

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROSOFT CORPORATION,
Petitioner,

v.

INTERDIGITAL PATENT HOLDINGS, INC.,
Patent Owner.

U.S. Patent No.: 8,737,933
Issued: May 27, 2014
Application No.: 13/930,743
Filed: June 28, 2013

Title: DATA TRANSFER BETWEEN WIRELESS DEVICES

DECLARATION OF PETER RYSAVY

MICROSOFT CORP. EXHIBIT 1003

TABLE OF CONTENTS

	Page
I. INTRODUCTION AND ENGAGEMENT	6
II. BACKGROUND AND QUALIFICATIONS	6
III. MATERIALS CONSIDERED AND INFORMATION RELIED UPON REGARDING '933 PATENT.....	10
IV. UNDERSTANDING OF PATENT LAW	15
V. LEVEL OF SKILL IN THE ART, AND STATE OF THE ART.....	19
VI. CLAIM CONSTRUCTION	20
VII. STATE OF THE ART	21
A. Bluetooth And Wi-Fi Were Ubiquitous	21
B. Bluetooth For Discovery, Wi-Fi For Data Transfers	24
C. Prompting Recipients To Accept Or Deny A File Transfer.....	26
D. Request To Send And Acceptance To Transfer.....	28
E. Touchscreens	30
VIII. GROUND 1: CLAIMS 1-9, 11, 13-14, 22-31, 33, 35-36, AND 44 ARE OBVIOUS OVER AHYA AND MCKILLOP.....	32
A. Ahya (EX1004)	32
B. McKillop (EX1005)	35
C. Combining Ahya and McKillop.....	36
1. A POSITA Would Have Been Motivated With A Reasonable Expectation Of Success To Implement Ahya+McKillop's Devices With Bluetooth For Detection And Wi-Fi For Content Transfer	38
2. A POSITA Would Have Been Motivated With A Reasonable Expectation Of Success	

To Implement Ahya+McKillop Devices To Allow Users To Deny Incoming Transfers Using Request And Acceptance Messages, As Was Common In The Art.....	40
---	----

D. Detailed Claim Mapping For Claims 1-9, 11, 13-14, 22-31, 33, 35-36, And 44.....	43
1. Claim 1	43
a) Element [1.1]	43
b) Element [1.2]	44
c) Element [1.3]	46
d) Element [1.4]	47
e) Elements [1.5-1.6]	49
f) Element [1.7]	54
2. Claim 2	56
3. Claim 3	58
4. Claim 4	58
5. Claim 5	59
6. Claim 6	60
7. Claim 7	60
8. Claim 8	61
9. Claim 9	61
10. Claim 11	62
11. Claim 13	63
12. Claim 14	64
13. Claim 22	65

14.	Claims 23-31, 33, 35-36, And 44.....	67
IX.	GROUND 2: CLAIMS 1-9, 11, 13-14, 22-31, 33, 35-36, AND 44 ARE OBVIOUS OVER AHYA, MCKILLOP, AND TURNER.....	67
X.	GROUND 3: CLAIMS 1-9, 11, 13-14, 22-31, 33, 35-36, AND 44 ARE OBVIOUS OVER HODDIE AND HINCKLEY	68
A.	Hoddie (EX1006)	68
B.	Hinckley (EX1007)	69
C.	Combining Hoddie And Hinckley	70
D.	Mapping Claims 1-9, 11, 13-14, 22-31, 33, 35-36, And 44 To Hoddie And Hinckley	73
1.	Claim 1	73
a)	Element [1.1]	73
b)	Element [1.2]	74
c)	Element [1.3]	76
d)	Element [1.4]	76
e)	Elements [1.5-1.6]	78
f)	Element [1.7]	81
2.	Claim 2	82
3.	Claim 3	83
4.	Claim 4	83
5.	Claim 5	84
6.	Claim 6	85
7.	Claim 7	85
8.	Claim 8	86

9.	Claim 9.....	86
10.	Claim 11	87
11.	Claim 13	87
12.	Claim 14.....	88
13.	Claim 22	88
14.	Claims 23-31, 33, 35-36, And 44.....	90
XI.	GROUNDS 4-12: CLAIMS 20-21 AND 42-43 ARE OBVIOUS OVER EACH OF THE GROUND 1-3 COMBINATIONS IN FURTHER VIEW OF AHOLAINEN (EX1071), CHOURAKI (EX1075), OR JOHANSON (EX1076)	90
A.	Claims 20-21	90
1.	Grounds 4-6: Aholainen's Class-Of-Device-Based Filtering...	91
2.	Grounds 7-9: Chouraki's Relationship-Based Filtering	94
3.	Grounds 10-12: Johanson's Distance-Based Filtering	96
4.	Claims 42-43	98

I, Peter Rysavy, do hereby declare as follows:

I. INTRODUCTION AND ENGAGEMENT

1. I have been retained as an independent expert on behalf of Microsoft Corporation in connection with the above-captioned Petition for Inter Partes Review (“IPR”) to provide my analyses and opinions on certain technical issues related to U.S. Patent No. 8,737,933 (hereinafter “the ’933 patent”).

2. I am being compensated at my usual and customary rate for the time I spent in connection with this IPR. My compensation is not affected by the outcome of this IPR.

3. Specifically, I have been asked to provide my opinions regarding whether claims 1-9, 11, 13-14, 20-31, 33, 35-36, and 42-44 (each a “challenged claim” and collectively the “challenged claims”) of the ’933 patent would have been obvious to a person having ordinary skill in the art (“POSITA”) as of December 23, 2008. It is my opinion that each challenged claim would have been obvious to a POSITA after reviewing the prior art discussed herein.

II. BACKGROUND AND QUALIFICATIONS

4. I am an expert in the fields of wireless networking and communications. More specifically, I have expertise in Bluetooth, Wi-Fi, and mobile systems. In formulating my opinions, I have relied upon my training, knowledge, and experience in the relevant art. A copy of my curriculum vitae is appended to this declaration as

Appendix A and provides a description of my professional experience, including my academic and employment history, publications, conference participation, awards and honors, and more. The following is a brief summary of my relevant qualifications and professional experience.

5. I graduated with BSEE and MSEE degrees from Stanford University in 1979, with my master's degree emphasizing communications technologies.

6. From 1988 to 1993, I was vice president of engineering and technology at Traveling Software (later renamed LapLink), at which projects included LapLink, LapLink Wireless, and connectivity solutions for a wide variety of computing platforms, including handheld laptops and handheld devices. During this period, I was responsible for evaluating wireless communications technologies for use with the LapLink file transfer and synchronization product families. I also managed the development of a short-range wireless modem called LapLink Wireless that replaced a serial-data cable connection between computers.

7. Prior to Traveling Software, I spent seven years at Fluke Corporation, where I worked on data-acquisition products and touchscreen technology. My work in touchscreens included analyzing technologies used for touchscreens and developing new touchscreen technology.

8. I am now the president of the consulting firm Rysavy Research LLC and have worked as a consultant in the field of networking systems and wireless

technology since 1993. As a consultant I specialize in wireless systems, including the wireline networking systems that support them. My work includes working with networking protocols at all layers of the protocol stack, including the TCP/IP family of protocols. One of my clients in 1994 was McCaw Cellular (which later became AT&T Wireless), the leading U.S. cellular company at the time. I did multiple projects for McCaw Cellular, helping me develop my expertise in networking technologies.

9. Beginning in 1994, I began teaching public courses, including courses that I taught at Portland State University, the University of California at Los Angeles, at conferences, and through my own organization. These courses included content about cellular networks, Wi-Fi and other wireless local area networks, Bluetooth, paging, and mobile-application architectures.

10. Past projects have included reports on the evolution of networking technologies, evaluation of wireless technologies, analysis of mobile applications, strategic consultations, system design, articles, courses and webcasts, network performance measurement, test reports, and involvement in multiple patent litigation cases. My past and current clients include more than one hundred organizations.

11. I have written more than one hundred and ninety articles, reports, and papers, and have taught more than forty public courses and webcasts, on networking

technologies and mobile systems. I have also performed technical evaluations of many networking technologies.

12. From 2000 to 2016, as part of my consulting practice, I was the executive director of the Portable Computer and Communications Association (PCCA), which was formally incorporated in May of 1993, then operated as the Wireless Technology Association. The PCCA's mission was to promote the interoperability of wireless-data systems, and its initial work was to develop specifications for interfaces between computers and wireless modems.

13. I have extensive experience with standards and specifications in the wireless industry, including analyzing standards and specifications documents associated with dozens of projects, and being the executive director of the Portable Computer and Communications Association (PCCA) for sixteen years, an organization that developed wireless interoperability specifications, one of which became adopted by the TIA/EIA as the TIA/EIA-678 standard.

14. In the more than twenty-five years of my consulting career, I have studied or worked with nearly every major wireless technology related to cellular networks and wireless local-area networks, as well as the wireline networks associated with them.

III. MATERIALS CONSIDERED AND INFORMATION RELIED UPON REGARDING '933 PATENT

15. In preparing this declaration, I have reviewed the following materials bearing Exhibit Nos. that I understand are being referenced in the IPR to which my declaration accompanies:

LIST OF EXHIBITS

No.	Description
1001	U.S. Patent No. 8,737,933 (“ the '933 Patent ”)
1002	File History of U.S. Patent No. 8,737,933
1003	N/A
1004	U.S. Patent Application Pub. No. 2009/0298419 to Ahya et al. (“ Ahya ”)
1005	U.S. Patent Application Pub. No. 2008/0166967 to Christopher D. McKillop (“ McKillop ”)
1006	International Patent Application Pub. No. WO 2005/1072895 to Peter Hoddie (“ Hoddie ”)
1007	U.S. Patent Application Pub. No. 2007/0191028 to Hinckley et al. (“ Hinckley ”)
1008	Sidhu et al., <i>Emerging Wireless Standards – WiFi, ZigBee and WiMAX</i> , International Journal of Electronics and Communication Engineering Vol. 1 No. 1, at 43-48 (2007)
1009	Harry Newton, Newton’s Telecom Dictionary, 20 th Updated and Expanded Edition (excerpted) (2004)
1010	U.S. Patent Application Pub. No. 2009/0034498 to Banerjea et al. (“ Banerjea ”)
1011	N/A
1012	U.S. Patent Application Pub. No. 2007/0135046 to Kapur et al. (“ Kapur ”)

No.	Description
1013	U.S. Patent Application Pub. No. 2009/0215398 to Adler et al. (“ Adler ”)
1014	Bluetooth Specification Version 1.1, Vol. 2, “Profiles” (Feb. 22, 2001)
1015	Megowan et al., Infrared Data Association® (IrDA®) Object Exchange Protocol OBEX™ Version 1.3 (Jan. 3, 2003).
1016	Postel et al., RFC 959, File Transfer Protocol (FTP) (Oct. 1985)
1017	K. Sollins, RFC 1350, The TFTP Protocol (Revision 2) (Jul. 1992)
1018	Frodigh et al., <i>Wireless ad hoc networking—The art of networking without a network</i> , Ericsson Review No. 4, at 248-263 (2000)
1019	U.S. Patent Application Pub. No. 2007/0146347 to Louis B. Rosenberg (“ Rosenberg ”)
1020	Cheverst et al., <i>Exploring Bluetooth based Mobile Phone Interaction with the Hermes Photo Display</i> , Proceedings of the 7 th International Conference on Human Computer Interaction with Mobile Devices and Services, at 47-54 (Sep. 2005)
1021	User’s Guide for Nokia N72 (2006)
1022	U.S. Patent No. 7,356,347 to David Kammer (“ Kammer ”)
1023	Phil Karn, <i>MACA - A New Channel Access Method for Packet Radio</i> , The Proceedings of the 9 th ARRL Computer Networking Conference, at 134-140 (1990)
1024	Chatzimisios et al. <i>Optimisation of RTS/CTS handshake in IEEE 802.11 Wireless LANs for maximum performance</i> , IEEE Communications Society Globecom 2004 Workshops, at 270-275 (2004)
1025	Nokia 9500 Communicator User Guide (2004-2005)
1026	User’s Guide for Nokia N95 (2007)

No.	Description
1027	U.S. Patent Application Pub. No. 2005/0113079 to Hui Guo (“ Guo ”)
1028	U.K. Patent Application Pub. No. GB 2,439,364 to Turner et al. (“ Turner ”)
1029	U.S. Patent Application Pub. No. 2004/0242216 to Demetrios Boutsikakis (“ Boutsikakis ”)
1030	U.S. Patent No. 7,043,548 to Stephane Bouet (“ Bouet ”)
1031	Brad A. Myers, The Importance of Percent-Done Progress Indicators for Computer-Human Interfaces, Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (Apr. 1985)
1032	U.S. Patent Application Pub. No. 2009/0140986 to Karkkainen et al. (“ Karkkainen ”)
1033	U.S. Patent Application Pub. No. 2007/0124503 to Ramos et al. (“ Ramos ”)
1034	U.S. Patent No. 8,059,111 to Phil Harrison (“ Harrison ”)
1035	U.S. Patent Application Pub. No. 2006/0026521 to Hotelling et al. (“ Hotelling ’521 ”)
1036	Westerman et al., <i>Multi-Touch: A New Tactile 2-D Gesture Interface For Human-Computer Interaction</i> , Proceedings of the Human Factor and Ergonomic Society 45 th Annual Meeting, at 632-636 (2001)
1037	Jun Rekimoto, <i>Pick-and-Drop: A Direct Manipulation Technique for Multiple Computer Environments</i> , Proceedings of the 10th annual ACM symposium on User interface software and technology, at 31-39 (1997)
1038	U.S. Patent Application Pub. No. 2008/0009309 to Hwang-hyeon Gha (“ Gha ”)
1039	Pravin Bhagwat, <i>Bluetooth: Technology for Short-Range Wireless Apps</i> , at 96-103 (Jun. 2001)

No.	Description
1040	N/A
1041	N/A
1042	U.S. Patent Application Pub. No. 2003/0134629 to Ollis et al. (“ Ollis ”)
1043	N/A
1044	U.S. Patent Application Pub. No. 2006/0097991 to Hotelling et al., (“ Hotelling ’991 ”)
1045	U.S. Patent Application Pub. No. 2008/0168384 to Platzer et al. (“ Platzer ”)
1046	U.S. Patent No. 7,479,949 to Jobs et al., (“ Jobs ”)
1047	U.S. Patent Application Pub. No. 2008/0143685 to Lee et al. (“ Lee ”)
1048	File History of U.S. Patent No. 8,200,265
1049	U.S. Patent No. 8,200,265 to Carlton et al. (“ the ’265 patent ”)
1050	File History of U.S. Patent No. 8,478,207
1051	U.S. Patent No. 8,478,207 to Carlton et al. (“ the ’207 patent ”)
1052	N/A
1053	Bluetooth Specification Version 1.1, Vol. 1, “Core” (Feb. 22, 2001)
1054	European Patent Application Pub. No. 1,489,783 to Anders Angelhag (“ Angelhag ”)
1055	U.S. Patent Application Pub. No. 2005/0289195 to Lehtola et al. (“ Lehtola ”)
1056	N/A
1057	N/A

No.	Description
1058	Affidavit of Nathaniel E. Frank-White, Records Request Processor at the Internet Archive (“Frank-White”) Regarding Exhibits 1014-1015, 1053, and 1060-1062
1059	N/A
1060	User Guide for Nokia N91 (2006)
1061	User Guide for Nokia N75 (2006)
1062	User Guide for Nokia 9300 (2005)
1063	N/A
1064	User Guide for the Sony CLIE (2001)
1065	David Pogue, iPhone The Missing Manual (1 st ed. Aug. 2007)
1066	U.S. Provisional Patent Application No. 61/140,126 to Carlton et al. (“ the ’126 provisional ”)
1067	U.S. Patent Application Pub. No. 2007/0011335 to Burns et al. (“ Burns ”)
1068	Yardena Arar, <i>Bluetooth to work with Wi-Fi</i> , NetworkWorld (February 12, 2008)
1069	Staff’s Proposed Claim Constructions, <i>Certain Electronic Devices, Including Smartphones, Computers, Tablet Computers, And Components Thereof</i> , Inv. No. 337-TA-1373 (Dec. 4, 2023)
1070	InterDigital’s Proposed Claim Constructions, <i>Certain Electronic Devices, Including Smartphones, Computers, Tablet Computers, And Components Thereof</i> , Inv. No. 337-TA-1373 (Nov. 30, 2023)
1071	U.S. Patent No. 7,102,640 to Aholainen et al. (“ Aholainen ”)
1072	U.S. Patent Application No. 12/128,497 to Ahya et al. (“ As-Filed Ahya Application ”)
1073	Full Claims Listing (1-9, 11, 13-14, 20-31, 33, 35-36, 42-44)

No.	Description
1074	U.S. Patent Application Pub. No. 2005/0281237 to Heinonen et al. (“ Heinonen ”)
1075	International Patent Application Pub. No. WO 2006/092505 to Olivier Chouraki (“ Chouraki ”)
1076	U.S. Patent Application Pub. No. US 2003/0018744 to Johanson et al. (“ Johanson ”)
1077	BLUETOOTH TECHNOLOGY TO HARNESS THE SPEED OF 802.11, Bluetooth SIG Press Release (Feb. 11, 2008) (Archived by Internet Archive’s Wayback Machine on Feb. 14, 2008)
1078	Megowan et al., Infrared Data Association® (IrDA®) Object Exchange Protocol OBEX™ Version 1.5 (Aug. 14, 2009).
1079	U.S. Patent No. 7,333,514 to Anehem et al. (“ Anehem ”)
1080	U.S. Patent Application No. 11/804,359 to McKillop et al. (“ As-Filed McKillop Application ”)

IV. UNDERSTANDING OF PATENT LAW

16. I am not an attorney. For the purposes of this declaration, I have been informed about certain aspects of the law that are relevant to my opinions. My understanding of the law was provided to me by the Petitioner’s attorneys.

17. I understand that when considering the scope of the claims of a patent that the patent claim terms should generally be given the ordinary meaning that the terms would have to a person of ordinary skill in the art in question after reading the patent as of the earliest claimed priority date.

18. I understand that the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the term appears, but in the context of the entire patent, including the specification. I further understand that the principal considerations regarding the scope and meaning of the claims are the plain language of the claim (including the surrounding claim language and context), the patent specification, and the prosecution history. I understand that while a claim is to be read in light of the specification, one must generally avoid importing limitations into the claim from the specification. I am also informed that the prosecution history can often inform the meaning of the claim by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be. I applied these understandings when considering the scope and meaning of the claims of the '933 patent.

19. I understand that a prior art reference anticipates an asserted claim, and thus renders the claim unpatentable, if all elements of the claim are disclosed in that prior art reference, either explicitly or inherently (i.e., necessarily present or implied).

20. I further understand that a claim is unpatentable if it would have been obvious. Obviousness of a claim requires that the claim would have been obvious from the perspective of a POSITA at the time the alleged invention was made. I

understand that a claim could have been obvious from a single prior art reference or from a combination of two or more prior art references.

21. I understand that an obviousness analysis requires an understanding of the scope and content of the prior art, any differences between the alleged invention and the prior art, and the level of ordinary skill in evaluating the pertinent art.

22. I further understand that a claim would have been obvious if it unites old elements with no change to their respective functions, or merely substitutes one element for another known in the field, and that combination yields predictable results. While it may be helpful to identify a reason for this combination, I understand that there is no strict requirement of finding an express teaching, suggestion, or motivation to combine within the references. When a product is available, design incentives and other market forces can prompt variations of it, either in the same field or different one. If a POSITA can implement a predictable variation, obviousness likely bars its patentability. For the same reason, if a technique has been used to improve one device and a POSITA would recognize that it would improve similar devices in the same way, using the technique would have been obvious. I understand that a claim would have been obvious if common sense directs one to combine multiple prior art references or add missing features to reproduce the alleged invention recited in the claims.

23. I further understand that certain factors may support or rebut the obviousness of a claim. I understand that such secondary considerations include, among other things, commercial success of the patented invention, skepticism of those having ordinary skill in the art at the time of invention, unexpected results of the invention, any long-felt but unsolved need in the art that was satisfied by the alleged invention, the failure of others to make the alleged invention, praise of the alleged invention by those having ordinary skill in the art, and copying of the alleged invention by others in the field. I understand that there must be a nexus—a connection—between any such secondary considerations and the alleged invention. I also understand that contemporaneous and independent invention by others is a secondary consideration tending to show obviousness.

24. I am not aware of any allegations by the named inventors of the '933 patent or any assignee of the '933 patent that any secondary considerations tend to rebut the obviousness of any challenged claim of the '933 patent.

25. I understand that in considering obviousness, it is important not to determine obviousness using the benefit of hindsight derived from the descriptions found in the patent being considered.

26. I understand that other challenges to the patentability of a patent, including patent ineligibility, enablement, written description, and definiteness or clarity of claim language, cannot be raised in IPR proceedings before the Board.

27. I understand that Petitioner has the burden of proving unpatentability by a preponderance of evidence, which means that the claims are more likely than not unpatentable.

28. The analysis in this declaration is in accordance with the above-stated legal principles.

V. LEVEL OF SKILL IN THE ART, AND STATE OF THE ART

29. For purposes of this declaration, I understand the time of the invention to be December 2008, which is the filing date of the provisional application to which the '933 patent purportedly claims priority (provisional application no. 61/140,126). I am not offering an opinion on the propriety of this priority date at this time.

30. I understand that several factors are relevant to determining the level of ordinary skill in the art at the time of the claimed invention. I understand that those factors include: (1) the educational level of the inventor(s); (2) the type of problems encountered in the art; (3) prior art solutions to those problems; (4) the rapidity with which innovations are made; (5) sophistication of the technology; and (6) the educational level of active workers in the field.

31. Having reviewed and considered the '933 patent, its prosecution history, the state of the art at the time of the invention, including the level of skill of the persons with whom I worked, and the above-listed factors, it is my opinion that the person of ordinary skill in the art for purposes of the '933 patent in December

2008 (“POSITA”) would have held a bachelor’s degree in computer science, electrical engineering, computer engineering, or a closely related field, and one to three years of experience working with wirelessly connected mobile devices that used common wireless communications protocols such as Bluetooth and 802.11 / Wi-Fi. More education, e.g., a Master’s or Ph.D., would compensate for less work experience and vice versa. The overview of the state of the art provided below (*infra* Section VII) reflects some of the information within a POSITA’s knowledge. For example, the POSITA had working knowledge of the Bluetooth and IEEE 802.11 (Wi-Fi) specifications, and followed the development of those specifications as well as publications describing the evolution and use of those specifications.

