



(12) **United States Patent**  
Proctor, Jr. et al.

(10) **Patent No.:** US 7,990,904 B2  
(45) **Date of Patent:** Aug. 2, 2011

(54) **WIRELESS NETWORK REPEATER**

(75) Inventors: **James A. Proctor, Jr.**, Melbourne Beach, FL (US); **Kenneth M. Gainey**, Satellite Beach, FL (US)

(73) Assignee: **QUALCOMM Incorporated**, San Diego, CA (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1154 days.

(21) Appl. No.: **10/536,471**

(22) PCT Filed: **Dec. 16, 2003**

(86) PCT No.: **PCT/US03/39889**  
§ 371 (c)(1),  
(2), (4) Date: **May 26, 2005**

(87) PCT Pub. No.: **WO2004/062305**  
PCT Pub. Date: **Jul. 22, 2004**

(65) **Prior Publication Data**

US 2006/0098592 A1 May 11, 2006

**Related U.S. Application Data**

(60) Provisional application No. 60/433,171, filed on Dec. 16, 2002.

(51) **Int. Cl.**  
**H04J 3/08** (2006.01)

(52) **U.S. Cl.** ..... 370/315; 370/338

(58) **Field of Classification Search** ..... None  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

3,363,250 A	1/1968	Irving
4,000,467 A	12/1976	Lentz et al.
4,001,691 A	1/1977	Gruenberg
4,061,970 A	12/1977	Magneron et al.
4,081,752 A	3/1978	Sumi
4,124,825 A	11/1978	Webb et al.
4,204,016 A	5/1980	Chavannes
4,334,323 A	6/1982	Moore
4,368,541 A	1/1983	Evans

(Continued)

**FOREIGN PATENT DOCUMENTS**

CN 1186401 7/1998

(Continued)

**OTHER PUBLICATIONS**

Notification of the First Office Action from Chinese Patent Office dated Sep. 8, 2006 for the corresponding Chinese patent application No. 200380105267.7.

(Continued)

*Primary Examiner* — Lester Kincaid

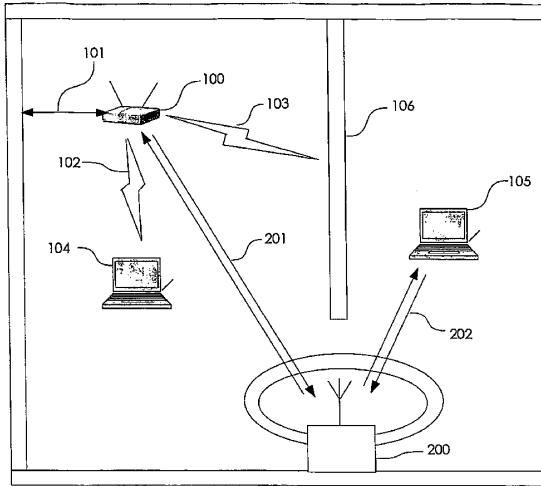
*Assistant Examiner* — Phuoc Doan

(74) **Attorney, Agent, or Firm** — Linda G. Gunderson

(57) **ABSTRACT**

A frequency translating repeater (250) for use in a time division duplex radio protocol communications system includes a processor (260), a bus (261), a memory (262), an RF section (264), and an integrated station device (264). An access point (210) is detected based on information transmitted frequency channels using a protocol. Detection is initiated automatically during a power-on sequence or by activating an input device such as a button. Frequency channels are scanned for a beacon signal and an access point chosen as a preferred access point based on a metric such as power level.

