

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RED HAT, INC.
Petitioner,

v.

COMPETITIVE ACCESS SYSTEMS INC.
Patent Owner

U.S. Patent No. 8,861,349
Issued: October 14, 2014
Filed: June 22, 2012
Inventor: Eric M DeLangis
Title: Broadband Communications Device

**PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. § 312 AND 37 C.F.R. § 42.104**

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1001	Declaration of Bill Lin, Ph.D. in support of <i>Inter Partes</i> Review
1002	<i>Curriculum Vitae</i> of Bill Lin
1003	Certified Copy of U.S. Patent No. 11,582,343
1004	Certified File History of U.S. Patent No. 11,582,343
1005	Certified Copy of U.S. Patent No. 11,418,641
1006	Certified File History of U.S. Patent No. 11,418,641
1007	Certified Copy of U.S. Patent No. 10,868,908
1008	Certified File History of U.S. Patent No. 10,868,908
1009	Certified Copy of U.S. Patent No. 9,350,649
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1011	Certified Copy of U.S. Patent No. 8,861,349
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1015	Certified Copy of U.S. Patent No. 7,606,156
1016	Certified File History of U.S. Patent No. 7,606,156
1017	U.S. Patent Application Publication No. 2004/0001512 A1 (“Challener”)
1018	U.S. Patent Application Publication No. 2003/0026221 A1 (“Kotzin”)
1019	James Carlson, <i>PPP Design, Implementation, and Debugging</i> (2d ed. 2000) (“Carlson”)
1020	Gilbert Held, <i>Network Design Principles and Applications</i> , 2000 (“Held”)
1021	U.S. Patent No. 6,917,960 (“Decasper”)

¹ Unless otherwise specified, citations are to the original page, column, and line numbers in exhibits rather than the PDF page. Citations corresponding to the PDF pagination are indicated in [[brackets]]. Unless otherwise noted, all emphases and annotations are added.

Exhibit No.	Description
1022	Johnny Chen, <i>New Approaches to Routing for Large-Scale Data Networks</i> (Rice University, 1999) (“Chen”)
1023	Declaration of Sylvia Hall-Ellis
1024	Webster's Ninth New Collegiate Dictionary, 1990
1025	Xin, W., Ishihara, S., and Mizuno, T., <i>A QoS-ensured Transmission Scheme with Content-based Priority for Mobile Cluster Users</i> , 2000 (“Xin”)
1026	U.S. Patent Application Publication No. 2002/0042274 A1 (“Ades”)
1027	U.S. Patent No. 7,003,580 (“Cook”)
1028	U.S. Patent No. 5,625,877 (“Dunn”)
1029	U.S. Patent Application Publication No. 2002/010866 A1 (“McCullough”)
1030	Candace Leiden & Marshall Wilensky, <i>TCP-IP for Dummies</i> (3d ed. 1999) (“Dummies”)
1031	U.S. Patent Application Publication No. 2003/0223450 A1 (“Bender”)
1032	U.S. Patent Application Publication No. 2004/0022224 A1 (“Billhartz”)
1033	Hung-Yun Hsieh & Raghupathy Sivakumar, <i>A Transport Layer Approach for Achieving Aggregate Bandwidths on Multi-homed Mobile Hosts</i> (2002) (“Hsieh”)
1034	U.S. Patent No. 6,778,495 (“Blair”)
1035	Cisco Systems, Inc., <i>Troubleshooting Async Multilink PPP Operations</i> (2001) (“Cisco”)
1036	U.S. Patent Application Publication No. 60/377,631 (“Tucker”)
1037	Konishi et al., <i>Web SHAKE: A fast WWW access method for mobile terminals on temporary cluster networks</i> , IEEE Proceedings April 28-May 2, 2002 (“Konishi”)
1038	RFC 1990: The PPP Multilink Protocol (MP), August 1996
1039	<i>Competitive Access Systems, Inc. v. Oracle Corporation, and Oracle America, Inc.</i> , 1:23-ca-00286-ADA, Dkt. 82 (W.D.TX. Aug. 10, 2023)
1040	<i>Red Hat, Inc. v. Competitive Access Systems, Inc.</i> , 4:24-cv-00130-D, Dkt. 1 (E.D.N.C. Sep. 3, 2024)

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1041	<i>Red Hat, Inc. v. Competitive Access Systems, Inc.</i> , 4:24-cv-00130-D, Dkt. 1-10 (E.D.N.C. Sep. 3, 2024)
1042	Lai et al., <i>Measuring Bandwidth</i> , IEEE (1999)
1043	RFC 2663: IP Network Address Translator (NAT) Terminology and Considerations, August 1999
1044	U.S. Patent No. 5,878,040 (“Peirce”)
1045	“A Novel Mechanism for Data Streaming Across Multiple IP Links for Improving Throughput and Reliability in Mobile Environments,” IEEE INFOCOM 2002 (“Phatak”)
1046	RFC 2543: SIP: Session Initiation Protocol, March 1999
1047	RFC 2131: Dynamic Host Configuration Protocol, March 1997
1048	RFC 1945: Hypertext Transfer Protocol – HTTP/1.0, May 1996
1049	Endler, David, <i>Brute-Force Exploitation of Web Application Session IDs</i> , iALERT White Paper, Nov. 1, 2001 (“Endler”)
1050	Rappaport, Theodore S., et al., <i>Wireless Communications and Application Above 100 GHz: Opportunities and Challenges for 6G and Beyond</i> , IEEE Access, Vol. 7, 2019 (“Rappaport”)
1051	Reex. Control No. 90/019,265
1052	Gast, Matthew S., <i>802.11 Wireless Networks – The Definitive Guide</i> , 2002
1053	Shoemake, Matthew B., <i>Wi-Fi (IEEE 802.11b) and Bluetooth CoExistence Issues and Solutions for the 2.4 GHz ISM Band</i> , Texas Instruments, Feb. 2001, Ver. 1.1
1054	Furuskär, Anders, et al., <i>EDGE: Enhanced Data Rates for GSM and TDMA/136 Evolution</i> , IEEE Personal Communications, June 1990
1055	RFC 2326: Real Time Streaming Protocol (RTSP), April 1998
1056	Random House Webster’s Computer & Internet Dictionary, 3 rd ed., December 1998
1057	Andrew S. Tanenbaum, <i>Computer Networks</i> , Chps. 1 & 5 (3d ed. 1996)
1058	Adolfo Rodriguez <i>et al.</i> , <i>TCP/IP Tutorial and Technical Overview</i> , Chps. 1 & 14 (Prentice Hall PTR 2002)

Petition for *Inter Partes* Review of U.S. Patent No. 8,861,349

Exhibit No.	Description
1059	Richard O. LaMaire, et al., <i>Wireless LANs and Mobile Networking: Standards and Future Directions</i> , IBM, May 31, 1996

Petitioner Red Hat, Inc. (“Red Hat”) respectfully requests *inter partes* review of claims 1-20 (“Challenged Claims”) of U.S. Patent No. 8,861,349 (“the ’349 Patent”).

I. INTRODUCTION

The Challenged Claims of the ’349 Patent are unpatentable in view of two references that were not substantively considered during its original prosecution before the Patent Office, the Challener and Kotzin references.

The ’349 patent is directed to a device referred to by the ’349 Patent as a residential communications gateway (“RCG”). The RCG connects a residence (*e.g.*, an Internet user) to a communications network (*e.g.*, the Internet via an Internet service provider or “ISP”) “over a customer’s existing POTS line, and it doesn’t require any network infrastructure build out like DSL and Cable services.” EX1011, 3:10-12. The RCG was intended “to enhance, not replace, the existing telephone line” by aggregating bandwidth over the “last mile” of copper over which almost all residential customers received their communication services in the 2002 time frame. *Id.*, 1:18-20; 3:16-18.

Yet, as discussed below, aggregating bandwidth among devices to resolve the “last mile” or similar bandwidth issues was known in the prior art. For example, the ’349 patent acknowledges that it is merely applying RFC 1990, the PPP Multilink Protocol that was published in August 1996, to achieve a multilink broadband

connection. *Id.*, 11:2-4. The PPP Multilink Protocol teaches using link aggregation to increase bandwidth. EX1038.

Against this backdrop, this Petition, supported by the Declaration of Dr. Bill Lin, Ph.D., presents two grounds based on the Challener and Kotzin references, which render the Challenged Claims obvious as discussed in detail below.

II. OVERVIEW OF CHALLENGE AND RELIEF REQUESTED

Petitioner requests cancellation of the Challenged Claims as unpatentable under 35 U.S.C. §103.

A. Prior Art Patents and Printed Publications

Petitioner's challenge is based on these references, which predate the earliest claimed priority date of the '349 Patent:

1. U.S. Patent Application Publication No. 2003/0026221 ("Kotzin") (EX1018) was filed on August 2, 2001, published on February 6, 2003, and is prior art under at least pre-AIA 35 U.S.C. § 102(e).

2. U.S. Patent Application Publication No. 2004/0001512 A1 ("Challener") (EX1017) was filed on June 28, 2002, published on January 1, 2004, and is prior art under at least pre-AIA 35 U.S.C. § 102(e).

B. Relief Requested

Petitioner requests cancellation of the Challenged Claims as unpatentable under 35 U.S.C. §103. The grounds are set forth below and supported by the declaration of Dr. Bill Lin.

Ground	Claims	Proposed Statutory Rejection
I	1-20	Obvious under § 103 in view of Kotzin
II	1-20	Obvious under § 103 in view of Challenger

III. TECHNOLOGY OVERVIEW

A. Bandwidth Aggregation

Before the alleged invention of the '349 Patent, it was well-known that devices like gateways could aggregate bandwidth. It was well-known that gateways extend the connectivity of a network and help achieve greater bandwidth without additional remote hardware or changes to the existing physical infrastructure. EX1017, ¶¶[0014], [0016], Fig. 3, EX1028, 6:35-40, EX029, Abstract, ¶¶[0002], [0085]; EX1020 at 256. Algorithms were also developed to effectively aggregate, or “bundle,” multiple connections between source and destination. For example, the Multipath TCP protocol was well known prior to the '349 Patent's earliest priority date. The TCP/IP protocol on which Multipath TCP is based was created in the 1980s. *See* EX1030, 100-12; EX1020, 142, 281-82; EX1022, 8, 119, 124, 143-44; EX1033. And Multipath TCP was proposed as early as 1999. EX1022, 8. Multipath TCP uses two or more paths between a server and client to transmit packets between them, instead of the single path used in traditional TCP. *Id.*, Chapter 7. Additionally, TCP was recognized as helpful to provide flow control and congestion control. *Id.*, 243-44. TCP was also known to employ a tuple (including source address/port and

destination address/port) in order to uniquely identify a particular communication session. EX1043 §2.3.

B. Bandwidth Aggregation as a Solution to the Last Mile Problem

In the late 1990s and early 2000s, the “last mile” problem—referring to the final segment of the telecommunications network connecting homes to service providers, typically via low-bandwidth copper wires—was widely recognized as a major bottleneck in residential networking, as most users were limited to Plain Old Telephone Service (POTS) lines despite the availability of high-capacity core infrastructure like fiber optics. EX1017, ¶[0004]. To address this, solutions emerged that leveraged existing infrastructure with low-cost enhancements rather than costly upgrades. For example, Challenger describes a bandwidth sharing device that allows an end user to aggregate bandwidth from multiple other devices, increasing effective bandwidth without modifying the physical network. *See id.*, ¶[0040]. Similarly, Cook acknowledged the limitations of single communication paths to the client’s interface and proposed supplementing wireline connections with wireless links, enabling parallel data transmission and higher aggregate bandwidth without the need for additional wireline installations. See EX1027, 1:29-33, 1:50-56.

IV. THE ’349 PATENT

The ’349 Patent claims priority to Provisional Application No. 60/418,521 (“’521 Application”), which was filed on October 15, 2002. Petitioner reserves the

right to challenge the priority date, but Challener and Kotzin are still prior art even if the '349 Patent's priority date is October 15, 2002.

A. Claims

The '349 Patent has 20 claims. Independent claims 1, 13, 16, and 20 recite methods and devices for providing broadband communications services and increasing bandwidth through multilink connections. Dependent claims 2-12, 14, 15, and 17-19 recite different attributes associated with the network, aggregation, and multilink connection. All claims constitute the Challenged Claims. As discussed below, all Challenged Claims are disclosed or rendered obvious by the Challener and Kotzin references.

B. Specification

The alleged problem in the art that the '349 Patent set out to solve was that high-speed data services required expensive infrastructure enhancements to local telephone service lines to resolve "last mile" bandwidth issues. EX1011, 1:15-20, 2:1-10. The purported solution provided is sharing and aggregating bandwidth from multiple RCGs, or broadband communications devices such as gateways or routers, which was already known in the art using prior-art protocols such as MPPP. *Id.*, 2:18-44, Fig. 7. As discussed below, however, this solution for sharing and aggregating bandwidth among multiple broadband communication devices was already proposed by Challener and Kotzin.

C. Prosecution History

The application that issued as the '349 Patent was filed on June 22, 2012, with eight apparatus claims all directed to communications devices aggregating data. EX1012, [[8]]-[[10]] (6-22-2012 Application Data Sheet).

The Examiner rejected the application several times. In the final office action prior to allowance related to obviousness, the Examiner noted that the prior art disclosed “simultaneously receiving packets from different transmission medium,” and rendered obvious aggregating data from multiple sources. *Id.*, [[201]]-[[203]] (4/21/2014 Office Communication). The Applicant filed an amendment and argued that the Examiner relied upon non-analogous art that did not disclose several limitations, including the claimed “multilink request” or connection and two devices wirelessly connected and concurrently receiving data from the network. *Id.*, [[667]]-[[671]] (7/21/2014 Application Communication). The Examiner issued a notice of allowance on September 8, 2014. *Id.*, [[706]]-[[707]] (Notice of Allowance and Fees Due (PTOL-85)).

As discussed below, all of the claims are disclosed or rendered obvious by the analogous art Challener and Kotzin.

D. Person of Ordinary Skill in the Art

As Dr. Lin explains in his Declaration, a POSITA at the time of the '349 Patent would have had at least a bachelor's degree in electrical engineering, computer science, or a related field, and at least one year of experience with network

design. Individuals with different education and additional experience could still be of ordinary skill in the art if that additional experience compensates for a deficit in their education and experience. EX1001, ¶¶51-54.

V. CLAIM CONSTRUCTION

Claims in an IPR are interpreted and construed under *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005). For purposes of this proceeding only, terms in the Challenged Claims need not be construed. If PO raises claim construction arguments, Petitioner reserves the right to respond. Petitioner notes, however, that in a previous case, PO contended that “multilink connection” means “[a] connection including multiple physical links,” and that “multilink group transfer” means “transferring data over a multilink connection.” EX1039, 8-9. Petitioner disagrees with PO, but notes that the Challenged Claims are rendered obvious by Challenger and Kotzin even under Petitioner’s constructions.²

² Petitioner does not present any § 101 or §112 challenges herein but reserves the right to challenge the patentability under §§ 101 and 112 in litigation or any other appropriate forum. Nothing contained in this Petition or supporting papers is an admission or acknowledgement that the specification of the ’349 Patent satisfies §§ 101 and 112.

VI. OVERVIEW OF THE PRIOR ART

A. Kotzin

Kotzin discloses a bandwidth aggregation system where the bandwidth available to a plurality of wireless units in a wireless network can be shared with a primary wireless unit, thereby increasing the wireless bandwidth available to the primary wireless unit. EX1018, Abstract, ¶[0024]. The primary wireless unit receives data over a first network from an Internet web server, such as a cellular network, and over a second wireless network from one or more of the other wireless units, such as an 802.11 or Bluetooth network in combination with a cellular network. Kotzin explains that wireless units connect with each other so units “receive portions of the communication on behalf of the destination wireless apparatus,” resulting in higher effective bandwidth. *Id.* ¶¶[0028], [0031], [0035]. Kotzin’s system is illustrated below:

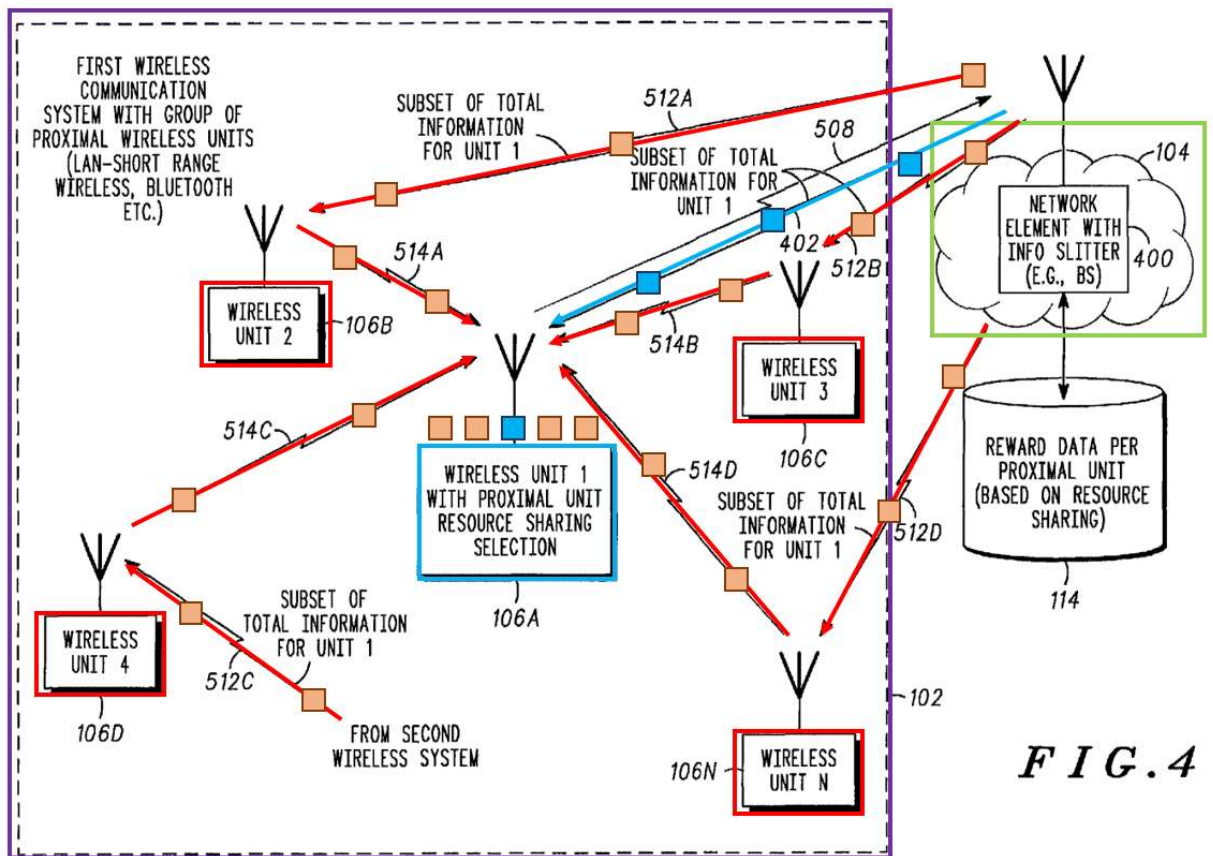


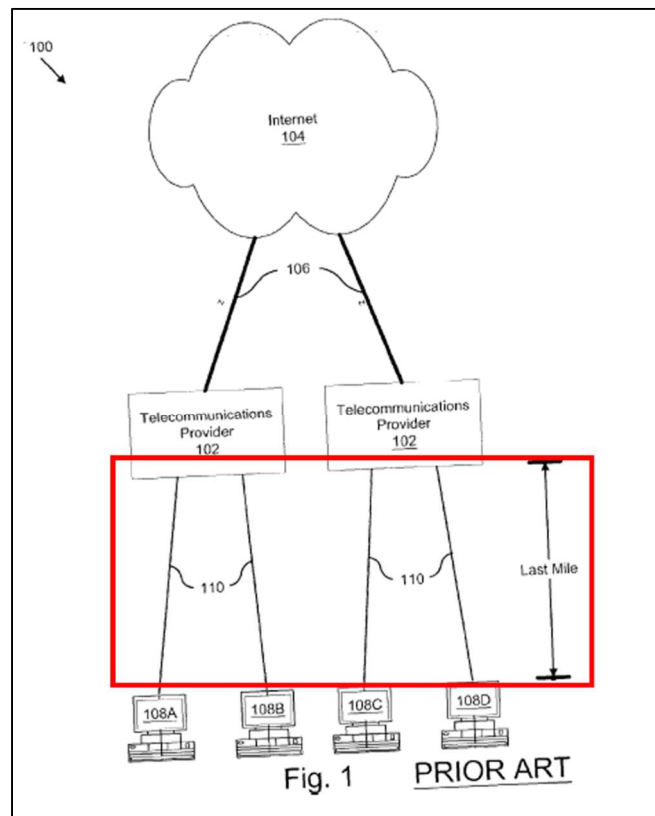
FIG. 4

With reference to Kotzin's Figure 4 shown above, Kotzin discloses that wireless unit 106A (blue), for example, can make use of bandwidth from wireless units 106B, 106C, 106D, and 106N (orange) to receive data from a device on external network 104 (e.g., the Internet) (green). Thus, Internet data packets from an Internet server destined for wireless unit 106A can be split among multiple links to each of the wireless units 106A, 106B, 106C, 106D, and 106N, and then relayed from each of 106B to 106N to be aggregated by 106A. In this manner the bandwidth available to

106A is increased by using, in addition to its own bandwidth, additional bandwidth allocated to wireless units 106B, 106C, 106D, and 106N.