32. I have used this level of ordinary skill in the art in forming my opinions as set forth in this declaration. My opinions are from the perspective of this level of ordinary skill in the art. I met or exceeded this level of skill in the art in December 2008.

VI. CLAIM CONSTRUCTION

33. I understand that, in IPR, claim terms should be given the ordinary meaning that the terms would have to a person of ordinary skill in the art on the earliest effective filing date, in view of the specification and file history.

34. For this declaration, I apply the plain and ordinary meaning of all claim terms. I reserve the right to offer my opinions on any constructions or construction issues presented by Patent Owner InterDigital Patent Holdings, Inc.

VII. STATE OF THE ART

A. Bluetooth And Wi-Fi Were Ubiquitous

35. Bluetooth and Wi-Fi were well-known wireless communication protocols that were commonly used in prior art devices ranging from smartphones to laptop computers. EX1005, [0003]; EX1065, 12, 68-70, 106-111; *see also* EX1054, [0008]; EX1067, [0006]; EX1071, 1:11-22; EX1074, [0002-6]. By as early as May 2007, “[f]or example, a laptop computer such as the MacBookPro” was “configured to communicate wirelessly in accordance with both the Wi-Fi and the Bluetooth standards.” EX1005, [0003]. Similarly, by at least August 2007, “[t]he iPhone ha[d] more antennas than an ant colony: one for the cellular network, one for Wi-Fi hot spots, and a third for Bluetooth.” EX1065, 68; *see also* EX1067, [0006] (by July 2006, “[m]any devices that include[d] Bluetooth also support[ed] other wireless technologies including 802.11a, 802.11b, 802.11g, WiMAX and Ultra Wide Band (UWB) radios”). The Bluetooth and Wi-Fi protocols were so common, they were defined in dictionaries. EX1009, 26 (by 2004, “802.11b,” “also called Wi-Fi,” was “the most common wireless local area network”), 119 (“Bluetooth” is a

“wireless protocol that is used to communicate from one device to another” and “version 1.1 allows a Bluetooth device to communicate with up to 8 devices”).

36. **The Bluetooth specification** provides the information that developers need to develop Bluetooth-compatible products. *See, e.g.*, EX1014, EX1053, EX1015. Thus, when I taught the Bluetooth protocol in courses (*supra* par. 9), I would regularly reference the documents associated with this specification. The Bluetooth specification comprises two volumes: the core (EX1053) and the profile (EX1014). The Bluetooth protocol incorporates aspects of the OBEX protocol (such as the OBEX PUT operation for pushing files), described in the OBEX specification (EX1015). *Infra* par. 53. The v1.1 Bluetooth specification (EXS 1014 and 0153) and the v1.3 OBEX specification (EX1015) describe core and basic Bluetooth functionality that persists to this day. In general, the Bluetooth specification over the years has been backward compatible so that devices previously programmed based on older versions of the specification can communicate with devices programmed or updated based on newer versions. As such, the POSITA in 2008 would have been familiar with the functionality described by these specifications. The portions of the Bluetooth and OBEX specifications relied on in this IPR did not change materially, if at all, between 2001 and 2009. For example, OBEX v1.5 from 2009 contains the exact same disclosure on the PUT exchange for the claimed request and acceptance messages. EX1078, 100-101. Thus, for the purposes relied on in this declaration,

these Bluetooth and OBEX specifications (EX1014-15 and EX1053) reflect a POSITA's working knowledge of the pertinent aspects of the Bluetooth and OBEX protocols. Similarly, **for Wi-Fi, IEEE 802.11 is the specification** that provides the information that developers need to develop Wi-Fi-compatible products. As someone who taught courses on IEEE 802.11 (*supra* par. 9), I can confirm that IEEE 802.11 included the four-way RTS-CTS handshake discussed in EXS 1018, 1023-1024 and that these exhibits reflect a POSITA's working knowledge of IEEE 802.11 in the 2008 timeframe. Ericsson Review, the publisher of EX1018, is a well-known publisher. In fact, I have personally reviewed and utilized numerous articles published by Ericsson Review dating back to 2001. Multiple patent references also cite this Frodigh paper (EX1018): U.S. Patent Nos. 6,954,443, 7,333,514 (EX1079), and 7,415,268. EX1079, 2:17-24 ("Aspects of BLUETOOTH™ systems are disclosed in ... M. Frodigh et al., "Wireless ad hoc Networking—The Art of Networking without a Network", *Ericsson Review* no. 4, pp. 248-263 (2000), both of which are currently available on the World Wide Web").

37. The Bluetooth protocol supported short-range personal area networks (PANs), and by at least 2001, included: (1) inquiry and discovery processes (part of Bluetooth's generic access profile) for discovering nearby devices, and (2) a service discovery protocol (SDP) for discovering the capabilities of (i.e., the services supported by) nearby devices. EX1039, 96-103; EX1053, 331-391; EX1014, 13-97;

EX1009, 119; EX1022, 1:42-2:13, 11:2-4; EX1074, [0006]; *see also* EX1012, [0022]; EX1067, Abstract, [0004], [0009], [0019], [0021], [0040], FIG. 2; EX1010, [0026]; EX1005, [0013-17], [0038], [0041-45], claims 1-2, FIG. 4; EX1006, 9:17-10:9.

B. Bluetooth For Discovery, Wi-Fi For Data Transfers

38. It was well known to detect / discover nearby devices using Bluetooth, or another low-power communication protocol, to save power and then, when transferring files, using Wi-Fi, or another higher-speed protocol, to expedite the transfer, thus providing a high-speed, power-efficient file transfer process.

39. This Bluetooth-to-Wi-Fi switching functionality was publicly discussed as being incorporated into at least one wireless technology standard—Bluetooth 3.0—at least ten months before the '933 patent's earliest alleged priority date. EX1068, 1-2; EX1077, 1 (In February 2008, Bluetooth SIG was implementing “the wireless technology equivalent of ‘low hanging fruit’” by “taking classic Bluetooth connections” and “allowing [them] to jump on top of the already present 802.11 radio, when necessary, to send bulky entertainment data, faster.”). This 2008 article is consistent with my own experience in 2008, as I recall industry articles and press releases that discussed the Bluetooth Special Interest Group (“SIG”) announcement of plans to link Bluetooth with Wi-Fi to make it easier for users to

transfer images and large data files such as music and video. Similar technology is reflected in at least six prior art publications.

40. Hoddie (published November 2005), for example, discloses “search[ing] for other devices ... using Bluetooth” and if “the size of the file would make it more appropriate to send ... across a Wi-Fi connection (because of the improved bandwidth of the Wi-Fi connection compared to a Bluetooth connection),” the devices “agree on setting up a Wi-Fi connection,” and the sending device “sends the file to the [receiving device] across the Wi-Fi connection.” EX1006, 3:30-4:22; *see also id.*, 3:16-6:11, 9:9-14:9, claims 2, 4, FIGS 3-4.

41. McKillop (filed May 2007) similarly discloses that its system and methods “can provide highly power efficient wireless communications by utilizing a low power, limited range protocol, such as Bluetooth, in order to find and establish a high speed communications path. Once the high speed communications path is found, such as a Wi-Fi network, the systems and methods can switch from the slower communications protocol to the high speed protocol until the particular event is over.” EX1005, [0013]; *see also id.*, Abstract, [0002], [0006-7], [0014-18], [0034], [0038], [0042-47], claims 2-4, FIGS. 2, 4.

42. Burns (published January 2007) discloses using “Bluetooth to provide the network management functions such as device discovery, service discovery, security negotiation and connection establishment,” and then to “establish a

secondary data channel,” such as Wi-Fi, for “data communication.” EX1067, [0040-41]; *see also id.*, [0009-10], [0012], [0047], [0051].

43. Banerjea (filed July 2008) discloses that “a Bluetooth connection (BT connection) 110 may be established between the mobile communication devices,” and then “[m]ultimedia data may be transmitted over the WiFi connection.” EX1010, [0026-27]; *see also id.*, Abstract, [0008-10], [0037-47].

44. Adler (filed February 2008) discloses “establishing a first connection between a first device and a second device with a first networking standard,” such as Bluetooth, and then “transferring data between the first and second devices using [a] second networking standard,” such as Wi-Fi. EX1013, [0006-8]; *see also id.*, Abstract, [0038-56], claim 5.

45. Kapur (published June 2007) discloses that “[a]fter the Bluetooth® device 1002 discovers the Bluetooth® device 1004, the Bluetooth® protocol stack within the Bluetooth® device 1002 may configure the high-speed data connection 1008,” which includes an 802.11 (Wi-Fi) connection. EX1012, [0065-66]; *see also id.*, [0022], [0029].

C. Prompting Recipients To Accept Or Deny A File Transfer

46. Numerous references reflect that it was well-known to prompt intended recipients of a content transfer to either accept or reject that transfer, thus allowing users to avoid receipt of unwanted content.

47. Hinckley, for example, discloses “displaying on the receiving device an indication that information is to be received” (EX1007, claim 3), such as the “file name” (EX1007, [0061]) and if the user rejects the information, “blocking the receipt of the indicated information” (EX1007, claim 4). *See also id.*, [0035], [0038], [0058-62], FIG. 3. For example, “a user sees a thumbnail preview of the image ... that another user is transmitting, and can choose whether or not to accept it (Yes/No). By selecting NO, the receiving user is stopping the transfer of information from the sending device.” *Id.*, [0061]; *see also id.*, [0035], [0038], [0058-62], FIG. 3.

48. Guo similarly discloses the receiving mobile phone’s “processor 10 causes GUI 12 to prompt the user to accept the data file 16.” EX1027, [0017].

49. Turner shows that, by at least 2006, Bluetooth prompted users to accept or deny a transfer: “if a connection does result in some type of file transfer, users can be prompted as to whether they wish to accept such a transfer.” EX1028, 2:9-11; *see also id.*, (further explaining how users can “prevent unwanted connections to a device and a subsequent infection by malware”).

50. Numerous user guides confirm that Nokia phones presented prompts to users asking them if they “want[ed] to accept the Bluetooth message” and would show the incoming message only if the user accepted. EX1062, 87; EX1025, 86; EX1021, 77; *see also* EX1026, 21; EX1060, 89; EX1061, 110.

51. The prior art Cheverst reference shows one such exemplary prompt.



Figure 6. Typical mobile phone display prompting the user to receive her selected image

EX1020, 49.

D. Request To Send And Acceptance To Transfer

52. Many then-existing protocols employed pre-transfer request and acceptance messages to set up / negotiate the transfer, ensure the sending device is authorized to transfer the file, and/or ensure the receiving device is ready for the transfer. EX1014, 23, 316-393; EX1053, 425, 428-441; EX1015, 10, 14, 16, 22-43, 73-74; EX1016, 18, 44; EX1017, 4-5; EX1018, 261-262. Specifically, these prior art references disclose sending, to a target device, a message requesting to transfer a file, and receiving, from the target device, an acceptance to transfer the file. *Id.*

53. Bluetooth version 1.1, as specified in the Bluetooth v1.1 specification (published in 2001), used the Object Exchange Protocol (OBEX) PUT operation to transfer a file, which involved sending a “request” to transfer a named file to a target

device and then sending the file only after receiving a “[r]esponse” of “CONTINUE” from the target device. EX1015, 73-74; *see also id.*, 8, 10, 13-16, 22-24, 29-31, 50-51, 62; EX1014, 23, 316-330, 339-361, 368-390; EX1053, 425, 428-441; EX1055, [0006]; EX1057.

9.2.4 Example Put Exchange

An application wishes to PUT a 2000 byte file named “Test File Object” with the time stamp 0x41a50016 (Jan 9, 1992, 11:02:00 UTC). The OBEX packet size is 512 bytes.

Pre-Transfer
Request and
Response
Messages

Transfer

	Opcode or Response plus Headers	Final bit	Header Data	Header Length	Running Total of Data Exchanged
Request →	PUT Name Length Time		"Test File Object" "2000" "19920109T110200Z"	37 19	
Response ←	CONTINUE no headers	✓			
Request →	PUT Body		"start of file data.."	509	506 bytes

EX1015, 74 (excerpted) (red annotations added).

54. Further, well-known ad-hoc Wi-Fi protocols (used for direct, device-to-device communications and defined by the distributed coordination function (DCF) mode of IEEE 802.11) used similar request and acceptance messages—a four-way handshake known as RTS-CTS—to ensure data was successfully transferred and not interrupted by other devices on the network. EX1018, 261-262; *see also* EX1023, 1; EX1024, 270. Specifically, in RTS-CTS, “[a] terminal ... that wants to send data” does so by completing a “[f]our-way handshake—the sending node sends a request-to-send (RTS) packet to the receiving terminal. If the receiver

accepts the request, it replies with a clear-to-send (CTS) packet. If no collisions have occurred, the sender then begins transmitting its data.” EX1018, 262.

55. Indeed, by at least the 1980s, such pre-transfer request and acceptance messages were common in file transfer protocols. The specification of the File Transfer Protocol (FTP) (published in 1985), for example, specifies that the user device sends a “transfer request command” and that when the connection is established with the server device, “the server-PI sends a confirming reply to the user-PI.” EX1016, 18. Similarly, the specification for the Trivial File Transfer Protocol (TFTP) (published in 1992), specifies that “a transfer is established by sending a request ... and receiving a positive reply.” EX1017, 4.

E. Touchscreens

56. The '933 patent itself admits that touchscreens were known and were known to provide a simplified user experience. EX1001, 1:21-34 (“As the sophistication of user interfaces supporting data transfers has developed (for example, the emergence of touch screen and multi-touch technology), the user experience has been simplified considerably.”), 3:27-30, 8:15-38.

57. Indeed, multi-touch touchscreens were first developed decades earlier and had become widespread (e.g., such as in the iPhone) by the '933 patent's earliest alleged priority date (December 23, 2008) because they were versatile and easy to use. EX1036, 632, 633 (“In 1984, Lee at the University of Toronto first implemented

a capacitive sensor array capable of tracking multiple touches simultaneously.”), 634-635; EX1045, [0064], [0127], [0133], (a “multi-point touch screen is ... configured to detect multiple touches ... from ... multiple fingers concurrently touching ... the display”), [0141], claims 7, 14, 19, 24; EX1044, [0004] (“Touch screens, in particular, are becoming increasingly popular because of their ease and versatility of operation.”); EX1035, [0004] (“There exist today many styles of input devices” such as “touch screens.”), [0007-10]; EX1046, 2:16-20 (“To avoid problems associated with pushbuttons and complex menu systems, portable electronic devices may use touch screen displays.”), 12:33-39 (“multi-touch sensitive tablets [were] described in” several patents to Westerman); EX1065, 18-19, 92, 116, 144, 176-177.

58. Moreover, the use of taps, swipes, and other gestures on a multi-touch touchscreen to perform various functions, such as to select content and/or intended recipients, among other functions (e.g., pinch to zoom, swipe to scroll), was well known in the art, as reflected in, for example, the iPhone. EX1065, 17-19 (describing tap, flick, and other gestures), 63 (“Tap the person you want to text.”), 91-98 (select photo to send); EX1046, 19:45-46 (“the gesture corresponding to selection is a tap”), 25:30-31 (select a contact “by a tap”), 33:24-26, 34:8-11, 34:33-41 (pinch to zoom), 36:2-6 (tap to select recipient), 36:17-18 (tap to select contact), 56:28-37 (tap to select recipient); EX1035, Abstract, [0008] (“in touch pads, selections may be made

when one or more tap are detected”), [0066-72], [0084-105]; EX1045, [0011], [0060] (pinch to zoom), [0065], [0078-83], [0097-108]; EX1033, [0067], [0083], [0085], [0091], [0093], [0111] (“tapping on a single photo to select it); EX1034, 5:64-65 (“[a] particular file may be selected, e.g., by touching it”); EX1036, 636; EX1037, 32; EX1004, [0019-20], [0032-35], [0037], [0064], FIGS. 1, 3; EX1019, Abstract, [0004-6], [0015-31], claims 1-2, 4, FIGS. 4A, 4B; EX1032, Abstract, [0005-12], [0020], [0024-25], [0028], [0036-49].

VIII. GROUND 1: CLAIMS 1-9, 11, 13-14, 22-31, 33, 35-36, AND 44 ARE OBVIOUS OVER AHYA AND MCKILLOP

A. Ahya (EX1004)

59. Ahya is in the same field of endeavor as the ’933 patent: data transfer between wireless devices. EX1001, Title; EX1004, Title, Abstract, [0002], [0005].

60. Ahya discloses touchscreen-containing mobile stations (e.g., mobile telephones) that wirelessly communicate with one another over a wireless link (e.g., radio frequency (RF) signals) using a wireless communication protocol, such as Bluetooth and/or Wi-Fi (802.11). EX1004, Abstract, [0006], [0013-18], [0034], [0045], [0052-53], FIGS. 1-2; *see also* EX1008, 44 (“Wi-Fi is meant to be used generically when referring to any type of 802.11 network”); EX1009, 26 (“802.11b is also called Wi-Fi”).

61. The mobile stations detect one another “in accordance with the Bluetooth protocol” (EX1004, [0018]) and exchange media content (“data files, text,

audio, video and/or any other information that may be communicated in an electronic format”) (EX1004, [0032]) over a direct wireless link, responsive to a user’s touchscreen inputs. EX1004, [0033-37], [0041], [0045], [0062], [0064]; FIGS. 2-3.

62. A user can, for example, send media content to another mobile station over a wireless communication link using a simple tap and swipe gesture. EX1004, [0034-35], [0037], [0045], [0062], [0064]. Specifically, the user selects the content to send by “selecting the identifier 174 associated with the content 170” (EX1004, [0035]) with “a stylus or an appendage (e.g., finger or thumb)” (EX1004, [0045]). The user then identifies the mobile station to send the content by “moving the identifier in the general direction of the mobile station 120-140 and/or user 122-142 to which the user 112 desires the content 170 to be communicated.” EX1004, [0037].

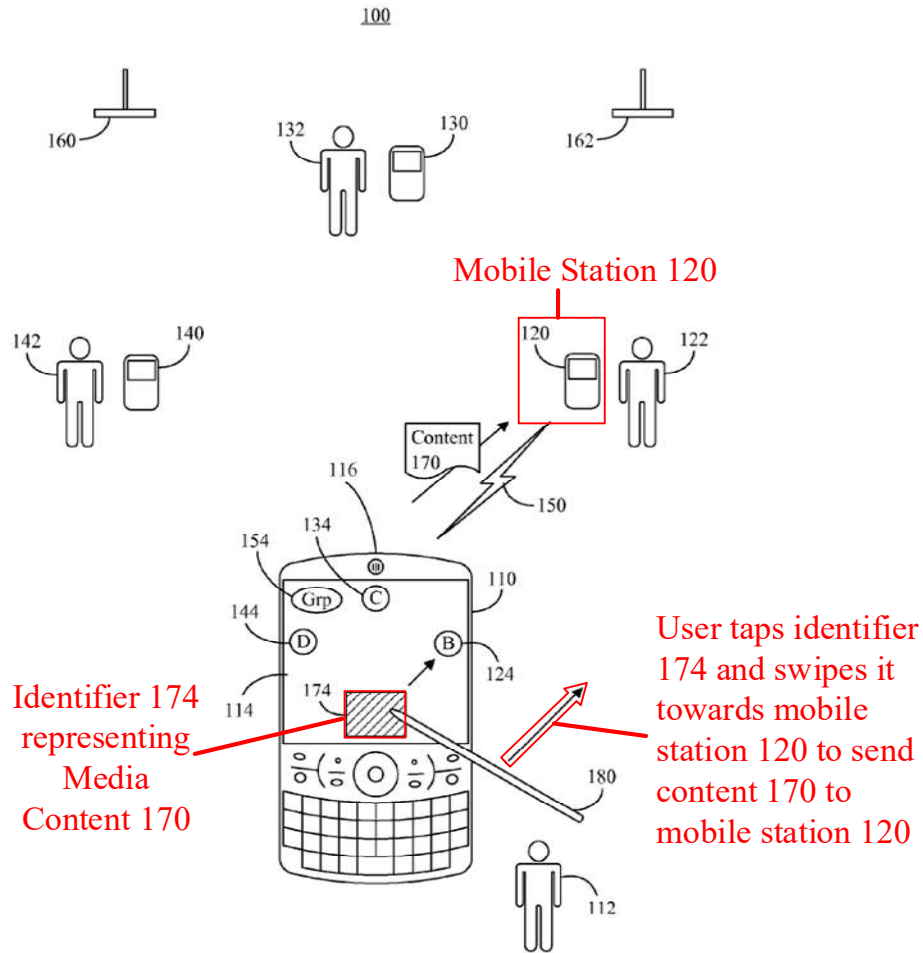


FIG. 1

EX1004, FIG. 1 (red annotations added).

63. “In response, the mobile station 110 can transmit the content 170 to the mobile station [] via the direct wireless communication link 150.” EX1004, [0033]. Specifically, the transceiver “wirelessly transmits the content to the second mobile station” (EX1004, [0006]), using a wireless communication protocol, “such as 802.11” (EX1004, [0015]).

64. Ahya also discloses prompting the user of the mobile station to confirm the intended recipient to prevent accidentally sending content to the wrong person. EX1004, [0023], [0038], [0041] (“user prompts [] can be implemented on the mobile station 110 ... to reduce the likelihood of content being accidentally sent to non-intended recipients”).

B. McKillop (EX1005)

65. McKillop is in the same field of endeavor as the '933 patent: data transfer between wireless devices. EX1001, Title; EX1005, Abstract, [0009-15], claim.

66. In the same field as Ahya, McKillop similarly discloses touchscreen-containing wirelessly connected electronic devices that communicate with one another using wireless communication protocols, such as Bluetooth and/or Wi-Fi. EX1005, Abstract, [0010-15], [0028-29], [0037], [0041-45], FIGS. 3-4. Like Ahya, McKillop uses Bluetooth to detect and establish initial communication with other devices. EX1005, [0013-17], [0038], [0041-45], claims 1-2, FIG. 4.