**50 Claims, 6 Drawing Sheets**



## U.S. PATENT DOCUMENTS

4,509,206 A	4/1985	Carpe et al.	6,222,503 B1	4/2001	Gietema et al.
4,701,935 A	10/1987	Namiki et al.	6,272,351 B1	8/2001	Langston et al.
4,723,302 A	2/1988	Fulmer et al.	6,285,863 B1	9/2001	Zhang et al.
4,777,653 A	10/1988	Bonnerot et al.	6,298,061 B1	10/2001	Chin et al.
4,783,843 A	11/1988	Leff et al.	6,304,563 B1	10/2001	Blessent et al.
4,820,568 A	4/1989	Harpell et al.	6,304,575 B1	10/2001	Carroll et al.
4,922,259 A	5/1990	Hall et al.	6,331,792 B1	12/2001	Tonietto et al.
5,023,930 A	6/1991	Leslie	6,339,694 B1	1/2002	Komara et al.
5,095,528 A	3/1992	Leslie et al.	6,342,777 B1	1/2002	Takahashi et al.
5,214,788 A	5/1993	Delapierre et al.	6,363,068 B1	3/2002	Kinoshita et al.
5,220,562 A	6/1993	Takada et al.	6,370,185 B1	4/2002	Schmutz et al.
5,280,480 A	1/1994	Pitt et al.	6,370,369 B1	4/2002	Kraiem et al.
5,333,175 A	7/1994	Ariyavisitakul et al.	6,377,612 B1	4/2002	Baker et al.
5,341,364 A	8/1994	Marra et al.	6,377,640 B2	4/2002	Trans et al.
5,349,463 A	9/1994	Hirohashi et al.	6,384,765 B1	5/2002	Sjostrand et al.
5,368,897 A	11/1994	Kurihara et al.	6,385,181 B1	5/2002	Tsutsui et al.
5,371,734 A	12/1994	Fischer et al.	6,388,995 B1	5/2002	Gai et al.
5,373,503 A	12/1994	Chen et al.	6,393,299 B1	5/2002	Mizumoto et al.
5,383,144 A	1/1995	Kato	6,404,775 B1	6/2002	Leslie et al.
5,408,197 A	4/1995	Miyake et al.	6,441,781 B1	8/2002	Rog et al.
5,408,618 A	4/1995	Aho et al.	6,473,131 B1	10/2002	Neugebauer et al.
5,430,726 A	7/1995	Moorwood et al.	6,480,481 B1	11/2002	Park et al.
5,446,770 A	8/1995	Urabe et al.	6,501,955 B1	12/2002	Durrant et al.
5,465,251 A	11/1995	Judd et al.	6,535,732 B1	3/2003	McIntosh et al.
5,471,642 A	11/1995	Palmer	6,539,028 B1	3/2003	Soh et al.
5,485,486 A	1/1996	Gilhousen et al.	6,539,204 B1	3/2003	Marsh et al.
5,509,028 A	4/1996	Marque-Pucheu et al.	6,549,542 B1	4/2003	Dong et al.
5,515,376 A	5/1996	Murthy et al.	6,549,567 B1	4/2003	Fullerton et al.
5,519,619 A	5/1996	Seda	6,563,468 B2	5/2003	Hill et al.
5,608,755 A	3/1997	Rakib et al.	6,574,198 B1	6/2003	Pettersson
5,610,916 A	3/1997	Kostreski et al.	6,628,624 B1	9/2003	Mahajan et al.
5,648,984 A	7/1997	Kroninger et al.	6,664,932 B2	12/2003	Sabet et al.
5,654,979 A	8/1997	Levin et al.	6,671,502 B1	12/2003	Ogawa et al.
5,659,879 A	8/1997	Dupuy	6,684,058 B1	1/2004	Karacaoglu et al.
5,678,177 A	10/1997	Beasley	6,690,657 B1	2/2004	Lau et al.
5,678,198 A	10/1997	Lemon et al.	6,694,125 B2	2/2004	White
5,684,801 A	11/1997	Amitay et al.	6,718,160 B2	4/2004	Schmutz et al.
5,697,052 A	12/1997	Treatch	6,728,541 B2	4/2004	Ohkura
5,726,980 A	3/1998	Rickard et al.	6,766,113 B1	7/2004	Al-Salameh
