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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/540,773	05/30/2017	9667337	08610001C7	3686

30743 7590 05/10/2017
WHITHAM, CURTIS & COOK, P.C.
11491 SUNSET HILLS ROAD
SUITE 340
RESTON, VA 20190

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 281 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Theodore S. Rappaport, Riner, VA;

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	14540773
Filing Date	2014-11-13
First Named Inventor	Rappaport
Art Unit	2649
Examiner Name	
Attorney Docket Number	08610001C7

64	5898382	A	1999-04-27	Treatch	
65	6718160	B2	2004-04-26	Schmutz	
66	6505032	B1	2003-01-07	McCorkle et al.	
67	6590545	B2	2003-07-08	McCorkle	
68	5634196	A	1997-05-27	Alford	
69	6110221	A	2000-08-29	Pai et al.	
70	6373833	B1	2002-04-19	Suonvieri et al.	

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U.S.PATENT APPLICATION PUBLICATIONS

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Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
Change(s) applied to document, /H.J.L./ 3/28/2017	1	20040157550	A1	2004-08-12	Nakagawa	
	2	20020093928	A1	2002-07-18	LoGalbo et al. ~~Motorola INC.~~	

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Attorney Docket Number		08610001C7

	42	7787513	B2	2010-08-31	Siwiak et al.	
	43	6806821	B2	2004-10-19	McLemore	
	44	7983613	B2	2011-07-19	Rappaport	
Change(s) applied to document, /H.J.L./ 3/28/2017	45	6754882	B1	2004-06-22	Sanchez et al. ~~XILINX INC.~~	
	46	8331854	B2	2012-12-11	Rappaport	
	47	5592491	A	1997-01-07	Dinkins	
	48	4659878	A	1987-04-21	Dinkins	
	49	5633876	A	1997-05-27	Dinkins	
	50	4932049	A	1990-06-05	Lee	
	51	5086506	A	1992-02-04	Hall et al.	
	52	6671351	B2	2003-12-30	Menard et al.	

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Attorney Docket Number	08610001C7	

	31	8483319	B2	2013-07-09	Tang	
	32	8175191	B2	2012-05-08	Tang et al.	
Change(s) applied to document /H.J.L./ 3/28/2017	33	7945215	B2	2011-05-17	Tang ~~Adaptrum INC.~~	
	34	7289813	B2	2007-10-30	Karaoguz	
	35	6348986	B1	2002-02-19	Doucet et al.	
	36	6186908	B1	2001-02-13	Kawasaki et al.	
	37	6934511	B1	2005-08-23	Lovinggood et al. ~~Andrew Corp.~~	
	38	5012211	A	1991-04-30	Young et al. ~~Hughes Aircraft Co.~~	
	39	4626845	A	1986-12-02	Ley ~~Epic Systems INC.~~	
	40	4298179	A	1981-11-03	Gilcher ~~American Standard INC.~~	
	41	6952456	B1	2005-10-04	Aiello et al. ~~Pulse Link INC.~~	

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	20	8577300	B2	2013-11-05	Gossain et al.	
	21	8583157	B2	2013-11-12	Stanforth et al.	
	22	8644868	B2	2014-02-04	Gossain et al.	
	23	8700077	B2	2014-04-15	Schmidt et al.	
	24	8755830	B2	2014-06-17	Roberts et al.	
	25	8792901	B2	2014-07-29	Schmidt	
	26	8804680	B2	2014-08-12	Schmidt et al.	
	27	8824970	B2	2014-09-02	Schmidt et al.	
Change(s) applied to document, /H.J.L./ 3/28/2017	28	8831625	B2	2014-09-09	~~Joslyn et al. Spectrum Bridge INC. et al.~~	
	29	8559891	B2	2013-10-15	Tang et al.	
	30	8509706	B2	2013-08-13	Tang et al.	