67. Once communications have been established, however, McKillop discloses switching to Wi-Fi to transfer the media content (e.g., pictures). EX1005, Abstract, [0013-17], [0038], [0042-45], claims 2-4, FIG. 4. Wi-Fi is preferred over Bluetooth, such as when “a large data transfer is desired,” because it is “higher

bandwidth” (i.e., faster), and thus transfers files more quickly. EX1005, [0042]; *see also id.*, Abstract, [0013-15], [0038], [0043-45], claims 1-3.

68. As one example, McKillop describes how when a “user selects an option that could require high speed access” (e.g., obtain large files such as pictures), the device “begins sending out seek ping signals looking for another Bluetooth device.” EX1005, [0043]; *see also id.*, [0014]. Once a response is received from another device, “the original device initiates a handshaking process,” “the two devices agree to switch their communication mode to Wi-Fi,” and the “high speed communication begin[s]” (e.g., a photo transfer over Wi-Fi begins). EX1005, [0044, 45]; *see also id.*, [0014-15], [0017], [0042-43], claim 1, FIG. 4.

69. McKillop explains that this protocol switching advantageously provides “power efficient high speed communication[s]” because Bluetooth is “low power” and Wi-Fi is “high speed.” EX1005, Title, Abstract, [0003], [0013-15], [0046], claims 2-3; *see also id.*, [0002], [0018], [0041-43], [0047]. McKillop also explains that Wi-Fi has a greater range than Bluetooth. EX1005, [0006].

C. Combining Ahya and McKillop

70. Ahya and McKillop each discloses Bluetooth- and Wi-Fi-enabled wireless devices that include touchscreens for receiving user inputs and Bluetooth discovery for detecting other nearby devices. EX1004, [0013-20], [0032-35], [0037], [0045], [0049], [0062], [0064], claim 11, FIGS. 1, 3; EX1005, Title, Abstract, [0002-

7], [0010-17], [0028-30], [0034], [0038], [0042-47], claims 2-5, FIGS. 2-4. When implementing these wireless devices, a POSITA would have been motivated to program the devices to switch from Bluetooth to Wi-Fi to transfer content, as taught by McKillop, because Wi-Fi is faster (i.e., has higher throughput speeds) than Bluetooth. *See, e.g.*, EX1005, Abstract, [0003], [0006] (“Wi-Fi connections ... operate at significantly higher speeds” than Bluetooth), [0013-15], [0016] (the devices “agree to switch to Wi-Fi to take advantage of the higher bandwidth.”), [0042], claims 2-3.

71. Further, when implementing the Ahya+McKillop wireless devices, a POSITA would have been motivated to program the devices to prompt users to either accept or deny an incoming file transfer and to initiate the transfer only after receiving the recipient’s acceptance, as was well known in the art, so that users could reject unwanted content (e.g., spam, malware, file size too large, content not appropriate for receiving device, etc.). In implementing this functionality, a POSITA would have programmed the devices to exchange request and acceptance messages, as was well-known in then-existing file transfer protocols. *Supra* Sections VII.C-D.

72. A POSITA would have reasonably expected to succeed in implementing these features because they would have required only minor software code that was well within the skill of a POSITA as evidenced by these features’ ubiquity in the prior art. *Supra* Sections, VII.A-D.

**1. A POSITA Would Have Been Motivated
With A Reasonable Expectation Of Success
To Implement Ahya+McKillop's Devices With
Bluetooth For Detection And Wi-Fi For Content Transfer**

73. McKillop provides express motivation for switching from Bluetooth to Wi-Fi to transfer files: speed and range. *See, e.g.*, EX1005, [0006] (compared to Bluetooth “Wi-Fi connections have a greater range ... and operate at significantly higher speeds”). McKillop specifically teaches using Bluetooth when searching for and connecting with another device because Bluetooth is “low power,” and thus saves power, and then switching to Wi-Fi to transfer data because it is “high speed.” EX1005, Title, Abstract, [0002-3], [0006], [0013-14], [0017], [0038], claims, 2-3, FIG. 4; *see also id.*, [0015-16], [0018], [0041-45]. Thus, a POSITA implementing Ahya+McKillop would have been motivated to use Bluetooth to detect other devices and then switch to Wi-Fi when transferring files, as taught by McKillop and well known in the art, because Wi-Fi is faster than Bluetooth and has a greater range. EX1004, [0018]; EX1005, Abstract, [0002-3], [0013-18], [0038], [0041-47], claims 2-3, FIGS. 3-4; *supra* Sections VII.A-B. This provides a high-speed, power-efficient file transfer system, as expressly taught by McKillop.

74. The resulting combination requires only minor software code. Ahya and McKillop each teaches devices that support both Bluetooth and Wi-Fi, as was common. EX1004, [0013-16], [0018], [0034], [0045], [0052-53], [0055], FIGS. 1-

2; EX1005, [0017], [0024], [0033-34]; *see also id.*, Abstract, [0003-7], [0010-18], [0029-30], [0038-46]; *supra* Sections VII.A-B.

75. Specifically, POSITAs understood that it was beneficial to include both Bluetooth and Wi-Fi so that mobile devices could directly wirelessly connect with nearby devices using Bluetooth and connect with a router using Wi-Fi to access the Internet. Wi-Fi was also useful for ad hoc connections between wireless devices, as well as for connecting to peripheral devices, such as printers.

76. The combination retains Ahya's Bluetooth discovery (EX1004, [0018]; EX1005, [0013-17], [038], [0041-45]) for any device-to-device interactions prior to actual transfer of content to save power, as taught by McKillop, and entails implementing minor software code to switch to Wi-Fi when transferring a file to expedite the transfer, as taught by McKillop. EX1005, Abstract, [0002-3], [0013-18], [0038], [0041-47], claims 2-3, FIGS. 3-4.

77. A POSITA would have reasonably expected to succeed in implementing this minor software code because it was well within the skill of a POSITA, as reflected by the numerous prior art references disclosing this Bluetooth-to-Wi-Fi switching. *Supra* Sections VII.A-B.

2. A POSITA Would Have Been Motivated With A Reasonable Expectation Of Success To Implement Ahya+McKillop Devices To Allow Users To Deny Incoming Transfers Using Request And Acceptance Messages, As Was Common In The Art

78. A POSITA also would have been further motivated to further implement the Ahya+McKillop wireless devices to prompt users to either accept or deny incoming file transfers, as described by numerous background references—including Hinckley, Guo, Turner, and several Nokia phone user guides—to allow users to reject unwanted content (e.g., spam, malware, file size too large, content not appropriate for receiving device, etc.). *Supra* Section VII.C.

79. Turner, for example, explains that “Bluetooth does provide various security mechanisms that can be used to prevent unwanted connections to a device and a subsequent infection by malware.” EX1028, 2. For example “if a connection does result in some type of file transfer, users can be prompted as to whether they wish to accept such a transfer.” *Id.*

80. Cheverst shows one such exemplary prompt.



Figure 6. Typical mobile phone display prompting the user to receive her selected image

EX1020, 49.

81. Hinckley further discloses that displaying “a thumbnail preview of the image o[r] file name that another user is transmitting” lets the recipient “know exactly what they are agreeing to receive before they actually receive it.” EX1007, [0061-62].

82. Thus, a POSITA would have been motivated to implement the Ahya+McKillop wireless devices such that they prompt a user to accept or decline an incoming transfer so that the user knows what the incoming file is and can prevent the file from being transferred if the user does not want to receive the file, such as if they suspect the file could contain malicious content and/or if the file is from an unknown sender.

83. The resulting combination requires only minor software code. Ahya teaches including “a display” that displays prompts in each of the wireless devices. EX1004, Abstract, [0006], [0019-20], [0023], [0034], [0037-38], [0041-42], [0045], [0049], claims 8-12, 15-18, 20, FIGS. 1-3. Thus, implementing this well-known prompt functionality in the Ahya+McKillop devices would have required only minor software code, including: (1) software to notify the receiving device about the transfer (i.e., by sending a message to the receiving device requesting to transfer a selected file); (2) software to, responsive to receiving such a request to transfer a file, display a message prompting the user to accept or deny the transfer; and (3) software to, upon receiving the user’s acceptance to receive the file, forward this acceptance to the sending device (i.e., by sending an acceptance message) to let the sending device know when it is allowed to start sending the selected file. The sending device, in turn, would wait to initiate and/or complete the transfer of the file until receiving the acceptance message from the receiving device.

84. Implementing the exchange of these messages (e.g., using Bluetooth, or Wi-Fi, or both) was straightforward given that such pre-transfer messages were commonly utilized in many file transfer protocols, including FTP, TFTP, Wi-Fi’s RTS-CTS, and Bluetooth’s OBEX PUT operation. *Supra* Section VII.D. A POSITA would have reasonably expected to succeed in implementing this minor software modification to the Ahya+McKillop wireless devices at least because it was well

within the programming skill of a POSITA, as reflected by the numerous prior art references disclosing this messaging functionality. *Id.* Wireless devices of the time when the patent was filed used operating systems (e.g., Windows, iPhone iOS) that provided application programming interfaces (APIs) for sending and receiving messages using the communications interfaces, including Wi-Fi and Bluetooth. Thus, a POSITA could have readily written a program to send and receive the pre-transfer messages over Bluetooth then switched to Wi-Fi for transferring the file, again using the available communications APIs. Alternatively, the POSITA could have written the program to first switch to Wi-Fi then send and receive the pre-transfer messages over Wi-Fi, followed by transferring the file.

**D. Detailed Claim Mapping For Claims
1-9, 11, 13-14, 22-31, 33, 35-36, And 44**

1. Claim 1

a) Element [1.1]

[1.1] A method performed by a wireless transmit/receive unit (WTRU), the method comprising:

85. To the extent the preamble is limiting, Ahya-McKillop satisfies it. Ahya's "mobile stations" (WTRUs) "communicate among each other via direct wireless communication links." EX1004, [0013-14]. Ahya's mobile stations are WTRUs at least because the '933 patent says so. EX1001, 2:26-32 ("wireless transmit/receive unit (WTRU)' includes but is not limited to ... a mobile station").

Moreover, Ahya’s exemplary types of mobile stations—“personal digital assistants, mobile computers, mobile terminals, mobile telephones, mobile radios, [and] application specific devices” (EX1004, [0013], FIGS. 1-3)—fall within the ’933 patent’s WTRU definition. EX1001, 2:26-32 (“wireless transmit/receive unit (WTRU)’ includes but is not limited to ... a communications device, a mobile station, a fixed or mobile subscriber unit, a pager, a cellular telephone, a personal digital assistant (PDA), a computer, or any other type of device capable of operating in a wireless environment.”). Similarly, McKillop’s “portable electronic device[s]” such as a “mobile or cellular telephone[s] or . . . computer[s]” (WTRUs) include “Wi-Fi circuitry” and “Bluetooth circuitry” for establishing a “direct communications path.” EX1005, [0017], [0024], [0033-34]; *see also id.*, Abstract, [0003-7], [0010-18], [0029-30], [0038-46]. As explained in the following paragraphs, it would have been obvious to implement a wireless device (e.g., a mobile station, mobile phone, and/or computer) in accordance with Ahya’s and McKillop’s teachings to perform the claimed method. Thus, the Ahya+McKillop system satisfies the preamble.

b) Element [1.2]

[1.2] processing, by the WTRU, a touchscreen input to select a media element;

86. Ahya discloses this claim element. Specifically, Ahya discloses that a user selects “content” such as a “video” (media element) by selecting, with their

finger or stylus via a touchscreen, an “identifier,” such as “an icon, an image, a graphic,” representing that content, as shown in FIG. 1. EX1004, [0019]; *see also id.*, [0019-20], [0032-35], [0037], [0045], [0049], [0062], [0064], claim 11, FIGS. 1, 3. A “video” is a claimed media element. *See* EX1001, claims 3, 25 (“the media element is any one of a photograph, video, or a document”).

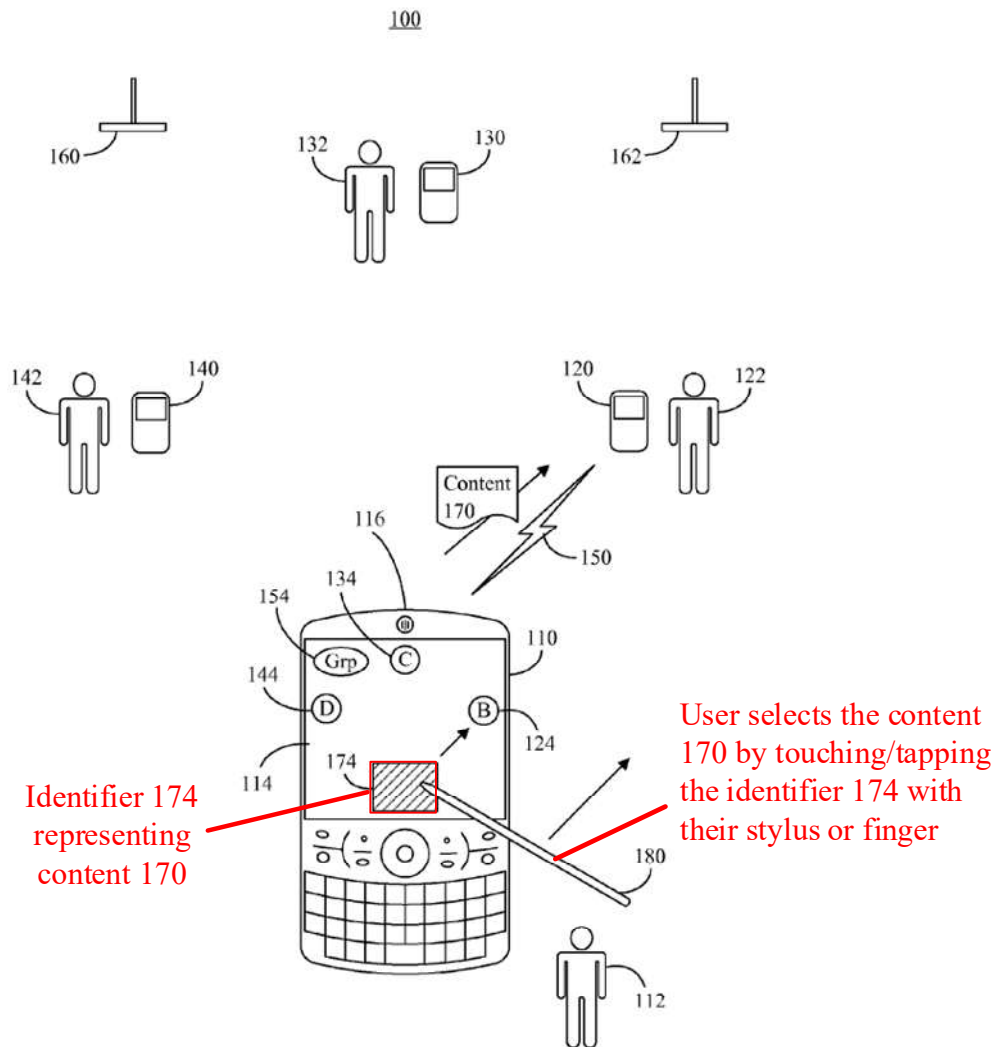


FIG. 1

EX1004, FIG. 1 (red annotations added).

87. Ahya’s “mobile station” (WTRU) processes this “selection of the identifier representing the content” at least because it detects and acts upon the selection. EX1004, [0064]; *see also id.*, [0032-35], [0037], [0055] (“[t]he controller 202 also can process user inputs received via the user interface 204”). Thus, the Ahya+McKillop system satisfies this element.

c) Element [1.3]

[1.3] detecting, by the WTRU using Bluetooth, a plurality of WTRUs in proximity to the WTRU;

88. Ahya discloses this claim element. Specifically, Ahya discloses that the mobile stations (WTRU) “can detect the presence of one or more of the [other three] mobile stations ... in accordance with the Bluetooth protocol.” EX1004, [0018]; *see also id.* FIG. 1 (showing example with detecting mobile station 110 and three detected mobile stations 120, 130, 140). POSITAs understood that Bluetooth detects other wireless devices in proximity because Bluetooth is a short-range personal area network (PAN) (EX1004, [0015], [0018]) that includes discovery protocols to discover other Bluetooth devices that are within Bluetooth’s range of “approximately 10 meters” (EX1022, 1:66) or “less than 30 feet” (EX1009, 119). *E.g.*, EX1022, 1:42-2:13; *see also supra* Section VII.A. McKillop similarly discloses detecting other wireless devices using Bluetooth. EX1005, [0013-17], [038], [0041-45]. Thus, the Ahya+McKillop system satisfies this element.

d) **Element [1.4]**

[1.4] processing, by the WTRU, another touchscreen input to select a WTRU of the plurality of WTRUs;

89. Ahya discloses this claim element. Specifically, Ahya discloses that a user uses the touchscreen to select one of the “mobile station[s] 120-140” (a WTRU of the plurality of WTRUs) by “moving the identifier in the general direction of the mobile station ... to which the user 112 desires the content 170 to be communicated.” EX1004, [0037]; *see also id.*, [0019-20], [0032-35], [0064], FIGS. 1, 3. Ahya illustrates this selection in FIG. 1:

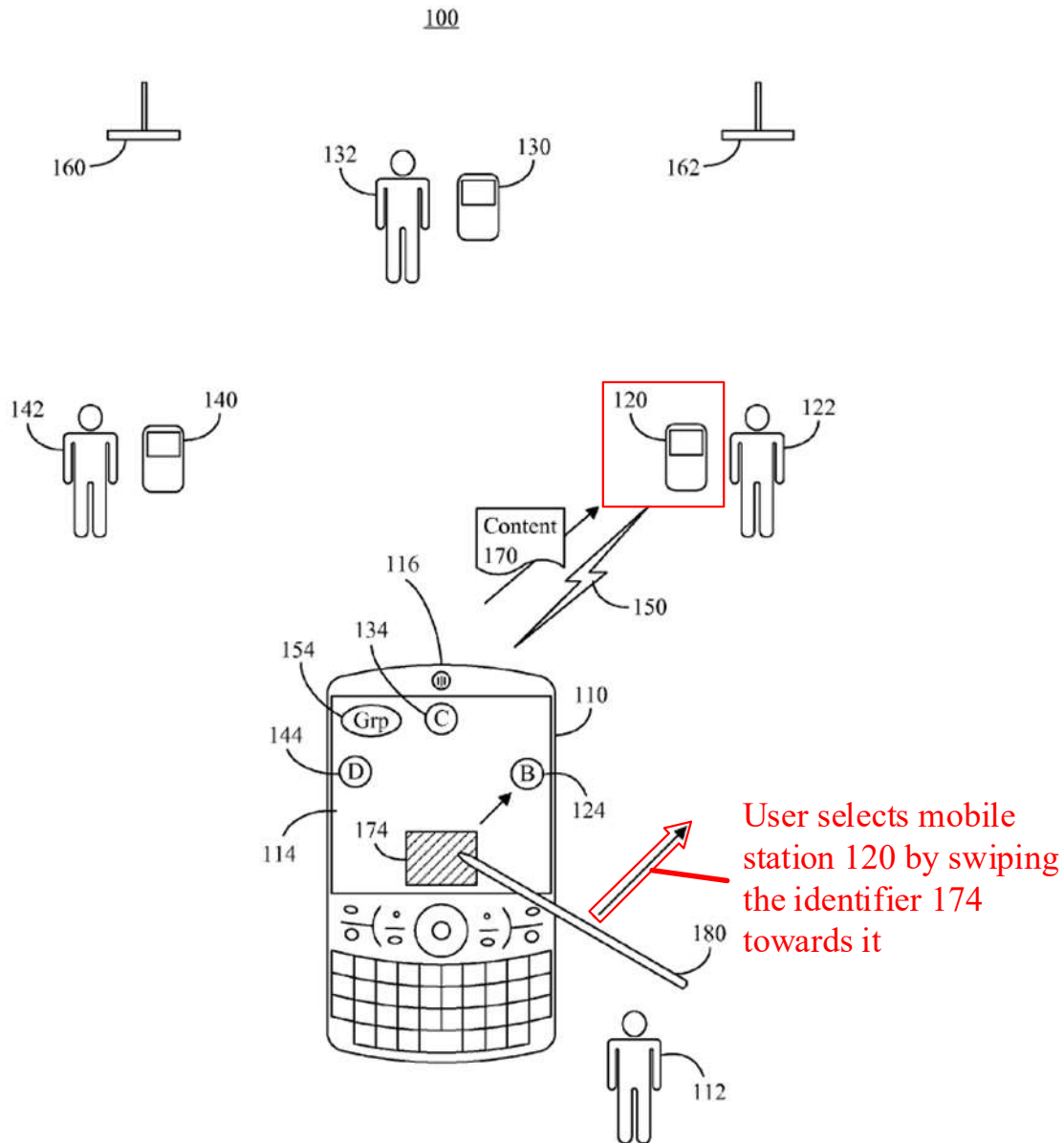


FIG. 1

EX1004, FIG. 1 (red annotations added).

90. The wireless device processes this selection of the other wireless device by “detecting the appendage or stylus being moved toward the determined direction in which the second [wireless device] is positioned.” EX1004, [0064]; *see also id.*,

[0032-35], [0037], [0055]. Thus, Ahya discloses processing, by the WTRU, another touchscreen input to select a WTRU of the plurality of WTRUs.

91. Thus, the Ahya+McKillop system satisfies this element.

e) **Elements [1.5-1.6]**

[1.5] sending, by the WTRU, a message to transfer the selected media element to the selected WTRU;
 [1.6] receiving, by the WTRU, an acceptance to transfer the selected media element to the selected WTRU;

92. These limitations are obvious over Ahya-McKillop, as implemented based on the knowledge of a POSITA.

93. As evidenced by numerous background prior art references, when implementing content transfer systems, it was well-known to prompt the user of a receiving device to either accept or deny an incoming data transfer. *Supra*, Section VII.C; EX1007, [0061], claims 3-4; EX1027, [0017] (“[The receiving mobile phone’s] processor 10 causes GUI 12 to prompt the user to accept the data file 16”); EX1028, 2 (“users can be prompted as to whether they wish to accept such a transfer”).

94. Cheverst, for example, shows a “[t]ypical mobile phone display prompting the user to receive her selected image” by selecting either “yes” or “no”:



Figure 6. Typical mobile phone display prompting the user to receive her selected image

EX1020, 49.