5,732,334 A	3/1998	Miyake et al.	6,781,544 B2	8/2004	Saliga et al.
5,745,846 A	4/1998	Myer et al.	6,788,256 B2	9/2004	Hollister
5,754,540 A	5/1998	Liu et al.	6,880,103 B2	4/2005	Kim et al.
5,764,636 A	6/1998	Edsall et al.	6,904,266 B1	6/2005	Jin et al.
5,767,788 A	6/1998	Ness	6,906,669 B2	6/2005	Sabet et al.
5,771,174 A	6/1998	Spinner et al.	6,934,511 B1	8/2005	Lovinggood et al.
5,784,683 A	7/1998	Sistanizadeh et al.	6,934,555 B2	8/2005	Silva et al.
5,794,145 A	8/1998	Milam	6,944,139 B1	9/2005	Campanella et al.
5,812,933 A	9/1998	Niki	6,957,042 B2	10/2005	Williams
5,815,795 A	9/1998	Iwai	6,983,162 B2	1/2006	Garani et al.
5,825,809 A	10/1998	Sim	6,985,516 B1	1/2006	Easton et al.
5,852,629 A	12/1998	Iwamatsu et al.	6,990,313 B1	1/2006	Yarkosky et al.
5,857,144 A	1/1999	Mangum et al.	7,027,418 B2	4/2006	Gan et al.
5,862,207 A	1/1999	Aoshima	7,027,770 B2	4/2006	Judd et al.
5,875,179 A	2/1999	Tikalsky	7,043,203 B2	5/2006	Miquel et al.
5,883,884 A	3/1999	Atkinson	7,050,442 B1	5/2006	Sugar et al.
5,884,181 A	3/1999	Arnold et al.	7,050,452 B2	5/2006	Sugar et al.
5,890,055 A	3/1999	Chu et al.	7,058,368 B2	6/2006	Nicholls et al.
5,903,553 A	5/1999	Sakamoto et al.	7,088,734 B2	8/2006	Newberg et al.
5,907,794 A	5/1999	Lehmusto et al.	7,103,344 B2	9/2006	Menard et al.
5,963,846 A	10/1999	Kurby et al.	7,120,930 B2	10/2006	Maufer et al.
5,987,304 A	11/1999	Latt	7,123,670 B2	10/2006	Gilbert et al.
6,005,855 A	12/1999	Zehavi et al.	7,123,676 B2	10/2006	Gebara et al.
6,005,884 A *	12/1999	Cook et al. .... 375/132	7,132,988 B2	11/2006	Yegin et al.
6,014,380 A	1/2000	Hendel et al.	7,133,391 B2	11/2006	Belcea
6,032,194 A	2/2000	Gai et al.	7,133,460 B2	11/2006	Bae et al.
6,061,548 A	5/2000	Reudink et al.	7,139,527 B2	11/2006	Tamaki et al.
6,088,570 A	7/2000	Komara et al.	7,167,526 B2	1/2007	Liang et al.
6,101,400 A	8/2000	Ogaz et al.	7,187,904 B2	3/2007	Gainey et al.
6,108,364 A	8/2000	Weaver, Jr. et al.	7,193,975 B2	3/2007	Tsutsumi et al.
6,128,512 A	10/2000	Trompower et al.	7,194,275 B2	3/2007	Bolin et al.
6,128,729 A	10/2000	Kimball et al.	7,200,134 B2	4/2007	Proctor, Jr. et al.
6,163,276 A	12/2000	Irving et al.	7,215,964 B2	5/2007	Miyake et al.
6,188,694 B1	2/2001	Fine et al.	7,230,935 B2	6/2007	Proctor, Jr. et al.
6,188,719 B1	2/2001	Collomby	7,233,771 B2	6/2007	Proctor, Jr. et al.
6,195,051 B1	2/2001	McCoy et al.	7,248,645 B2	7/2007	Vialle
6,202,114 B1	3/2001	Dutt et al.	7,254,132 B2	8/2007	Takao et al.
6,215,982 B1	4/2001	Trompower et al.	7,299,005 B1	11/2007	Yarkosky et al.
6,219,739 B1	4/2001	Dutt et al.	7,315,573 B2	1/2008	Lusky et al.
			7,319,714 B2	1/2008	Sakata et al.