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	9	8249966	B2	2012-08-21	Stanforth et al.	
	10	8279823	B2	2012-10-02	Stanforth et al.	
	11	8290848	B2	2012-10-16	Duffus et al.	
	12	8380194	B2	2013-02-19	Gossain et al.	
	13	8406188	B2	2013-03-26	Schmidt et al.	
	14	8457644	B2	2013-06-04	Schmidt et al.	
	15	8504087	B2	2013-08-06	Stanforth et al.	
	16	8521636	B2	2013-08-27	Chang et al.	
Change(s) applied to document, /H.J.L./ 3/28/2017	17	8526944	B2	2013-09-03	Gossain et al. ~~Spectrum Bridge INC~~	
	18	8532686	B2	2013-09-10	Schmidt et al.	
	19	8576817	B2	2013-11-05	Stanforth et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		14540773
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U.S. PATENTS							Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	
Change(s) applied to document, /H.J.L./ 3/28/2017	1	7958041	B2	2011-06-07	Stanforth et al. ~~Spectrum Bridge INC.~~		
	2	8041627	B2	2011-10-18	Stanforth et al. ~~Spectrum Bridge INC.~~		
	3	8073458	B2	2011-12-06	Chang et al.		
	4	8139496	B2	2012-03-20	Stanforth et al.		
	5	8160599	B2	2012-04-12	Stanforth et al.		
	6	8175612	B2	2012-05-08	Palmer et al.		
	7	8233928	B2	2012-07-31	Stanforth et al.		
	8	8234208	B2	2012-07-31	Stanforth et al.		

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Change(s)
applied
to document,
/H.J.L./
3/28/2017

Change(s)
applied
to document,
/J.E./
4/27/2017

3	20040259494	A1	2004-12-23	Mazar ~~Cardiac Pacemakers INC.~~	
4	20030162504	A1	2003-08-28	Sabongi et al.	
5	20030220075	A1	2003-11-27	Baker et al.	
6	20060285577	A1	2006-12-21	Santhoff et al. ~~Pulse Link INC.~~	
7	20050018640	A1	2005-01-27	Fullerton et al.	
8	20050197121	A1	2005-09-05	Fujiwara et al.	
9	20030162528	A1	08/2003 ~~2003-11-13~~	~~Dagleish et al.~~ Juzswik	
10	20030211828	A1	11/2003 ~~2003-08-28~~	~~Juzswik~~ Dagleish et al.	
11	20040178928	A1	2004-09-16	Butzer et al.	
12	20120033714	A1	2012-02-09	Lakkis et al.	
13	20040212537	A1	2004-10-28	Mohammadian	

<i>Index of Claims</i> 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE							
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<i>Index of Claims</i> 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
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<i>Index of Claims</i> 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

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<i>Index of Claims</i> 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

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CLAIM		DATE							
Final	Original	10/17/2016	02/06/2017						
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Issue Classification 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.	
	Examiner DEWANDA SAMUEL	Art Unit 2464	

CPC						
Symbol					Type	Version
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H04W		4		18	A	2013-01-01
H04W		16		14	A	2013-01-01
H04W		24		00	A	2013-01-01
H04W		28		10	A	2013-01-01
H04W		88		04	I	2013-01-01
H04W		28		0236	I	2013-01-01
H04W		28		048	I	2013-01-01
H04W		12		08	I	2013-01-01
H04W		12		12	A	2013-01-01
H04W		12		00	A	2013-01-01
H04B		7		15521	I	2013-01-01
H04B		7		15557	I	2013-01-01
H04W		4		06	I	2013-01-01
H04W		24		08	I	2013-01-01
H04W		84		005	A	2013-01-01
H04W		84		18	A	2013-01-01
H04B		7		1555	I	2013-01-01

CPC Combination Sets							
Symbol				Type	Set	Ranking	Version

/DEWANDA SAMUEL/ Examiner.Art Unit 2464 (Assistant Examiner)	02/06/2017 (Date)	Total Claims Allowed: 63	
/RICKY NGO/ Supervisory Patent Examiner.Art Unit 2464 (Primary Examiner)	02/06/2017 (Date)	O.G. Print Claim(s) 45	O.G. Print Figure 7

