is that the SERVICE field in 802.11g is only partially consistent with the SERVICE field in 802.11b. 802.11b provides a long PPDU to

facilitate demodulation and delivery of the PSDU. EX1018, §18.2.1. The long PPDU (defined in Section 18.2.2.1) contains a Long PLCP header having a “SERVICE field” that supports the High Rate extension of 802.11b. *Id.*, §18.2.3.4. 802.11b defines the SERVICE field as follows:

Table 97—SERVICE field definitions

b0	b1	b2	b3	b4	b5	b6	b7
Reserved	Reserved	Locked clocks bit 0 = not 1 = locked	Mod. selection bit 0 = CCK 1 = PBCC	Reserved	Reserved	Reserved	Length extension bit

Id. 802.11g also uses the long preamble PPDU but defines its SERVICE field partially inconsistently as follows:

Table 123C—SERVICE field bit definitions

b0	b1	b2	b3	b4	b5	b6	b7
Reserved	Reserved	Locked Clock Bit 0 = not locked 1 = locked	Modulation Selection 0 = Not ERP-PBCC 1 = ERP-PBCC	Reserved	Length Extension Bit (ERP-PBCC)	Length Extension Bit (ERP-PBCC)	Length Extension Bit

EX1019, 19.3.2.1 (red annotations added to show the differences with 802.11b). A POSITA would have understood that 802.11g’s specific ERP-PBCC options for the b3, b5-b6 bit fields are absent from 802.11b’s respective bit fields. EX1019 §§19.1.1, 19.3.2.1; EX1002, ¶210.

A second example is that the 802.11g PPDU is only partially consistent with an 802.11b PPDU. The 802.11b PPDU is defined as follows:

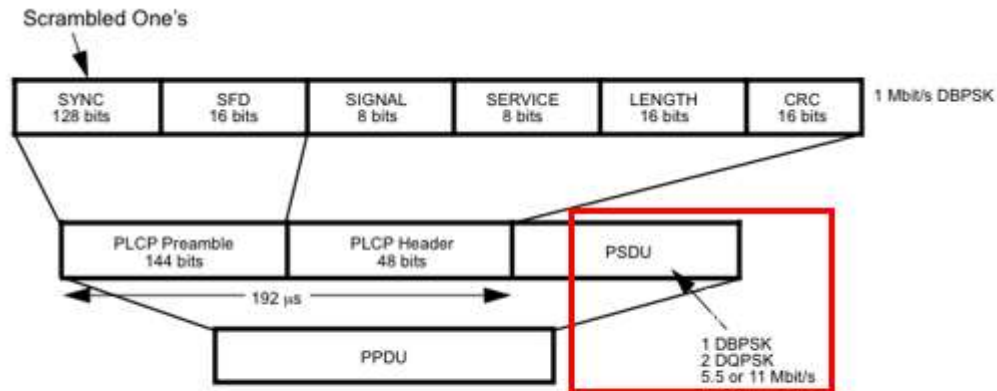


Figure 127—Long PLCP PDU format

EX1018 §18.2.2.1 (red annotation added to show difference). The PPDU in 802.11g uses a DSSS modulated PLCP Preamble and PLCP Header (a common aspect with 802.11b) but uses an OFDM modulated PSDU payload (inconsistent with 802.11b). EX1019 §§19.1.2(d)(1), 19.3.2.4, 19.7.1.