95. Thus, as explained *supra* Section VIII.C.2, it was obvious to implement the Ahya+McKillop devices to prompt users to either accept or deny incoming file transfers. This common feature allowed users to prevent unwanted content (e.g., spam, malware, file size too large, content not appropriate for receiving device, etc.) from being transferred. *Supra* Sections VII.C, VIII.C.2. This functionality also complements Ahya’s teachings to present similar prompts on the sending device to “reduce the likelihood of content being accidentally sent to non-intended recipients.” EX1004, [0041]. Specifically, Ahya teaches prompting the sending user “to enter additional inputs to select the target mobile station.” EX1004, [0038]; *see also id.*, [0023].

96. Thus, a POSITA would have been motivated to implement the Ahya+McKillop devices to also present prompts on the receiving devices (in addition to the sending devices), so that the wireless devices not only prevent unintended transfers on the sender side, as taught by Ahya, but also prevent unwanted transfers on the receiving side. Ahya's complementary teachings to present prompts on the sending mobile station confirm that a POSITA would have reasonably expected to succeed in implementing prompts on the receiving device by simply adding similar software instructions for displaying and processing of user inputs. *Id.*

97. Moreover, a POSITA implementing this prompt functionality on the receiving device would have found it obvious (if not necessary) to do so through use of two messages: (i) a message requesting to transfer certain content, sent by the sending device to the receiving device after the sending user selected the content to send; and (ii) a message to accept the transfer of the selected content, received by the sending device from the receiving device after the receiving user confirmed acceptance. Such a request message would notify the receiving device of the transfer so that it could prompt the user to confirm or deny the transfer. The corresponding acceptance message would let the sending device know of the receiving user's acceptance so that the sending device knows when it is authorized to start the transfer.

98. This beneficial user confirmation functionality thus involved a simple back-end process of exchanging two messages. A POSITA would have reasonably expected success in implementing this functionality because it required only basic computer code that was well within the programming skill of a POSITA, as reflected by the fact that this messaging functionality was well known and commonly employed in then-existing file transfer protocols. *Supra* Section VII.D.

99. For example, POSITAs knew that one common way to implement this message exchange was using Bluetooth's OBEX PUT operation, in which a sending device (called the "client" in Bluetooth) sent a request to a receiving device (called the "server" in Bluetooth) with the name and length / size of the file to be sent. EX1015, 73-74; *see also id.*, 10, 22; EX1014, 319, 330; EX1053, 266, 425, 428-441. As illustrated below, the server device would then send a "response" to "CONTINUE" (an acceptance) to the client device, and thereafter, the client device would start sending the file to the server device.

9.2.4 Example Put Exchange

An application wishes to **PUT** a 2000 byte file named "**Test File Object**" with the time stamp 0x41a50016 (Jan 9, 1992, 11:02:00 UTC). The OBEX packet size is 512 bytes.

		Opcode or Response plus Headers	Final bit	Header Data	Header Length	Running Total of Data Exchanged
Request To Send File Named "Test File Object"	Request →	PUT Name Length Time		"Test File Object" "2000" "19920109T110200Z"	37 19	
Response To Continue	Response ←	CONTINUE no headers	✓			
Start of Transfer	Request →	PUT Body		"start of file data.."	509	506 bytes

EX1015, 74 (excerpted) (red annotations added).

100. Another obvious alternative was Wi-Fi's four-way RTS-CTS handshake (a well-known option for ad hoc Wi-Fi protocols defined by IEEE 802.11 DCF mode). EX1018, 261-262. This protocol used similar request and acceptance messages whereby "the sending node sends a request-to-send (RTS) packet to the receiving terminal. If the receiver accepts the request, it replies with a clear-to-send (CTS) packet. If no collisions have occurred, the sender then begins transmitting its data." *Id.*; see also EX1023, 1; EX1024, 270.

101. Moreover, the specifications for FTP and TFTP, published in the 1980s and 1990s, respectively, also disclose use of request and acceptance messages. EX1016, 18, 44; EX1017, 4 ("[a] transfer is established by sending a request ... and receiving a positive reply"), 5.

102. These background references reflect that POSITAs knew how to implement these pre-transfer request and acceptance messages, including through use of at least the Bluetooth and/or Wi-Fi protocols disclosed in each of Ahya and McKillop. Thus, based on his or her knowledge, as reflected in numerous background references, a POSITA would have naturally and easily included the claimed messaging functionality when implementing functionality to prompt a user to accept or deny an incoming transfer.

103. Thus, the Ahya+McKillop system satisfies these elements.

f) **Element [1.7]**

[1.7] and transferring, by the WTRU using a WiFi communication, the selected media element to the selected WTRU.

104. Ahya in combination with McKillop satisfies this claim element.

105. As explained above for element [1.3] (*supra* Section VIII.D.1.c), Ahya and McKillop each discloses using Bluetooth to detect and establish communications with other mobile stations (WTRUs). EX1004, [0018]; EX1005, [0013-17], [038], [0041-45]. Ahya further discloses that its mobile stations support Wi-Fi (802.11) and discloses wirelessly transferring a “video” (media element). EX1004, [0013-15], [0032-43], [0052-53], [0055], [0062-65], claims 1-3, FIGS. 1, 3; *see also* EX1008, 44; EX1009, 26 (“802.11b is also called Wi-Fi”).

106. McKillop expressly discloses switching from Bluetooth to Wi-Fi to transfer files because of its higher bandwidth. EX1005, Title, Abstract, [0002-3], [0006], [0010-17], [0028-30], [0034], [0038], [0042-47], claims, 3, 5, FIG. 4. Specifically, McKillop teaches using Bluetooth to initially detect and connect with another because Bluetooth is low power but teaches switching to Wi-Fi to transfer data because it is higher bandwidth / faster, as also taught by numerous other prior art references. *Id.*, Title, Abstract, [0002-3], [0006], [0013-17], [0038], [0041-46], claims, 3, 5, FIG. 4; *supra* Sections VII.A-B.

107. Thus, a POSITA implementing the Ahya+McKillop devices would have been motivated to use Bluetooth for any device-to-device interactions prior to actual transfer of content (as taught by Ahya) to save power (as taught by McKillop), and to switch to Wi-Fi (with its higher data speeds) for the actual transfer of media content to speed up the transfer (as taught by McKillop). EX1004, [0018]; EX1005, Title, Abstract, [0002-3], [0006], [0013-17], [0038], [0041-46], claims, 3, 5, FIG. 4; *supra* Sections VII.A-B.

108. Moreover, a POSITA would have been further motivated to use Wi-Fi for data transfers because it has a “greater range” than Bluetooth, as taught by McKillop, thus allowing users to move more freely during the transfer without interrupting or aborting the transfer. EX1005, [0006].

109. A POSITA would have reasonably expected to succeed in implementing this combination because it would have required only minor software code that was well within the programming skills of a POSITA. Specifically, since Ahya and McKillop each discloses supporting Bluetooth and Wi-Fi, a POSITA would have needed only to program the Ahya+McKillop devices to switch from Bluetooth to Wi-Fi at some point prior to the transfer to utilize the higher bandwidth Wi-Fi protocol. EX1004, [0015-16], [0052]; EX1005, Abstract, [0010], [0013-18], [0028-30], [0034], [0038], [0042-46], claim 5. The technical ease of implementing

this improvement is confirmed by the numerous background prior art references disclosing this Bluetooth-to-Wi-Fi switching. *Supra* Section VII.B.

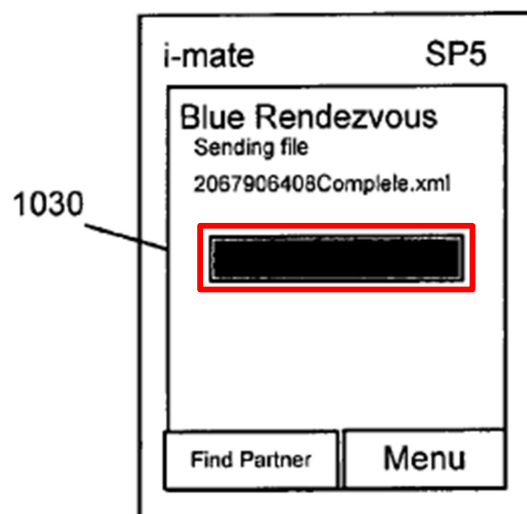
110. Thus, the Ahya+McKillop system satisfies this element.

2. Claim 2

2. The method of claim 1 further comprising: displaying, by the WTRU, a progress of the transfer to the selected WTRU.

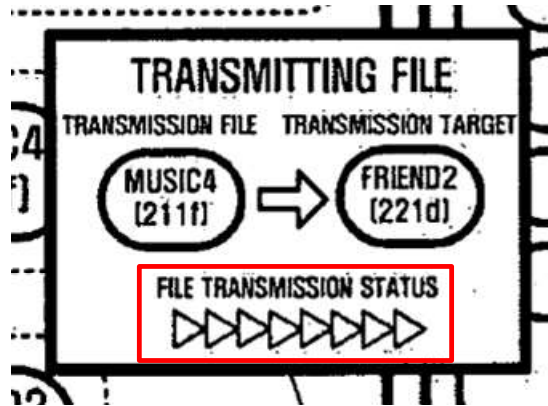
111. Ahya+McKillop and the knowledge of a POSITA render claim 2 obvious at least because it was well known to display the progress of a data transfer to inform the user of the status of the transfer.

112. Hinckley, for example, discloses that “[w]hen the user presses a soft key associated with the Send icon 1022, a progress bar gives feedback on the transfer. This is illustrated at 1030.” EX1007, [0058].



EX1007, FIG. 10 (excerpted) (red annotations added).

113. As another example, Lee discloses displaying a “file transmission status,” “thereby giving [] feedback to the user.” EX1047, FIG. 11C, [0130], [0010].



EX1047, FIG. 11C (excerpted) (red annotations added).

114. As another example, Boutsikakis discloses that “[d]uring data transmission, the systems and methods of the present invention may provide an indication to the user that the transmission is in progress. The systems and methods may also provide an indication when transmission has been completed.” EX1029, [0013].

115. It also was known to display a progress bar on the receiving device. EX1030, 6:44-50, FIG 5.

116. Moreover, the use of progress bars generally, and their benefits, were well known more than 20 years before the '933 patent's alleged priority date. EX1031 (published in 1985), 11-12 (“Progress indicators give the user enough information at a quick glance to estimate how much of the task has been completed and when the task will be finished.”), 16-17.

117. Thus, a POSITA would have been motivated to program the Ahya+McKillop devices to display the progress of the transfer to indicate the time remaining for the transfer so that, for example, users know when they may move their devices out of Wi-Fi range of each other. A POSITA would have had a reasonable expectation of success in implementing this functionality in the Ahya+McKillop devices because it would have required only elementary computer code that was well within the programming skill of a POSITA, as evidenced by the widespread use of such functionality in the art.

118. Thus, the Ahya+McKillop system satisfies the claim.

3. Claim 3

3. The method of claim 1 wherein the media element is any one of a photograph, video, or a document.

119. This claim is obvious over Ahya and McKillop because Ahya discloses that its “content” includes a “video” and McKillop discloses that its media is a “picture[]” or “photo.” EX1004, [0032]; EX1005, [0014-15].

120. Thus, the Ahya+McKillop system satisfies the claim.

4. Claim 4

4. The method of claim 1 wherein the touchscreen input or the another touchscreen input is a tap.

121. This claim is obvious over Ahya in view of the state of the art. As explained above for claim 1, Ahya discloses that the user “select[s]” the identifier

(e.g., icon) displayed on Ahya’s touchscreen with a “stylus 180 or [] appendage.” EX1004, [0035]; *see also id.*, [0019], [0034], [0045], [0064], claims 11, 18, FIG. 1. A POSITA would have understood and/or at least have found it obvious that this “select[ion]” on the touchscreen is a tap because it was well understood that this is how a user selects an icon on a touchscreen. *Supra* Section VII.E. As discussed above in Section VII.E, Karkkainen, Ramos, Harrison, Hotelling ’521, Westerman, and Rekimoto for example, each discloses selecting an item on a touchscreen by tapping it. EX1032, [0024]; EX1033, [0111] (“tapping on a single photo to select it”); EX1034, 5:64-65 (“[a] particular file may be selected, e.g., by touching it”); EX1035, [0008]; EX1036, 636 (“tap to left click”); EX1037, 32 (“the user picks up an [sic] computer object by tapping it”).

122. Claim 4 is further obvious because the ’933 patent itself admits that it was known to convert touchscreen “user actions” and inputs, including a “tap 6A,” “to electromechanical signals through mechanisms known in the art.” EX1001, 8:15-38.

123. Thus, the Ahya+McKillop system satisfies the claim.

5. Claim 5

5. The method of claim 1 wherein the message to transfer is a request.

124. This claim is obvious over Ahya and McKillop in view of the state of the art. Specifically, it would have been obvious to implement the message as a

request because, as explained above for claim 1, it was well known in the art for the message to be a request, as reflected in then-existing file transfer protocols. *Supra* VIII.D.1.e (elements [1.5-1.6]); EX1014, 330 (“PUT request”); EX1015, 74 (“Request”); EX1017, 4 (“sending a request”), 5; EX1018, 262 (“the sending node sends a request-to-send (RTS)”). This reflects the common sense understanding that the purpose of sending a message before initiating a transfer is to request permission to initiate the transfer.

125. Thus, the Ahya+McKillop system satisfies the claim.

6. Claim 6

6. The method of claim 1 wherein the WiFi communication is a WiFi link.

126. This claim is obvious over Ahya and McKillop because Ahya discloses that its wireless communication (e.g., Wi-Fi) is a “wireless communication link.” EX1004, [0015]; *supra* Section VIII.D.1.f (element [1.7]); *see also* EX1005, Abstract, [0013-17], [0038], [0042-45], claims 2-4, FIG. 4.

127. Thus, the Ahya+McKillop system satisfies the claim.

7. Claim 7

7. The method of claim 1 wherein the WiFi communication or Bluetooth is provided by a communication peripheral.

128. This claim is obvious over Ahya and McKillop because Ahya discloses that the “mobile station[s]” (WTRUs) each include “transceivers” (communication

peripherals) that provide the Wi-Fi communication or Bluetooth. EX1004, Abstract, [0052] (“The transceiver(s) 224 can communicate data via IEEE 802 wireless communications, for example, 802.11, 802.15 and 802.16, Bluetooth”), [0055], FIG. 2; *see also* EX1005, [0030], [0034], FIG. 2.

129. Thus, as implemented, the Ahya+McKillop system satisfies the claim.

8. Claim 8

8. The method of claim 1 wherein Bluetooth discovery is used to detect the plurality of WTRUs in proximity to the WTRU.

130. Because Ahya and McKillop each discloses using Bluetooth to detect other wireless devices (EX1004, [0018]; EX1005, [0013-17], [038], [0041-45]), it would have been obvious to detect the nearby wireless devices using Bluetooth discovery, such as the Bluetooth device discovery provided by the Bluetooth’s generic access profile because this is how Bluetooth works, as described by the Bluetooth specification. EX1014, 38-43; *see also id.*, 13-97; *supra* Sections VII.A, VIII.D.1.c.

131. Thus, as implemented, the Ahya+McKillop system satisfies the claim.

9. Claim 9

9. The method of claim 8 wherein the Bluetooth discovery is provided using a service discovery protocol.

132. As explained above for claim 8 (*supra* Section VIII.D.8), each of Ahya and McKillop discloses using Bluetooth for discovery. EX1004, [0018]; EX1005,

[0013-17], [038], [0041-45]. POSITAs knew, as detailed in the Bluetooth specification, that Bluetooth's discovery includes a service discovery protocol (SDP). EX1014, 69-98; EX1053, 331-391; *see also supra* Section VII.A; EX1012, [0028] ("The SDP 208 may be utilized for querying Bluetooth® device information, Bluetooth® device services, and characteristics of the services."). The '933 patent itself admits as much. *See, e.g.*, EX1001, 5:38-46 ("a service discovery protocol (SDP) such as currently available in protocols such as Bluetooth®" may be invoked "to discover all of the TapAPP enabled WTRUs operating in a particular location").

133. Thus, a POSITA naturally would have implemented the Ahya+McKillop system to provide the Bluetooth discovery taught by Ahya and McKillop using an SDP at least because this was standard practice when implementing the Bluetooth specification.

134. Thus, the Ahya+McKillop system satisfies the claim.

10. Claim 11

11. The method of claim 1 further comprising:
determining, by the WTRU, that the selected WTRU is compatible to transfer the selected media element.

135. McKillop teaches determining that the selected device is compatible to transfer the content, such as a picture / photo (selected media element), by determining whether the selected device has Wi-Fi capabilities. EX1005, [0014], [0045] ("a determination is made as to whether the second device has the capability

to also communicate using the Wi-Fi protocol”). Moreover, compatibility checks were well known in the art. EX1029, [0011]; EX1042, [0007]; EX1038, Abstract, [0028]; EX1067, [0046]; EX1006, 12:32-13:4. POSITAs understood that these routine compatibility checks helped ensure that the receiving device is actually capable of receiving and processing the selected media element using the chosen protocol.

136. Thus, a POSITA would have been motivated to implement the Ahya+McKillop wireless devices to make a compatibility determination, as taught by McKillop, to ensure the receiving device can actually accept the transfer, as was well known in the art. EX1029, [0011]; EX1042, [0007]; EX1038, Abstract, [0028]; EX1067, [0046]; EX1006, 12:32-13:4. A POSITA would have had a reasonable expectation of success in implementing this functionality because it would have required only elementary computer code that was well within the programming skill of a POSITA, as evidenced by the numerous prior art references that disclose this compatibility check.

137. Thus, the Ahya+McKillop system satisfies the claim.

11. Claim 13

13. The method of claim 1 further comprising:
determining, by the WTRU, environment information that lists the plurality of WTRUs in proximity to the WTRU.

138. The Ahya+McKillop Bluetooth discovery process satisfies this claim because it allows the sending device to determine environment information that includes a list of the nearby devices. EX1004, [0018-21], [0026], FIG. 1. Moreover, as explained above for claim 9, the combined Ahya+McKillop system employed Bluetooth's service discovery protocol (SDP) since Ahya and McKillop each discloses using Bluetooth for discovery. *Supra* Section VIII.D.9; EX1004, [0018]; EX1005, [0013-17], [038], [0041-45]. The '933 patent itself admits that the Bluetooth protocol gathers the environment information. EX1001, 5:38-40 ("The environment information 301 may be gathered via a service discovery protocol (SDP) such as currently available in protocols such as Bluetooth®.").

139. Thus, the Ahya+McKillop system in view of a POSITA's knowledge of the Bluetooth protocol satisfies this claim.

12. Claim 14

14. The method of claim 1 wherein the WTRU processes the touchscreen input based on information from a touchscreen.

140. As explained above for elements [1.2] and [1.4], the Ahya+McKillop devices include a touchscreen and would process touchscreen input. EX1004, [0034], [0045]; *supra* Sections VIII.D.1.b, VIII.D.1.d (elements [1.2], [1.4]). A POSITA would have understood or at least found it obvious that the touchscreen input was based on information from the touchscreen. If the processors of the

Ahya+McKillop devices (WTRUs) did not receive information from the touchscreen, they would have no way of knowing whether touchscreen inputs have been entered, much less be able to process these inputs.

141. Thus, the Ahya+McKillop system satisfies the claim.

13. Claim 22

[22.1] The method of claim 1 further comprising:
 [22.2] receiving, by the WTRU from another WTRU, a request to transfer other media;
 [22.3] receiving, in response to accepting the request by the WTRU, the other media; and
 [22.4] displaying, by the WTRU, the other media in its entirety to a user of the WTRU.

142. Ahya and McKillop each teaches systems with a plurality of mobile devices (WTRUs) wirelessly communicating content with one another. EX1004, Abstract, [0013-18], [0032-37], FIG. 1; EX1005, Abstract, [0013-17], [0042-45], claim 1. A POSITA would have found it obvious that, within a combined Ahya+McKillop system, each device not only sends content to other devices but also receives content from those devices. Indeed, it would be counterintuitive to implement the system any other way. Within such a system, one obvious use scenario would have been a first device *sending* content to a second device, and then *receiving* content from a third device, with each content transfer employing the Bluetooth-to-WiFi switching method explained above with respect to claim 1. Under this and other similar and equally obvious use scenarios, claim 1 would have been

satisfied by the first transfer and claim 22 by the second transfer. *Supra* Sections VIII.C.2, VIII.D.1.e-f (explaining, for elements [1.5-1.7], why it was obvious to exchange the claimed request-to-transfer and acceptance-to-transfer messages when exchanging media between devices). This would have involved performing the claim 1 sending, receiving, and transferring steps—claim elements [1.5-1.7]—when sending content, and to perform the claim 22 receiving steps—elements [22.2] and [22.3]—when receiving content. A POSITA would have understood that each of the Ahya+McKillop devices sends and receives content to and from the other wireless devices because they are each equipped with the same wireless capabilities. EX1004, Abstract, [0006], [0013-18], [0034], [0045], [0052-53], FIGS. 1-2; EX1005, [0017], [0024], [0033-34]; *see also id.*, Abstract, [0003-7], [0010-18], [0029-30], [0038-46]. Thus, the Ahya+McKillop system satisfies this claim's receiving steps ([22.2] and [22.3]) because it allows a user to send a media element to one device and receive media from another device and this receiving involves the claimed receiving steps.

143. It also would have been obvious to a POSITA to program the Ahya+McKillop devices to display the received media to the user so that the user can see it. Perhaps the entire purpose of the transfer, especially when it involved a photo or video, was for displaying the transferred content on the receiving device. Thus, it would have been at least obvious to display the entirety of the content received on any of the receiving devices in the Ahya+McKillop system.

144. Thus, as implemented, the Ahya+McKillop system satisfies the claim.

14. Claims 23-31, 33, 35-36, And 44

145. Claims 23-31, 33, 35-36, and 44 are substantively identical to claims 1-9, 11, 13-14, and 22, respectively, but recite performing many of the claimed actions with a processor / circuitry. Because Ahya and McKillop each discloses performing its disclosed actions with processors and/or circuitry, these claims are obvious over Ahya, McKillop, and the state of the art for the reasons provided above in Sections VIII.C-D.13. EX1004, [0007], [0044-56], [0067-68], claims 19-20, FIG. 2; EX1005, [0010], [0024], [0028], [0033-37].

IX. GROUND 2: CLAIMS 1-9, 11, 13-14, 22-31, 33, 35-36, AND 44 ARE OBVIOUS OVER AHYA, MCKILLOP, AND TURNER

146. Claims 1-9, 11, 13-14, 22-31, 33, 35-36, and 44 are further obvious in view of Turner (discussed above in Ground 1 as a background reference).