# US 7,990,904 B2

Page 3

7,321,787	B2	1/2008	Kim et al.
7,339,926	B2	3/2008	Stanwood et al.
7,352,696	B2	4/2008	Stephens et al.
7,409,186	B2	8/2008	Van Buren et al.
7,430,397	B2	9/2008	Suda et al.
7,450,936	B2	11/2008	Kim
7,457,587	B2	11/2008	Chung
7,486,929	B2	2/2009	Van Buren et al.
7,577,398	B2	8/2009	Judd et al.
7,590,145	B2	9/2009	Futch et al.
7,623,826	B2	11/2009	Pergal et al.
7,676,194	B2	3/2010	Rappaport et al.
7,729,669	B2	6/2010	Van Buren et al.
2001/0031646	A1	10/2001	Williams et al.
2001/0040699	A1	11/2001	Osawa et al.
2001/0050580	A1	12/2001	O'Toole
2001/0050906	A1	12/2001	Odenwalder et al.
2001/0054060	A1	12/2001	Fillebrown et al.
2002/0004924	A1	1/2002	Kim et al.
2002/0018487	A1	2/2002	Chen et al.
2002/0034958	A1	3/2002	Oberschmidt et al.
2002/0045461	A1	4/2002	Bongfeldt et al.
2002/0061031	A1	5/2002	Sugar et al.
2002/0089945	A1	7/2002	Belcea et al.
2002/0101843	A1 *	8/2002	Sheng et al. .... 370/338
2002/0102948	A1	8/2002	Stanwood et al.
2002/0109585	A1	8/2002	Sanderson
2002/0115409	A1	8/2002	Khayrallah et al.
2002/0119783	A1	8/2002	Bourlas et al.
2002/0136268	A1	9/2002	Gan et al.
2002/0141435	A1	10/2002	Newberg et al.
2002/0159506	A1	10/2002	Alamouti et al.
2002/0163902	A1	11/2002	Takao et al.
2002/0177401	A1	11/2002	Judd et al.
2003/0026363	A1	2/2003	Stoter et al.
2003/0139175	A1	7/2003	Kim
2003/0179734	A1	9/2003	Tsutsumi et al.
2003/0185163	A1	10/2003	Bertonis et al.
2003/0211828	A1	11/2003	Dalgleish et al.
2003/0235170	A1 *	12/2003	Trainin ..... 370/338
2003/0236069	A1	12/2003	Sakata et al.
2004/0029537	A1	2/2004	Pugel et al.
2004/0038707	A1	2/2004	Kim
2004/0047333	A1	3/2004	Han et al.
2004/0047335	A1	3/2004	Proctor, Jr. et al.
2004/0056802	A1	3/2004	Hollister
2004/0110469	A1	6/2004	Judd et al.
2004/0131025	A1	7/2004	Dohler et al.
2004/0146013	A1	7/2004	Song et al.
2004/0157551	A1	8/2004	Gainey et al.
2004/0166802	A1	8/2004	McKay, Sr. et al.
2004/0176050	A1	9/2004	Steer et al.
2004/0198295	A1	10/2004	Nicholls et al.
2004/0208258	A1	10/2004	Lozano et al.
2004/0218683	A1	11/2004	Batra et al.
2004/0229563	A1	11/2004	Fittion et al.
2004/0235417	A1	11/2004	Dean
2004/0248581	A1	12/2004	Seki et al.
2004/0264511	A1	12/2004	Futch et al.
2005/0014464	A1	1/2005	Larsson et al.
2005/0030891	A1	2/2005	Stephens et al.
2005/0042999	A1	2/2005	Rappaport
2005/0130587	A1	6/2005	Suda et al.
2005/0201315	A1	9/2005	Lakkis
2005/0254442	A1	11/2005	Proctor Jr., et al.
2005/0286448	A1	12/2005	Proctor et al.
2006/0028388	A1	2/2006	Schantz
2006/0035643	A1	2/2006	Vook et al.
2006/0041680	A1	2/2006	Proctor, Jr.
2006/0052066	A1	3/2006	Cleveland et al.
2006/0052099	A1	3/2006	Parker et al.
2006/0056352	A1	3/2006	Proctor et al.
2006/0063484	A1	3/2006	Proctor, Jr., et al.
2006/0063485	A1	3/2006	Gainey et al.
2006/0203757	A1	9/2006	Young et al.
2006/0262026	A1	11/2006	Gainey et al.
2007/0025349	A1	2/2007	Bajic et al.
2007/0025486	A1	2/2007	Gainey et al.
2007/0032192	A1	2/2007	Gainey et al.