Issue Classification 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
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	19		38	11	57	25	76	63	95						

/DEWANDA SAMUEL/ Examiner.Art Unit 2464 (Assistant Examiner)	02/06/2017 (Date)	Total Claims Allowed: 63	
/RICKY NGO/ Supervisory Patent Examiner.Art Unit 2464 (Primary Examiner)	02/06/2017 (Date)	O.G. Print Claim(s) 45	O.G. Print Figure 7

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
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30743 7590 02/13/2017
WHITHAM, CURTIS & COOK, P.C.
11491 SUNSET HILLS ROAD
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RESTON, VA 20190

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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

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(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/540,773	11/13/2014	Theodore S. Rappaport	08610001C7	3686

TITLE OF INVENTION: Intelligent broadband relay for wireless networks for connectivity to mobile or portable devices

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	05/15/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
SAMUEL, DEWANDA A	2464	370-315000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

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- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
- (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Whitham, Curtis

2 & Cook, P.C.

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

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- ☒ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
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- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature

Michael E. Whitham

Date

4/13/17

Typed or printed name

Michael E. Whitham

Registration No. 32,635

Electronic Patent Application Fee Transmittal

Application Number:	14540773			
Filing Date:	13-Nov-2014			
Title of Invention:	Intelligent broadband relay for wireless networks for connectivity to mobile or portable devices			
First Named Inventor/Applicant Name:	Theodore S. Rappaport			
Filer:	Michael E. Whitham/Walter Richardson			
Attorney Docket Number:	08610001C7			
Filed as Small Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	480	480

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Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				480

Electronic Acknowledgement Receipt

EFS ID:	28928206
Application Number:	14540773
International Application Number:	
Confirmation Number:	3686
Title of Invention:	Intelligent broadband relay for wireless networks for connectivity to mobile or portable devices
First Named Inventor/Applicant Name:	Theodore S. Rappaport
Customer Number:	30743
Filer:	Michael E. Whitham/Walter Richardson
Filer Authorized By:	Michael E. Whitham
Attorney Docket Number:	08610001C7
Receipt Date:	14-APR-2017
Filing Date:	13-NOV-2014
Time Stamp:	11:10:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 480
RAM confirmation Number	041417INTEFSW00008182502041
Deposit Account	
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	08610001c7_if.pdf	79750	no	1
			aa1cb6fe7f2cbb9de977130a698b4e51165 bbcaa		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30640	no	2
			a7880eccd4a09cb7a8a5e6e8c6a88772502 3d0d7		
Warnings:					
Information:					
Total Files Size (in bytes):			110390		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

<i>Index of Claims</i> 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA				☐ T.D.				☐ R.1.47			
CLAIM		DATE													
Final	Original	10/17/2016	02/06/2017												
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	2	-	-												
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<i>Index of Claims</i> 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

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=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA				☐ T.D.				☐ R.1.47			
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	71	✓	=												
	72	✓	=												

<i>Index of Claims</i> 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE							
Final	Original	10/17/2016	02/06/2017						
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<i>Index of Claims</i> 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE							
Final	Original	10/17/2016	02/06/2017						
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	111		=						

Issue Classification 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.	
	Examiner DEWANDA SAMUEL	Art Unit 2464	

CPC						
Symbol					Type	Version
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CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

/DEWANDA SAMUEL/ Examiner.Art Unit 2464 (Assistant Examiner)	02/06/2017 (Date)	Total Claims Allowed: 63	
/RICKY NGO/ Supervisory Patent Examiner.Art Unit 2464 (Primary Examiner)	02/06/2017 (Date)	O.G. Print Claim(s) 45	O.G. Print Figure 7

Issue Classification 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

US ORIGINAL CLASSIFICATION						INTERNATIONAL CLASSIFICATION									
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED				
370			315			H	0	4	B	7 / 14 (2006.01.01)					
CROSS REFERENCE(S)															
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)														
370	466	328													