147. Turner is in the same field of endeavor as the '933 patent: data transfer between wireless devices. EX1001, Title; EX1028, Title, 1-4.

148. As explained above for Ground 1, Turner discloses prompting a user to either accept or deny an incoming transfer (EX1028, 2) and a POSITA would have been motivated with a reasonable expectation of success to include this prompt functionality in the Ahya+McKillop wireless devices so that users could reject unwanted content (e.g., spam, malware, file size too large, content not appropriate for receiving device, etc.), and would have easily implemented this prompt

functionality by programming the Ahya+McKillop wireless devices to exchange request and acceptance messages (claim element [1.5-1.6]), as was well-known in then-existing file transfer protocols. *Supra* Sections VIII.C.2, VIII.D.1.e.

149. Thus, for at least the reasons provided above in Ground 1, claims 1-9, 11, 13-14, 22-31, 33, 35-36, and 44 are further obvious over Ahya, McKillop, Turner, and the knowledge of a POSITA.

X. GROUND 3: CLAIMS 1-9, 11, 13-14, 22-31, 33, 35-36, AND 44 ARE OBVIOUS OVER HODDIE AND HINCKLEY

A. Hoddie (EX1006)

150. Hoddie (EX1006) in the same field of endeavor as the '933 patent: data transfer between wireless devices. EX1001, Title; EX1006, Abstract, 1:24-6:11, claim 1.

151. Hoddie discloses wireless devices (e.g., PDAs such as the Sony CLIE, laptops, etc.) that communicate with one another using two different wireless communication protocols, such as Bluetooth and Wi-Fi. EX1006, 3:2-6:24, 7:16-15:25, FIGS. 1, 3-4. Specifically, when a user “wants to send a data file to a[nother] user,” (EX1006, 3:26-28) such as an “image file” (i.e., a picture) (EX1006, 5:24-28), the sending device uses Bluetooth to “search[] for other devices” (EX1006, 3:30-31), “open a [] connection” (EX1006, 4:1), and “negotiate how to send the file” (EX1006, 4:8-9). If “the size of the file would make it more appropriate to send ... across a Wi-Fi connection (because of the improved bandwidth of the Wi-Fi

connection compared to a Bluetooth connection),” the devices “agree on setting up a Wi-Fi connection,” and the sending device “sends the file to the [receiving device] across the Wi-Fi connection.” EX1006, 4:9-22.

152. The user initiates the file transfer by “select[ing] a ‘send file’ operation and a file to send” using “the user interface” (e.g., the touchscreen of a Sony CLIE personal digital assistant (PDA)) and “confirm[ing] ... the intended recipient of the selected file.” EX1006, 3:27-4:4; EX1058, 24-25, 26 (“[i]nput device” of a “Sony CLIE PEG-TH55” includes a “[t]ouch-screen”), 27.

B. Hinckley (EX1007)

153. Hinckley (EX1007) is in the same field of endeavor as the ’933 patent: data transfer between wireless devices. EX1001, Title; EX1007, Abstract, [0010-12].

154. Like Hoddie, Hinckley discloses touchscreen-containing mobile devices that wirelessly exchange files such as images using a wireless protocol such as Bluetooth. EX1007, Abstract, [0010-12], [0027], [0031-38], [0058-62], FIGS. 6, 8-10. Hinckley, however, additionally discloses notifying the user of a receiving device of an incoming transfer (e.g., via a displayed prompt) to give the user an opportunity to accept or reject the transfer. EX1007, [0035], [0038], [0058-62], claims 3-4, FIGS. 3, 9. For example, discloses “displaying on the receiving device an indication that information is to be received” (*id.*, claim 3), including, for

example, the “file name” or “thumbnail preview” (*id.*, [0061]) of an image to be received. The user “may be presented with a Yes/No option to receive the image” (*id.*, [0038]) and if the user rejects the image / information (e.g., selects the No option), the receiving device “block[s] the receipt of the indicated information” (*id.*, claim 4).

C. Combining Hoddie And Hinckley

155. When implementing wireless, mobile devices that detect each other using Bluetooth and then use Wi-Fi to transfer files or other content between one another, as taught by Hoddie, a POSITA would have been motivated to implement the wireless devices with a touchscreen interface that prompted receiving users to either accept or deny incoming file transfers on the touchscreen interface, as taught by Hinckley, to allow users to prevent unwanted content (e.g., spam, malware, file size too large, content not appropriate for receiving device, etc.) from being transferred, as similarly explained above for Ground 1. *Supra* Sections VII.D, VIII.C.2. VIII.D.1.e; EX1007, [0035], [0038], [0058-62], FIGS. 3, 9.

156. Hinckley, for example, explains that including the “a thumbnail preview of the image o[r] file name” in the prompt lets the recipient “know exactly what they are agreeing to receive before they actually receive it.” EX1007, [0061-62].

157. Turner explains that such prompts were standard parts of Bluetooth security mechanisms to, for example, prevent malware infections. EX1028, 2:7-11 (“Bluetooth does provide various security mechanisms that can be used to prevent unwanted connections to a device and a subsequent infection by malware.” For example, “if a connection does result in some type of file transfer, users can be prompted as to whether they wish to accept such a transfer.”).

158. Thus, a POSITA would have been motivated to prompt a user to accept or decline an incoming transfer so that the user knows what the incoming file is and can prevent the file from being transferred if the user does not want to receive the file, such as if they suspect the file could contain malicious content and/or if the file is from an unknown sender.

159. The resulting combination requires only minor software code. Specifically, when implementing wireless devices in accordance with Hoddie’s and Hinckley’s teachings, it would have been obvious to a POSITA to program the wireless devices to exchange request and acceptance messages before transferring files, as was commonly done in many file transfer protocols, including FTP, TFTP, RTS-CTS, and Bluetooth’s OBEX PUT operation. *Supra* Section VII.D.

160. Specifically, it would have been obvious to program the sending device to send a request to transfer the content to the receiving device so that the receiving device knows about the transfer and can prompt the user to either accept or deny it.

It further would have been obvious to program the receiving device to send an acceptance back to the sending device when the receiving user approves the transfer so that the sending device knows when it is authorized to start and/or complete the file transfer, as similarly explained above for Ground 1. *Supra*, Sections VIII.C.2. VIII.D.1.e.

161. A POSITA would have reasonably expected to succeed in implementing this minor software modification at least because it was well within the programming skill of a POSITA, as reflected by the numerous prior art references disclosing this messaging functionality. *Id.* Furthermore, the POSITA would have been motivated to implement the mobile devices with touchscreens, for several reasons. First, Hoddie itself identifies the Sony Clie™ as an exemplary mobile device and it was known that at least two of these Clie™ models had touchscreen interfaces. EX1058, 24-27; EX1064, 12, 25. Thus, Hoddie itself teaches to use a known touchscreen device. Second, Hinckley notes that “[m]obile devices typically include one or more buttons, *touch screens*, or active digitizers through which the mobile device receives explicit instructions from the user” (EX1007, [0003]) and discloses touchscreen embodiments (EX1007, [0027], Fig. 1). Third, as discussed above, touchscreens and their benefits for users, especially users of mobile devices, were so common that a POSITA would have been motivated with a reasonable expectation of success to implement the Hoddie+Hinckley mobile

devices with a touchscreen interface for user operations. *Supra* Section VII.E; *see also* EX1001 1:30-35 (noting, in background section, the emergence of touch screen technology and its simplification of the user experience). Indeed, the '933 patent takes touchscreen technology for granted, assuming it was within the knowledge of a POSITA. EX1001, 3:27-30 (stating that “underlying mechanics and technologies of touchscreens and displays are beyond the scope of this disclosure”); *id.*, 8:35-38.

D. Mapping Claims 1-9, 11, 13-14, 22-31, 33, 35-36, And 44 To Hoddie And Hinckley

1. Claim 1

a) Element [1.1]

[1.1] A method performed by a wireless transmit/receive unit (WTRU), the method comprising:

162. To the extent the preamble is limiting, Hoddie discloses it. Specifically, Hoddie discloses “wireless devices” (WTRUs) such as “PDA[s],” “laptop computer[s],” and “digital camera[s]” that include at least two “wireless interfaces,” “connected to respective antennas” for wirelessly communicating with each other. EX1006, 3:19-8:29, FIGS. 1-2. Hoddie’s “wireless devices,” e.g., “PDA[s]” and “computer[s],” are WTRUs at least because the '933 patent says so. EX1001, 2:26-32 (a WTRU “includes but is not limited to ... a personal digital assistant (PDA), a computer, or any other type of device capable of operating in a wireless environment”). Hinckley similarly discloses “mobile phones (or other wireless

devices)” that each include one or more “wireless communication components.” EX1007, [0010], [0030-31], *see also id.*, [0034], [0036-37], claim 1, FIGS. 3-4. As explained in the following paragraphs, it would have been obvious to implement a wireless device in accordance with Hoddie’s and Hinckley’s teachings to perform the claimed method.

163. Thus, the Hoddie+Hinckley system satisfies the preamble.

b) Element [1.2]

[1.2] processing, by the WTRU, a touchscreen input to select a media element;

164. Hoddie and Hinckley render obvious this element. Hoddie discloses its “PDA” such as “the CLIE by Sony” (WTRU), “respon[ds]” to a user “select[ing] ... a file to send” “[u]sing the user interface.” EX1006, 3:19-30; *id.*, 16:11-13 (“the computer receives data from the input ... devices” and “performs operations on the data”). Hinckley similarly discloses that “the user may choose one or more files to transmit to the other device” and that the user “selects a file [] to send ... using the normal mode of selecting items on the mobile device.” EX1007, [0058]. It would have been obvious to implement the Hoddie+Hinckley devices with a touchscreen at least because the Sony CLIE disclosed by Hoddie had a touchscreen user interface. EX1058, 24-25, 26, (the “[i]nput device” of a “Sony CLIE PEG-TH55” includes a “[t]ouch-screen”), 27; EX1064, 12 (The Sony CLIE’s screen “is touch-sensitive”), 25. Indeed, Hinckley confirms that touchscreens were an obvious design choice as

its background specifies that “[m]obile devices ... typically include one or more buttons, touch screens, or active digitizers.” EX1007, [0003]. Touchscreens and their benefits (ease and simplicity of use) were also well known in the art, as acknowledged by the ’933 patent itself, further confirming that a POSITA would have been motivated with a reasonable expectation of success to use touchscreens for the devices in the Hoddie+Hinckley system. EX1001, 1:29-34, 3:27-30, 8:15-38; *supra* Section VII.E.

165. Hoddie’s “file” satisfies the claimed “media element” because it includes a “picture” or “digital image,” (EX1006, 5:24-26) i.e., a photograph, which is one of the claimed types of media elements. EX1001, claims 3, 25 (“the media element is any one of a photograph, video, or a document”).

166. It would have been obvious to a POSITA to have implemented the Hoddie+Hinckley devices to process the user’s touchscreen input to select a media element because if the devices did not process the user input, the user input would not do anything, i.e., the user would not actually be able to select content if the devices did not process the user’s input to select the content. This ability to select content was a basic, well-known, and fundamental functionality of touchscreen-containing devices. *Supra* Section VII.E; EX1019, [0017] (“a user can select a data file by placing his finger upon a graphical icon... displayed upon the touch screen display”); EX1033, [0111] (“tapping on a single photo to select it); EX1034, 5:64-

65 (“[a] particular file may be selected, e.g., by touching it”); EX1047, [0073] (“the user touches and thus selects a desired file”). Hoddie+Hinckleys touchscreen would have little to no value if it did not even allow such basic functionality. Thus, it would have been obvious to implement the Hoddie+Hinckley devices with this functionality.

167. Thus, the Hoddie+Hinckley system satisfies this element.

c) Element [1.3]

[1.3] detecting, by the WTRU using Bluetooth, a plurality of WTRUs in proximity to the WTRU;

168. Hoddie discloses this element at least because it discloses “search[ing] for other devices available for communication using Bluetooth.” EX1006, 3:29-31; *see also id.*, 9:17-24 (“The first device finds the second device using a default interface ... such as Bluetooth.”), 10:6-9 (“a device periodically sends out a beacon signal using a Bluetooth interface to find nearby and available Bluetooth-compatible devices and maintains a list of available devices”), FIGS. 3, 5. Hinckley similarly discloses detecting other wireless devices using Bluetooth. EX1007, [0034], [0039], [0042-44], [0049].

169. Thus, the Hoddie+Hinckley system satisfies this element.

d) Element [1.4]

[1.4] processing, by the WTRU, another touchscreen input to select a WTRU of the plurality of WTRUs;

170. Hoddie expressly discloses confirming the intended recipient through the user interface, (e.g., the touchscreen). EX1006, 4:2-4, 11:21-26. Specifically, Hoddie discloses that the PDA (WTRU) “confirms with the [] user that the laptop is the intended recipient of the selected file,” such as “by presenting a list of available devices to the user through the user interface.” *Id.* Hinckley similarly discloses that “the user may select a contact to send.” EX1007, [0059]; *see also id.*, Abstract, [0011], [0047], claim 9, FIG. 9. For the same reasons it would have been at least obvious to implement the Hoddie+Hinckley devices with a touchscreen for selecting the media element, as explained above for element [1.2], a POSITA would have found it obvious that the user would also use the touchscreen to select the intended recipient (selected WTRU). Numerous references disclose using a touchscreen to select an intended recipient, further evidencing the obviousness of using the Hoddie+Hinckley devices’ touchscreen for this purpose. *Supra* Section VII.E; EX1046, 36:17-18 (“one of the displayed contacts is selected [] e.g., by a tap on a contact in the list”); EX1047, [0085] (“The user selects a transmission target by touching it.”).

171. A POSITA also would have understood and/or at least have found it obvious to implement the Hoddie+Hinckley devices to process this touchscreen input to select an intended recipient because Hoddie expressly discloses receiving the input and then performing actions responsive to this input. Specifically, Hoddie

discloses “[a]fter receiving the confirmation” that “the laptop is the intended recipient of the selected file,” the WTRU “determine[s] the available interface(s) of the other device” and “negotiate[s] how to send the file.” EX1006, 4:2-9.

172. Thus, the Hoddie+Hinckley system satisfies this element.

e) Elements [1.5-1.6]

[1.5] sending, by the WTRU, a message to transfer the selected media element to the selected WTRU;
 [1.6] receiving, by the WTRU, an acceptance to transfer the selected media element to the selected WTRU;

173. As explained in the following paragraphs, Hoddie teaches a back-end file transfer “negotiation” that renders obvious the claimed sending and receiving steps. And Hinckley teaches prompting users to accept/reject content for sending, which further would have rendered obvious the claimed sending and receiving steps.

174. Hoddie discloses that in response to the user requesting to send the “data file” such as a “digital image” (selected media element) to the “laptop” (selected WTRU), the “PDA” (WTRU) and the laptop “determine the available interface(s) ... through queries,” “find that each supports Wi-Fi communication,” and “negotiate how to send the file.” EX1006, 4:4-9, 5:25. This negotiation involves “proposal and counterproposal negotiation ... until the two devices agree upon a compatible interface.” *Id.*, 13. Specifically, “[t]he devices select a compatible interface using one [or] more communication criteria” such as “speed, bandwidth,

data rate ... [and] data size requirements.” *Id.*, 13:3-4, 13:15-21. Due to the large size of the file, “the PDA and laptop agree on setting up a Wi-Fi connection” “because of the improved bandwidth of the Wi-Fi connection.” *Id.*, 4:8-14. The devices “agree on the details of setting up an ‘ad hoc’ wireless network,” “open the Wi-Fi connection,” and then “the PDA sends the file to the laptop across the Wi-Fi connection.” *Id.*, 4:15-22; *see also id.*, 12:10-13:33.

175. A POSITA would have understood that these back-end processes of “negotiat[ing] how to send the file” and “agree[ing] on” the ad hoc Wi-Fi connection based on the “data size requirements” of the file involve, or at least render obvious, performing the claimed sending and receiving steps. EX1006, 4:7-19, 13:3-21.

176. **Message To Transfer:** A POSITA would have understood or at least found it obvious that the sending device would send a message to transfer the selected media element to the receiving device for the receiving device to know the size of the file and “agree upon” an interface (Wi-Fi) that is appropriate for the file’s size, as taught by Hoddie. *Id.*, 4:4-6:2, 8:13-29, 10:10-11:32, 13:3-15:25. Indeed, Hoddie confirms that the first wireless device, e.g., the PDA, “sends a proposal” to send the selected file over a “proposed interface” to the other device. EX1006, 13:6-8. This alone, satisfies the claimed sending step.

177. **Acceptance To Transfer:** Further, a POSITA would have understood or at least found it obvious that the receiving device would have to send an

acceptance to the sending device to transfer the selected media element over the Wi-Fi connection for the sending device to know that the receiving device has “agreed upon” the Wi-Fi connection as the interface for the file transfer. EX1006, 4:4-6:2, 8:14-30, 10:10-11:33, 13:3-15:25.

178. The claimed sending and receiving steps are further obvious in view of Hinckley’s front-end user prompt teachings. Hinckley teaches prompting the receiving user to either accept or deny an incoming transfer, which, as explained above for Ground 1, would have obviously involved performing the claimed sending and receiving steps. EX1007, [0035], [0038], [0058-62], FIGS. 3, 9; *supra* Sections VII.C-D, VIII.C.2, VIII.D.1.e.

179. Specifically, a POSITA would have found it obvious that the sending device sends a request to transfer the selected content to the recipient’s device for the recipient’s device to know—and be able to notify the user—that the sending device is attempting to transfer the selected media element, especially since Hinckley discloses displaying the “name” of the incoming file to the receiving user. EX1007, [0061]; *supra* Sections VIII.C.2, VIII.D.1.e. A POSITA further would have found it obvious that the receiving device would in turn need to forward the receiving user’s acceptance (i.e., send an acceptance message) to the sending device so that the sending device knows when it is allowed to start sending the media element. *Supra* Sections VIII.C.2, VIII.D.1.e.

180. A POSITA would have been motivated to combine this functionality with the file transfer teachings taught by Hoddie so that the receiving user knows what the incoming content is and can prevent the file from being transferred if the user does not want to receive the file, such as if the user suspects it could contain malicious content (e.g., malware) and/or if the file is from an unknown sender. EX1028, 2.

181. Further, a POSITA would have reasonably expected to succeed in incorporating the underlying messaging functionality needed to implement Hinckley's prompt functionality because it would have required only basic computer code that was well within the programming skill of a POSITA, as reflected by this messaging functionality being well known and commonly employed in then-existing file transfer protocols. *Supra* Section VII.D; *see also supra* Sections VIII.C.2, VIII.D.1.e.

182. Thus, the Hoddie+Hinckley system satisfies these elements.

f) Element [1.7]

[1.7] and transferring, by the WTRU using a WiFi communication, the selected media element to the selected WTRU.

183. Hoddie discloses this element because it discloses "send[ing]" (transferring), by the "wireless device[]" such as the "PDA" (WTRU) using a "Wi-Fi connection," the "file" such as an "image file" (the selected media element) to the

“wireless device[]” such as a “laptop” (the selected WTRU). EX1006, 3:26-13:33, claim 4. For example, Hoddie discloses that the “PDA sends the file to the laptop across the Wi-Fi connection.” EX1006, 4:20-22.

184. Thus, the Hoddie+Hinckley system satisfies this element.

2. Claim 2

2. The method of claim 1 further comprising: displaying, by the WTRU, a progress of the transfer to the selected WTRU.
--

185. Hoddie discloses this dependent claim at least because its “wireless device” (WTRU) “presents a confirmation of the completion to the user.” EX1006, 12:2-6. That is, Hoddie displays a progress of the transfer to the intended recipient (selected WTRU) by indicating when the transfer is complete. EX1006, 12:4-6.

186. This claim also is obvious in view of Hinckley because Hinckley teaches displaying “a progress bar” to provide the user with “feedback on the transfer.” EX1007, [0058]. A POSITA would have been motivated to implement the Hoddie+Hinckley wireless devices to display a progress bar, as taught by Hinckley, so that the user knows not only when the transfer is complete, as taught by Hoddie, but also how the transfer is progressing so that the user has an indication of how much time is left for the transfer, as was well known in the art. EX1031 (published in 1985), 11-12 (“Progress indicators give the user enough information at a quick

glance to estimate how much of the task has been completed and when the task will be finished.”).

187. The POSITA would have reasonably expected success in incorporating Hinckley’s progress bar into the Hoddie+Hinckley system because it would have required only basic computer code to display the progress of the transfer based on monitoring the content transferred as compared to the total size of the file, and then displaying that information similar to the transfer complete messages disclosed by Hoddie.

188. Thus, the Hoddie+Hinckley system satisfies this claim.

3. Claim 3

3. The method of claim 1 wherein the media element is any one of a photograph, video, or a document.

189. Hoddie discloses that the “data file” (media element) is a “digital image,” i.e., a photograph, and Hinckley similarly discloses that its file is an “image.” EX1006, 5:24-6:2; EX1007, [0038], [0054-55], [0061-62].

190. Thus, the Hoddie+Hinckley system satisfies this claim.

4. Claim 4

4. The method of claim 1 wherein the touchscreen input or the another touchscreen input is a tap.

191. As explained above for claim 1, it would have been obvious to implement the Hoddie+Hinckley devices to process a user’s touchscreen inputs.

Supra Sections X.D.1.b, X.D.1.d. And as explained above in Section VIII.D.4, a POSITA would have understood and/or at least have found it obvious that this touchscreen input is a tap because it was well understood that this is how a user selects an icon on a touchscreen. *Supra* Section VII.E.

192. Thus, the Hoddie+Hinckley system satisfies this claim.

5. Claim 5

5. The method of claim 1 wherein the message to transfer is a request.

193. As explained above for claim 1, the Hoddie+Hinckley system's message to transfer the selected media element over a proposed interface (e.g., Wi-Fi) is a request. *Supra* Section X.C, X.D.1.e; EX1006, 4:4-21, 10:16-20, 12:10-15:25. Specifically, a POSITA would have understood that the initial message to transfer the selected content is a request at least because it is a "proposal" (EX1006, 13:4-10, 13:23-25) and the wireless devices (WTRUs) subsequently "agree upon" an interface (Wi-Fi) and communication mode (ad hoc) over which to send the selected media element. EX1006, 13:3-33; *see also id.*, 4:7-14, 7:4-8, 8:19-24, 10:9-11:32.