## FOREIGN PATENT DOCUMENTS

EP	0523687	1/1993
EP	0709973 A1	5/1996
EP	0715423	6/1996
EP	0847146 A2	6/1998
EP	0853393 A1	7/1998
EP	0860953	8/1998
GB	2272599	5/1994
GB	2351420 A	12/2000
JP	62040895	2/1987
JP	63160442	7/1988
JP	64011428	1/1989
JP	02100358	4/1990
JP	03021884	1/1991
JP	05063623	3/1993
JP	05102907	4/1993
JP	6013947	1/1994
JP	06334577	12/1994
JP	07030473	1/1995
JP	07079187	3/1995
JP	07079205	3/1995
JP	08097762	4/1996
JP	08274706	10/1996
JP	09018484 A	1/1997
JP	09162903	6/1997
JP	09182155	7/1997
JP	10032557 A	2/1998
JP	10135892	5/1998
JP	11055713	2/1999
JP	11127104	5/1999
JP	2000031877	1/2000
JP	2000502218 T	2/2000
JP	2000082938 A	3/2000
JP	2000236290	8/2000
JP	2000269873	9/2000
JP	2001111575 A	4/2001
JP	2002033691	1/2002
JP	2002111571 A	4/2002
JP	2002271255	9/2002
JP	2003174394	6/2003
JP	2004328666	11/2004
JP	2005531202	10/2005
JP	2005531265	10/2005
JP	2006503481	1/2006
JP	2006505146	2/2006
KR	100610929	8/2006
WO	W09214339	8/1992
WO	W09734434	9/1997
WO	W09858461 A1	12/1998
WO	W09959264 A2	11/1999
WO	W00050971 A2	8/2000
WO	W00152447	7/2001
WO	W00182512 A1	11/2001
WO	0208857 A2	1/2002
WO	0208857	1/2002
WO	02017572	2/2002
WO	WO03013005 A2	2/2003
WO	04002014	12/2003
WO	WO2004001986 A2	12/2003
WO	WO2004002014	12/2003
WO	WO2004004365	1/2004
WO	WO2004032362	4/2004
WO	WO2004038958	5/2004
WO	2004062305 A1	7/2004
WO	WO05115022	12/2005

## OTHER PUBLICATIONS

IEEE Std 802.11g-2003, "Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications: Amendment 4: Further Higher Data Rate Extension in the 2.4 GHz Band." IEEE Computer Society, Published by The Institute of Electrical and Electronics Engineers, Inc., Jun. 27, 2003.  
 IEEE Std 802.11b-1999, "Part 11: Wireless LAN Medium Access

Control (MAC) and Physical Layer (PHY) specifications: Higher-Speed Physical Layer Extension in the 2.4 GHz Band," IEEE-SA Standards Board, Supplement to ANSI/IEEE Std. 802.11, 1999 Edition, Approved Sep. 16, 1999.