B. Challenger

Challenger discloses a method and apparatus for bandwidth sharing to increase the bandwidth available to a user connected to the Internet. EX1017, Abstract. Challenger explains that in the prior art, a user's access (such as the user of computer 108B in Figure 1 below) to bandwidth was limited by "last mile" communication infrastructure, as shown in Figure 1 reproduced below:



Id., Fig. 1; *see also id.* ¶¶[0034]–[0036]. Challenger explains that “[d]ue to low bandwidth capability, the last mile telecommunications lines 110 prove to be a significant bottleneck precluding broadband connectivity between the Internet 104 and the end user terminals 108.” *Id.* ¶[0036].

To address this shortcoming, Challenger discloses “a wireless and automatic aggregation process among separate sharing entities.” EX1017, ¶[0012]; *see also id.* ¶[0014]. Challenger discloses a “bandwidth sharing device” (“BSD”) connected to the Internet that can wirelessly connect to other bandwidth sharing devices also connected to the Internet, so that unused bandwidth can be aggregated to increase the effective bandwidth for a user. *Id.* ¶¶[0040]–[0056]. Figure 2, reproduced below, depicts how bandwidth sharing devices can be used to improve a prior art system:

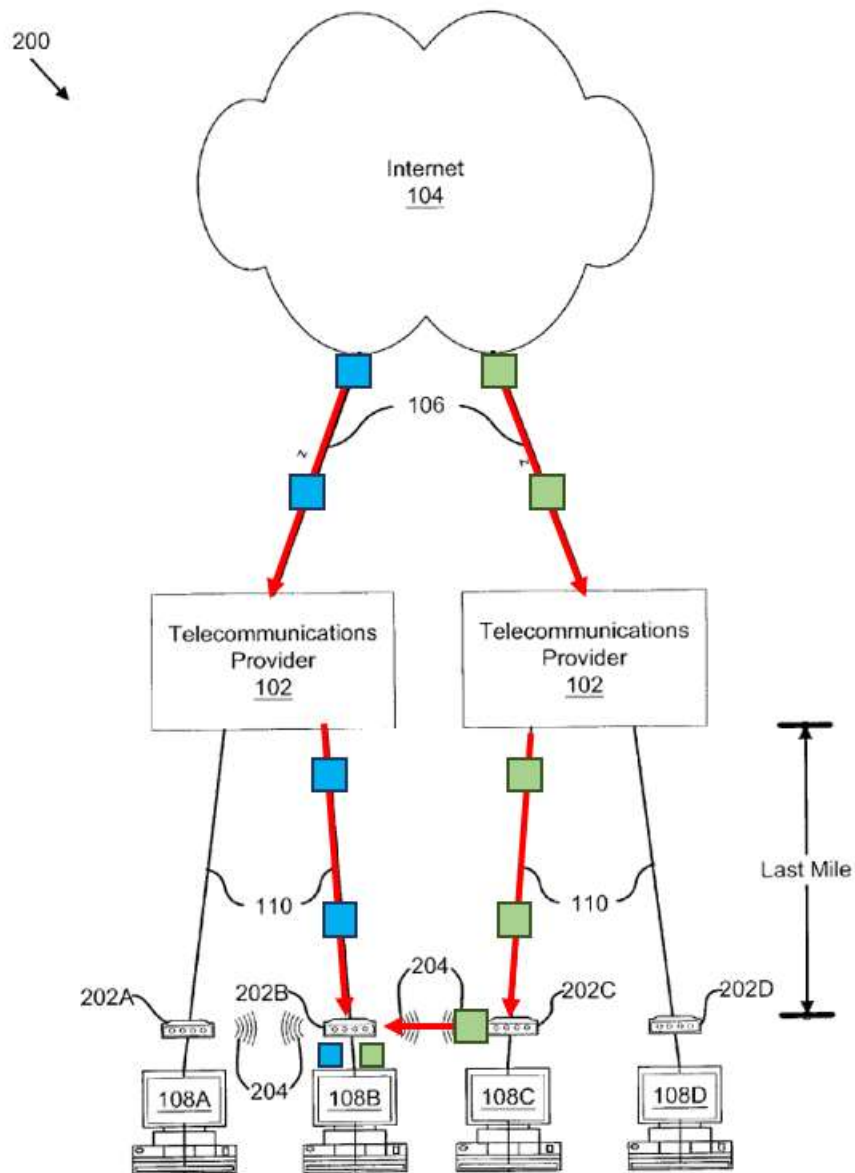


Fig. 2

Id. Fig. 2. As shown in the above example, data packets from the Internet 104 destined for computer 108B are split along two paths, one directly to 108B over 202B's last mile connection, and a second path comprised of 202C's last mile connection and its wireless connection 204 with 202B. The data packets, shown above in blue for one path and green for another, are then aggregated together at

202B, thereby increasing the total bandwidth available to computer 108B. *Id.* ¶¶[0018], [0046]. In the above example, Challenger refers to BSD 202B as a “master” BSD, and BSD 202C as a “slave” BSD. In Challenger’s system, the master BSD is in charge of automatically setting up and managing bandwidth sharing with one or more slave BSDs. *Id.* ¶¶[0017], [0020]-[0023].

VII. SPECIFIC GROUNDS FOR PETITION UNDER 37 C.F.R. § 42.104(B)

A. Ground I: Claims 1-20 Are Obvious in View of Kotzin

1. Independent Claim 1

- a. [1.pre.] “A method for increasing bandwidth and data throughput comprising the steps of:”*

Kotzin discloses a plurality of wireless units that use short-range wireless system 102 (*e.g.*, an 802.11 WiFi network) for increasing (*i.e.*, aggregating) the total bandwidth of one of the wireless units, for example Unit 106A, when communicating with a device on external network 104, such as an Internet web server referred to as element 400 in Kotzin. EX1018, Abstract, ¶[0024]. Using Unit 106A as an example for this analysis, Kotzin’s wireless units connect with each other wirelessly so units “receive portions of the communication on behalf of the destination wireless apparatus 106 *a*” from the external network, resulting in higher effective bandwidth for Unit 106A. *Id.* ¶¶[0035], ¶[0028], [0031]. The external network is described by Kotzin as “a wireless wide area network (WAN) communication system 104 such as a digital cellular communication system, the Internet, or any other suitable communication system.” *Id.* ¶[0022]. When additional

bandwidth is needed, the destination communication device (*e.g.*, unit 106A) sends “to each of the participating proximal wireless units, a partial bandwidth request indicating an amount of data to be received by a party from the wide area network.” *Id.*, ¶[0040]. It would have been obvious to a POSITA that by increasing bandwidth available to a Unit, “data throughput” (or the amount of data transmitting through the network) is also increased, because throughput is the amount of actual data transmitted per unit time. EX1001, ¶61.

- b. [1.1] “*sending a multilink request from a first device to a second device to join a multilink connection, the first device being connected at a first location to a network, the second device being connected at a second location to the network, the second location being geographically separate from the first location, the first device and the second device being configured for accessing the network; and;*”

Kotzin discloses that wireless unit 106A, when seeking to use the available bandwidth from other wireless units, sends requests to the other wireless units for assistance in transferring data to wireless unit 106A, and does so by requesting wireless units to join a multilink connection. *See* EX1018, Fig-5 (step 504A); Fig-6 (step 604), ¶[0039].

In one example depicted in Figures 4 to 6, Kotzin teaches procedures for setting up resource sharing via a multilink connection on behalf of unit 106A. *See id.*, Figs-4-6, ¶¶[0037]-[0038]. In this read, unit 106A is the claimed “*first device.*” 106A is “*connected at a first location to a network*” as it is a wireless unit, “such as an Internet appliance” including mobile devices such as PDAs, handheld units, and

laptops, and would be located in a home, office, or other geographic location. *Id.* ¶[0022], Fig-4. Further, 106A is connected “to a network,” specifically WAN 104. *Id.* (“The communication system 100 also includes a wireless wide area network (WAN) communication system 104”).

Kotzin’s 106A (the first device) can also connect to the same WAN via a second wireless unit, for example UNIT 2. Figure 5, which illustrates the messaging that is used to configure bandwidth sharing in Kotzin’s system, refers to Unit 106A as “UNIT 1.” Kotzin teaches that UNIT 1 sends message 504A—referred to by Kotzin as a “shared resource participation query”—the claimed “*multilink request*,” to UNIT 2 asking whether UNIT 2 can participate in a multilink communication by sharing its unused bandwidth. *Id.*, Fig-5. Message 504A is a “multilink request” because it is requesting that UNIT 2 form one of the physical links in a multi-link connection where data from 106A will be transmitted and received over multiple links. *Id.* Fig-5, ¶¶[0037], [0040]. Further, in this read, UNIT 2 is the claimed “*second device*.”

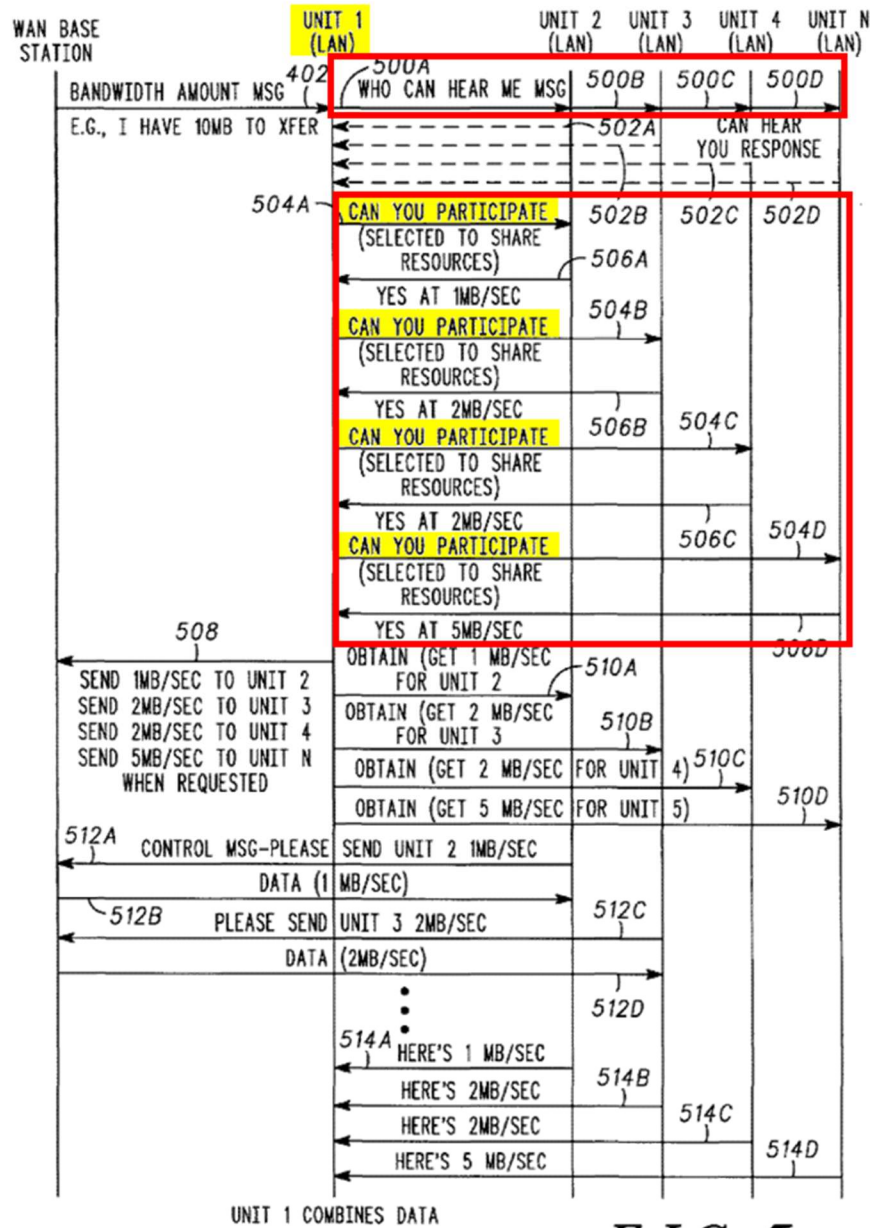


FIG. 5

Id. UNIT 2 is “connected at a second location to the network,” as, like UNIT 1, it is the same type of wireless unit that may located in a home, office, or otherwise mobile. *Id.* ¶[0022], Fig. 4. It would likewise be connected to “a network” WAN 104. *Id.*

Kotzin also discloses “*the second location being geographically separate from the first location,*” as the wireless units only need be in “close enough proximity to allow wireless local area network communication” but need not be the same location. *Id.* ¶¶[0022], [0035]. Kotzin also provides examples of wireless units that are mobile, such as PDAs, handheld units, and laptops, *id.* ¶[0022], and thus a POSITA would have understood and found obvious that they may be located at different geographic locations. Further, as discussed in §VII.A.13.c, Kotzin’s bandwidth sharing is implementable when a wireless unit is connected to a “completely different WAN system,” which a POSITA would have understood to be at a geographically separate location. *Id.* ¶[0035] (“the wireless apparatus 106a-106n may be subscriber radios on completely different WAN systems.”); EX1001, ¶¶63-67.

Further, “*the first device and the second device [are] configured for accessing the network*” as the wireless units are connected to WAN 104 and have WAN transceivers. EX1018, ¶[0022], Figs. 1, 4.

- c. [1.2] “*when the multilink request is accepted by the second device, receiving at the first device first data from the network at the first location and during the multilink connection, concurrently receiving second data over a wireless connection from the second device, the second data being received at the second location from the network.*”

Kotzin discloses that its wireless units may receive data from network element 400. In one embodiment, the network element may be an Internet web server 400:

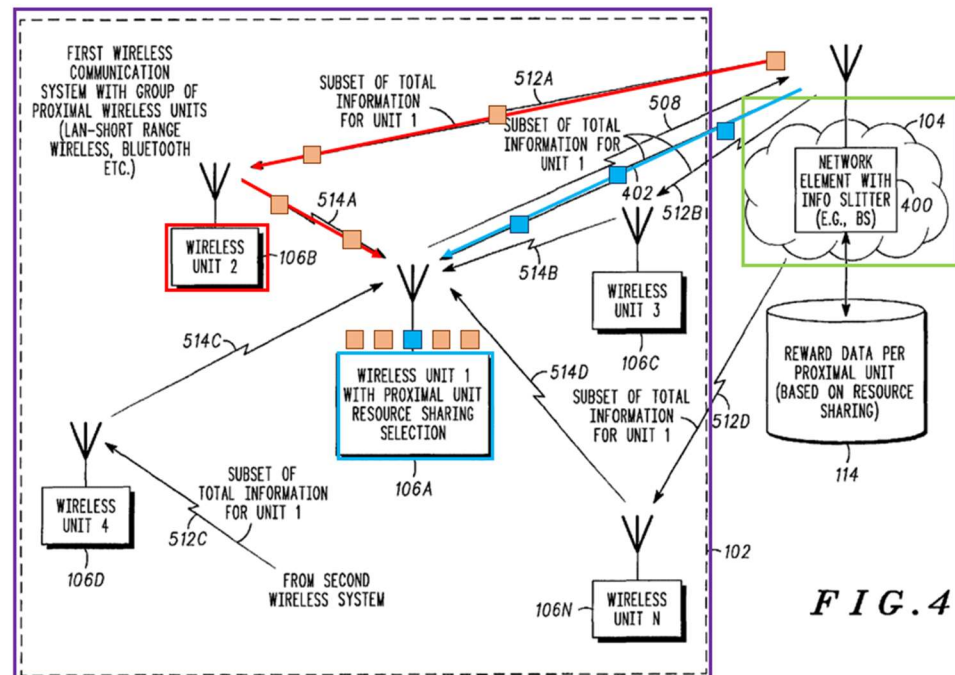
“a network element 400, such as a cellular base station (BS), **Internet Web server**, or any other suitable unit within the second wireless communication system 104, splits (*i.e.*, distributes) a communication destined for the wireless apparatus 106a[.]” EX1018, ¶[0035]. Thus, as discussed above, when downloading information from a network device such as Internet web server 400, Kotzin teaches that a first device (106A or UNIT 1) may send a multilink request (504A) to a second device (106B or UNIT 2), as well as other devices, requesting them to share their bandwidth with 106A when downloading data from an Internet web server 400 for a particular communication session. *See* §VII.A.1.b. Thus, once a multilink connection has been set up, where 106A will be using its own bandwidth plus additional bandwidth for one or more wireless units, including at least UNIT 2 for example, 106A will proceed to download data from Internet web server 400. Internet web server 400 will split those packets among different links.

First, some portion of the download data will be transmitted directly to 106A over the WAN from Internet web server 400. EX1018, ¶[0039] (“the wireless apparatus **106a itself may also participate in receiv[ing] a portion of the message destined for it**”), Fig-4. Thus, Kotzin teaches “*receiving at the first device first data from the network at the first location and during the multilink connection.*”

Second, assuming UNIT 2 has been successfully recruited to share bandwidth with 106A, *id.* ¶¶[0038]-[0039], a second portion of the download data will be

transmitted from Internet web server 400 to UNIT 2. *Id.*, ¶¶[0039]-[0040] (“the network element 400 responds by transmitting to each of the participating wireless units, subsets of the total information destined for the wireless apparatus 106a.”), ¶[0041], Fig-4. UNIT 2 in turn will forward the data it receives over its LAN connection (e.g., 802.11) to 106A. Thus, Kotzin teaches “*receiving at the first device first data from the network at the first location and during the multilink connection.*”

This is illustrated below:



Kotzin also teaches that Unit 106A “concurrently” receives both sets of data, because it is using two separate interfaces to receive the data: a WAN interface to receive data directly from Internet web server 400, and a LAN interface to receive data from UNIT 2. *Id.* ¶¶[0002], [0022], [0037]-[0041], Fig-5. As Kotzin explains,

a wireless unit has a common air interface that “can *simultaneously* provide a connection to a wide area network (such as the internet via a point of presence) and other local subscriber units.” *Id.* ¶[0003].

2. Dependent Claim 2

- a. [2] “*The method of claim 1, wherein the first location and the second location are physically isolated from each other.*”

Kotzin renders [1] obvious. *See* §VII.A.1.

A POSITA would have understood and found obvious that Kotzin’s wireless devices may be “physically isolated from each other,” as the devices are connected wirelessly across a spatial distance. *See* §VII.A.1.b. Thus, the locations are physically isolated because they are not physically connected through, for example, an ethernet cable.