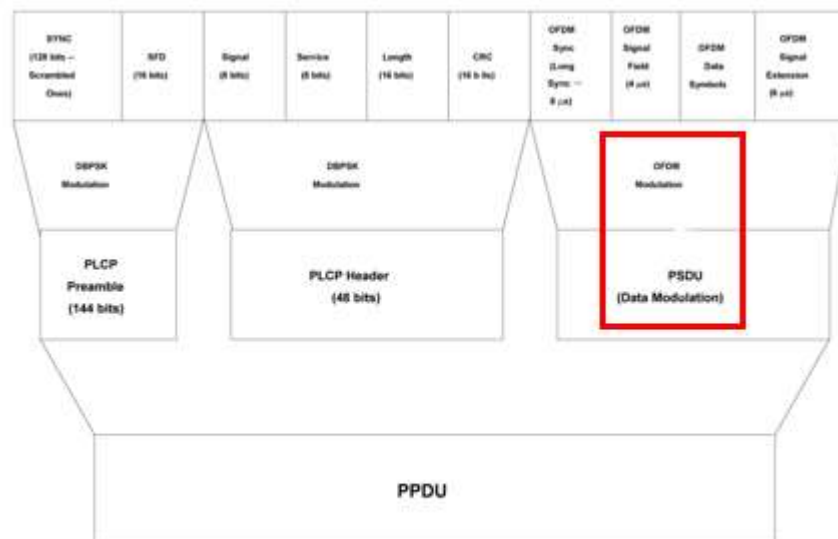


Figure 153A—Long preamble PPDU format for DSSS-OFDM

EX1019 §19.3.2.4.1 (red annotation showing 802.11g inconsistency). EX1002, ¶211.

As a third example, the 802.11g information element (“g-IE”) is only partially consistent with the 802.11b information element (“b-IE”). The b-IE is defined as follows:

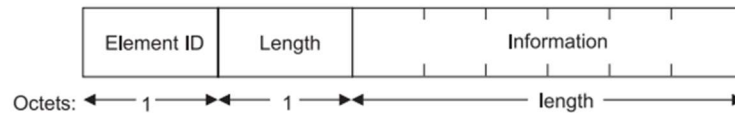
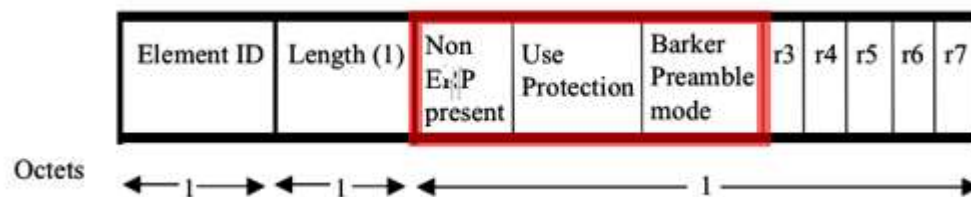


Figure 34—Element format

EX1018 §7.3.2. The g-IE, however, is defined as follows:



EX1019 §7.3.2.13. The g-IE is modified from b-IE to include the “NonERP Present,” “Use Protection,” and “Barker Preamble mode” bits. Moreover, b-IE uses Element ID 3 (DSSS Parameter Set IE) whereas g-IE may use Element ID 42 (ERP IE). *See* EX1017 §7.3.2 (Table 20); EX1019 §7.3.2; EX1002, ¶¶212-13.

These examples show aspects of 802.11g that are only partially consistent with 802.11b. The common aspects reduce interference to enhance coexistence, for example, by allowing 802.11g devices to transmit DSSS preambles that are consistent with 802.11b such that 802.11b devices can decode them to determine wireless medium availability, even though they cannot decode the OFDM payload. EX1019, 19.3.2.1(c)(3)) (SERVICE field having NonERP-PBCC options that can

be used by 802.11b (*id.* §7.3.22, 9.10)), 19.1.2(d)(1), 19.3.2.4, 19.7.1 (DSSS-OFDM format), EX1019 §9.10 (NonERP, Use Protection bits); EX1002, ¶214.

In the combination, Hansen also teaches the precise combination of 802.11b and 802.11g, and that 802.11g is a partially consistent overlay of 802.11b. EX1009, [0043]-[0046], [0064], [0071], Fig. 3. Hansen teaches the claimed overlay protocol by transmitting a frame to a device compliant with one 802.11 protocol (i.e., 802.11g) comprising “set up portions” consistent with one or more aspect of a different 802.11 protocol (i.e., 802.11b-PPDU) and a data portion consistent to the receiving device (i.e., 802.11g-OFDM). *Id.* For example, Hansen teaches that communications with the 802.11g device having 802.11b set up portions and an 802.11g data portion facilitate coexistence with 802.11b devices while advantageously communicating with the 802.11g device at a higher data rate. *Id.*; *see also id.* [0051]-[0054], [0058]. Additionally, Hansen teaches that the same hardware/software may be used to communicate with both 802.11b and 802.11g devices. *Id.*, [0042]; EX1002, ¶215.