Code of Federal Regulations, Title 47 Telecommunication; "Federal Communications Commission code part 15.407," Federal Communications Commission vol.1, chapter I, part 15.407.

IEEE Std. 802. 11-1999 (Reaff 2003), "Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications," LAN MAN Standards Committee of the IEEE Computer Society; Paragraphs 7.2.3.1 and 7.2.3.9; Paragraph 15.4.6.2 and 18.4.6.2.

IEEE Std 802.11b-1999, "Part 11; Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications: Higher-Speed Physical Layer Extension in the 2.4 GHz Band," IEEE-SA Standards Board, Supplement to ANSI/IEEE Std. 802.11. 1999 Edition, Approved Sep. 16, 1999.

IEEE Std 802.11g-2003, "Part 11; Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) specifications: Amendment 4: Further Higher Data Rate Extension in the 2.4 GHz Band," IEEE Computer Society, Published by The Institute of Electrical and Electronics Engineers, Inc., Jun. 27, 2003.

IEEE Std 802.16-2001; "Part 16: Air Interface for Fixed Broadband Wireless Access Systems," IEEE Computer Society and the IEEE Microwave Theory and Techniques Society, Published by The Institute of Electrical and Electronics Engineers, Inc., Apr. 8, 2002.

IEEE Std 802.11-1999 (Reaff 2003), "Part 11; Wireless Lan Medium Access Control (MAC) and Physical Layer (PHY) Specifications," LAN MAN Standards Committee of the IEEE Computer Society; Paragraphs 7.2.3.1 and 7.2.3.9; Paragraph 7.3.2.4; Paragraphs 15.4.6.2 and 18.4.6.2.

Andrisano, et al., On the Spectral Efficiency of CPM Systems over Real Channel in the Presence of Adjacent Channel and CoChannel Interference: A Comparison between Partial and Full Response Systems, IEEE Transactions on Vehicular Technology, vol. 39, No. 2, May 1990.

First Office Action issued from the Chinese Patent Office in connection with corresponding Chinese application No. 200380101286.2. (corresponding U.S. Appl. No. 10/530,546).

Draft Corrigendum to IEEE Standard for Local and Metropolitan Area Networks—Part 16: Air Interface for Fixed Broadband Wireless Access Systems, IEEE P802.16-2004/Cor1/D5.

Draft IEEE Standard for Local and Metropolitan Area Networks—Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems; Amendment for Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands. IEEE P802.16/E/D12. Oct. 2005.

Office Action English translation dated Jul. 4, 2008 issued Chinese Patent Office for Application No. 03814391.7.

Office Action English translation dated Jun. 29, 2009 issued from Japanese Patent Office for Application No. 2004-541532.

Translation of Office Action in Japanese application 2004-515701, corresponding to U.S. Appl. No. 10/516,327, citing WO00050971, JP2000-031877, JP2002-033691, JP2002-111571 and JP11-127104, Dated Jun. 11, 2010.

Translation of Office Action in Japanese application 2004-544751, corresponding to U.S. Appl. No. 10/531,078, citing WO00050971, JP2002-111571, JP05-102907, JP63-160442, JP2000-502218, JP10-032557 and JP2000-082983. Dated Oct. 16, 2009.

Translation of Office Action in Japanese application 2004-565505, corresponding to U.S. Appl. No. 10/563,471, citing JP08-097762 and JP2001-111575. Dated Sep. 9, 2009.

Translation of Office Action in Japanese application 2004-565505, corresponding to U.S. Appl. No. 10/563,471, citing JP08-097762, JP2001-111575, JP09-018484 and JP11-055713. Dated Oct. 7, 2010.

Translation of Office Action in Japanese application 2004-565505, corresponding to U.S. Appl. No. 10/563,471, citing JP09-018484. Dated Mar. 26, 2010.