194. Moreover, the corresponding message to transfer in well-known file transfer protocols was a request. EX1014, 330 ("PUT request"); EX1015, 74 ("Request"); EX1017, 4 ("sending a request"); EX1018, 262 ("the sending node sends a request-to-send (RTS)").

195. Thus, as implemented, the Hoddie+Hinckley system satisfies this claim.

6. Claim 6

6. The method of claim 1 wherein the WiFi communication is a WiFi link.

196. Hoddie discloses this dependent claim because it discloses that the Wi-Fi communication is a “connection” / “channel,” i.e., a link, between the two WTRUs that allow them to exchange data files. EX1006, 3:19-8:13, 10:9-15:16; EX1009, 483 (“Link” is “another name for a communications channel or circuit.”). This connection / channel includes “e.g., a service set identifier (SSID) and encryption settings.” EX1006, 4:17-18.

197. Thus, the Hoddie-Hinckley system satisfies this claim.

7. Claim 7

7. The method of claim 1 wherein the WiFi communication or Bluetooth is provided by a communication peripheral.

198. Hoddie discloses this dependent claim because it discloses that the “wireless interfaces” “operate[]” with their respective “antenna to support wireless connections” such as “Wi-Fi” and “Bluetooth.” EX1006, 7:31-8:5; *see also id.*, 3:19-7:15, claims 2-4, FIGS. 1-2.

199. Thus, the Hoddie+Hinckley system satisfies this claim.

8. Claim 8

8. The method of claim 1 wherein Bluetooth discovery is used to detect the plurality of WTRUs in proximity to the WTRU.

200. A POSITA would have found it obvious to implement the Hoddie+Hinckley devices to utilize Bluetooth discovery to detect the nearby devices because, as explained above for claim element [1.3], Hoddie and Hinckley each discloses using Bluetooth to detect nearby wireless devices (WTRUs), and Bluetooth's generic access profile (Bluetooth discovery) performs this device detection. *Supra* Section X.D.1.c; EX1006, 3:29-31, 9:17-19, 10:6-9, FIGS. 3, 5; EX1007, [0034], [0039], [0042-44], [0049]; EX1014, 38-43; *see also id.*, 13-97; *supra* Sections VII.A, VIII.D.1.c.

201. Thus, the Hoddie+Hinckley system satisfies this claim.

9. Claim 9

9. The method of claim 8 wherein the Bluetooth discovery is provided using a service discovery protocol.

202. Hoddie discloses this claim at least because it uses Bluetooth to detect and discover the interfaces (services) offered by nearby devices (*supra* Section X.D.8), and as explained in Section VII.A., Bluetooth included a service discovery protocol (SDP) to discover the services offered by detected devices, as admitted by the '933 patent. EX1006, 3:29-32, 7:4-8, 9:9-10:27, 12:10-13:33, 14:9-15:25; *supra* Section VII.A; EX1001, 5:38-46; EX1014, 69-98; EX1053, 331-391.

203. Thus, the Hoddie+Hinckley system satisfies this claim.

10. Claim 11

11. The method of claim 1 further comprising:
determining, by the WTRU, that the selected WTRU is compatible to transfer
the selected media element.

204. Hoddie discloses this dependent claim at least because it discloses that wireless device (WTRU) uses a “Bluetooth interface” to find “compatible devices.” EX1006, 10:6-9; *see also id.*, 3:29-31, 9:11-10:9, 12:24-15:25. Moreover, the Hoddie+Hinckley wireless device must determine that the selected device (selected WTRU) is compatible to transfer the selected media element because Hoddie teaches negotiating with the selected device until they “agree on” a compatible interface, such as Wi-Fi, over which to send the selected media element. EX1006, 4:4-19, 7:4-15, 8:19-24, 10:9-11:32, 13:3-33. If the devices cannot agree on an interface, i.e., they are not compatible, they “end the communication.” EX1006, 13:11-13.

205. Thus, the Hoddie+Hinckley system satisfies this claim.

11. Claim 13

13. The method of claim 1 further comprising:
determining, by the WTRU, environment information that lists the plurality of
WTRUs in proximity to the WTRU.

206. Hoddie discloses this dependent claim at least because it discloses that the WTRU “maintains a list of available devices.” EX1006, 10:7-9; *see also id.*, 11:19-22.

207. Thus, the Hoddie+Hinckley system satisfies this claim.

12. Claim 14

14. The method of claim 1 wherein the WTRU processes the touchscreen input based on information from a touchscreen.

208. This claim is obvious because a POSITA would have understood and/or at least have found it obvious that the Hoddie+Hinckley devices process the touchscreen input based on information from the touchscreen. EX1006, 3:26-4:4. If the processors of the Hoddie+Hinckley wireless devices (WTRUs) do not receive any information from the touchscreen, they would have no way of knowing whether touchscreen inputs have been entered, much less be able to process these inputs.

209. Thus, the Hoddie+Hinckley system satisfies this claim.

13. Claim 22

[22.1] The method of claim 1 further comprising:
 [22.2] receiving, by the WTRU from another WTRU, a request to transfer other media;
 [22.3] receiving, in response to accepting the request by the WTRU, the other media; and
 [22.4] displaying, by the WTRU, the other media in its entirety to a user of the WTRU.

210. Hoddie and Hinckley each teaches systems with a plurality of mobile devices (WTRUs) wirelessly communicating content with one another. EX1006, Abstract, 1:24-2:16, 3:2-6:24, 7:3-15:25, FIGS. 1, 3-4.; EX1007, Abstract, [0010-12], [0027], [0031-38], [0058-62], FIGS. 6, 8-10. A POSITA would have found it

obvious that, within a combined Hoddie+Hinckley system, each device not only sends content to other devices but also receives content from those devices. Indeed, it would be counterintuitive to implement the system any other way. Within such a system, one obvious use scenario would have been a first device *sending* content to a second device, and then *receiving* content from a third device, with each content transfer employing the Bluetooth-to-WiFi switching method explained above with respect to claim 1. Under this and other similar and equally obvious use scenarios, claim 1 would have been satisfied by the first transfer and claim 22 by the second transfer. *Supra* Sections X.D.1.e-f, X.D.5 (explaining, for elements [1.5-1.7], why it was obvious to exchange the claimed request-to-transfer and acceptance-to-transfer messages when exchanging media between devices). Thus, as explained above in Section VIII.D.13, this would have involved performing the claim 1 sending, receiving, and transferring steps—claim elements [1.5-1.7]—when sending content, and performing the claim 22 receiving steps—elements [22.2] and [22.3]—when receiving content. Thus, the Hoddie+Hinckley system satisfies this claim’s receiving steps ([22.2] and [22.3]).

211. It would have been obvious to a POSITA to program the Hoddie+Hinckley wireless devices to display the received media to the user so that the user can see it. Perhaps the entire purpose of the transfer, especially when it involved a photo or video, was for displaying the transferred content on the receiving

device. Thus, it would have been at least obvious to display the entirety of the content received on any of the receiving devices in the Hoddie+Hinckley system.

212. Thus, as implemented, the Hoddie+Hinckley system satisfies this claim.

14. Claims 23-31, 33, 35-36, And 44

213. Claims 23-31, 33, 35-36, and 44 are substantively identical to claims 1-9, 11, 13-14, and 22, respectively, but recite performing many of the claimed actions with a processor / circuitry. Because Hoddie discloses performing its disclosed actions with one or more programmable processors and/or circuitry, these claims are obvious over Hoddie and Hinckley for the reasons provided above in Sections X.D.1-X.D.13. EX1006, 15:26-16:14.

XI. GROUND 4-12: CLAIMS 20-21 AND 42-43 ARE OBVIOUS OVER EACH OF THE GROUND 1-3 COMBINATIONS IN FURTHER VIEW OF AHOLAINEN (EX1071), CHOURAKI (EX1075), OR JOHANSON (EX1076)

A. Claims 20-21

[20.1] The method of claim 1 further comprising:
 [20.2] displaying, by the WTRU, a subset of the detected plurality of WTRUs in proximity to the WTRU; and
 [20.3] wherein the subset is not all of the detected plurality of WTRUs.

[21.1] The method of claim 20¹ further comprising:
 [21.2] processing, by the WTRU, a user input selecting criteria; and

¹ The Certificate of Correction corrects the claim to depend from claim 20, not claim 1.

[21.3] wherein the subset of the detected plurality of WTRUs is displayed in response to the selected criteria.

214. Aholainen, Chouraki, and Johanson each discloses allowing a user to filter which detected devices are displayed based on various criteria: Aholainen based on type / class of device (EX1071, Abstract, 1:28-33, 2:45-54, 5:21-6:3, 7:6-23, 13:19-27, 15:20-55, 16:7-10, 17:39-41 (claim 17), FIGS 2-3A), Chouraki based on relationship with the device (friend vs. neutral vs. blacklist) (EX1075, 38:9-15), and Johanson based on distance (EX1076, [0020], claim 3). A POSITA would have been motivated to incorporate each of these filtering functionalities because each provides a streamlined list of detected devices, allowing the user to quickly select a desired recipient without being inundated with too many options. *E.g.*, EX1071, 2:45-48 (filtering the list of available Bluetooth devices beneficially reduces the user being “inundate[d]” with “information about those Bluetooth devices that he/she wishes to ignore”).

1. Grounds 4-6: Aholainen’s Class-Of-Device-Based Filtering

215. Aholainen (EX1071) is analogous art to the ’933 patent because they are both within the same field of endeavor: data transfer between wireless devices. *E.g.*, EX1001, Title; EX1071, 1:23-2:35, 2:51-6:39, 12:12-38, 15:33-38, 17:66-18:15 (claim 20).

216. Aholainen discloses using Bluetooth to detect other devices (*e.g.*, EX1071, 1:17-2:18, 2:54-65, 7:23-64, 8:35-51, 11:30-39, 14:49-15:22), and filtering out devices that a user has blocked/prohibited so that the user is “not inundate[d]” with “information about those Bluetooth devices that he/she wishes to ignore.” *Id.*, 2:45-48, 16:7-10; *see also id.*, Abstract, 2:51-53, 5:21-6:3, 7:6-23, 13:19-27, 15:20-55, 17:39-41 (claim 17), FIGS 2-3A. For example, the user can block certain types of devices (*i.e.*, classes of devices or “CoD” for short), such as “advertisement broadcasting” devices and “vending machine” devices. *Id.*, 1:28-33, 5:21-53, 13:19-27. The user’s device then displays an indication (*e.g.*, an icon) of only those detected devices that are not on the user’s prohibited list (a subset of the detected devices based on the user’s selected criteria). *Id.*, Abstract, 2:51-54, 5:53-6:3, 7:7-10, 15:20-55, 16:7-10.

217. A POSITA would have been motivated to implement the Ahya+McKillop and Hoddie+Hinckley devices to allow the user to customize which types of detected devices are displayed so that the user is not inundated with unwanted options, as taught by Aholainen. EX1071, 2:45-48, 16:7-10. For example, someone who never uses vending machines may not want vending machines cluttering the list of available devices. Similarly, someone who primarily uses their mobile phone to share photos with friends may want to see only mobile phones.

218. A POSITA would have reasonably expected success in implementing this filtering functionality in the Ahya+McKillop and Hoddie+Hinckley devices because it would have required only minor software modifications. The devices taught by Ahya and Hoddie already use Bluetooth discovery to detect other devices and display the detected devices to the user. EX1004, [0018-20], FIG. 1; EX1006, 3:29-31 (Bluetooth discovery), 10:3-9 (Bluetooth discovery), 11:23-26 (display detected devices). This Bluetooth discovery process discovers the detected devices' type. EX1071, Abstract, 1:11-55; EX1053, 56-57, 105-109; EX1014, 28, 38-56, 92-93, 334. Specifically, as discussed above, Ahya and Hoddie each discloses wireless devices that detect nearby devices using Bluetooth discovery (EX1004, [0018]; EX1006, 10:3-9). As discussed by Aholainen and the Bluetooth Specification, this Bluetooth discovery involves sending an inquiry scan and receiving, from detected devices, an inquiry response (i.e., a frequency hop synchronization (FHS) packet) that includes an indication of the detected device's type (i.e., its CoD). EX1071, Abstract, 1:11-55; EX1053, 56-57, 105-109; EX1014, 28, 38-56, 92-93, 334.

219. Thus, a POSITA would have only needed to modify the software of the Ahya+McKillop and Hoddie+Hinckley devices to: allow the user to block certain types of devices, cross-check detected devices' types against this list of prohibited devices types, and display only the types of devices not on the user's prohibited list. This reasonable expectation of success is further confirmed by the fact that others

had disclosed a similar kind of device filtering based on the detected devices' capabilities. EX1038, [0028-54]; EX1075, 38:12-16.

220. Thus, Ahya-McKillop-Aholainen (ground 4), Ahya-McKillop-Turner-Aholainen (ground 5), and Hoddie-Hinckley-Aholainen (ground 6) each render obvious claims 20 and 21.

2. Grounds 7-9: Chouraki's Relationship-Based Filtering

221. Chouraki (EX1075) is analogous art to the '933 patent because they are both within the same field of endeavor: data transfer between wireless devices. *E.g.*, EX1001, Title; EX1075, 3:26-36, 5:19-23, 17:32-33, 18:15-17, 41:16-39, 46:29-32.

222. Chouraki discloses a filtering screen that allows a user to filter which Bluetooth-detected devices are displayed on the user's device based on the detected devices' "relationship with the device: 'Friend', 'Neutral', 'Blacklist'." EX1075, 38:9-15. In addition to defining their relationship with other devices, the user also defines personal information blocks with a visibility level, including "visible," "filter," and "invisible," that "defines which remote devices will be able to read the information contained in this block." *Id.*, 32:11-36. Chouraki thus teaches selectively sending information based on relationship, ranging from more information shared with a "friend" device and no information shared with a blacklist device. *Id.*, 27:1-10. Chouraki also teaches providing this "configurable filter" which "excludes

devices based on criteria” in order “[t]o eliminate a remote device from the list of detected devices.” *Id.*, 23:17-19.

223. A POSITA would have been motivated to implement this filtering functionality in the Ahya+McKillop and Hoddie+Hinckley devices to streamline the list of displayed devices, as taught by Aholainen, prioritize and more easily facilitate interactions with friends, help avoid sending personal information to mere acquaintances (“Neutral” individuals), and avoid seeing or communicating with individuals the user did not want to see or communicate with (“Blacklist[ed]” individuals). EX1075, 27:1-10, 23:17-19. By their very nature, “friend” and “blacklist” reflect what was well-known and common-sense: users regularly share things with their friends and often wish to not engage with certain “blacklisted” users when sharing content. Reading these passages in Chouraki, a POSITA would understand the benefits of this filtering functionality: avoiding unwanted interactions with those on a blacklist and allowing the user to prioritize and more easily facilitate interactions with friends.

224. A POSITA would have reasonably expected success in implementing this filtering functionality in the Ahya+McKillop and Hoddie+Hinckley devices because it would have required only minor software modifications to: allow the user to designate devices as either friends or blacklisted devices, allow the user to filter

based on their desired level of privacy/relation, and display the devices according to the user's filter setting.

225. Thus, Ahya+McKillop+Chouraki (ground 7), Ahya+McKillop+Turner+Chouraki (ground 8), and Hoddie+Hinckley+Chouraki (ground 9) each render obvious claims 20 and 21.

3. Grounds 10-12: Johanson's Distance-Based Filtering

226. Johanson (EX1076) published January 23, 2003 and is prior art under Section 102(b). Johanson is analogous art to the '933 patent because they are both within the same field of endeavor: data transfer between wireless devices. *E.g.*, EX1001, Title; EX1076, [0001], [0005-7], [0016-26], claims 1, 7-9, 17-19, 21-23, 25-29, FIGS. 1-2, 5.

227. Johanson notes that the increasing number of wireless devices, especially in crowded mobile environments, made it more difficult for a user to “select to which wireless device a connection is desired.” EX1076, [0002]-[0003]. It further notes the potential benefits of selecting a device “based on its location relative to the wireless user.” *Id.* [0004]. Against this backdrop, Johanson teaches a technique that purportedly “makes it easy to select a nearby wireless electronic device” ([0005]) and “mitigates” the above-noted problems ([0006]). *See also id.*, Abstract, [000-4], [0007], [0015], [0019-20], [0025]. Among other things, Johanson teaches allowing a user to filter displayed devices based on a “maximum distance.”

EX1076, [0020] (“the user can set the maximum distance that an electronic device 20 can be from the user and still be displayed”), claim 3.

228. A POSITA would have been motivated to implement a distance-based filtering functionality in the Ahya+McKillop and Hoddie+Hinckley systems to “make[] it easy to select a nearby wireless electronic device[] to communicate with,” and mitigate the issues encountered in crowded mobile environment, as taught by Johanson. EX1076, [0002-0006], [0020]. For example, if two users next to one another in a crowded area want to share photos with each other, they would face less difficulty selecting each others’ devices if the displayed devices were limited to a smaller area.

229. A POSITA would have reasonably expected success in implementing this “maximum distance” filtering functionality in the Ahya+McKillop and Hoddie+Hinckley devices because it required only minor software modifications to transmit GPS coordinates over Bluetooth, allow the user to filter based on their desired search radius, and display only the devices within the user-set radius.

230. Thus, Ahya+McKillop+Johanson (ground 10), Ahya+McKillop+Turner+Johanson (ground 11), and Hoddie+Hinckley+Johanson (ground 12) each render obvious claims 20 and 21.

4. Claims 42-43

231. Claims 42-43 are substantively identical to claims 21-22 but recite performing the claimed actions with the processor and circuitry of claim 23. As explained above in Sections VIII.D.14 and X.D.14, the Ahya+McKillop and Hoddie+Hinckley devices each performs their disclosed actions with one or more programmable processors and circuitry. EX1004, [0007], [0044-56], [0067-68], claims 19-20, FIG. 2; EX1006, 15:26-16:14. Thus, these claims 42-43 are obvious over the ground 4-12 combinations for the same reasons claims 21-22 are obvious. *Supra* Section XI.A.1-3.

I, Peter Rysavy, do hereby declare and state, that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: December 20, 2023

A handwritten signature in black ink that reads "Peter Rysavy". The signature is written in a cursive style with a horizontal line underneath it.

Signature

APPENDIX A

Peter Rysavy – Curriculum Vitae

PO Box 680, Hood River, OR 97031, USA
+1-541-386-7475, public.temp1@rysavy.com, <http://www.rysavy.com>

**Peter Rysavy is an expert in data networking,
wireless technology, and mobile computing**

Contents

1. EDUCATION	1
2. WORK EXPERIENCE	1
3. PATENTS.....	4
4. TESTIFYING AND CONSULTING EXPERIENCE IN LITIGATION.....	4
5. PUBLIC SPEAKING.....	8
6. PUBLISHED ARTICLES AND REPORTS	8
7. WIRELESS COURSES	18

1. Education

BSEE, MSEE Electrical Engineering, Stanford University, 1979.

2. Work Experience

Rysavy Research. 1993 to Present: President

Peter Rysavy is president of Rysavy Research LLC, a consulting firm that has specialized in data networking, wireless technology, and mobile computing since 1993. Projects have included testifying in multiple venues, evaluation of data network capabilities, reports on wireless technology evolution, network performance measurement, test reports, spectrum analysis for broadband services, strategic consultations, system design, articles, courses, and webcasts.

Peter Rysavy has expertise in all aspects of data networking, internet technologies, TCP/IP, fiber, DOCSIS, voice communications, IP Multimedia Subsystem (IMS), IEEE 802.11 (Wi-Fi), wireless hotspots, mesh networks, metro and municipal Wi-Fi, paging technology, 2G, 3G, 4G, 5G (Release 15, Release 16, Release 17, Release 18), IMT-Advanced, IMT-2020, Global System for Mobile Communications (GSM), General Packet Radio Service (GPRS), Enhanced Data Rates for GSM Evolution (EDGE), Universal Mobile Telecommunications System (UMTS), Code Division Multiple Access (CDMA), Wideband CDMA (WCDMA), High Speed Downlink Packet Access (HSDPA), High Speed Uplink Packet Access (HSUPA), High Speed Packet Access (HSPA), HSPA+, Long Term Evolution (LTE), LTE-Advanced, LTE-Advanced Pro, LTE-Licensed Assisted Access (LAA), LTE-U, 5G, CDMA2000, CDMA2000 1XRTT, Evolved Data Optimized (EV-DO), Bluetooth, WiMAX, IEEE 802.16 (IEEE 802.16e, IEEE 802.16m), wireless security, smartphones, smartphone operating systems, Mobile IP, Evolved Packet System (EPS), Evolved Packet Core (EPC), machine-to-machine communications (M2M), Internet of Things (IoT), remote monitoring and control systems, location-based services, e-mail, wireless e-mail, browsers, mobile browsers, media gateways, orthogonal frequency division multiplexing (OFDM),

orthogonal frequency division multiple access (OFDMA), voice over IP (VoIP), mobile video, wireless spectrum, spectrum sharing, spectral efficiency, capacity analysis, and mobile computing architectures.

Patent Litigation

Peter Rysavy has worked in numerous cases, both as testifying and consulting expert. He has trial experience, reports, and depositions. See section 4 for details.

Analysis

Rysavy Research analyzes wireless technologies for capability, compatibility, interoperability, and intellectual-property considerations.

Training

Rysavy Research conducts wireless-technology training, both publicly and privately.

Testing and Reports

Rysavy Research tests, evaluates, and reports on all major wireless technologies.

Application Development and Deployment

Rysavy Research works with companies to define architectures, select vendors, perform pilots, and to deploy wireless systems and applications.