3. Dependent Claim 3

- a. [3] “*The method of claim 1, further comprising the step of aggregating the second data received over the wireless connection and the first data received over the connection at the first location.*”

Kotzin renders [1] obvious. *See* §VII.A.1.

Kotzin illustrates in Figures 4 and 5 that UNIT 1, at its own location, aggregates the data received from Units 2 (and other Units) with the data it receives directly from the external network 104.

Kotzin further explains that the UNIT 1 (106a) can direct the base station (or Internet Web server in the same embodiment) or server message 508 as to how “to

split the portions of message so that apparatus 106a knows how to combine the message 514a-d” received from the other wireless units. EX1018, ¶¶ [0035] and [0041]. Thus, in a situation where UNIT 1 receives data directly from the Internet but also data from the other wireless units such as UNIT 2, UNIT 1 will aggregate the received data to assemble the overall communication. Because multiple parallel links are being used by UNIT 1, its bandwidth increases to amount greater than the individual bandwidth of the links. *Id.*, ¶¶[0028], [0031], [0035], Fig-4.

4. Dependent Claim 4

- a. [4] “*The method of claim 1, wherein a connection at the first location and a connection at the second location are network connection points.*”

Kotzin renders [1] obvious. *See* §VII.A.1.

As discussed above, UNIT 1 and UNIT 2 may be physically isolated at different locations. *See* §VII.A.1.b. Because UNIT 1 is connected to the WAN via its WAN transceiver, that connection is a network connection point. Similarly, UNIT 2’s connection to the WAN at a different location is also a network connection point. Both UNITS are also available via the LAN to a server as WAN connection points for other UNITS. EX1018, ¶¶[0019], [0025], [0035], Fig-4.

5. Dependent Claim 5

- a. [5] “*The method of claim 1, wherein the first device and the second device are consumer networking devices.*”

Kotzin renders [1] obvious. *See* §VII.A.1.

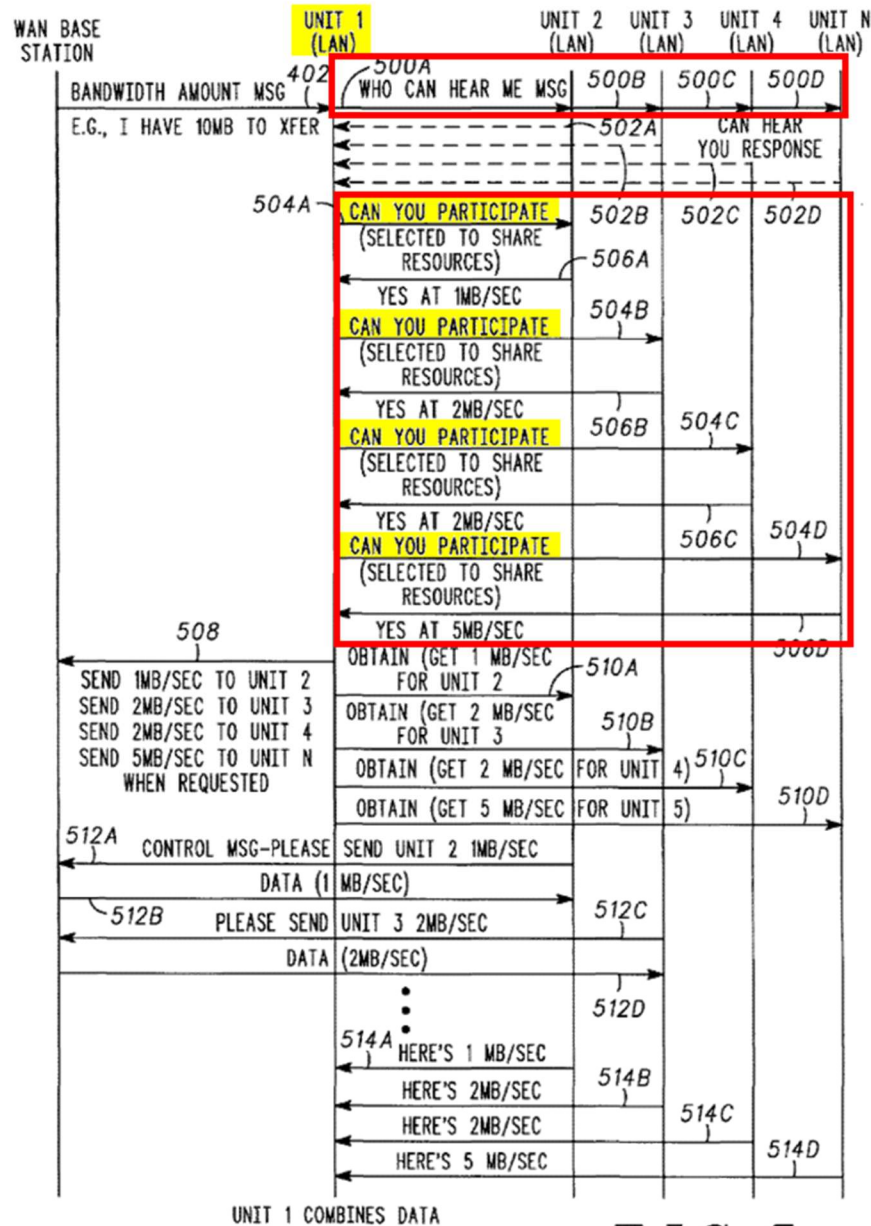
Kotzin discloses that its wireless units may be consumer networking devices such as “radiotelephone appliance, including, but not limited to, hand held apparatus, laptop computers, desk top computers....” EX1018, ¶[0022].

6. Dependent Claim 6

- a. [6.1] “The method of claim 1, further comprising the steps of: sending another multilink request from the first device to a third device, the third device being connected at a third location to the network, the third location being geographically different than the first location and the second location; and”*

Kotzin renders [1] obvious. See §VII.A.1.

As shown in Fig. 5, Kotzin’s UNIT 1 may send request message 504—referred to by Kotzin as a “shared resource participation query,” or request to participate in a multilink communication—to not only UNIT 2 but also UNITS 3, 4, and N (messages 504B, 504C, and 505D):



Id.; see also §VII.A.1.b. UNIT 3, for example, is a third device and as a wireless unit like UNIT 2, it would be “connected at a third location to the network, the third location being geographically different.” See §VII.A.1.b.

- b. [6.2] “when another multilink request is accepted by the third device, concurrently receiving third data during the multilink connection over a second wireless connection

between the first device and the third device.”

A POSITA would have understood that Kotzin’s requesting UNIT 106A “concurrently” receives data from resource sharing wireless UNITS 106B, C, and N. *See* §VII.A.1.c. A POSITA would have further understood that, when another multilink request is accepted by UNIT 106C, for example, UNIT 106A may also concurrently receive that data. For example, Kotzin explains that “[e]ach of the wireless units 106a-106n, in this embodiment, includes both a wireless local area network communication transceiver, such as a Bluetooth™-based transceiver, and a wireless wide area network transceiver, such as a CDMA cellular transceiver.” EX1018, ¶¶[0022], [0003], [0035]. A POSITA would have understood and found obvious that the Bluetooth™ protocol and other protocols such as 802.11 permitted UNIT 106A to receive data from UNITS 106B, C, and N concurrently. *See* EX1045, 773 (“For instance, host *A* might be a laptop at an airport with access to the Internet via an 802.11 LAN (say interface A_1), a Bluetooth scatternet (A_2), and a cellular phone modem (A_3)). *See* EX1001, ¶68.

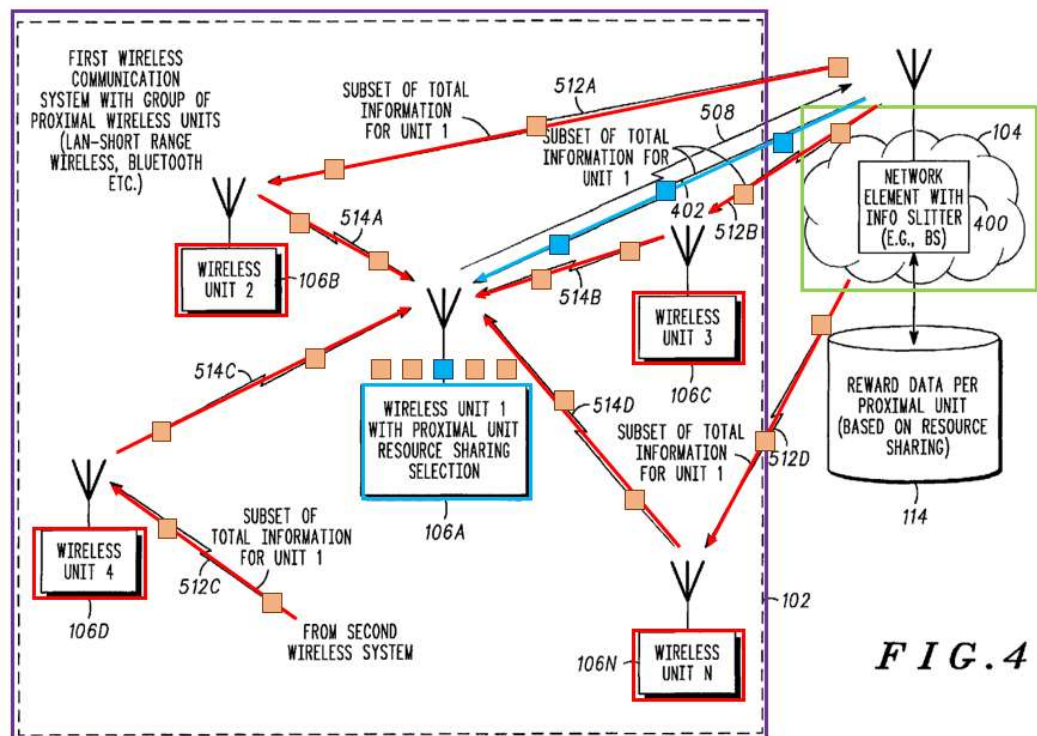
7. Dependent Claim 7

- a. [7] “The method of claim 6, further comprising the step of aggregating the first data, the second data and the third data.

Kotzin discloses or at least renders [6] obvious. *See* §VII.A.6.

Kotzin explains that the UNIT 1 (106a) can direct the base station or server message 508 as to how “to split the portions of message so that apparatus 106a

knows how to combine the message 514a-d” received from the other wireless units. EX1018, ¶[0041]. Thus, in a situation where UNIT 1 receives data directly from the Internet but also data from the other wireless units (“*first data, the second data and the third data*”), UNIT 1 will aggregate those data units to retrieve the overall communication. This packet splitting and aggregation is illustrated in annotated Figure 4 below:



EX1018, Fig-4, ¶[0030]-[0041]; see also §VII.A.3.

8. Dependent Claim 8

- a. [8] “The method of claim 1, wherein the first data and the second data are received as data packets.”

Kotzin renders [1] obvious. See §VII.A.1.

Kotzin discloses or renders obvious that the multilink communications are ***packet-based***, as digital data communications as disclosed by Kotzin are typically packet-based. EX1018, ¶[0035]. For example, Kotzin discloses that its wireless units communicate with Internet Web servers. *Id.* ¶[0033]. A POSITA would have understood and found obvious that Internet Web communications use data packets based on the TCP/IP protocol. EX1001, ¶¶69-70. Kotzin also discloses that its wireless units communicate with a GSM or CDMA network. A POSITA would have understood and found obvious that GSM and CDMA data networks also use packet-based communication. *Id.* (citing EX1018, ¶[0003]). Kotzin also discloses that its wireless units can communicate using the IEEE 802.11 and Bluetooth™ protocols, which also use packet-based communications. EX1018, ¶[0022].

9. Dependent Claim 9

- a. [9] “*The method of claim 1, wherein the network is the Internet.*”

Kotzin renders [1] obvious. See §VII.A.1.

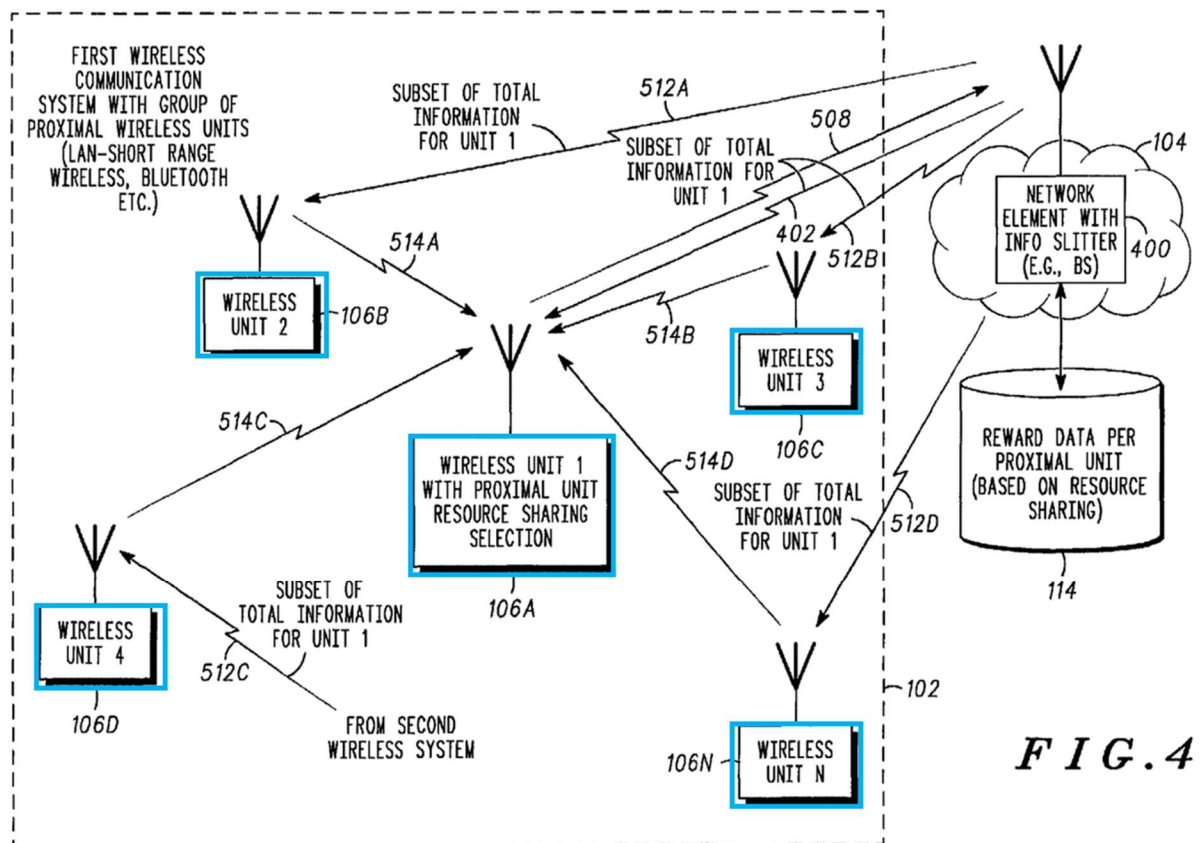
Kotzin discloses that the wireless units 106 communicate in a peer-to-peer arrangement with each other using wireless LAN communication transceivers and communicate individually with network 104. EX1018, ¶[0022]. Kotzin explains that network 104 is a wireless wide area network communication system “such as a digital cellular communication system, the ***Internet***, or any other suitable communication system.” *Id.*

10. Dependent Claim 10

- a. [10] “The method of claim 1, wherein the second device is a wireless device.”

Kotzin renders [1] obvious. See §VII.A.1.

Kotzin discloses that each of the devices 106A, B, C, and N participating in the multilink connection are wireless devices as illustrated in Figure 4.



EX1018, Fig-4; see also *id.*, ¶¶[0035]-[0038].

11. Dependent Claim 11

- a. [11] “The method of claim 1, wherein the network is one or a combination of a cable network, a telecommunication network, an optical network and a communications network.”

Kotzin renders [1] obvious. See §VII.A.1.

Kotzin explains that the network 104 can be “a digital cellular communication system, the Internet, or any other suitable communication system,” and therefore discloses the network as at least “*a telecommunication network*” or “*a communications network*.” EX1018, ¶[0022].

12. Dependent Claim 12

- a. [12] “*The method of claim 1, wherein the wireless connection is a cellular connection, a satellite connection, a Wi-Fi connection, a WiMax connection or a Bluetooth connection.*”

Kotzin renders [1] obvious. See §VII.A.1.

As discussed in §VII.A.1.c, Kotzin discloses “*concurrently receiving second data over a **wireless connection** from the second device.*” Kotzin also discloses that the “*wireless connection*” via the LAN system is “compliant, for example, with the Bluetooth™ standard, or any other suitable short range communication protocol including, but not limited to, 802.11 or optical communication protocols.” EX1018, ¶[0022]; EX1001, ¶71. Thus Kotzin discloses “*the wireless connection*” is at least a Wi-Fi connection (802.11) or a Bluetooth™ connection.

13. Independent Claim 13

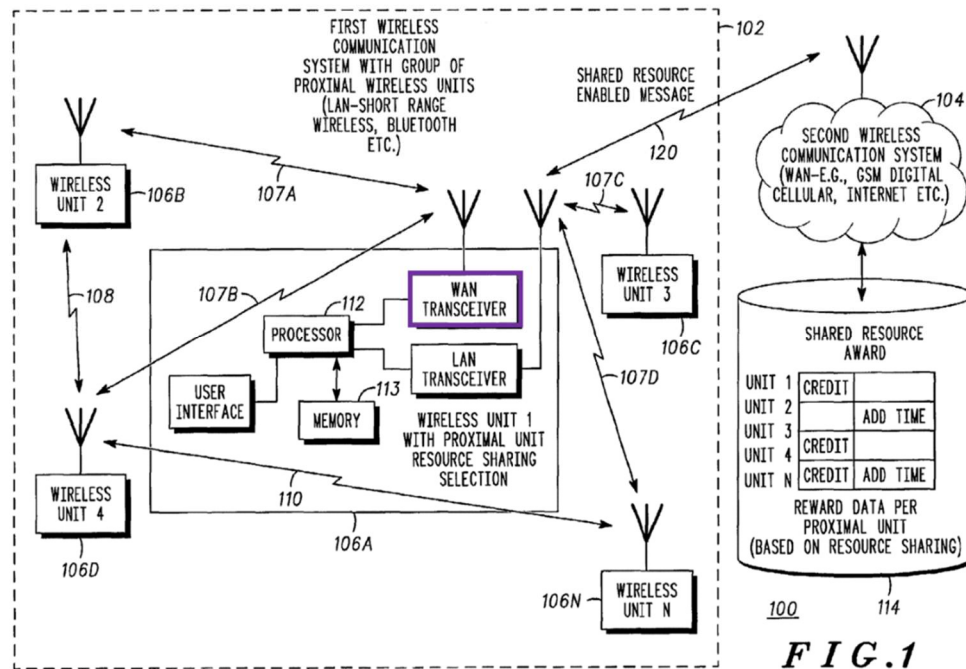
- a. [13.pre.] “*A device comprising:*”

Kotzin discloses “a communications device that is capable of providing broadband communications service,” namely any of Kotzin’s wireless units 106. See EX1018, ¶[0023].