Translation of Office Action in Korean application 2008-7026775, corresponding to U.S. Appl. No. 11/730,361, citing KR100610929 Dated Aug. 30, 2010.

Translation of Office Action in Japanese application 2009-503041, corresponding to U.S. Appl. No. 11/730,361, citing WO05115022, JP10-135892, JP2005-531265, 2006-503481, JP2005-531202 AND JP2006-505146. Dated Oct. 26, 2010.

Translation of Office Action in Korean application 2009-7010639, corresponding to U.S. Appl. No. 12/439,018, citing WO01052447 and US2004/0208258, Dated Nov. 15, 2010.

\* cited by examiner

Office communication dated Jan. 12, 2007 issued from the European Patent Office for counterpart application No. 03734136.9-1246 (corresponding U.S. Appl. No. 10/516,327).

Office communication dated Oct. 19, 2006 issued from the Mexican Patent Office for counterpart application No. PA/a/2004/011588 (corresponding U.S. Appl. No. 10/516,327).

Official communication issued from the European Patent Office dated Aug. 7, 2007 for the corresponding European patent application No. 03759271.4-2412 (corresponding U.S. Appl. No. 10/531,078).

Second Office Action issued from the Chinese Patent Office on Jul. 20, 2007 in connection with corresponding Chinese application No. 200380101286.2 (corresponding U.S. Appl. No. 10/530,546).

Specifications for 2.3 GHz Band Portable Internet Service—Physical & Medium Access Control Layer, TTAS KO-06-0082/R1, Dec. 2005. Third Office Action issued from the Patent Office of People's Republic of China dated Jan. 4, 2008 in corresponding Chinese Patent Application No. 200380101286.2 (corresponding U.S. Appl. No. 10/530,546).

Translation of Office Action issued by Chinese Patent Office on Oct. 19, 2007 in connection with the corresponding Chinese application No. 03814391.7 (corresponding U.S. Appl. No. 10/516,327).

U.S. PTO Office Action mailed on Apr. 17, 2007 for the corresponding U.S. Appl. No. 11/339,838, now U.S Patent No. 7,230,935.

U.S. PTO Office Action mailed on Jan. 24, 2007 for the corresponding U.S. Appl. No. 11/339,838, now U.S. Patent No. 7,230,935.

U.S. PTO Office Action mailed on Nov. 21, 2006 for the corresponding U.S. Appl. No. 11/339,838, now U.S. Patent No. 7,230,935.

U.S. PTO Office Action mailed on Nov. 6, 2006 for the corresponding U.S. Appl. No. 11/339,838, now U.S. Patent No. 7,230,935.

Draft IEEE Standard for Local and Metropolitan Area Networks—Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems; Amendment for Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands. IEEE P802.16/E/D12. Oct. 2005.

Office Action English translation dated Jul. 4, 2008 issued Chinese Patent Office for Application No. 03814391.7.

Office Action English translation dated Jun. 29, 2009 issued from Japanese Patent Office for Application No. 2004-541532.

Translation of Office Action in Japanese application 2004-515701, corresponding to U.S. Appl. No. 10/516,327, citing WO00050971, JP2000-031877, JP2002-033691, JP2002-111571 and JP11-127104, Dated Jun. 11, 2010.

Translation of Office Action in Japanese application 2004-544751, corresponding to U.S. Appl. No. 10/531,078, citing WO00050971, JP2002-111571, JP05-102907, JP63-160442, JP2000-502218, JP10-032557 and JP2000-082983. Dated Oct. 16, 2009.

Translation of Office Action in Japanese application 2004-565505, corresponding to U.S. Appl. No. 10/563,471, citing JP08-097762 and JP2001-111575. Dated Sep. 9, 2009.

Translation of Office Action in Japanese application 2004-565505, corresponding to U.S. Appl. No. 10/563,471, citing JP08-097762, JP2001-111575, JP09-018484 and JP11-055713. Dated Oct. 7, 2010.