Finally, the intrinsic record discloses an embodiment wherein the networks are 802.11g and 802.11b. EX1012 (Vleugels I), [0119]; EX1002, ¶216.

The combination discloses 1.d.3 “and at least some of the communications using the second wireless network protocol impinge on at least some antennae used for the first wireless network [signals use same antenna].” EX1002, ¶¶218-19.

Gurevich teaches simultaneously communicating with different devices which operate on the same frequency band (e.g., 802.11b/g) using the same physical interface. EX1010, [0032], [0037]-[0038], [0066]. Thus, the communications on each network will impinge on antennae for the other network. In the combination, multiple antennae would have been present and impinged on as taught by Hansen. EX1009, Fig. 2, [0036]-[0039], [0042] (“plurality of antennas). Further, 802.11/b/g teaches multiple antennas may be supported. EX1019, §19.8.3 (Tx/Rx antennas); EX1017 §14.8.2. A POSITA would have understood that multiple antennae are often illustrated as a single antenna in block diagrams, as is the case in other figures in Hansen. EX1002, ¶218.

Accordingly, a POSITA would have understood that Gurevich alone, or in combination with the teachings of 802.11/b/g and/or Hansen, satisfies limitation 1.d under any construction. *See* Section IX.D.2. EX1002, ¶219.

f. 1.e

The combination discloses 1.e “data forwarding logic, implemented in the network-enabled hub using hardware and/or software [GC-WD], that forwards data between an originating node and a destination node, wherein the originating node is a node in one of the first and second wireless networks and the destination node is a node in the other of the first and second wireless network.” EX1002, ¶¶220-25.

Gurevich discloses forwarding data between, for example, an originating node in a first network and a destination node in a second network. EX1010, Fig. 3, [0048]-[0049], [0051]-[0054] (range extension), [0063]-[0067]. Gurevich teaches the CPU executes layer 3 IP routing between devices on the multiple networks. *Id.*, Fig. 3, [0037], [0056]-[0058], [0062]-[0070] (IP address of nodes); EX1002, ¶221.

Additionally, Gurevich teaches that layer 2 forwarding can be used alone or in combination with layer 3. *Id.*, [0057]-[0058]; *id.*, [0009], [0044]-[0053], [0056]. It would have been obvious to a POSITA to apply the techniques from 802.11/b/g as expressly incorporated in Gurevich for any layer 2 forwarding. *See* Section IX.D.2; EX1002, ¶222.

X. THIS PETITION IS PROPER UNDER 35 U.S.C. §§314(A) AND 325(D)

A. The *Fintiv* Factors Favor Institution under §314(A)

The *Fintiv* factors weigh in favor of institution.

B. Stay

Judge Albright has not yet indicated whether he would grant a stay in the case of institution. In such situations, the PTAB has generally declined to speculate on the likelihood of his doing so, instead counting this factor neutral. Thus, this factor is neutral.

C. Trial Date

This IPR will complete prior to any trial in the TPL Litigation.

Petitioner Microsoft is not involved in litigation with Ozmo and, therefore, this IPR will complete prior to any trial against Microsoft.

This IPR is likely to finish reasonably close to any trial in the Dell Litigation. Using the filing date of June 21, 2022 and the average time to trial in the WDTX of 27.2 months (EX1011), trial in the Dell Litigation could start in late September 2024. This IPR is likely to complete within a few months of that date. Thus, this factor weighs against a discretionary denial.

D. Parallel Proceeding

The TCL Litigation is in its infancy and there is no litigation against Microsoft. The Dell Litigation is in its early stages. Fact discovery just opened, and the parties have not filed any dispositive motions. Expert reports and dispositive motions will not have come due by the time an institution decision has been rendered. Thus, there will be no significant investment of resources wasted upon the Board's institution. *See Sand Revolution v. Continental Intermodal Group*, IPR2019-01393, Paper 24 at 10-11. Thus, this factor favors institution.