- b. [13.1] “*an interface that establishes a network connection at a first location to a first network and receives first data*

packets over the network connection;”

Kotzin explains that its wireless unit 106A includes a WAN transceiver (*i.e.*, *an interface*) that establishes a network connection with a WAN (104) to receive data over that WAN. EX1018, Fig-1, ¶¶[0022], [0040]. As discussed in §VII.A.1.b, WAN (104) is the claimed “first network” and would be at a first location:



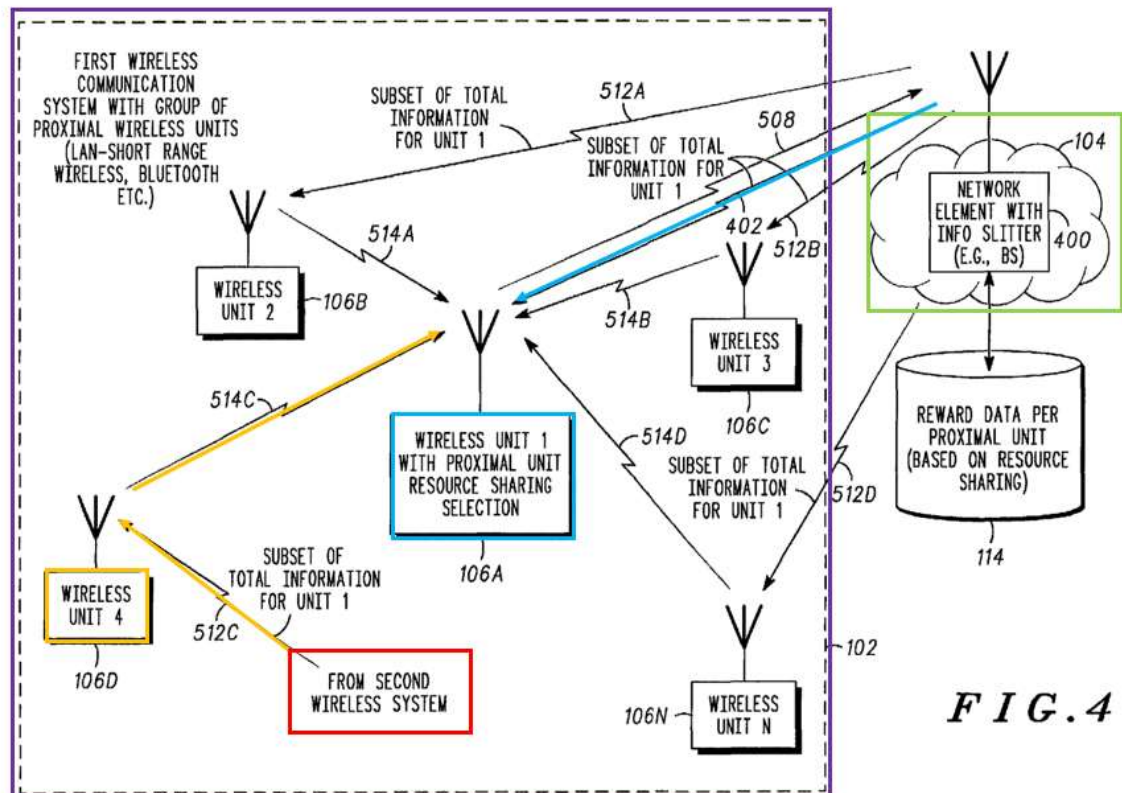
Id., Fig-1.

Further, as discussed in §VII.A.8, to the extent Kotzin does not expressly teach that data is transmitted as packets, it would have been obvious to a POSITA.

- c.* [13.2] “a wireless interface that is configured to establish a wireless connection to a remote communications device, the remote communications device being connected at a second location to a second network; and”

Kotzin teaches that the second wireless unit, UNIT 4 could be connected to a “completely different WAN system,” or second network. EX1018 (“the wireless

apparatus 106a-106n may be subscriber radios on completely different WAN systems.”). This is shown for example in Figure 4, which identifies Unit 4 (orange) as receiving information “from second wireless system” (red):



Further, the second wireless unit is a “remote communications device” in a “second location” because, as explained in §VII.A.1.b, the wireless units may be located in a home, office, or otherwise mobile. EX1018, ¶¶[0022], Fig. 4. Further, the wireless units only need be in “close enough proximity to allow wireless local area network communication” but need not be the same location. *Id.* ¶¶[0022], [0035].

To the extent that the claimed “first location” and “second location” are construed to require distinct locations and Kotzin does not expressly teach that UNIT 4 (e.g., wireless unit 106D) is connected to the network at a second distinct location from wireless unit 106A, such a modification would have been obvious. *See* §VII.A.1.b; §VII.A.2.

d. [13.3] “a processor that sends a multilink request over the wireless interface to the remote communications device to join the multilink connection”

Kotzin discloses that its wireless unit 106A has a processor 112 “such as a digital signal processor, microprocessor, discrete logic or any other suitable circuitry that provides the proximal unit resource sharing selection.” EX1018, ¶[0023], Fig-1.

As discussed in §VII.A.1.b, Kotzin discloses that a wireless unit, for example the wireless unit 106A, seeking to use the available bandwidth from other wireless units (Units 2-N) sends a request to the other wireless units that requests assistance in transferring data to wireless unit 106A, and does so by requesting use of a portion of unused bandwidth of the other wireless units:

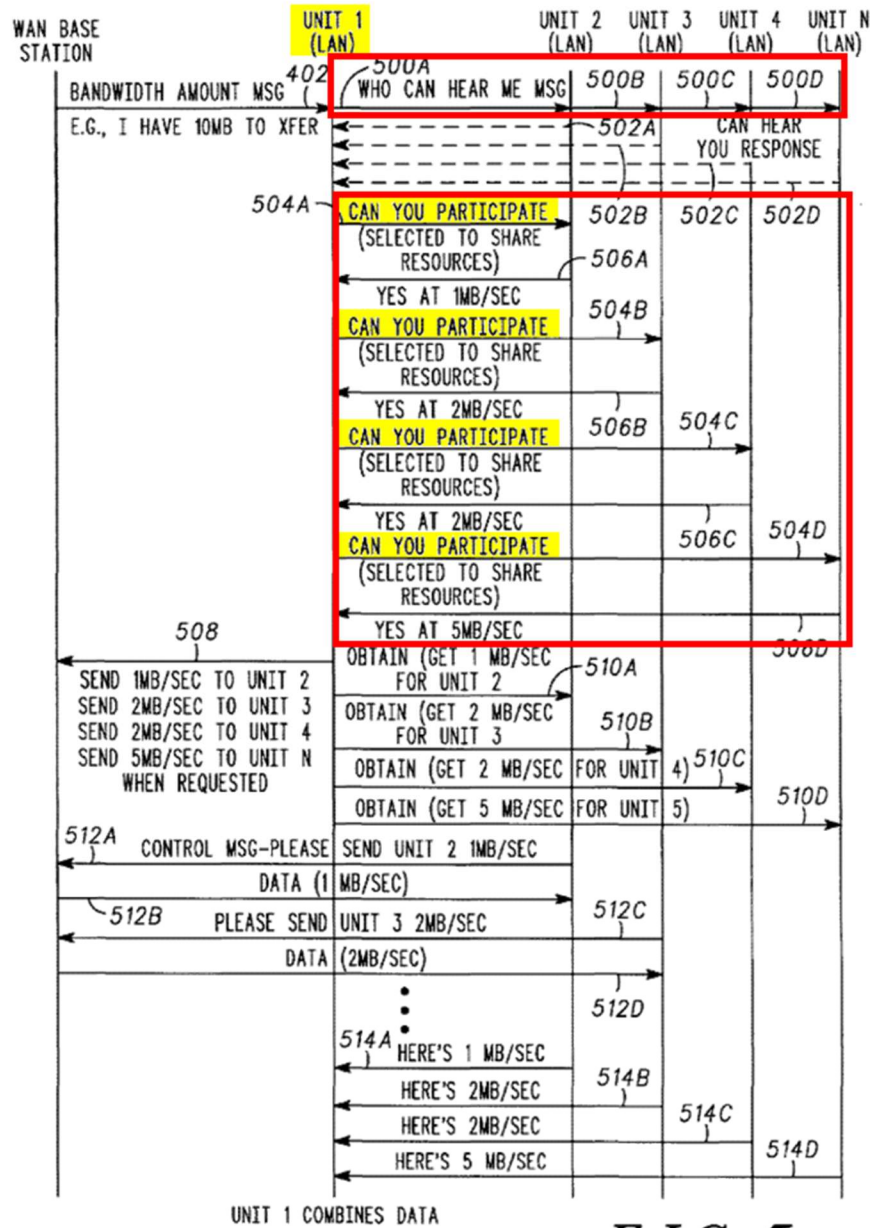


FIG. 5

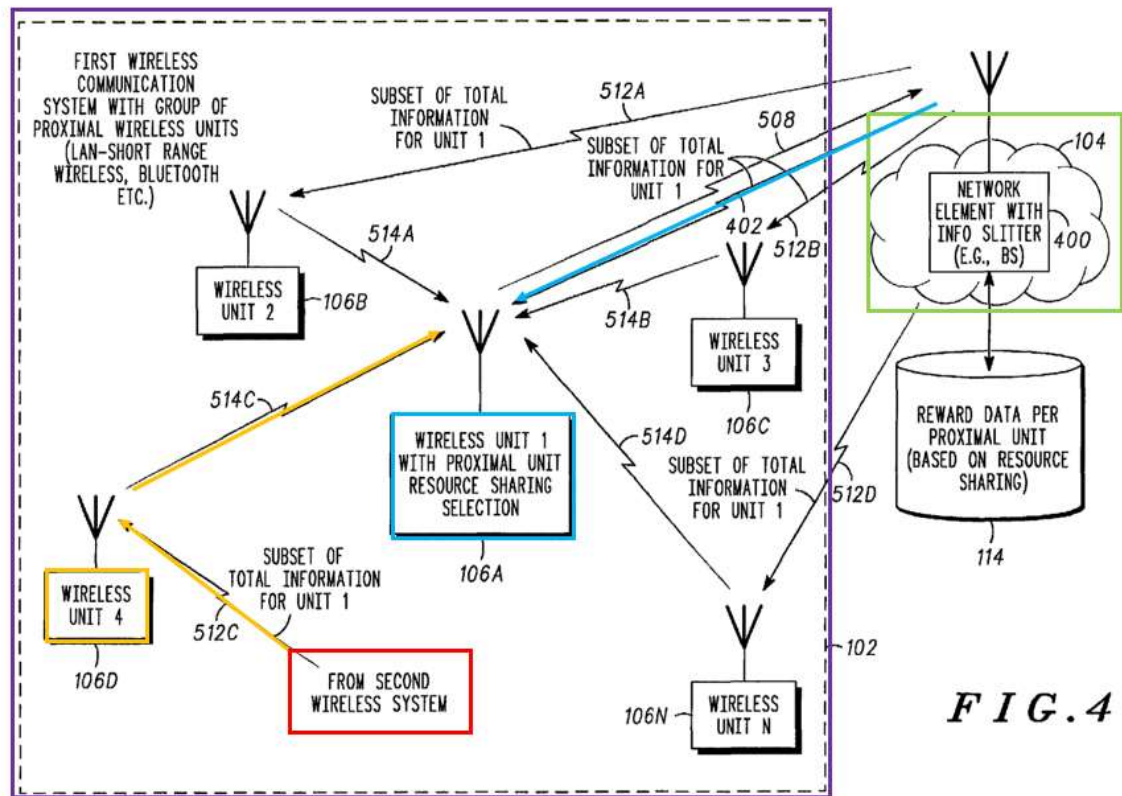
Id., Fig-5.

- e. [13.4] "receives from the interface the first data packets from the first network and when the multilink request is accepted by the remote communications device concurrently receives from the wireless interface second data packets from the second network, the second data packets being received at the second location from the

second network.”

First, as described in §VII.A.1.c some portion of the download data will be transmitted directly to 106A over the WAN from Internet web server 400. EX1018, ¶[0039] (“the wireless apparatus **106a** *itself may also participate in receiv[ing] a portion of the message destined for it*”), Fig-4. Thus, Kotzin teaches “*receives from the interface the first data packets from the first network.*”

Second, as described in §VII.A.13.c, Kotzin teaches that the second wireless unit, UNIT 4 (**orange**) receives data “from second wireless system” or a second WAN system (**red**) and sends that data to 106A over LAN (514C):



Id., Fig-4. This is further described in Figure 5, which demonstrates each of the UNITS that receives request 504 from UNIT 1 responds with the amount of available bandwidth that it can share with UNIT 1. For example, UNIT 4 responds with message 506C indicating it can share a bandwidth of 2MB/sec. *See* EX1018, ¶[0038]; Fig-5. Then, UNITS 2-N share the bandwidth with UNIT1 as illustrated in Figure 5 below. *Id.* ¶[0041]

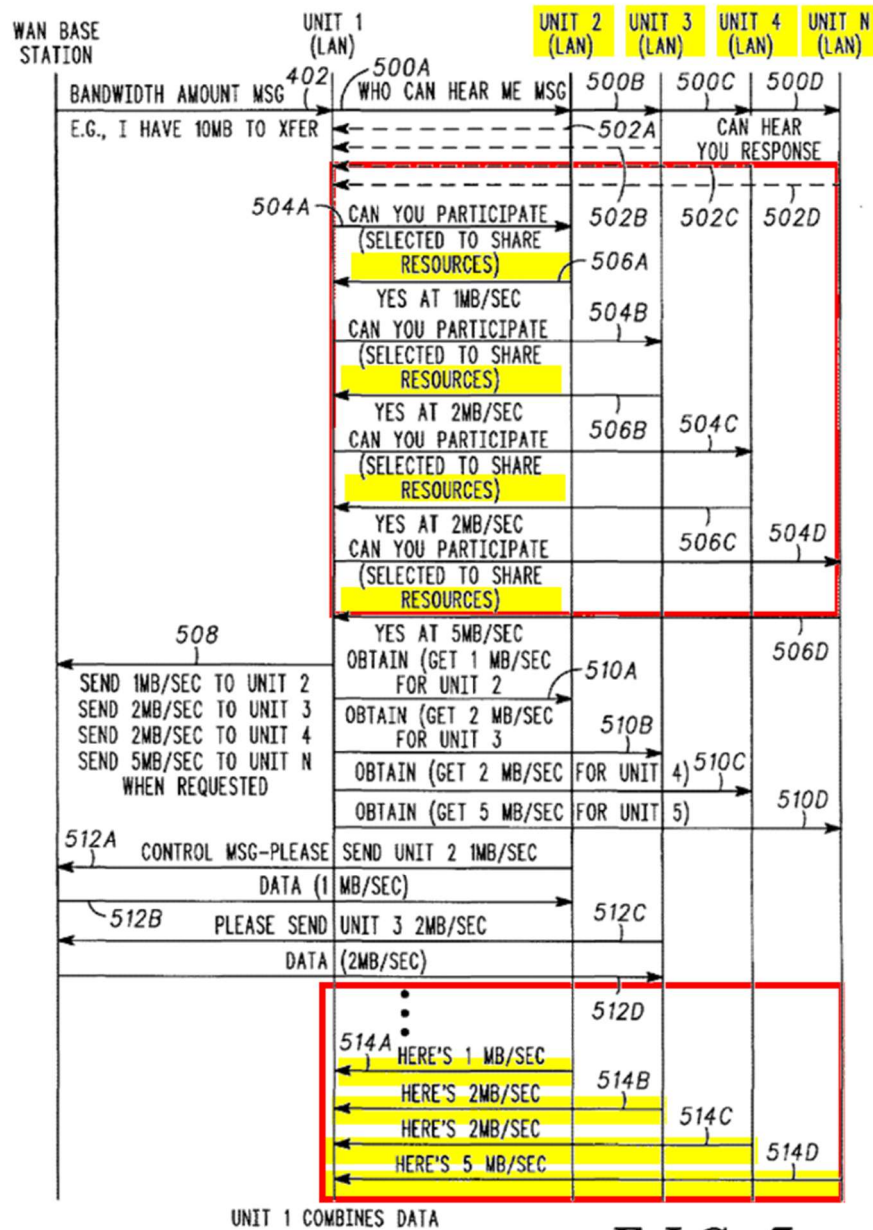


FIG. 5

Id., Fig-5.

Third, as described in §VII.A.1.c, Kotzin also teaches that the data packets are received “concurrently,” because it is using two separate interfaces to receive the data: a WAN interface to receive data directly from Internet web server 400, and a

LAN interface to receive data from UNIT 4. *Id.* ¶¶[0002], [0022], [0037]-[0041], Fig-5. As Kotzin explains, a wireless unit has a common air interface that “can *simultaneously* provide a connection to a wide area network (such as the internet via a point of presence) and other local subscriber units.” *Id.* [0003].

Fourth, a POSITA would also have understood the “*second data packets being received at the second location from the second network*” as Kotzin describes receiving data from devices 106b-106n and “the wireless apparatus 106a-106n may be subscriber radios on completely different WAN systems.” See §§VII.A.1.c, VII.A.13.c; EX1001 ¶72.

14. Dependent Claim 14

- a. [14] “*The device of claim 13, wherein the device is one of a modem, cellular phone, a router, a computer, hotspot device and a tablet.*”

Kotzin renders [13] obvious. See §VII.A.13.

Kotzin discloses that the device 106A can be “an Internet appliance, radiotelephone appliance, including, but not limited to, hand-held apparatus, laptop computers, desk top computers, or any other suitable wireless communication apparatus,” disclosing the device as at least “a cellular phone,” “a computer,” or “a tablet.” EX1018, ¶[0022].

15. Dependent Claim 15

- a. [15] “*The device of claim 13, wherein the device is part of a home-based network system.*”

Kotzin renders [13] obvious. See §VII.A.13.

Kotzin explains that the wireless unit 106A forms a part of the wireless LAN 102, *see* §VII.A.1.b, which a POSITA would have known are commonly used in home-based network systems. EX1001 ¶73.

16. Independent Claim 16

- a. [16.pre.] “A method for providing broadband communications services, comprising:”

See §VII.A.1.a.

- b. [16.1] “sending to a remote host an inquiry in whether the remote host is able to support a multilink connection;”

As discussed in §VII.A.1.b, Kotzin explains that when one of its wireless units desires to download information from an Internet Web server or the like with the participation of other wireless units, *i.e.*, engage in a “multilink” communication, its processor will send a request to another wireless unit (*i.e.*, a “remote host”) to form a multilink connection. EX1018, ¶[0035]; *see also id.*, Figs 4-6, ¶¶[0035]-[0041]. A POSITA would have understood the wireless units are “remote hosts.” First, these other wireless units are *remote* because they can communicate with remote computers and other devices on an external network, including the Internet. EX1001, ¶74. The ’349 Patent explains that the term “remote” refers to a computer located on the Internet, not the distance between the communication devices that share bandwidth with each other. EX1011, 11:46-50. Further, the ’349 Patent does not impose any distance requirement as to the term “remote.” *See* EX1011. A reading of the ’349 specification indicates that bandwidth-sharing communication devices

can be spaced apart—for example, in different households—as long as the devices are within wireless communication range of each other. EX1001, ¶74. Similarly, Kotzin teaches that its wireless units can be physically spaced apart from each other, as long as they are within wireless communications range for whichever wireless technology is used to connect them, for example 802.11 or Bluetooth™. EX 1018, ¶¶[0003], [0022]. “Each of the wireless units 106a-106n ... includes both a wireless local area network communication transceiver, such as a Bluetooth™-based transceiver, and a wireless wide area network transceiver, such as a CDMA cellular transceiver.” EX1018, ¶[0022]; *see also id.* Fig. 1. Accordingly, Kotzin’s devices have an interface for connecting wirelessly to at least one remote communications device, *i.e.*, the other units in the LAN. Second, a POSITA would have understood that the wireless units are remote *hosts* because the wireless units provide bandwidth sharing services. *Id.*, ¶¶[0037]-[0038], Fig-5; EX1001, ¶74.

- c. [16.2] “*receiving first data packets over a first connection to the Internet;*”

As described above, 106A receives packets directly over the WAN from Internet web server 400. *See* §§VII.A.1.c, VII.A.8, VII.A.13.b.