Translation of Office Action in Japanese application 2004-565505, corresponding to U.S. Appl. No. 10/563,471, citing JP09-018484. Dated Mar. 26, 2010.

Translation of Office Action in Korean application 2008-7026775, corresponding to U.S. Appl. No. 11/730,361, citing KR100610929 Dated Aug. 30, 2010.

Translation of Office Action in Japanese application 2009-503041, corresponding to U.S. Appl. No. 11/730,361, citing WO05115022, JP10-135892, JP2005-531265, 2006-503481, JP2005-531202 AND JP2006-505146. Dated Oct. 26, 2010.

Translation of Office Action in Korean application 2009-7010639, corresponding to U.S. Appl. No. 12/439,018, citing WO01052447 and US2004/0208258, Dated Nov. 15, 2010.

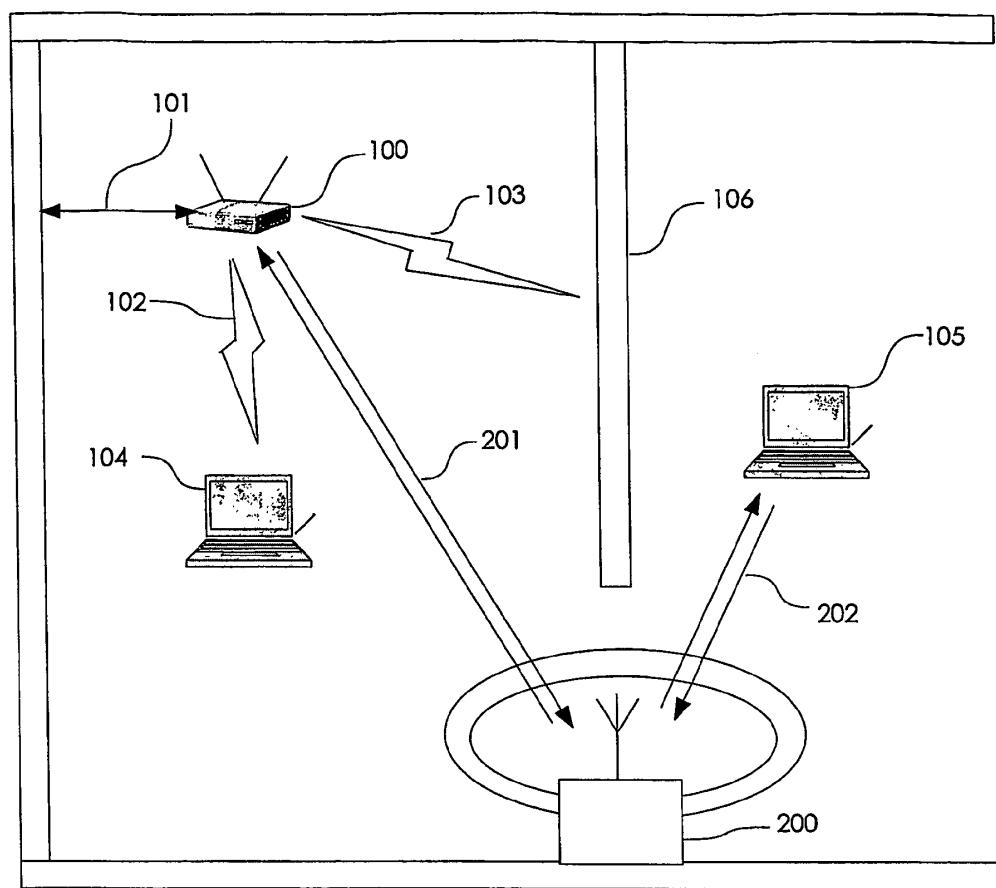


FIG. 1

# Explore Litigation Insights



Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

### API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

### LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

### FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

### E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.