Clients from 1993 to present include:

5G Americas, ADT, AlphaSights, AltaVista, Anchorage Partners, Antenna Software, Apple, Arris, AT&T, AT&T Wireless, Aventail, Black Lowe & Graham, Bluetooth SIG, Broadbeam, Canopy Spectrum, Cingular Wireless, City of Seattle, CMP Media, Compression Laboratories, Coinstar, Comverse Network Systems, Cravath Swaine & Moore, Cricket Wireless, Crosslink Capital, Customer Focused Strategies, Datacomm Research, CTIA – The Wireless Association, Data Communications Magazine, Datacomm Research, Delco Electronics, Epicenter, Epicron, Ericsson, Fish and Richardson, Fitbit, Fluke, Foley Lardner, Fossil, GE, Gerson Lehrman Group, Gibson Dunn, Good, Google, GSMA, GuidePoint, Haynes & Boones, Hillman Company, Hobnob, Holland & Knight, Huawei, Hughes Network Systems, IMS Expert Services, Informa, Information Week, Intel, IT World, iWindsurf, Juniper Networks, Kecker & Van Nest, King & Spalding, Kirkland & Ellis, Klarquist Sparkman, Mayer Brown, MCCI, McGuire Woods, Medtronic Physio-Control, Microsoft, Mobile Computing Promotion Consortium (MCPC), Mobile Future, Moffatt Thomas, Motorola, NetMotion Wireless, Network Magazine, Network Computing Magazine, New York State Wireless Association, Nokia, Norcom Networks, Novatel Wireless, OmniSky, Pacific Commware, Park & Associates, Perkins Coie, Portable Computer and Communications Association (PCCA), Portland State University, Powell and Gilbert, Research in Motion (RIM), Park and Associates, Quality in Motion, RKM Holdings, Rogers Communications, RPX, Ruckus Wireless, Sanyo, SkyGo, Sprint, Stratos Product Development Group, Superconductor Technologies, Symbian, T-Mobile, TCI, Teklicon, Tektronix, Teledyne Electronic Technologies, Third Bridge, Traveling Software

(LapLink), United Business Media, University of British Columbia, UCLA, US Department of Defense, Verizon Wireless, Wells Fargo, White & Case, Whitworth Analytics, WiMAX Forum, Wireless Data Forum, Wireless Technology Association, WRQ, Xerox Palo Alto Research Center, and Xircom.

Wireless Technology Association. 2000 to 2016: Executive Director.

Managed all the logistics of a non-profit industry organization that that evaluated wireless technologies, investigated mobile communications architectures, and promoted wireless-data interoperability. Organized and moderated more than fifty industry workshops.

Traveling Software (LapLink), Bothell, WA, USA. 1992 to 1993: Vice President of Technology.

Researched and evaluated key technologies. Developed Traveling Software's wireless communications strategy for local area and wide area connections. Helped define overall product and technology directions. Prototyped new technologies. Collaborated with technology partners. Developed license agreements for sale and purchase of technology. Participated in strategic sales efforts. Frequently traveled around the US and Asia. Spoke at conferences. Attended and monitored standards efforts. Managed patent applications and patent issues.

Traveling Software (LapLink), Bothell, WA, USA. 1988 to 1992: Vice President, Research and Development.

Developed Traveling Software's Research and Development department. Recruited over thirty professionals, including managers, design engineers, quality assurance engineers and technical writers. Under my management, we implemented: documented design and quality assurance procedures; a version control system; complete archiving with off-site storage; regular performance appraisals; a bonus plan; and well defined career paths. This R&D organization successfully brought in house all strategic technology and also released numerous successful software products for the retail PC market, including LapLink, LapLink Mac, DOS Connect for the HP 95LX, Organizer Link for the Sharp Wizard, and PC Link for the Casio BOSS.

Fluke Corporation, Everett, WA, USA. 1979 to 1981 and 1983 to 1988: Program Manager, Project Manager, Design Engineer.

As program manager, managed marketing group to determine target markets, sales channels, positioning and promotion in support of Fluke's operator interface business. As project manager, managed development of an entire family of communications-oriented touch terminals. Fluke introduced the first member, the 1020 Touch Control Screen in May, 1986. Directed software (C code for 68000 family processor), digital hardware (surface mount, semi-custom IC's, computer aided engineering), package design (injection molded plastic parts, steel chassis), and manuals (in English, French, German and Japanese.) Coordinated many groups: design, manufacturing, purchasing, component engineering, and marketing. As design engineer from 1979 to 1981, designed hardware and firmware for various systems, including: RS-232 communications; IEEE-488 communications; RS-485 multi-drop communications; thermal printer interface; cartridge drive interface; vacuum display driver and keypad driver.

Other Work Experience:

Time Office Computers, Australia, 1981 to 1983: Ethernet networking, random-access memory, power supply hardware development.

Stanford University, USA, 1976-1979: software consulting services for university/industry collaborations.

Additional information:

Available at <https://rysavy.com/>.

3. Patents

Peter Rysavy is the co-inventor of US4929935A, Apparatus for aligning raster scanned image to touch panel, filed May 2, 1986.

Peter Rysavy is the co-inventor of US4941845 A, Data transfer cable, filed June 7, 1989.

4. Testifying and Consulting Experience in Litigation

Summary

Fifty engagements in cases as a testifying expert.

Forty-eight engagements in patent cases as a testifying expert.

Court testimony as testifying expert in patent-litigation trial for Apple.

Ten patent-related depositions as testifying expert.

One breach-of-contract litigation deposition as testifying expert.

Thirty-three expert declarations for Inter Partes Review covering twenty patents.

Seven expert reports on non-infringement covering fifteen patents.

Eight expert reports on invalidity covering ten patents.

Four declarations related to claim construction.

Sixteen patent cases as consulting expert.

Three expert reports on non-patent matters.

Training in testifying and patents, 2020. (*Seak: How to be an Effective Expert Witness. How to Excel and Succeed as an Expert Witness in Patent Cases: Special Techniques.*)

Current Patent Cases as Testifying Expert

Two cases. Details available upon request.

Prior Patent Cases as Testifying Expert (most recent on top)

Testifying expert for LG Electronics. Claim construction, U.S. Patent 9,854,545. Declaration filed June 23, 2023. Deposed July 12, 2023.

Testifying expert for Alarm.com. Inter Partes Review. U.S. Patent No. 9,349,262. *Case No. IPR2022-00728.* Firm: Cravath, Swaine & Moore. Declaration filed March 18, 2022.

Testifying expert for Alarm.com. Inter Partes Review. U.S. Patent No. 7,956,739. *Case No. IPR2022-00714.* Firm: Cravath, Swaine & Moore. Declaration filed March 15, 2022.

Testifying expert for T-Mobile. Inter Partes Review. U.S. Patent No. 9,918,196. Firm: *Case No. IPR2022-00669.* Firm: McGuire Woods. Declaration filed March 4, 2022.

Testifying expert for ADT. Inter Partes Review. U.S. Patent No. 9,349,262. *Case No. IPR2022-00612.* Firm: Cravath, Swaine & Moore. Declaration filed February 7, 2022.

Testifying expert for Amazon. Inter Partes Review. U.S. Patent 10,791,442. *Case No. IPR2022-00260.* Firm: Perkins Coie. Declaration filed December 10, 2021.

Testifying expert for Fossil. Non-infringement, U.S. Patent Nos. 8,738,794; 8,892,752; and 9,749,847. *Case No. 4:17-CV-05933-YGR.* Firm: Fish & Richardson. Expert report on non-infringement October 29, 2021.

Testifying expert for ADT. Inter Partes Review. U.S. Patent No. 7,956,739. *Case no. IPR2021-01374.* Firm: Cravath, Swaine & Moore. Declaration filed August 6, 2021. Deposed April 26, 2022.

Testifying expert for Huawei. Inter Partes Review. U.S. Patent 6,704,304. *Case no. IPR2021-01012.* Firm: Fish & Richardson. Declaration filed May 26, 2021.

Testifying expert for Huawei. Inter Partes Review. U.S. Patent 7,460,658. *Case no. IPR2021-00691.* Firm: Fish & Richardson. Declaration filed April 6, 2021.

Testifying expert for T-Mobile. Claim construction. U.S. Patent 6,922,728. *Case No. 2:20-cv-281-JRG.* Firm: Gibson Dunn. Declaration filed March 15, 2021. Deposed March 31, 2021.

Testifying expert for Huawei. Inter Partes Review. U.S. Patent 8,429,480. *Case no. IPR2021-00229.* Firm: Fish & Richardson. Declaration filed November 30, 2020.

Testifying expert for Huawei. Inter Partes Review. U.S. Patent 7,515,546. *Case no. IPR2021-00225.* Firm: Fish & Richardson. Declaration filed November 30, 2020.

Testifying expert for Huawei. Inter Partes Review. U.S. Patent 7,508,755. *Case no. PR2021-00224.* Firm: Fish & Richardson. Declaration filed November 30, 2020.

Testifying expert for Ericsson. Inter Partes Review. U.S. Patent No. 7,016,676. *Case no. IPR2020-00376.* Firm: Haynes and Boone, LLP. Declaration of December 22, 2019.

Testifying expert for Microsoft. Inter Partes Review. U.S. Patent No. 6,664,891. *Case no. IPR2019-01188.* Firm: Klarquist Sparkman. Declaration filed June 11, 2019. Second declaration filed May 25, 2020. Patent Trial and Appeal Board ruled challenged claims unpatentable, November 4, 2020.

Testifying expert for Microsoft. Inter Partes Review. U.S. Patent No. 7,016,676. *Case no. IPR2019-01116.* Firm: Klarquist Sparkman. Declaration filed May 29, 2019. Second declaration filed May 19, 2020. Patent Trial and Appeal Board ruled challenged claims unpatentable, October 26, 2020.

Testifying expert for Microsoft. Inter Partes Review. U.S. Patent No. 6,993,049. *Case no. IPR2019-01026*. Firm: Klarquist Sparkman. Declaration filed May 6, 2019. Second declaration filed May 19, 2020.

Testifying expert for RPX. Inter Partes Review. U.S. Patent 7,245,917. *Cases no. IPR2018-01387, IPR2018-01388*. Firm: Klarquist Sparkman. Declaration filed July 13, 2018. Declaration for opposition to motion to amend filed August 8, 2019.

Testifying expert for Verizon. Non-infringement, U.S. Patent No. 9,642,024. *Traxcell v. Verizon. Case no. 2:17-cv-00721-RWS-RSP*. Firm: Holland & Knight. Expert report on non-infringement July 17, 2019. Deposed August 9, 2019. Motion for summary judgement granted September 18, 2019.

Testifying expert for Fossil. Non-infringement and invalidity, U.S. Patent No. 6,490,443. *Freemy v. Fossil, case no. 2:18-cv-00049*. Firm: Fish & Richardson. Expert report on non-infringement, May 13, 2019. Expert report on invalidity April 22, 2019. Deposed May 21, 2019. Parties settled.

Testifying expert for Fossil. Inter Partes Review. U.S. Patent 6,490,443. *Case no. IPR2019-00755*. Firm: Fish & Richardson. Declaration filed April 1, 2019.

Testifying expert for Microsoft. Inter Partes Review. U.S. Patent 9,531,657. *Case no. IPR2017-01411*. Firm: Klarquist Sparkman. Declaration filed May 8, 2017. On November 28, 2018, the Patent Trial and Appeal Board ruled all claims to be unpatentable.

Testifying expert for Arris. Non-infringement and invalidity (one patent), U.S. Patent No. RE45,126. *Sony v. Arris, ITC No. 337-TA-1049*. Firm: Fish & Richardson. Expert report on non-infringement, October 13, 2017. Expert report on invalidity September 27, 2017. Case settled in December 2017.

Testifying expert for Microsoft. Inter Partes Review. U.S. Patent 8,848,892. *Case no. IPR2017-01052*. Firm: Klarquist Sparkman. Declaration filed March 9, 2017. Deposed November 30, 2017. On September 19, 2018, the Patent Trial and Appeal Board ruled all claims to be unpatentable.

Testifying expert for Apple. Non-infringement and invalidity. U.S. Patent 6,321,092. *Unwired Planet v. Apple, Case No. 13-cv-04134*. Firm: Gibson Dunn. Expert reports on non-infringement and invalidity, March 7, 2017.

Testifying expert for Google, Inter Partes Review.

U.S. Patent 5,809,428. *Case nos. IPR2017-00529, IPR2017-00530, and IPR2017-00559*. Three declarations filed December 30, 2016. Firm: Fish & Richardson. Parties settled as of May 2017 and IPR proceedings terminated.

U.S. Patent 5,754,946. *Case nos. IPR2017-00536 and IPR2017-00537*. Two declarations filed December 29, 2016. Firm: Fish & Richardson. Parties settled as of May 2017 and IPR proceedings terminated.

U.S. Patent 5,894,506. *Case nos. IPR2017-00532, IPR2017-00533, IPR2017-00534, and IPR2017-00535*. Four declarations filed December 28, 2016. Firm: Fish & Richardson. Parties settled as of May 2017 and IPR proceedings terminated.

Testifying expert for T-Mobile, non-infringement. U.S. Patent Nos. RE41,490, RE43,306, 5,790,793, 7,450,957, and 8,078,200. *Intellectual Ventures v. T-Mobile US*, case no. 1:13-cv-01632-LPS. Firm: Gibson Dunn. Expert report May 26, 2016. Deposed September 20, 2016. Parties settled.

Testifying expert for RPX, Inter Partes Review.

U.S. Patents 8,135,342 and 8,879,987. *Case nos. IPR2016-01052, IPR2016-01053, and IPR2016-01054*. Declaration filed May 17, 2016. Firm: Klarquist Sparkman. January 2017, all IPRs were instituted on a majority of the claims in the petitions, and patent owner ultimately canceled all instituted claims.

U.S. Patents 8,135,342 and 8,879,987. *Case nos. IPR2016-00985 and IPR2016-00989*. Declaration filed April 30, 2016. Firm: Klarquist Sparkman. January 2017, both IPRs were instituted on a majority of the claims in the petitions, and patent owner ultimately canceled all instituted claims.

Testifying expert for Microsoft, invalidity and non-infringement. U.S. Patents 6,346,047 and 6,684,062. *Eleven Engineering Inc. et al. v. Microsoft Corporation et al.*, Case No. 09-903-LPS (D. Del.). Firm: Fish & Richardson. Plaintiff conceded to non-infringement based on claim construction July 2016 prior to report submission.

Testifying expert for LG Electronics, non-infringement. U.S. Patent 8,055,820. *Cellular Communication Equipment LLC v. LG Electronics, Inc., et al.*, Case no. 6:13-cv-00508 (EDTX). Firm: Mayer Brown. Case settled July 2016 prior to report submission.

Testifying expert for Amazon, Barnes & Noble, MediaTek, Nokia, Samsung, Texas Instruments, invalidity. U.S. Patent No. 5,487,069. *CSIRO v. MediaTek et al.*, Case No. 6:12-cv-578-LED-KNM. Firms: Covington & Burling, O'Melveny & Myers, Quinn Emanuel Urquhart & Sullivan, White & Case. Report on invalidity December 19, 2014. Deposed March 6, 2015. Case settled July 2015.

Testifying expert for Apple, non-infringement (three patents) and invalidity (two patents). U.S. Patent Nos. 6,317,831, 6,647,260, and 6,532,446. *Unwired Planet v. Apple*, case No. 13-cv-04134. Firm: Gibson Dunn. Expert report on non-infringement January 12, 2015. Expert report on invalidity December 3, 2014; rebuttal-reply report on invalidity January 26, 2015. Deposed February 13, 2015. Case settled in April 2017.

Testifying expert for Apple, invalidity. U.S. Patent Nos. 7,555,267, 7,570,954, and 7,792,492. *GPNE v. Apple*, case no. 12-CV-02885-LHK. Firm: Fish & Richardson. Report on invalidity January 4, 2014. Deposed February 20, 2014. Testified in court October 17 and October 20, 2014. Jury verdict of non-infringement on all three patents.

Testifying expert for HTC, invalidity (one patent), in *Nokia v. HTC, ITC Investigation No. 337-TA-847*. Firm: White & Case. Report 2013. Patent withdrawn from dispute.

Other Patent-Litigation Testimony

Claim-construction declaration for Microsoft in *Eleven Engineering Inc. et al. v. Microsoft Corporation et al.*, No. 09-903-LPS (D. Del.), January 28, 2016. Case details above.

Claim-construction declaration for Apple in *Unwired Planet v. Apple*, April 7, 2014. Case details above.

Declaration "*In re Patent Application of Han-Jin JOH, 11/266,114.*" Docket No. P2481US00, April 18, 2012. Firm: H.C. Park & Associates, PLC.

Declarations for Front Row Technologies in *Inter Partes Reexam. 95/001,565*, April 4, 2011; *95/001,568*, March 7, 2011; *95/001,566*, March 4, 2011. Firm: Black, Lowe & Graham PLLC.

Non-Patent Litigation Testimony

Testifying expert for Instant Checkmate, Robert Fischer and Stephanie Lukis individually and on behalf of all others similarly situated v. Instant Checkmate LLC, Civil action 1:19-cv-04892 (N.D. Ill.). Firm: Jenner & Block. Report September 17, 2021.

Testifying expert for Sprint, Truckstop.net vs. Sprint Communications, Case No. CV-04-561-S-BLW. Firm: Moffatt Thomas. Report March 31, 2006, supplemental report September 28, 2006. Deposed May 3, 2007. Worked on case 2005 to 2010.

Consulting Expert History

Twenty cases.

Law firms include: Axinn, Veltrop & Harkrider; Finnegan, Henderson, Farabow, Garrett & Dunner; Foley & Lardner; HC Park & Associates; Holland & Knight, Keker & Van Nest; King & Spalding; Kirkland & Ellis; Klarquist Sparkman; Mayer Brown, Maynard, Coper & Gale; Powell Gilbert; Simpson Thacher & Bartlett.

Clients include: Amazon, Apple, Huawei, Lenovo, Motorola, Nokia, Pantech, Research in Motion (RIM), Samsung, Sanyo, SkyTel (Verizon), Starent, Thales, and T-Mobile.

5. Public Speaking

Peter Rysavy has spoken at more than 60 public events, such as conferences, as a keynote presenter, moderator, and panelist. See <https://rysavy.com/speaking/> for details.

6. Published Articles and Reports

The 200 articles, reports, and white papers by Peter Rysavy, listed from most recent to oldest, include the following:

1. Declaration, submitted to the FCC, analyzing in technical detail why today's internet fits the legal definition of an information service as opposed to a telecommunications service. December 2023.
2. "5G Mid-Band Spectrum: The Benefits of Full Power, Wide Channels, and Exclusive Licensing," December 2022. Report published by CTIA.
3. "Lessons Learned from the CBRS Spectrum Experiment," April 2022. Article for Fierce Wireless.
4. "3G Shutdowns Should Not Be Delayed," February 2022. Article for Fierce Wireless.
5. "Rational Decisions Needed on C-band and Altimeters," November 2021. Article for Fierce Wireless.

6. "The Folly of Attempting to Future-proof Broadband," June 2021. Article for Light Reading.
7. "No Magic Spectrum Sharing Solutions," April 2021. Article for Fierce Wireless.
8. "5G Mid-Band Spectrum Deployment," February 2021. Rysavy Research Report.
9. "DoD's proposed 5G spectrum sharing fraught with problems," October 2020. Article for Fierce Wireless.
10. "Global 5G: Rise of a Transformational Technology," September 2020. Report published by 5G Americas.
11. "Latest Tech Aims to Solve Riddle for Rural Broadband," August 2020. Article for Fierce Wireless.
12. "6 GHz Should Be Allocated for Both Licensed and Unlicensed Applications," March 2020. Article for Light Reading.
13. "Virtualization Will Transform the Wireless Industry," December 2019. Article for Fierce Wireless.
14. "Global 5G: Implications of a Transformational Technology," September 2019. Report published by 5G Americas.
15. "How Title II Net Neutrality Undermines 5G," June 2019. Report published by Rysavy Research.
16. "How the 'Save the Internet' Act Breaks 5G," May 2019. Article for Bloomberg Law.
17. "Bad Idea of Nationalized 5G Network Put to Rest," April 2019. Article for Fierce Wireless.
18. "Untangling C-band for a New Broadband Future," January 2019. Article for Fierce Wireless.
19. "Broadband Disruption: How 5G Will Reshape the Competitive Landscape—Second Edition," November 2018. Report published by Datacomm Research.
20. "LTE to 5G: The Global Impact of Wireless Innovation," August 2018. Report published by 5G Americas.
21. "Mid-Band Spectrum for 5G Needed Now," August 2018. Article published by Fierce Wireless.
22. "Small Cells – Suddenly Essential," March 2018. Article published by RCR Wireless.
23. "How 5G Will Solve Rural Broadband," January 2018. Article published by Fierce Wireless.
24. "The Power of Wireless Broadband," November 2017. Report published by Rysavy Research.
25. "Broadband Disruption: How 5G Will Reshape the Competitive Landscape," August 2017. Report published by Datacomm Research.
26. "Why 5G Will Be a Game Changer," August 2017. Article published by Fierce Wireless.

27. "LTE to 5G: Cellular and Broadband Innovation," August 2017. Report published by 5G Americas.
28. Declaration of Peter Rysavy. Exhibit to CTIA Comments to Federal Communications Commission, WC Docket No. 17-108, Restoring Internet Freedom. 2017.
29. "How "Title II" Net Neutrality Undermines 5G," April 2017. Report published by Rysavy Research.
30. "Accelerating Innovation in Unlicensed Spectrum," November 2016. Article published by Fierce Wireless.
31. "IoT & 5G: Wait or Move?" October 2016. Report published by Informa.
32. "Mobile Broadband Transformation," August 2016. Report published by 5G Americas.
33. "Threading the Spectrum Needle - Can LTE and Wi-Fi Coexist?" February 2016. Article published by Fierce Wireless.
34. "5G - Promises and Pitfalls," November 2015. Article published by RCR Wireless News.
35. "LTE and 5G Innovation: Igniting Mobile Broadband," August 2015. Report published by 4G Americas.
36. "Latest FCC Auction Shatters Spectrum Myths," January 2015. Article published by Gigaom.
37. "LTE Congestion Management - Enabling Innovation and Improving the Consumer Experience," January 2015. Report published by Mobile Future.
38. "Mobile Broadband Networks Should Not Be Hampered by Net Neutrality Constraints," September 2014. Article published by Fierce Wireless.
39. "How Wireless is Different - Considerations for the Open Internet Rulemaking," September 2014. Report for Mobile Future.
40. "Beyond LTE: Enabling the Mobile Broadband Explosion," August 2014. Report published by 4G Americas.
41. "Will LTE in Unlicensed Spectrum Unlock a Vast Store of Mobile Broadband Capacity?" June 2014. Article published by MIMO World.
42. "How will 5G compare to fiber, cable or DSL?" May 2014. Article published by Fierce Wireless.
43. "It's Time for a Rational Perspective on Wi-Fi," April 2014. Article published by Gigaom.
44. "Complexities of Spectrum Sharing - How to Move Forward," April 2014. Report published by Mobile Future.
45. "Canadian 700 MHz Auction: Analysis of Results." April 2014. Analysis of auction that concluded February 2014 in Canada.
46. "Challenges and Considerations in Defining Spectrum Efficiency," March 2014. Article for Proceedings of the IEEE.