E. Same Party

Petitioner Microsoft is not a party to any pending litigation. Ozmo's assertions of the 814 patent implicate Microsoft's Surface products, which are not at issue in the Dell or TCL Litigations.

The Board has previously considered this factor to weigh against discretionary denial when a Petitioner is not a party in a court proceeding. *See Kavo Dental Techs., LLC v. Osseo Imaging, LLC*, No. IPR2020-00671, Paper 10 at 24-25 (PTAB June 10, 2020).

F. Issue Overlap

PO has not yet identified its asserted claims in the TCL Litigation and there is no litigation against Petitioner Microsoft.

Four claims challenged in this IPR (8, 10, 12-13) are not asserted in the Dell Litigation. Therefore, a number of the validity issues addressed in this IPR will not be resolved in the Dell Litigation. Thus, this factor weighs against discretionary denial.

G. Other Considerations

Other considerations also weigh strongly against a discretionary denial. The patent has never been challenged in a post-issuance proceeding and the Grounds asserted herein were not considered during prosecution.

Additionally, PO has chosen to sue members of the public one at a time, suing HP in August 2021, Acer in November 2021, Dell in June 2022, and TCL in April 2023. Petitioner Microsoft (and the other members of the public) have a strong interest in resolving the validity of the Challenged Claims. This should weigh heavily against discretionary denial.

H. Compelling Merits

The showing in this Petition is compelling because each ground clearly discloses the amended “impinge” limitation that was the basis for allowing the claims. *See* Section IV.B. Moreover, Grounds 1-2 are based on 802.11/802.15 overlays, Grounds 3-4 are based on infrastructure/ad-hoc overlays, and Grounds 5-6 are based on 802.11b/g overlays. These grounds independently address the three different types of overlay networks discussed in the intrinsic record, individually and cumulatively presenting a compelling showing on the merits.

I. The *Becton Dickinson* Factors Favor Institution Under §325(d)

None of the combinations asserted herein were considered during prosecution, the combinations relied on are not cumulative of that relied upon by the PTO during prosecution and the combinations asserted herein satisfy the limitation the Examiner found lacking in the prior art of record. *See* Section IV.B. Thus, all the factors set out in *Becton, Dickinson and Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17-18 (PTAB December 15, 2017) (precedential) either favor institution or are neutral.

XI. CONCLUSION

Petitioner requests the Board cancel the Challenged Claims.

Dated: July 5, 2023

Respectfully submitted,

/s/ Brian K. Erickson

Brian K. Erickson Reg. No. 48,895

DLA Piper LLP (US)

303 Colorado, Suite 3000
Austin, TX 78701
brian.erickson@dlapiper.com
Phone: 512-457-7059
Fax: 512-721-2263

Chris Katsantonis
DLA Piper LLP (US)
444 West Lake Street, Suite 900
Chicago, IL 60606
chris.katsantonis@us.dlapiper.com
Phone: 312-368-218
Fax: 312-251-2884

*Attorneys for Petitioners Microsoft
Corporation, Dell Technologies Inc., and Dell
Inc.*

CERTIFICATION UNDER 37 CFR §42.24(d)

Under the provisions of 37 CFR §42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter Partes* Review totals 13,894, as calculated by Microsoft Word, which is less than the 14,000 allowed under 37 CFR §42.24(a)(i).

/s/ Brian K. Erickson

Brian K. Erickson

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§42.6(e) and 42.105(b), the undersigned hereby certifies that a copy of the foregoing Petition for *Inter Partes* Review and all Exhibits was provided to Patent Owner by emailing a copy of same (by agreement) to the following attorneys of record for the Patent Owner:

James Hall
Matthew Vella
Aaron Jacobs
James Foster
Robert Gilman
Prince Lobel Tye LLP
jhall@princelobel.com
mvella@princelobel.com
ajacobs@princelobel.com
jfoster@princelobel.com
rgilman@princelobel.com
ozmodell@princelobel.com

/s/ Brian K. Erickson

Brian K. Erickson