- d. [16.3] “*when the remote host indicates that the multilink connection is supported, receiving second data packets over a second connection, the first data packets being concurrently received with the second data packets during the multilink connection; and*”

As described above, after 106B (or UNIT 2) agrees to the multilink connection, it sends packets to 106A over LAN that it received from the WAN

system. 106A receives those packets from UNIT 2 concurrent with the receipt of data from the WAN via the Internet web server 400. *See* §§VII.A.1.c, VII.A.8. Figure 4, reproduced below, shows the remote host (106A) connected to the WAN (104) over a **first connection**, and connected to 106B over a **second connection**, and receiving the **first** and **second** data packets concurrently:

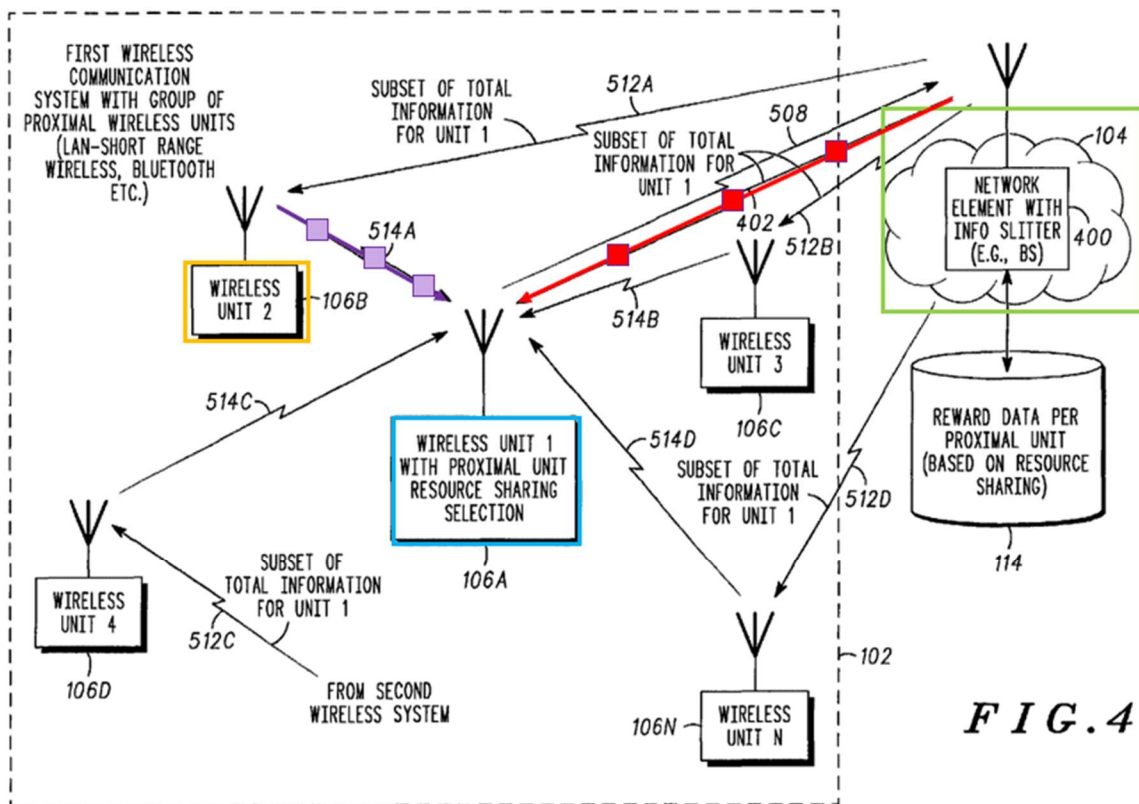


FIG. 4

EX1018, Fig. 4, ¶[0039].

- e. [16.4.] “wherein the first data packets create a first data stream and the second data packets create a second data stream.”

According to Kotzin, “the wireless apparatus 106a may directly combine portions of the data from each of the participating proximal units to obtain *the*

complete data stream or message.” EX1018, ¶[0041]. A POSITA would have understood this passage to mean that the first data creates a first data stream and the second data creates a second data stream which when combined form the complete data stream. EX1001, ¶76. Moreover, sending streams of data was a well-known method for transmitting large amounts of data and would have been obvious to implement in Kotzin’s system. *Id.*; *see also* EX1011, 11:34-38 (discussing receiving data stream), 13:12-16 (streaming video). Further, a POSITA would have understood that when sending data packets, each data packet creates a “data stream” as a function of design. EX1001, ¶76.

17. Dependent Claim 17

- a. [17] *“The method of claim 16, wherein the first data packets are received at a home-based network system, and wherein the second packets are received over the second connection at the home-based network system.”*

Kotzin renders [16] obvious. *See* §VII.A.16.

As explained above, wireless unit 106A forms a part of the wireless LAN 102. *See* §§VII.A.1.b, VII.A.15. A POSITA would have found it obvious to use Kotzin’s wireless LAN as a home-based network system. *See* §VII.A.15.

18. Dependent Claim 18

- a. [18] *“The method of claim 16, wherein the first data packets are received by a consumer-based network system, and wherein the second packets are received over the second connection at the consumer-based network system.”*

Kotzin renders [16] obvious. *See* §VII.A.16.

A POSITA would have found it obvious that Kotzin's wireless LAN is a consumer-based network system as Kotzin discloses that its wireless units are consumer networking devices such as "radiotelephone appliance, including, but not limited to, hand held apparatus, laptop computers, desk top computers." EX1018, ¶[0022]; *see also* §VII.A.5; EX1001, ¶77. Further, as discussed in §VII.A.4, Kotzin's 106A WAN connection is a connection point as is UNIT 2's LAN connection, thereby disclosing the second packets being received over "the second connection."

19. Dependent Claim 19

- a. [19.1] *"The method of claim 16, further comprising: during the multilink connection, receiving data packets over a plurality of wireless connections, the data packets being concurrently received with the first data packets; and"*

Kotzin renders [16] obvious. *See* §VII.A.16.

As described above, Kotzin discloses "*during the multilink connection, receiving data packets over a plurality of wireless connections, the data packets being concurrently received with the first data packets.*" *Id.*

As an alternative, Kotzin also discloses adding a third unit, for example, UNIT 3 (grey), to the multilink connection with another LAN connection:

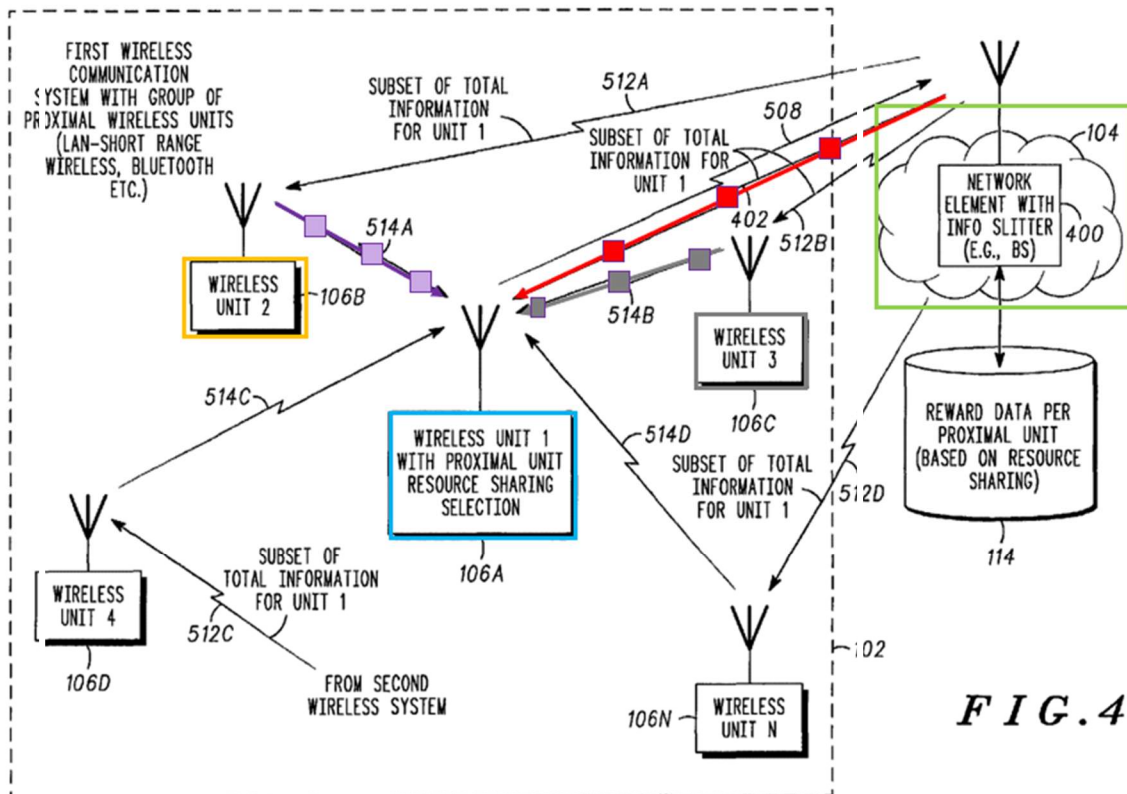


FIG. 4

EX1018, Fig.-4, *see also* Fig.-5, ¶[0035].

- b. [19.2] “aggregating the first data packets with the data packets.”

See §§ VII.A.3, VII.A.7. Where UNIT 1 is receiving packets directly from the Internet but also packets from other wireless units, UNIT 1 will aggregate those packets to retrieve the overall communication for the same reasons as explained in Section §VII.A.3.

20. Independent Claim 20

- a. [20.pre.] “A method for increasing bandwidth and data through put comprising the steps of:”
- b. [20.1] “sending a multilink request from a first device to a second device to join a multilink connection the first device being connected at a first location to a first network, the wireless device being connected at a second

location to the first network or a second network, the second location being geographically separate from the first location; and”

- c. [20.2] *“when the multilink request is accepted by the second device, receiving at the first device first data from the first network at the first location and during the multilink connection, concurrently receiving second data over a wireless connection from the wireless device, the second data being received at the second location from the first network or the second network.”*

[1] and [20] are directed to identical subject matter with one exception: In [1], first and second devices are connected to “a network”; in [20], “first device” is connected to the first network and the “wireless” device is connected to the first **or** second networks.³ Since the claim is sufficiently broad to read on the scenario where both the first device and “the wireless” device are connected to the first network, Kotzin renders obvious [20] for the same reasons that Kotzin renders obvious [1]. See §XI.B.2.

Further, Kotzin also discloses “the wireless device” being connected to a geographically separate “second network” as Kotzin illustrates in Figure 4, for example, Wireless Unit 4 transmitting in both uplink and downlink communications

³ The claim term “the wireless device” has no antecedent basis. Petitioner reserves the right to raise this issue and any other issue under 35 U.S.C. §112 in future proceedings. For the purposes of this petition, Petition is reading “wireless device” to be the “second device” as identified in Claim 1.

a subset of total information for Unit 1 from a second wireless system connected to Internet web server 400. Kotzin further explains that “the wireless apparatus 106a-106n may be subscriber radios on completely different WAN systems” (*i.e.*, separate WAN networks). EX1018, ¶¶ [0018], [0035].

B. Ground II: Claims 1-20 Are Obvious in View of Challenger

1. Independent Claim 1

- a. [1.pre.] “A method for increasing bandwidth and data throughput comprising the steps of:”*

Challenger discloses a “bandwidth sharing device” (“BSD”), which is a communication device that provides broadband communication services to computers and other devices that are connected to it. EX1017, ¶[0014]; *see also id.* ¶¶[0002]-[0012], [0019]-[0024]. Examples of Challenger’s BSDs are illustrated below in annotated Figure 2; they are labeled 202A, 202B, 202C, and 202D. *Id.*, Fig-2, ¶[0037].

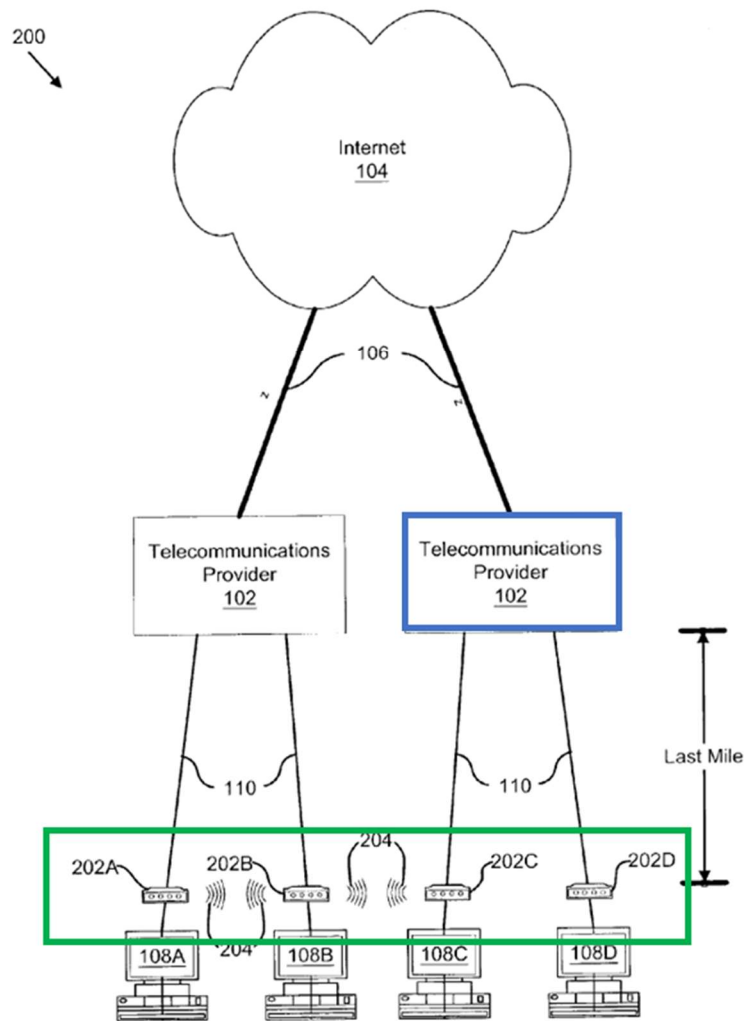


Fig. 2

Id., Fig-2 (BSDs in green). Challenger explains that end users are typically connected to the Internet via “low bandwidth copper lines [110], frequently referred to as the ‘last mile,’ [which] do not provide adequate bandwidth to allow for broadband communication over the Internet, despite the availability of high bandwidth on the fiber backbone.” *Id.*, ¶¶[0006], [0034]-[0036], Fig-1. “Without a solution to this ‘last mile’ bottleneck, much of the broadband fiber backbone may remain unused indefinitely.” *Id.*, ¶[0006]. To solve this problem, a BSD is installed “[a]t each

interface between an end user terminal and a last mile transmission line” and “configured to aggregate the available bandwidth of a plurality of last mile transmission lines for use by a single end user subscriber,” thereby providing broadband communication by increasing bandwidth for the subscriber. *Id.*, ¶¶[0018], [0036]-[0038] (to avoid the “significant bottleneck precluding broadband connectivity” the “bandwidth sharing devices ... aggregat[e] the available bandwidth of the last mile transmission lines”).

It would have been obvious to a POSITA that by increasing bandwidth available to a subscriber, “data throughput” (or the amount of data transmitting through the network) is also increased. EX1017, ¶[0046] (“the Internet 104 communications originating from the end user terminal 108B benefits from increased bandwidth available through the aggregation of last mile telecommunications lines 110 connected to the bandwidth sharing devices 202A and 202C, in addition to the bandwidth available from the last mile telecommunications line 110 connected to the bandwidth sharing device 202B.”); *See also* VII.A.1.a.

- b. [1.1] “*sending a multilink request from a first device to a second device to join a multilink connection, the first device being connected at a first location to a network, the second device being connected at a second location to the network, the second location being geographically separate from the first location, the first device and the second device being configured for accessing the network*”

Challenger explains that a BSD may operate “in either a master or slave mode.” EX1017, ¶[0017]. Challenger’s master BSD, “[t]hrough wireless communications ...

detects other bandwidth sharing devices connected to last mile telecommunications lines that are not currently in use.” *Id.*, ¶[0020]. “These other devices are then configured to operate in slave mode, controlled by instructions from the master device.” *Id.*, ¶¶[0020], [0017] (“The operations of the slave devices are determined by the commands from the master device[.]”), [0044]-[0045]. The master BSD uses a detection module, which “is configured to detect the availability of any and all other last mile telecommunications lines 110” such that when a BSD has available bandwidth, in response to a request from the master BSD the slave BSD “employs the slave module 404 and affirmatively makes known the availability of bandwidth to the ***requesting bandwidth sharing device 202***.” *Id.* ¶[0047].

A POSITA would have understood that Challenger’s request to a slave device is a multilink request because it requests that the slave device provide one of multiple physical links that will be used to receive or transmit data on behalf of the master BSD. EX1017, ¶[0015]; EX1001, ¶¶78-79. After a slave BSD informs the master BSD of its available bandwidth, a sharing module or a pro rata sharing module may be employed to connect the master and slave devices so that the slave device can share its available bandwidth with the master device. EX1017, ¶¶[0050]-[0051]. “[T]he method continues with bandwidth sharing arbitration and bandwidth sharing between [BSDs].” *Id.*, ¶[0021]. The connection of the BSDs for “bandwidth sharing between [BSDs]” (*id.*) comprises the claimed *sending a multilink request* because

the request is made over a connection of at least two physical links (*e.g.*, BSDs). EX1001, ¶¶78-79.

Further, both the first and second devices are connected to a network, “Internet” 104, at first and second locations which are “geographically separate.” Challenger explains that devices 202B and 202C are connected by wireless communications 204, and like the ’349 Patent, explains they are connected to “phone lines of a plurality of Internet users” to share bandwidth between the users. EX1017, ¶[0014]. A POSITA would have understood that a plurality of different Internet users (and their respective phone lines) would be connected at first and second, “geographically separate” locations, such as different houses in a neighborhood that are serviced by different telephone lines. EX1017, Fig-2, ¶[0037]; EX1001, ¶80. Challenger also discloses the difficulties in connecting the devices via “last mile” telecommunications lines 110, further confirming it discloses devices in geographically separate locations. *Id.*

Challenger further discloses “the first device and the second device being configured for accessing the network.” For example, Figure 2 illustrates devices 202B and 202C connected to the “Internet” 104. EX1017, ¶¶[0002], [0014], [0018], [0024], [0034], [0036], Fig-2.

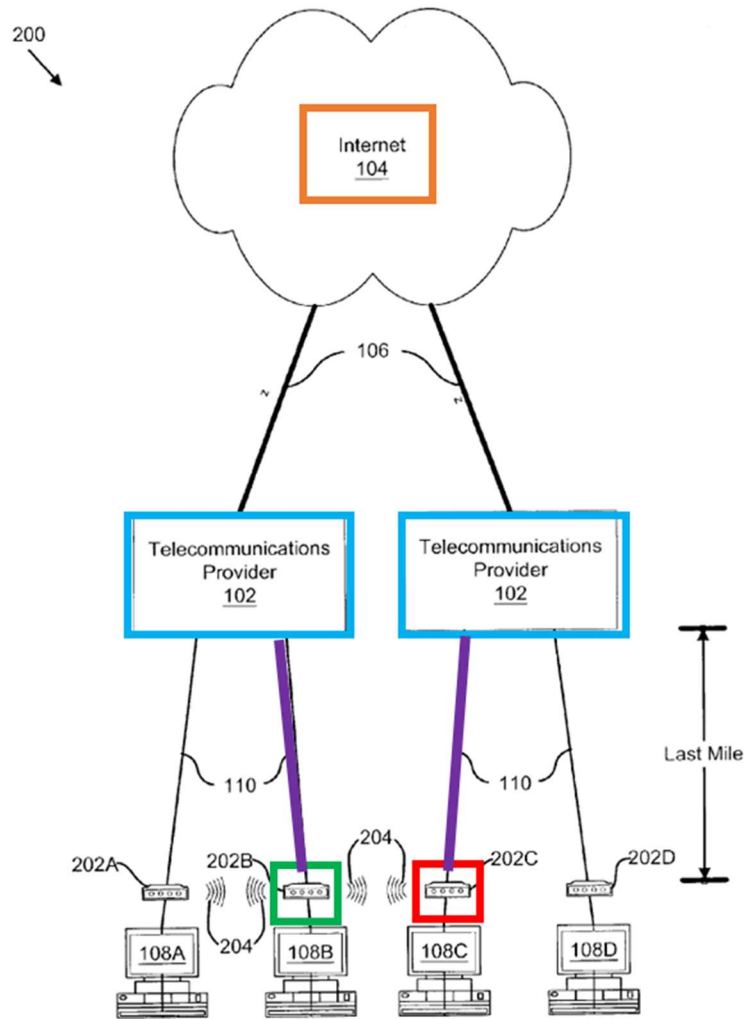


Fig. 2

As shown, BSDs 202B and 202C are connected to the Internet through last mile telecommunications lines 110 via telecommunications provider 102 and receive data from the Internet thus demonstrating 202B and 202C are “configured for accessing the network.” *Id.* Abstract, Fig-7, ¶¶[0034]-[0035], [0040]-[0041], [0065]-[0066].