47. "The High and Wide Future of Radio," March 2014. Column for Fierce Wireless.
48. "Uncertain Government Spectrum Policies Have Far-Reaching Consequences," November, 2013. Article for Bloomberg BNA Insights.
49. "Who Owns the Internet of Things?", September 2013. Column for Fierce Wireless co-authored with Chris Rezendes.
50. "Mobile Broadband Explosion - The 3GPP Wireless Evolution," August 2013. Report for 4G Americas.
51. "Learn How Technology Will Turn Less Desirable Airwaves into 'Beachfront' Spectrum," June 2013. Article for Gigaom.
52. "Efficiency of Spectrum Use," May 2013. Article for Fierce Wireless.
53. "2013 Mobile Commerce Survey," May 2013. Report for Information Week.
54. "Trends in Enterprise Cellular Network Data Usage," March 2013. Market research and report done in conjunction with NetMotion Wireless."
55. "White Spaces Networks Are Not "Super" Nor Even Wi-Fi," March 2013. Article for Gigaom.
56. "Mobile Commerce: State of the Market," February 2013. Coauthored report for Information Week.
57. "Vehicles and Mobility Are Converging but Fragmentation, Lack of Standards May Hinder Progress," February 2013. Column for Fierce Wireless.
58. "4G: Carriers, IT Pros Square Off," December 2012. Report for Information Week.
59. "Spectrum – All Options Essential, Including Incentive Auctions," December 2012. Blog for HighTech Forum.
60. "Spectrum Sharing with LTE is Conceivable But Not Trivial," November 2012. Column for Fierce Wireless.
61. "4G World: The Need For More Spectrum," October 2012. Column for Information Week.
62. "Spectrum Sharing Opens a Potential Attack Route," October 2012. Article for Gigaom.
63. "No Silver Bullets for FCC, NTIA Spectrum Challenge," September 2012. Article for Bloomberg BNA.
64. "Mobile Broadband Explosion – The 3GPP Wireless Evolution," September 2012. Report for 4G Americas.
65. "Spectrum Sharing – The Promise and The Reality," July 2012. Report for Mobile Future.
66. "Mobile Network Design and Deployment: How Incumbent Operators Plan for Technology Upgrades and Related Spectrum Needs," June 2012. Rysavy Research report.

67. "LTE: Huge Technology, Huge Challenges," March 2012. Report for Information Week.
68. "Wireless Spectrum Doomsday Looms," January, 2012. Column for InformationWeek.
69. "Unleashing the Wireless Power of Long-Term Evolution: Spectrum, and Lots of It," December 2011. Article for Bureau of National Affairs (BNA).
70. "Convergence of 3G/4G and Wi-Fi, October 2011. Report for InformationWeek.
71. "Comments on Citi 'Wireless Supply and Demand'," October 2011. Analysis and report.
72. "Mobile Broadband Explosion. 3GPP Broadband Evolution to IMT-Advanced (4G)," September 2011. Detailed report for 4G Americas.
73. "Public Safety Spectrum," July 2011. Analysis and report.
74. "Efficient Use of Spectrum," May, 2011. Report sponsored by CTIA, filed with the FCC.
75. "The Spectrum Imperative: Mobile Broadband Spectrum and its Impacts for U.S. Consumers and the Economy. An Engineering Analysis," March 2011. Report sponsored by Mobile Future.
76. "Application Mobilization: A Rapidly Changing Landscape," January 2011. Report published by Information Week.
77. "Smartphone Efficiency Report," January 2011. Rysavy Research report.
78. "Innovation Enabled by Mobile Wireless Network Management," Report sponsored by Mobile Future, filed with the FCC October, 2010.
79. "Strategic Use of Wi-Fi in Mobile Broadband Networks," October 2010, Rysavy Research white paper.
80. "Transition to 4G – 3GPP Broadband Evolution to IMT-Advanced," September 2010. Rysavy Research report for 4G Americas.
81. "Spectrum Shortfall Consequences," April 2010. Analysis written for CTIA and filed with the FCC.
82. "Beyond Smartphones," February, 2010. Article published by Information Week.
83. "Mobile Broadband Capacity Constraints And the Need for Optimization," February 2010. Rysavy Research report.
84. "The 2.6 GHz Spectrum Band - Unique Opportunity to Realize Global Mobile Broadband," December 2009. Report published by GSMA with Peter Rysavy providing the technology analysis on how best to manage the 2.6 GHz band.
85. "Net Neutrality Regulatory Proposals: Operational and Engineering Implications for Wireless Networks and the Consumers They Serve." Report sponsored by Mobile Future, filed with the FCC January, 2010.
86. "The Mobile Web Imperative," December 2010. Article published by Information Week.

87. "Air Pressure: Why IT Must Sort Out App Mobilization Challenges," October, 2009. Analytics report published by Information Week.
88. "Spectrum Crisis?" October, 2009. Article published by Information Week.
89. "HSPA to LTE-Advanced. 3GPP Broadband Evolution to IMT-Advanced (4G)" September 2009. Detailed report published by 3G Americas.
90. "3G Safeguards: Incomplete, Getting Better," May 2009. Article published by Information Week.
91. "Mobile Broadband Spectrum Demand," December 2008. Report commissioned by CTIA, released at CTIA Wireless March, 2009.
92. "Femtocells Suit Up For Work," January 2009. Article published by Information Week.
93. "Wireless E-Mail Efficiency Assessment," January 2009. Test report.
94. "HSPA Gets Uploads Almost Up To Download Speeds," September 2008. Article published by Information Week.
95. "EDGE, HSPA and LTE - Broadband Innovation," September 2008. White paper, published by 3G Americas.
96. "Code of the Road," August 2008. Article published by Information Week.
97. "Global Mobile," May 2008. Article published by Information Week.
98. "GPS Performance," March 2008. Test report.
99. "Mobile Application Development Quick Start Guide," March 2008. White paper, published by AT&T.
100. "Harnessing Mobile Middleware", December 2008. White paper published by AT&T.
101. "Security Requirements for Wireless Networking," December 2007. White paper.
102. "Mobile Application Development Best Practices," September 2007. Peter Rysavy co-wrote this white paper, published by AT&T.
103. "EDGE, HSPA, LTE: The Mobile Broadband Advantage", September 2007, White Paper for 3G Americas
104. "Handheld Computing Evolution", June 13, 2007, Network Computing Mobile Observer
105. "Reach Me if You Can", article on wireless application deployment, May 2007, Network Computing Magazine
106. "Global Mobile", May 23, 2007, Network Computing Mobile Observer
107. "Wireless Networks, Wired Bottlenecks", May 2, 2007, Network Computing Mobile Observer
108. "Breaking the Gray Flannel Ceiling", article on mobile IM, April 2007, Network Computing Magazine

109. "QoS and VoIP With 3G: Not an Easy Marriage", Apr 11, 2007, Network Computing Mobile Observer
110. "Mobile Linux Puzzle - Coming Together." March 2007, Network Computing Magazine.
111. "Learning from Bluetooth", Mar 21, 2007, Network Computing Mobile Observer
112. "Disconnect!", Feb 28, 2007, Network Computing Mobile Observer
113. "EV-DO Rev A: Upping the Ante", Feb 7, 2007, Network Computing Mobile Observer
114. "IEEE 802.11n for the Enterprise—Not a Trivial Upgrade", Jan 17, 2007, Network Computing Mobile Observer
115. "Google Embraces Mobile", Dec 20, 2006, Network Computing Mobile Observer
116. "Using VPNs with Wireless Networks", Nov 29, 2006, Network Computing Mobile Observer
117. "Evolved EDGE and the Future of TDMA", Oct 18, 2006, Network Computing Mobile Observer
118. "Wireless E-Mail Efficiency Assessment." Oct 13, 2006. White paper that presents the results of a detailed engineering assessment to compare network efficiency of RIM Blackberry versus Microsoft Direct Push.
119. "Mobile Broadband: EDGE, HSPA & LTE", Sep 2006. White paper published by 3G Americas.
120. "Mobile Computing Policy and De-Perimeterization", Sep 27, 2006, Network Computing Mobile Observer
121. "Trials and Tribulations in Assessing Wireless Network Performance", Sep 6, 2006, Network Computing Mobile Observer
122. "Time to Decide", article on wireless networking, Aug 31, 2006, Network Computing Cover Story
123. "Sprint Nextel, WiMAX and the Mobile Broadband Conundrum", Aug 16, 2006, Network Computing Mobile Observer
124. "Wide-Area Wireless—The Next Five Years", Jul 26, 2006, Network Computing Mobile Observer
125. "Anatomy of a Well-Designed Wireless Application", Jul 5, 2006, Network Computing Mobile Observer
126. "Wireless Network Assessment, EVDO and WiFi Hotspots." A detailed test report on the relative performance of CDMA2000 EVDO and WiFi hotspots. March 21, 2006.
127. "Using Your Cell Phone as a Modem", Jun 14, 2006, Network Computing Mobile Observer

128. "Convergence Update: IMS and UMA", May 24, 2006, Network Computing Mobile Observer
129. "Mobile Broadband - Trying to Catch a Fast-Moving Target", May 3, 2006, Network Computing Mobile Observer
130. "Integrated Voice/Data in 3G", Apr 12, 2006, Network Computing Mobile Observer
131. "Mobile Middleware in the Broadband Era", Mar 22, 2006, Network Computing Mobile Observer
132. "Figuring Out Metro Wi-Fi", Mar 1, 2006, Network Computing Mobile Observer
133. "Sprint Nextel's Jump to the Future", Feb 8, 2006, Network Computing Mobile Observer
134. "The Smartphone Conundrum", Jan 18, 2006, Network Computing Mobile Observer
135. "Municipal and Mesh Wi-Fi", Dec 21, 2005, column, Network Computing Mobile Observer
136. "Linksys WRT54G -- Not What It Used to Be", Nov 30, 2005, column, Network Computing Mobile Observer
137. "Confusion About 4G", Nov 9, 2005, column, Network Computing Mobile Observer
138. "Strong Capabilities, Difficult Decisions", Oct 27, 2005, article, Network Computing Magazine
139. "Hard Numbers and Experts' Insights on Migration to Evolved 3G and 4G Wireless Technology", Oct, 2005, updated public report, published by Datacomm Research
140. "Wireless Data Pricing--One Hundred Times Less Expensive and Still Not Satisfied", Oct 19, 2005, column, Network Computing Mobile Observer
141. "Secure Mobile Access Using SSL VPNs", Oct 2005, white paper, published by Aventail
142. "Embedded Wireless WAN", Sep 28, 2005, column, Network Computing Mobile Observer
143. "Redefining the Endpoint--Wireless Broadband Routers", Sep 7, 2005, column, Network Computing Mobile Observer
144. "Data Capabilities: GPRS to HSDPA and Beyond", Sep 2005, white paper, published by 3G Americas
145. "High Speed Downlink Packet Access (HSDPA)", Aug 17, 2005, column, Network Computing Mobile Observer
146. "The Uneven Uptake of Wireless Data", Jul 21, 2005, column, Network Computing Mobile Observer

147. "Where is WiMAX?", Jul 6, 2005, column, Network Computing Mobile Observer
148. "Mobile Broadband and the Multi-Network Path to 4G", Jul 2005, article, WiMAX Business and Technology Strategies
149. "Freed Up or Tied Down", Jul 21, 2005, article, Network Computing Magazine
150. "Wireless E-Mail for the Masses, Jun 15, 2005, column, Network Computing Mobile Observer
151. "Parallel Mobile Universes", May 25, 2005, column, Network Computing Mobile Observer
152. "Beyond the Airlink- IP Multimedia Subsystem", May 4, 2005, column, Network Computing Mobile Observer
153. "Secure Wireless Networking Using SSL VPNs", May 2005, white paper, published by Aventail
154. "3 Sides to 3G", Apr 13, 2005, column, Network Computing Mobile Observer
155. "Hard Numbers and Experts' Insights on Migration to Evolved 3G and 4G Wireless Technology", Feb, 2005, public report, published by Datacomm Research
156. "Forever Evolving", Oct 14, 2004, article, Network Computing Magazine
157. "Data Capabilities: GPRS to HSDPA", Sep 2004, white paper, published by 3G Americas
158. "Brush up on Bluetooth", Jun 24, 2004, article, Network Computing Magazine
159. "Policing the Airwaves", May 7, 2004, article, Secure Enterprise Magazine
160. "Device Drivers (Smartphones and Wireless PDAs)", Apr 15, 2004, article, Network Computing Magazine
161. "Making the Smart Choice (Smartphone and Wireless PDA Platform Review)", Apr 15, 2004, article, Network Computing Magazine
162. "Wireless Instant Messaging: Propelling SMS and Desktop IM to the Next Level", Oct 27, 2003, public report, published by Datacomm Research
163. Common Goals, Unique Strengths – Survey of Hotspot Operators, May 15, 2003, article, Network Computing Magazine
164. "Data Capabilities for GSM Evolution to UMTS", Nov 19, 2002, white paper, published by 3G Americas.
165. "Wireless Nirvana", Oct 21, 2002, article, Network Computing Magazine
166. "Voice Capacity Enhancements for GSM Evolution to UMTS", Jul 18, 2002, white paper, published by 3G Americas.
167. "Networking Standards and Wireless Networks", 2002, white paper, published by NetMotion Wireless

168. "Public Wireless LANs: Challenges, Opportunities and Strategies", Jul 9, 2001, public report, published by Datacomm Research
169. "Break Free With Wireless LANs", Oct 29, 2001, article, Network Computing Magazine
170. "MMDS Struggles to Find a Foothold", Oct 29, 2001, article, Network Computing Magazine
171. "Can MWIF Unify Cellular Protocols?", May 2001, column, M-Business Magazine
172. "M-Wallets: Not Ready Yet", Apr 2001, column, M-Business Magazine
173. "AT&T's GSM Move Could Ignite U.S. Market", Mar 2001, column, M-Business Magazine, March 2001
174. "Lessons From I-Mode", Feb 2001, column, M-Business Magazine
175. "E-Commerce Unleashed", Jan 22, 2001, article, Network Computing Magazine
176. "Mobile-Commerce ASPs Do the Legwork", Jan 22, 2001, article, Network Computing Magazine.
177. "Big Step to Mobile Payments", Jan 2001, column, M-Business Magazine.
178. "Emerging Technology: Clear Signals for General Packet Radio Service", Dec 2000, article, Network Magazine.
179. "WAP: Untangling the Wireless Standard", Nov 2000, article, Network Computing Magazine
180. "The Road to a Wireless Future", Oct 30, 2000, article, Network Computing Magazine
181. "Wireless Wonders (HiperLAN and Bluetooth) Coming Your Way", May 2000, article, Network Magazine.
182. "Managing Mobile Code", Aug 23, 1999, online manual, Network Computing Magazine.
183. "The Evolution of Cellular Data: On the Road to 3G", 1999, article published by Intel "On The Road To PCS", February 15, 1996, article, Network Computing Magazine.
184. "Wireless IP - A Case Study", Apr 30, 1999, article, PCS Data Today online journal
185. "Broadband Wireless: Now Playing in Select Locations", Oct 7, 1999, article, Data Communications Magazine
186. "Satellite Services: Don't Join the Space Race", Sep 21, 1999, column, Data Communications Magazine
187. "Making the Case for Fixed Wireless Technology", Jul 1999, column, Data Communications Magazine

188. "Wireless IP: Ready to Lift Off?", Mar 1999, column, Data Communications Magazine.
189. "Planning and Implementing Wireless LANS", 1999, online manual, Network Computing Magazine.
190. "Wireless Broadband and Other Fixed-Wireless Systems", 1998, online manual, Network Computing Magazine.
191. "General Packet Radio Service (GPRS)", September 30, 1998, GSM Data Today online journal.
192. "Wide-Area Wireless Computing", 1997, online manual, Network Computing Magazine.
193. "Internet-To-Go, Now With Mobile IP", November 1, 1997, article, Network Computing Magazine.
194. "Making The Call With Two-Way Paging", January 15, 1997, article, Network Computing Magazine.
195. "Cellular Data Communications Made Easy", July 1, 1997, article, Network Computing Magazine.
196. "Wireless Data Made To Order", March 15, 1996, article, Network Computing Magazine.
197. "TCP/IP: The Best Protocol for Remote Computing", public white paper, WRQ. 1996.
198. "Message Middleware In A Wireless Environment", April 15, 1996, article, Network Computing Magazine.
199. "On The Road To PCS", Feb 15, 1996, article, Network Computing Magazine
200. "The ABCs of PCS," Nov 7, 1994, article, Network World.

7. Wireless Courses

The following lists the public courses that Rysavy Research has taught. These are listed in the order of most recent to oldest. Rysavy Research has also privately taught on wireless technology at AT&T, Bluetooth SIG, Cingular Wireless, Cricket Communications, Intel, Medtronic, Microsoft, NetMotion Wireless, RIM, Tektronix, Teledyne, T-Mobile, and the U.S. Department of Defense.

1. Interop Conference, Las Vegas, May 2013. "Wireless Everywhere: LTE and Beyond," 1 hour course.
2. Bellevue, WA, April 2013. "4G: Deep Technology Insights," full-day course.
3. Interop Conference, Las Vegas, May 2012. "LTE Update," one-hour course.
4. Bellevue, WA, April 2012. "Mobile Broadband Explosion," full-day course.
5. Redmond, WA, December 2010. "Mobile Broadband - Technology Evolution and Strategic Considerations," full-day course.

6. Portland, OR, November 2010. "Mobile Broadband - Technology Evolution and Strategic Considerations," full-day course.
7. AT&T Developer Program, March 2010, "Guidelines for Delivering Streaming Services on AT&T's Wireless Network," one-hour webcast.
8. Bellevue, WA, Oct 2009. "Mobile Broadband - Entering the 4G Decade," 1.5-hour session at IEEE Wireless Workshop.
9. Bellevue, WA, Apr 2009. Portland, OR, May 2009. "Mobile Broadband Innovation - 3G to 4G Evolution and Impacts," full-day course.
10. 3G Americas, Dec 2008, "EDGE, HSPA, LTE - Broadband Innovation," one-hour webcast.
11. AT&T Developer Program, August 2008, "Broadband Innovation - Applications for New Broadband Networks," one-hour webcast.
12. AT&T Developer Program, June 2008, "Emerging Mobile Application Architectures," one-hour webcast.
13. AT&T Developer Program, March 2008, "Understanding Mobile Application Development Environments: Open Platforms, Tools, Capabilities, Developer Strategies," one-hour webcast.
14. AT&T Developer Program, Dec 2007, "Harnessing Mobile Middleware - Architectures, Functions and Integration," one-hour webcast.
15. AT&T Developer Program, Sep 2007, "Best Practices for Mobile Application Development - Strategies, Considerations, and Techniques for Optimal Development," one-hour webcast.
16. AT&T Developer Program, Apr 2007, "How Enterprises Can Get Ready for IP Multimedia Subsystem (IMS): IMS Strategies and Application Development Approaches," one-hour webcast.
17. Bellevue, WA, May 2006, "Evolution of Mobile Broadband", full-day course.
18. Portland State University, Apr 2006, "Wireless Technology Advances: Wi-Fi, 3G, WiMAX, Mobile Broadband", full-day course.
19. Portland State University, Sep 2005, "3G, Evolved 3G, 4G and WiMAX", full-day course.
20. Bellevue, WA, April 2005, "Wireless Technology Advances", full-day course.
21. CTIA Wireless Data University, Mar 2005, "Wi-Fi and WiMAX in Detail", half-day course.
22. Portland State University, Jan 2005, "Wi-Fi Technology - Evolution and Integration", full-day course.
23. CTIA Wireless Data University, Oct 2004, Wi-Fi - Technology, Evolution, Adoption and Hotspots, Added Section: WiMAX", half-day course.
24. Portland State University, Jun 2004, "3G, WiMAX and other Wide-Area Broadband Wireless Networks", full-day course.

25. CTIA Wireless Data University, Mar 2004, "Wi-Fi - Technology, Evolution, Adoption and Hotspots", half-day course.
26. Portland State University, Nov 2003, "Wi-Fi - Evolution, Adoption and Hotspots", full-day course.
27. CTIA Wireless Data University, Oct 2003, "Wi-Fi Technology - Evolution, Adoption and Hotspots", half-day course.
28. IEEE Wireless LAN Conference, 2002, "Wireless LAN Business and Marketing Issues", one-hour presentation.
29. Portland State University, 2002, "WLANs, 3G Cellular and Beyond", two-day course.
30. Portland State University, 2001, "Next Generation Cellular Data", full-day course.
31. CMP Web 2001, "The Wireless Web in Detail", full-day course.
32. IEEE Chapter Evening Presentation, 2001, "Wireless Networking Advances - Setting Reasonable Expectations", two-hour presentation.
33. UCLA, 2001, "Wireless Data Systems", full-day course.
34. CMP Web 2000, "Wireless Data Networks", full-day course.
35. UCLA, 2000, "Wireless Data Systems", two-day course.
36. UCLA, 1999, "New Third Generation Cellular, Digital PCS and Broadband Mobile Data - What Will Dominate?", four-day course co-taught with C. R. Baugh Ph.D.
37. Portable Design Conference, 1999, "Wireless Data Integration", full-day course.
38. Northcon, 1998, "Wireless Data Networking Advances", full-day course.
39. UCLA, 1998, "Technologies for Wireless Competitive Markets: Cellular, PCS and Wireless Data", four-day course co-taught with C. R. Baugh Ph.D.
40. UCLA, 1997, "Cellular, PCS and Wireless Data Technology", four-day course co-taught with C. R. Baugh Ph.D.
41. UCLA, 1996, "Wireless Voice And Data Communications (Personal Communications Services, Digital Cellular, and Wireless Data)", four-day course co-taught with C. R. Baugh Ph.D.
42. UCLA, 1995, "Wireless Voice and Data Communications (Personal Communications Services, Digital Cellular, and Wireless Data)", four-day course co-taught with C. R. Baugh Ph.D.
43. UCLA, 1994, "Wireless Voice and Data Communications (Personal Communications Services, Digital Cellular, and Wireless Data)", four-day course co-taught with C. R. Baugh Ph.D.