- c. [1.2] when the multilink request is accepted by the second device, receiving at the first device first data from the network at the first location and during the multilink connection, concurrently receiving second data over a wireless connection from the second device, the second data being received at the second location from the

network.

Challenger explains that once one or more slave BSDs have agreed to participate in a multilink connection with a master BSD, the multilink connection is used to receive packets from the Internet. EX1017, ¶¶[0057]-[0062], Fig-5.

When a slave BSD is sharing bandwidth with a master BSD—for example, a video stream from a website—the website generates packets and sends a first portion of the packets to the master BSD and a second portion of the packets to the slave BSD. *Id.*, ¶¶[0065]-[0066], Fig-7. The slave BSD then transmits the second portion of the packets to the master BSD over wireless connection 204 with the master BSD. *Id.*, ¶[0066] (“The packets received by the slave bandwidth sharing devices 202 are then transmitted 710, preferably wirelessly, to the master[.]”). “The master [BSD] 202 then **receives** 712 and assembles 714 the packets.” *Id.*; *see also* Fig-7 below.

Challenger thus also discloses “*the first device . . . receiving second data over a wireless connection from the second device.*” Specifically, it discloses a “slave bandwidth sharing device” 202C (second device) receiving data at its respective location on the network, and then wirelessly sending that data to the requesting or “master” device 202B (first device). *Id.*, Figs-2, 7, ¶¶[0065]-[0066] (“**The packets received by the slave bandwidth sharing devices 202 are then transmitted 710, preferably wirelessly, to the master bandwidth sharing device 202.**”).

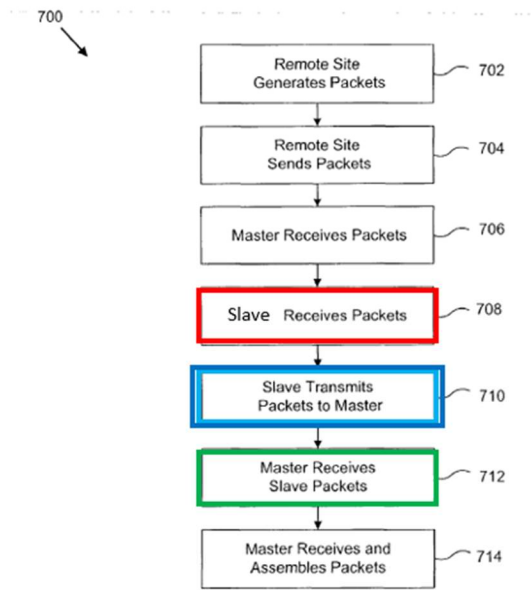


Fig. 7

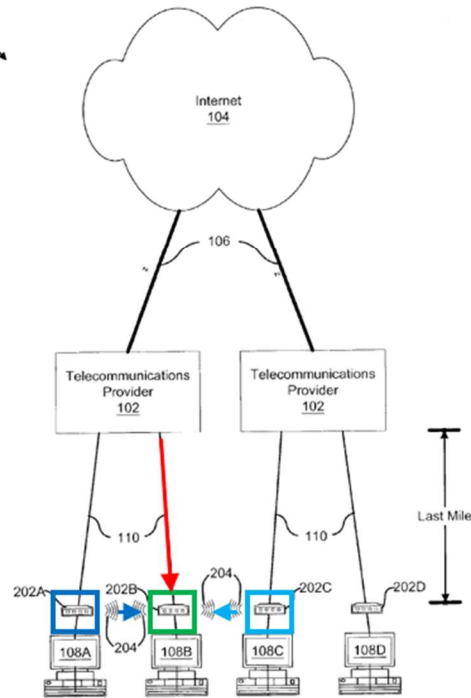


Fig. 2

EX1017, Figs-7, 2.⁴

Challenger further teaches that it concurrently receives the first and second data. Figure 7 of Challenger, which provides a flow chart of packets being sent from a remote device to an end user device, includes a single step 704 for the transmission of packets to both a master BSD and a slave BSD, which will ultimately both be

⁴ Figure 7 has a typographical error where steps 706 and 708 are both titled “Master Receives Packets,” but a POSITA would have understood that at step 708, slave BSDs receive packets. EX1017, Fig-7, ¶[0066]. This has been corrected in the annotated figure.

received by the end user terminal. Because the packets are sent to the master and slave BSDs at the same time, the link to those devices, and consequently their bandwidths, are utilized concurrently. Step 704 of Figure 7 is clear that packets are not sent first to the master BSD, and then to the slave BSD, but are sent in a single step: “The remote site then sends 704 some of the packets directly to the master bandwidth device 202 and sends 704 some of the packets to one or more slave bandwidth sharing devices 202.” *Id.*, ¶[0065]. Additionally, Challenger explains that BSD 202B operates in a master mode “*while* the bandwidth sharing devices 202A and 202C are operating in slave mode.” *Id.*, ¶[0046]. A POSITA would have understood or at least found obvious that the word “while” signifies that the links for both the master and the slave operations are being concurrently used, as “while” and “concurrent” both mean at the same time. EX1001, ¶¶81-82.

2. Dependent Claim 2

- a. [2] “*The method of claim 1, wherein the first location and the second location are physically isolated from each other.*”

[1] is obvious. *See* §VII.B.1.

A POSITA would have understood that the devices in Challenger in the “first” and “second” locations are “physically isolated from each other,” as the BSDs disclosed in Challenger are connected *wirelessly* to separate “last mile” telecommunications lines. EX1017, Fig-2, ¶[0037]. Further, Challenger explains that the devices are connected to “phone lines of a plurality of Internet users” to share

bandwidth between the users. *Id.*, ¶[0014]. A POSITA would have understood that a plurality of different Internet users (and their respective phone lines) would be physically isolated from each other, such as in different houses in a neighborhood, and wireless connections would not be needed unless the devices were physically isolated. *Id.*, Fig-2, ¶[0037]. Challenger also discloses the difficulties in connecting the devices via “last mile” telecommunications lines 110, further confirming it discloses physically isolated devices. *Id.* Thus, the locations are physically isolated because they are not physically connected through, for example, an ethernet cable. EX1001 ¶83.

3. Dependent Claim 3

- a. [3] *“The method of claim 1, further comprising the step of aggregating the second data received over the wireless connection and the first data received over the connection at the first location.”*

[1] is obvious. *See* §VII.B.1.

Challenger describes “aggregating” the second data received over the wireless connection and the first data, as it describes how “the packets received by the slave bandwidth sharing devices 202 [second device] are then transmitted 710, preferably wirelessly, to the master bandwidth sharing device 202. The master bandwidth sharing device 202 then **receives 712 and assembles 714 the packets.**” EX1017, Fig.-7, ¶¶[0066], Abstract (The “master bandwidth sharing device **wirelessly communicates with slave bandwidth sharing devices**, each having a connection to a local telecommunications line, **and aggregates the available bandwidth of the**

multiple telecommunications lines.”), Fig.-4, Fig.-5, Fig.-7 (“master receives and assembles packets”), [0014], [0018]-[0025]. Figure 2, reproduced below, depicts how the first and second data packets may be “aggregated”:

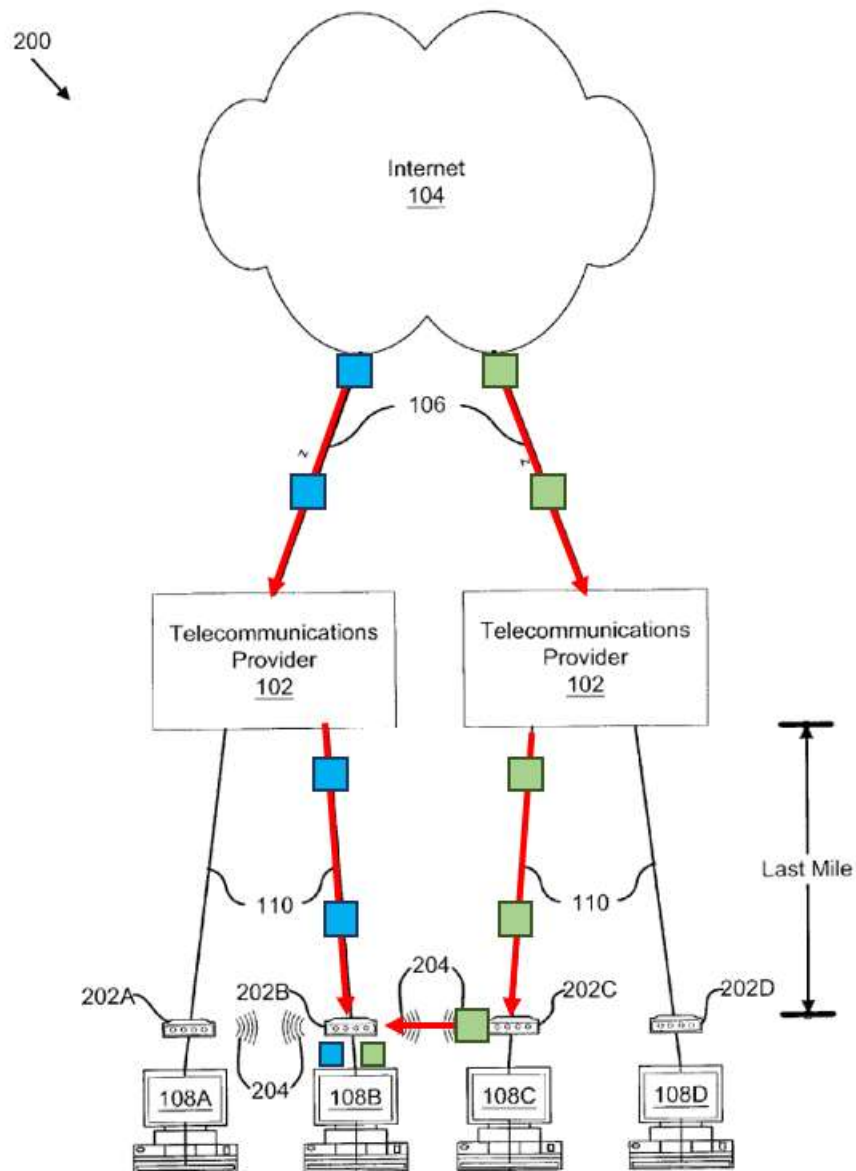


Fig. 2

Id., Fig. 2. As shown in the above example, data packets from the Internet 104 destined for computer 108B are split along two paths, one directly to 108B over

202B's last mile connection, and a second path comprised of 202C's last mile connection and its wireless connection 204 with 202B. The data packets, shown above in blue for one path and green for another, are then aggregated together at 202B. *Id.* ¶¶[0018], [0046].

4. Dependent Claim 4

- a. [4] “The method of claim 1, wherein a connection at the first location and a connection at the second location are network connection points.”

[1] is obvious. *See* §VII.B.1.

A POSITA would have understood that the first and second locations include “network connection points,” because Challenger discloses that the BSD 202B and 202C are both connected to the Internet via last mile telecommunications lines 110 via telecommunications provider 102. EX1017, Abstract, Fig-2, ¶¶[0034]-[0035], [0040]-[0041]; EX1001 ¶¶84-85.

5. Dependent Claim 5

- a. [5] “The method of claim 1, wherein the first device and the second device are consumer networking devices.”

[1] is obvious. *See* §VII.B.1.

The first and second devices are “consumer networking devices” because they are used by subscribers to telecommunication providers such as ISPs (and are thus consumers) to access the Internet. EX1017, Fig.-3, ¶¶[0012], [0014], [0016], [0023], [0040]-[0041].

6. Dependent Claim 6

- a. [6.1] *“The method of claim 1, further comprising the steps of: sending another multilink request from the first device to a third device, the third device being connected at a third location to the network, the third location being geographically different than the first location and the second location; and”*

[1] is obvious. See §VII.B.1.

Challener allows a master BSD to enlist more than one slave BSD. See EX1017, ¶[0038]. Challener discloses sending a request “from the first device to a third device,” *i.e.*, from 202B to 202A:

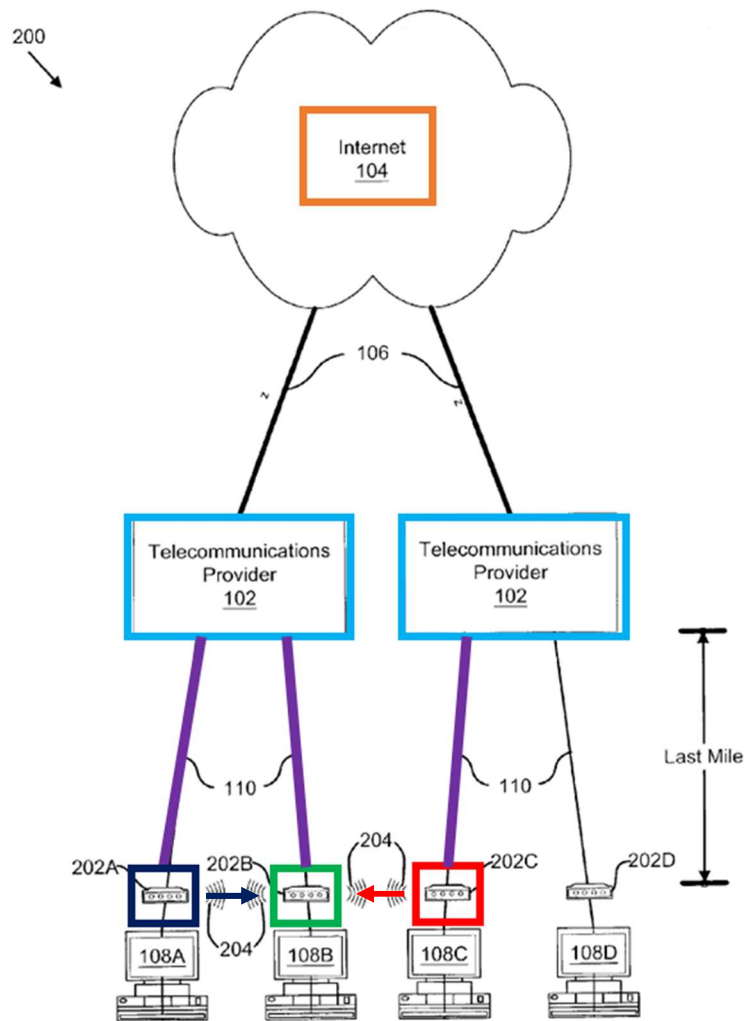


Fig. 2

A POSITA would have understood that the third device 202A is provided at a “geographically different” location, *i.e.*, a device in a third location [relative to first device 202B and second device 202C], as it connects to its own separate last mile telecommunications line 110. EX1017, ¶[0038]; *See also* §VII.B.2.a. Challenger teaches that after the first device (*i.e.*, the master bandwidth sharing device) connects to an available last mile telecommunications line 110, the first device “proceeds to detect 508 other available last mile telecommunications lines 110.” *Id.*, ¶[0058]; *see*

also id. ¶¶[0059]-[0062]. Accordingly, a POSITA would have understood that the first device would send a multilink request to the third device for the same reasons discussed in Section VII.B.1.b.

- b. [6.2] “when another multilink request is accepted by the third device, concurrently receiving third data during the multilink connection over a second wireless connection between the first device and the third device.”

When 202A accepts the multilink request and agrees to share bandwidth with 202B, a POSITA would have understood that the bandwidth requesting device (202B) “concurrently” receives third data from the third device (202A), because as discussed in §VII.B.1.c, Challenger explains that BSD 202B operates in a master mode “*while* the bandwidth sharing devices 202A and 202C are operating in slave mode,” ¶[0046]. BSD 202B would thus be receiving packets from the remote site concurrently with the slave BSDs. EX1017, Figs-7, 2, ¶[0065].

Further, as shown in annotated Figure 2, the third device 202A would be connected to the bandwidth requesting device 202B over a *second wireless connection* 204.

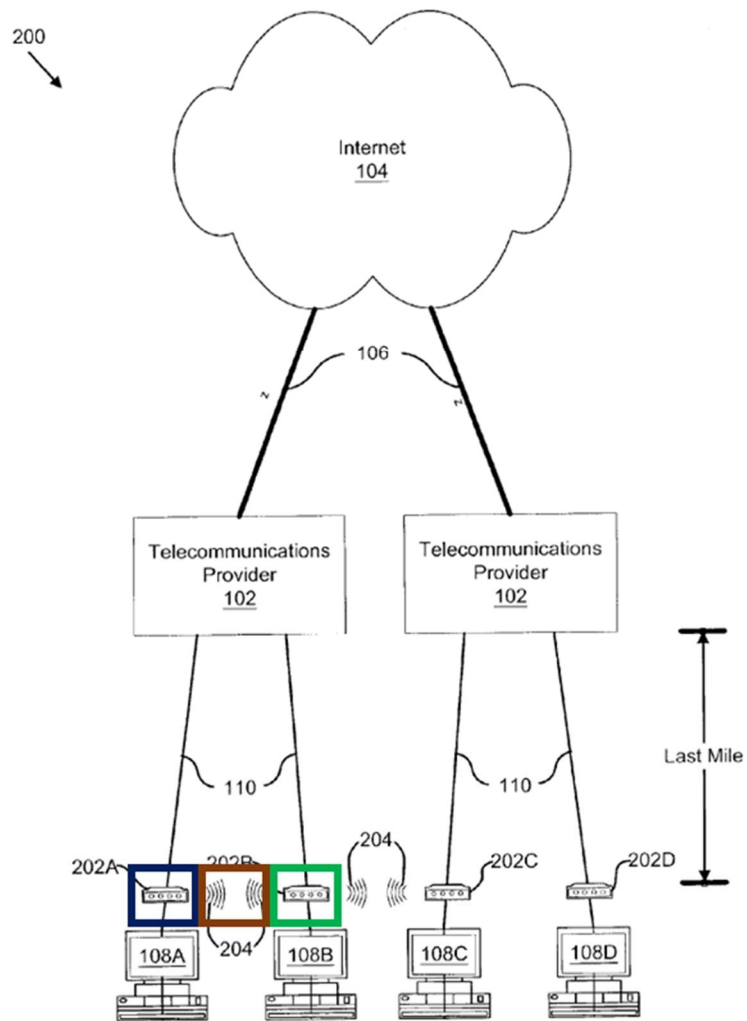


Fig. 2

EX1017, Fig-2, ¶¶[0063]-[0066].

7. Dependent Claim 7

- a. [7] “The method of claim 6, further comprising the step of aggregating the first data, the second data and the third data.”

[6] is obvious. See §VII.B.6.

Challener describes “[t]he master bandwidth sharing device wirelessly communicates with slave bandwidth sharing devices, each having a connection to a

local telecommunications line, and **aggregates** the available bandwidth of the **multiple telecommunications lines.**” EX1017, Abstract. A POSITA would thus have understood that Challenger aggregates first, second, and third data, as Challenger describes “aggregating” data between the bandwidth requesting device (202B) and sharing devices (202C and 202A). EX1017, Fig-7; EX1001 ¶86. Challenger further describes how the “packets received by the slave bandwidth sharing **devices 202** are then transmitted 710, preferably wirelessly, to the master bandwidth sharing device 202. **The master bandwidth sharing device 202 then receives 712 and assembles 714 the packets.**” *Id.*, ¶[0066].

8. Dependent Claim 8

- a. [8] “The method of claim 1, wherein the first data and the second data are received as data packets.”*

[1] is obvious. *See* §VII.B.1.

Challenger discloses sending data as data “packets.” EX1017, ¶¶[0065]-[0066] (“The receiving method 700 includes the step of the **remote site generating 702 packets for transmission** to the master bandwidth sharing device 202. **The remote site then sends 704 some of the packets directly to the master bandwidth device 202 and sends 704 some of the packets to one or more slave bandwidth sharing devices 202.**”).

9. Dependent Claim 9

- a. [9] “The method of claim 1, wherein the network is the*

Internet.”

[1] is obvious. *See* §VII.B.1.

Challenger discloses or renders [9] obvious. Challenger discloses the network as
“the Internet 104.”

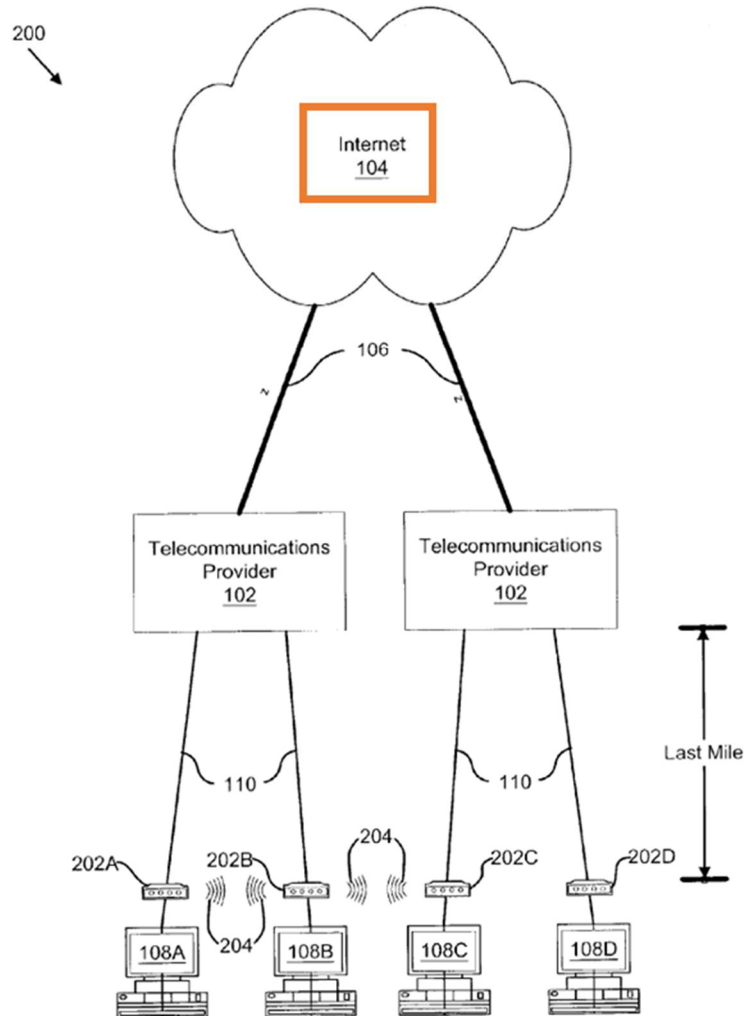


Fig. 2

EX1017, Fig-2, ¶¶[0002], [0034].

10. Dependent Claim 10

a. [10] “The method of claim 1, wherein the second device is

a wireless device.”

[1] is obvious. *See* §VII.B.1.

Challenger discloses the second device 202C “us[es] wireless communications 204 to increase the bandwidth available....” EX1017, ¶[0038].

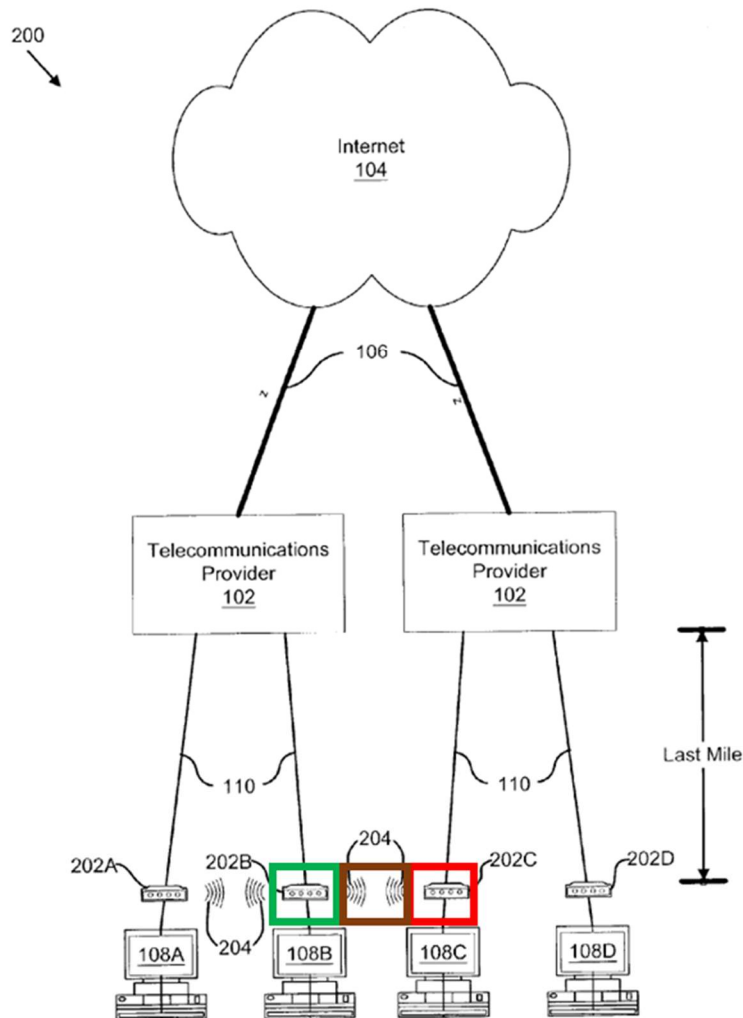


Fig. 2

In order for BSD 202C to use wireless communications 204, it must be a wireless device. EX1017, Fig-2, ¶[0038], [0061] (“Actual bandwidth sharing 516 involving

transmission of **wireless communications** 204 between bandwidth sharing devices 202”).

11. Dependent Claim 11

- a. [11] “The method of claim 1, wherein the network is one or a combination of a cable network, a telecommunication network, an optical network and a communications network.”

[1] is obvious. See §VII.B.1.

Challener discloses [11]. Challener discloses the network is the Internet, and thus discloses at least a network as a “telecommunication network” and “communications network.” EX1017, Abstract, Figs.-1-3, ¶¶[0002]-[0012], [0014], [0016]-[0025], [0034]-[0039], [0044], [0046]-[0048], [0050]-[0051], [0054].

12. Dependent Claim 12

- a. [12] “The method of claim 1, wherein the wireless connection is a cellular connection, a satellite connection, a Wi-Fi connection, a WiMax connection or a Bluetooth connection.”

[1] is obvious. See §VII.B.1.

Challener discloses communications between end user terminals “over wireless networks as commonly known in the prior art ..., for instance...the IEEE 802.11 standard.” EX1017, ¶[0039]. The IEEE 802.11 standard is a well-recognized standard for Wi-Fi. EX1001, ¶87 (citing EX1017, Figs.-2-3, Abstract, ¶¶[0012], [0014], [0020]-[0022], [0039]). Indeed, the ’349 Patent admits so. EX1011, 2:40-44.

13. Independent Claim 13

a. [13.pre.] “A device comprising:”

Challenger discloses “bandwidth sharing **devices 202** capable of aggregating the available bandwidth of the last mile transmission lines 110”:

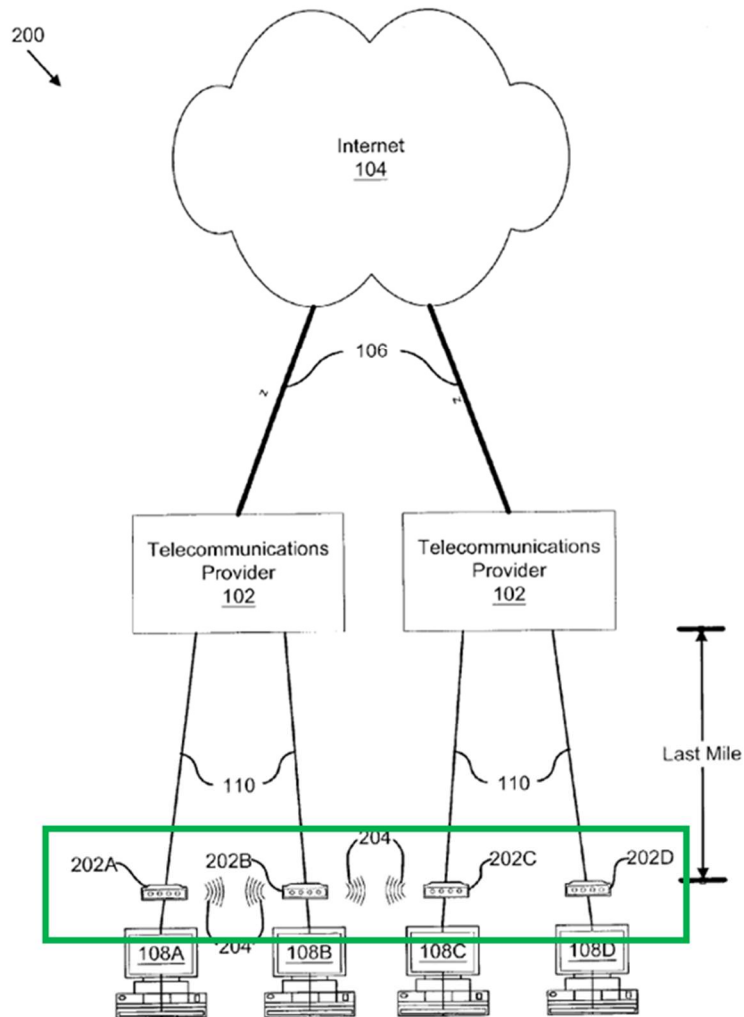


Fig. 2

EX1017, Fig-2, ¶[0037].

b. [13.1] “an interface that establishes a network connection at a first location to a first network and receives first data

packets over the network connection;”

Challenger discloses that a master BSD 202, such as 202B when operating in master mode, includes “a telecommunications line connection terminal 302 that allows for physical connection to a telecommunications provider 102 over a last mile telecommunications line 110”:

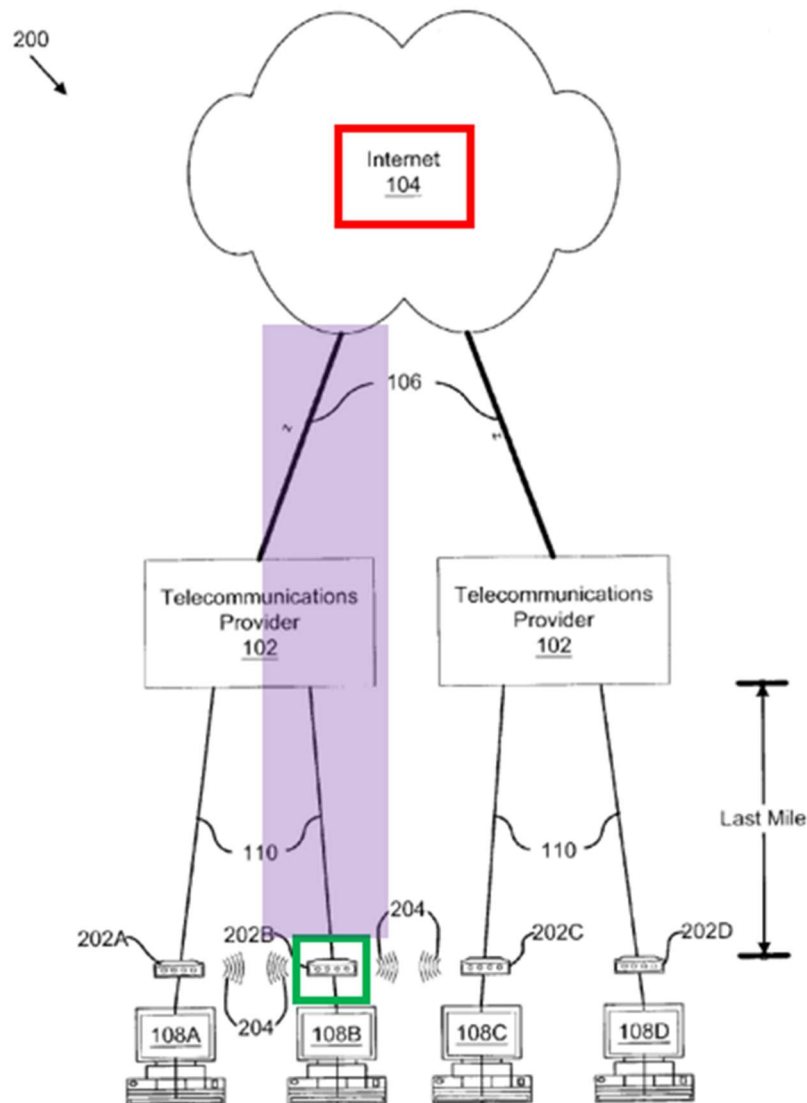


Fig. 2

EX1017 ¶[0040]; Fig 2. A POSITA would have understood and found obvious, that the physical connection to a telecommunications provider 102 over a last mile telecommunications line 110 is an interface that establishes the claimed *network connection at a first location to a first network*. EX1001, ¶88. As discussed in §VII.B.1.b, a POSITA would have understood that the devices would be connected at “locations,” such as houses in a neighborhood that are serviced by different telephone lines. EX1017, Fig-2, ¶[0037]. Further, a POSITA would further have understood that the connection between, for example, 202B and the Internet 104 forms the first network (purple).

When sharing bandwidth to receive information—for example, a video stream from a website—the website generates packets and sends a first portion of the packets to the master BSD via the telecommunications line connection terminal 302. *Id.*, ¶¶[0065]-[0066], Fig-7.

- c. [13.2] “a wireless interface that is configured to establish a wireless connection to a remote communications device, the remote communications device being connected at a second location to a second network; and”

A master BSD includes a wireless interface, such as an 802.11 interface, that wirelessly connects to a slave BSD. Each of Challenger’s BSDs is capable of “operat[ing] in either a master or a slave mode . . . in conjunction with a plurality of [BSDs] and associated telecommunications connections.” EX1017, ¶[0017]. Each

of Challenger's BSDs is a remote communications device when it is acting as a "slave" to a "master" BSD. Challenger discloses that the BSD operating in master mode "wirelessly communicates with slave bandwidth sharing devices[.]" *Id.*, Abstract; ¶¶[0014] ("[Master BSD] automatically and wirelessly aggregate[s] and arbitrate[s] available bandwidth with a second BSD[.]"), [0017] ("[BSD] operates in master mode"). "The wireless communications are transmitted and received by a wireless transceiver." *Id.*, ¶[0042]; *see also* ¶¶[0014], [0020], [0038]-[0041]. The wireless transceiver in the master BSD satisfies the claimed *an interface that establishes a network connection*.

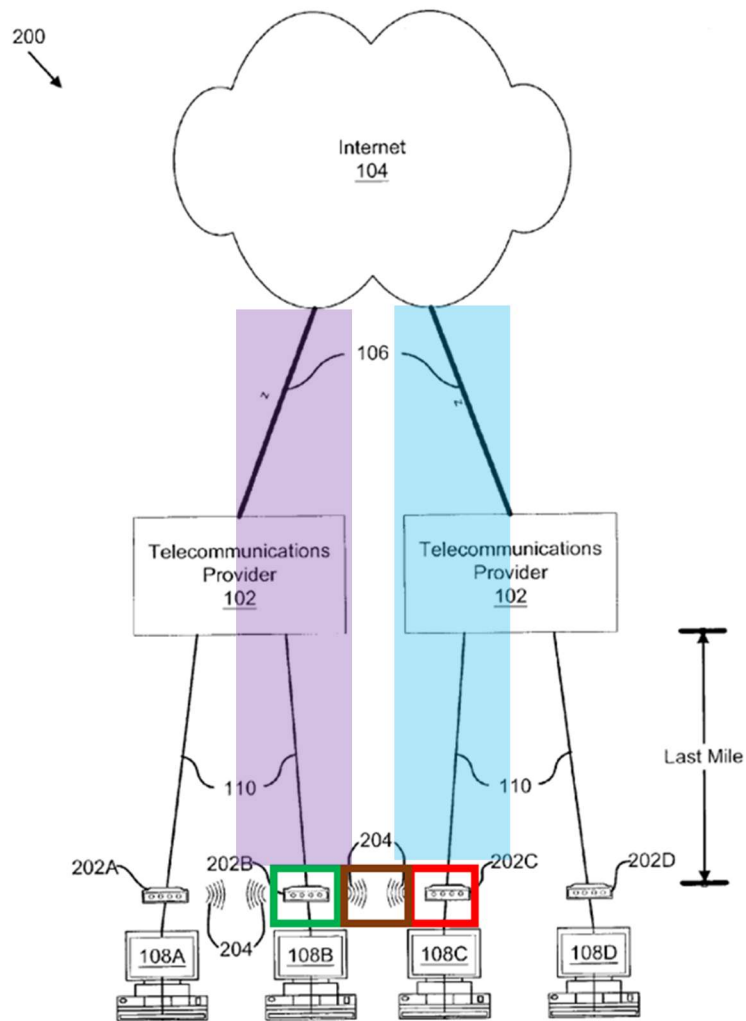


Fig. 2

Challener discloses the devices **202B** and **202C** are connected by **wireless communications 204**, and like the '349 Patent, explains they are connected to “phone lines of a plurality of Internet users” to share bandwidth between the users. *See* EX1017, ¶[0014]; EX1011, 2:37-38. This is further demonstrated in Figure 3, which depicts a BSD with a “wireless transceiver (**312**)”:

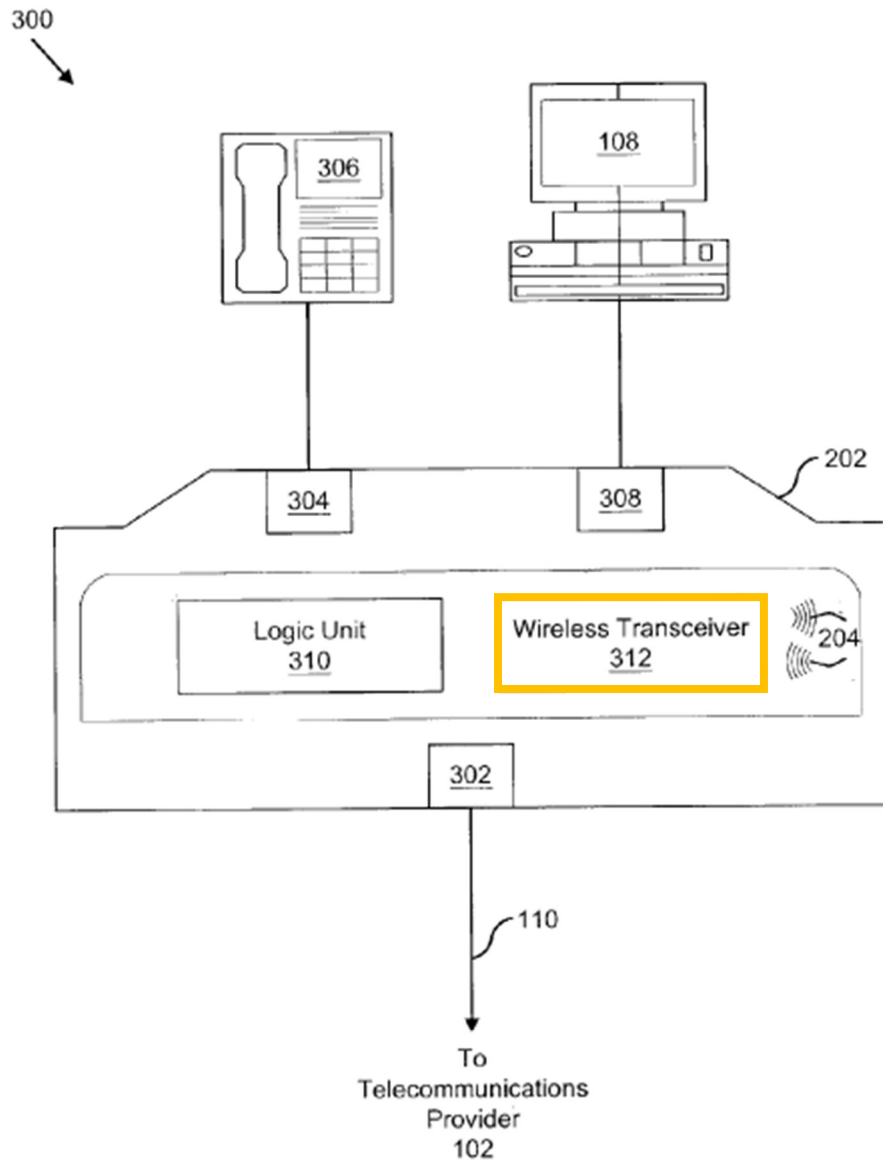


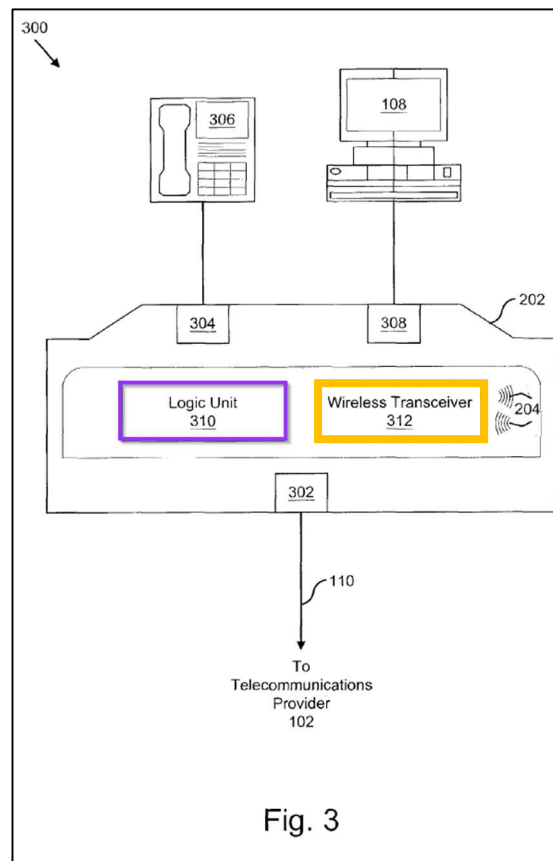
Fig. 3

A POSITA would have understood that a plurality of different Internet users (and their respective phone lines) would be connected at first and second, locations, such as different houses in a neighborhood, and the wireless connections used to

communicate between those devices would not be needed unless they were located separately. EX1017, Fig-2, ¶¶[0037]-[0038]; EX1001 ¶89. Further, Challenger discloses that the *second network* is 202C's ISP network to the Internet (104) depicted in blue in Figure 2 above. EX1017, Fig. 2.

- d. [13.3] “a processor that sends a multilink request over the wireless interface to the remote communications device to join the multilink connection”

Challenger discloses a logic unit that comprises the claimed *processor* as shown in annotated Figure 3 below.



EX1017, Fig-3. Challenger explains that a BSD is “controlled by a logic unit within the device.” *Id.*, ¶[0015]. The logic unit can be “programmed, hardwired, or

otherwise provided within a plurality of modules,” including “a master module 402, a slave module 404, a detection module 406, a bandwidth definition module 408, an arbitration module, a sharing module 410, a pro rata sharing module 412, and a release module 514,” as seen in Figure 4. *Id.*, ¶[0043]; Fig-4. Challenger further states that these modules may be “implemented in software for execution by various types of *processors*.” *Id.*, ¶[0068]. Specifically, Challenger discloses that the detection module 406 in logic unit 310 (claimed “processor”) of a master BSD sends a request to other BSDs using wireless interface 312 requesting assistance in transferring data to the master BSD, as discussed above with regard to limitation 1.1. *Id.*, ¶[0047]; §VII.B.1.b.

Thus, a POSITA would have understood that logic unit 310, which implements the various modules shown in Figure 4, is a processor that, among other things, sends a multilink request over the wireless interface to at least one remote communications device to join the multilink connection. EX1001, ¶90.

- e. *[13.4] “receives from the interface the first data packets from the first network and when the multilink request is accepted by the remote communications device, concurrently receives from the wireless interface second data packets from the second network, the second data packets being received at the second location from the second network.”*

When downloading data from an Internet website, for example, a master BSD such as 202B will receive from the website over the first network a portion of the

total data packets comprising the communication. This data will be received over interface 302. EX1017 ¶¶[0065]-[0066]; *see also* Fig-7; §VII.B.4.

When 202C has agreed to act as a slave, for example, 202C will receive over its own 302 interface a second portion of data packets over the website. 202C is at a different location from 202B, and will forward the packets to 202B so that they are received on 202B's wireless interface. Challenger further describes "receiv[ing] from the wireless interface the first data packets from the first network" and "concurrently receiv[ing] from the wireless interface second data packets from the second network, the second data packets being received at the second location from the second network," as it describes the first device, 202B, receiving first data from the first network, and receiving second data packets from the wireless interface from the second network via the second device 202C. EX1017, Fig.-7, ¶¶[0065]-[0066] (**"The receiving method 700 includes the step of the remote site generating 702 packets for transmission to the master bandwidth sharing device 202. [...] The packets received by the slave bandwidth sharing devices 202 are then transmitted 710, preferably wirelessly, to the master bandwidth sharing device 202."**). A POSITA would have understood that in Challenger the requesting device "concurrently" receiving second data from the second device. *See* §VII.B.1.c.

14. Dependent Claim 14

- a. [14] *"The device of claim 13, wherein the device is one of a modem, cellular phone, a router, a computer, hotspot*

device and a tablet.”

[13] is obvious. *See* §VII.B.13.

A POSITA would have understood the device in Challenger is a modem connected to the phone line or a router because the device is configured to allow other devices to connect to the internet. EX1017, ¶¶[0014]-[0021], [0039]; EX1001 ¶ 92. Further, a POSITA would have understood the device is a computer because it has a processor that executes code. EX1017, Figs.-2-3, ¶¶[0015], [0043], [0044]-[0056], [0067]-[0069]; EX1001 ¶¶93-94. Last, the device is a hotspot because the device serves as a network access point with wireless and wired connectivity. EX1017, Fig.-2, ¶¶[0037]-[0039]; EX1001 ¶95.

15. Dependent Claim 15

a. [15] “The device of claim 13, wherein the device is part of a home-based network system.”

[13] is obvious. *See* §VII.B.13.

It would have been obvious to a POSITA that the device in Challenger may be a part of a “home-based network system,” because Challenger is directed to residences or “homes” that are poorly served by “last mile” telecommunications lines and teaches using a low-cost bandwidth sharing system. EX1017, Fig-3, ¶¶[0004]-[0006], [0016] (describing network system as a router used to connect personal home devices); EX1001 ¶96.

16. Independent Claim 16

a. [16.pre.] “A method for providing broadband

communications services, comprising:”

See VII.B.1.a.

- b. [16.1] “sending to a remote host an inquiry in whether the remote host is able to support a multilink connection;”

As discussed in §VII.B.1.b, Challenger explains that a BSD may operate in master mode and request (i.e., “send an inquiry”) other BSDs (i.e., “remote hosts”) operate in slave mode to form “multilink” connections. A POSITA would have understood the slave BSDs are “remote hosts” because they are located remote from the master BSD and provide it with broadband services. EX1017, ¶¶[0060]-[0062], Figs-4,5; EX1001, ¶97. Figure 2, reproduced below, shows the requesting device 202B connected to the Internet (104) over a first connection, and connected to the remote host (202C) over a second connection:

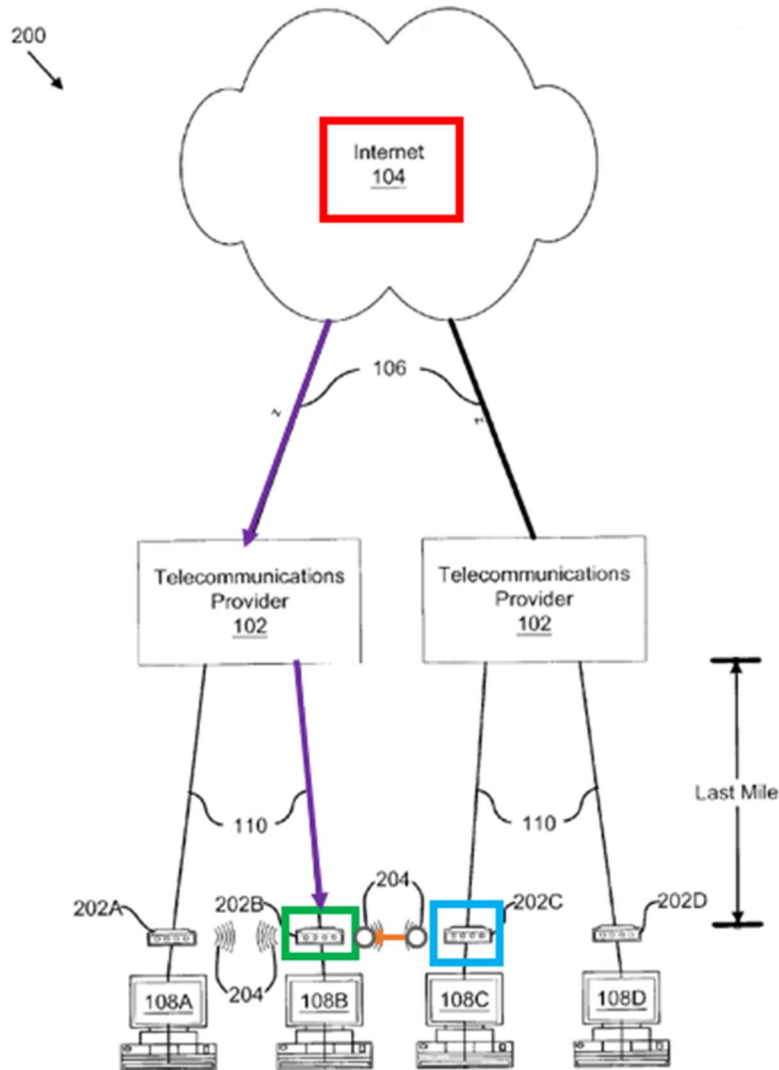


Fig. 2

Id., Fig. 2.

- c. [16.2] “receiving first data packets over a first connection to the Internet;”

See §§VII.B.1.c, VII.B.8, VII.B.13.b.

- d. [16.3] “when the remote host indicates that the multilink connection is supported, receiving second data packets over a second connection, the first data packets being concurrently received with the second data packets during

the multilink connection”

See §§VII.B.1.c, VII.B.8.

- e. [16.4] “wherein the first data packets create a first data stream and the second data packets create a second data stream.”

Challener discloses sending data packets in “data streams” as it explains a series of data packets are sent via multiple paths or links. EX1017, ¶[0063] (describing sending two streams of data packets). Indeed, sending streams of data was a well-known method for transmitting large amounts of data by sending a series of data packets. EX1011, 11:34-38 (discussing receiving data stream), 13:12-16 (streaming video).

17. Dependent Claim 17

- a. [17] “The method of claim 16, wherein the first data packets are received at a home-based network system, and wherein the second packets are received over the second connection at the home-based network system.”

[16] is obvious. See §VII.B.16.

Challener is directed to “end user subscribers” which a POSITA would have understood includes users at their “homes” (EX1017, Fig-3, ¶¶[0004]-[0006], [0009]-[0012], [0016]) and discloses the first data packets being received at the first device 202B, the “home-based network system,” and the second packets being received over the second connection from 202C. *Id.*, Fig-2; EX1001 ¶98.

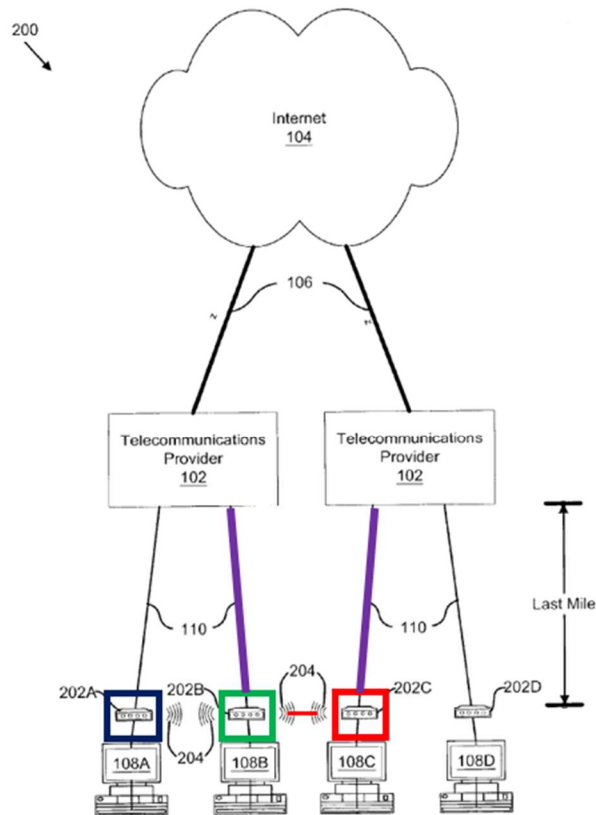


Fig. 2

Id., Fig-2.

18. Dependent Claim 18

- a. [18] “The method of claim 16, wherein the first data packets are received by a consumer-based network system, and wherein the second packets are received over the second connection at the consumer-based network system.”

[16] is obvious. See §VII.B.16.

Challenger is directed to “end user subscribers” poorly served by “last mile” telecommunications lines and discloses a low-cost bandwidth sharing system. EX1017, Fig-3, ¶¶[0004]-[0006], [0016]. Challenger’s proposed system is thus a “consumer-based network system.” EX1001, ¶99.

19. Dependent Claim 19

- a. [19.1] “The method of claim 16, further comprising: during the multilink connection, receiving data packets over a plurality of wireless connections, the data packets being concurrently received with the first data packets; and”

[16] is obvious. See §VII.B.16.

Challener discloses a “multilink connection.” See §VII.B.1.b. Further, in Challener, the multilink connection receives “data packets” over a plurality of wireless connections. EX1017, Abstract, Fig-7, ¶¶[0065]-[0066]; see also EX1038. Last, as explained above, a POSITA would have understood that the data packets are concurrently received. See §VII.B.1.c.

- b. [19.2] “aggregating the first data packets with the data packets.”

See §§ VII.B.3, VII.B.7.

20. Independent Claim 20

- a. [20.pre.] “A method for increasing bandwidth and data through put comprising the steps of:”
- b. [20.1] “sending a multilink request from a first device to a second device to join a multilink connection the first device being connected at a first location to a first network, the wireless device being connected at a second location to the first network or a second network, the second location being geographically separate from the first location; and”
- c. [2] “when the multilink request is accepted by the second device, receiving at the first device first data from the first network at the first location and during the multilink connection, concurrently receiving second data over a wireless connection from the wireless device, the second data being received at the second location from the first

network or the second network.”

As discussed in §VII.A.20, [1] and [20] are identical with one exception. In [1], first and second devices are connected to “a network.” In [20], “first device” is connected to the first network and the “wireless” device is connected to the first **or** second networks. Since the claim is sufficiently broad to read on the scenario where both the first device and the “wireless” device are connected to the first network, Challenger renders obvious [20] for the same reasons that it renders obvious [1]. *See* § VII.B.1.

Further, Challenger also discloses “the wireless device” being connected to a “second network” as Challenger discloses each device being connected to separate “last mile” telecommunications lines. EX1017, Fig-2, ¶¶[0018]-[0021].

VIII. SECONDARY CONSIDERATIONS

Petitioner is unaware of any evidence of alleged secondary indicia that would support non-obviousness of the '349 patent, but to the extent Patent Owner subsequently presents such evidence, Petitioner respectfully requests the right to respond.

IX. MANDATORY NOTICES

As set forth below and pursuant to 37 C.F.R. §42.8(a)(1), the following mandatory notices are provided as part of this Petition.

A. Real Party in Interest Under 37 C.F.R. § 42.8(b)(1)

Red Hat, Inc. is the real party in interest for Petitioner.

B. Related Matters

Red Hat has filed a complaint for declaratory judgment in *Red Hat, Inc. v. Competitive Access Systems, Inc.*, 5-24-cv-00505-D-BM. This case may affect, or be affected by, decisions in these proceedings.

C. Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Pursuant to 37 C.F.R. § 42.8(b)(3), Petitioner provides the following designation of counsel:

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D. Service Information Under 37 C.F.R. § 42.8(b)(4)

Red Hat concurrently submits a Power of Attorney, 37 C.F.R. § 42.10(b), and consents to electronic service by email at Red_Hat_III@kirkland.com.

X. PAYMENT OF FEES UNDER 37 C.F.R. § 42.103

The undersigned authorizes the Office to charge the fee set forth in 37 C.F.R. § 42.15(a)(1) for this Petition to Deposit Account No. 506092, consistent with the requested review of 20 claims, and any additional fees that may be due in connection with this Petition to be charged to the above-referenced deposit account.

XI. GROUNDS FOR STANDING UNDER 37 C.F.R. § 42.104(A)

Petitioner hereby certifies that the '349 Patent is available for IPR and that the Petitioner is not barred or estopped from requesting IPR challenging the Challenged Claims on the grounds identified herein. Neither Petitioner, nor any party in privity with Petitioner: (i) has filed a civil action challenging the validity of the Challenged Claims; (ii) has been served a complaint alleging infringement of the '349 Patent more than one year prior to the present date; or (iii) is estopped from challenging the claims on the grounds identified in the Petition. The Challenged Claims also have not been the subject of a prior IPR or a finally concluded district court litigation.

XII. DISCRETIONARY DENIAL IS NOT APPROPRIATE

Petitioner respectfully submits that discretionary denial is unwarranted in this case. The '349 patent has not been subject to any prior IPR or PGR petitions. Accordingly, this is not a "follow-on" petition, and there is no basis for the Board to exercise its discretion under 35 U.S.C. §314(a) and 37 C.F.R. §42.108(a). *Gen. Plastic Indus. Co. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 (P.T.A.B.

Sept. 6, 2017). Petitioner has filed only this single petition challenging the claims of the '349 patent and, therefore, has not imposed a substantial or unnecessary burden on the Board. *See* Trial Practice Guide Update (July 2019).

Furthermore, Petitioner's declaratory judgment complaint does not seek a judgment of invalidity and the declaratory judgment proceeding is in its early stages. As a result, there are no concerns of system inefficiencies or fairness due to parallel invalidity proceedings. *See Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 6 (P.T.A.B. Mar. 20, 2020) (precedential).

To the extent Patent Owner contends that discretionary denial is appropriate for any reason, Petitioner intends to oppose such arguments pursuant to the bifurcated briefing process set forth in the March 26, 2025 Stewart Memorandum.

XIII. CONCLUSION

Petitioner requests *inter partes* review of the Challenged Claims; there is a reasonable likelihood that Petitioner will show that they are obvious.

Dated: August 4, 2025

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

This Petition complies with the type-volume limitations as mandated in 37 C.F.R. § 42.24, totaling 12,557 words. Counsel has relied upon the word count feature provided by Microsoft Word.

/Todd M. Friedman/

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing document will be served on August 5, 2025, via overnight delivery directed to the attorney/agent of record for the patent as identified on USPTO Patent Center at the following address:

The Law Office of Clay McGurk
P.O. Box 1488
Orange, CA 92856

A courtesy copy is also being served via electronic mail and FTP on August 4, 2025 on the attorneys of record listed below for the following related matter:

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