/DEWANDA SAMUEL/ Examiner.Art Unit 2464 (Assistant Examiner)	02/06/2017 (Date)	Total Claims Allowed: 63	
/RICKY NGO/ Supervisory Patent Examiner.Art Unit 2464 (Primary Examiner)	02/06/2017 (Date)	O.G. Print Claim(s) 45	O.G. Print Figure 7

Issue Classification 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
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/DEWANDA SAMUEL/ Examiner.Art Unit 2464 (Assistant Examiner)	02/06/2017 (Date)	Total Claims Allowed: 63	
/RICKY NGO/ Supervisory Patent Examiner.Art Unit 2464 (Primary Examiner)	02/06/2017 (Date)	O.G. Print Claim(s) 45	O.G. Print Figure 7



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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/540,773	11/13/2014	2464	2530	08610001C7	65	2

CONFIRMATION NO. 3686

CORRECTED FILING RECEIPT



0000000089934363

30743
WHITHAM, CURTIS & COOK, P.C.
11491 SUNSET HILLS ROAD
SUITE 340
RESTON, VA 20190

Date Mailed: 03/16/2017

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Theodore S. Rappaport, Riner, VA;

Applicant(s)

Theodore S. Rappaport, Riner, VA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/676,207 11/14/2012 PAT 8923754 *
which is a CON of 13/157,789 06/10/2011 PAT 8331854
which is a CON of 12/689,052 01/18/2010 PAT 7983613
which is a CON of 10/919,515 08/17/2004 PAT 7676194
which claims benefit of 60/498,324 08/28/2003
and claims benefit of 60/496,913 08/22/2003

(*)Data provided by applicant is not consistent with PTO records.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: No

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 11/28/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/540,773**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Intelligent broadband relay for wireless networks for connectivity to mobile or portable devices

Preliminary Class

370

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

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Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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NOTICE OF ALLOWANCE AND FEE(S) DUE

30743 7590 02/13/2017
WHITHAM, CURTIS & COOK, P.C.
11491 SUNSET HILLS ROAD
SUITE 340
RESTON, VA 20190

EXAMINER

SAMUEL, DEWANDA A

ART UNIT

PAPER NUMBER

2464

DATE MAILED: 02/13/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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14/540,773

11/13/2014

Theodore S. Rappaport

08610001C7

3686

TITLE OF INVENTION: Intelligent broadband relay for wireless networks for connectivity to mobile or portable devices

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	05/15/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

30743 7590 02/13/2017
WHITHAM, CURTIS & COOK, P.C.
11491 SUNSET HILLS ROAD
SUITE 340
RESTON, VA 20190

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/540,773	11/13/2014	Theodore S. Rappaport	08610001C7	3686

TITLE OF INVENTION: Intelligent broadband relay for wireless networks for connectivity to mobile or portable devices

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	05/15/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
SAMUEL, DEWANDA A	2464	370-315000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached. ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.	2. For printing on the patent front page, list (1) The names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____ (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____ 3 _____
---	---

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted: ☐ Issue Fee ☐ Publication Fee (No small entity discount permitted) ☐ Advance Order - # of Copies _____	4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above) ☐ A check is enclosed. ☐ Payment by credit card. Form PTO-2038 is attached. ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).
---	---

5. Change in Entity Status (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/540,773	11/13/2014	Theodore S. Rappaport	08610001C7	3686

30743 7590 02/13/2017
WHITHAM, CURTIS & COOK, P.C.
11491 SUNSET HILLS ROAD
SUITE 340
RESTON, VA 20190

EXAMINER

SAMUEL, DEWANDA A

ART UNIT	PAPER NUMBER
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2464

DATE MAILED: 02/13/2017

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/540,773	Applicant(s) RAPPAPORT, THEODORE S.	
	Examiner DEWANDA SAMUEL	Art Unit 2464	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 19 January 2017.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 45-49,51-54,56-80,82-85 and 87-111. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some *c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. ☒ Notice of References Cited (PTO-892) | 5. ☐ Examiner's Amendment/Comment |
| 2. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 6. ☒ Examiner's Statement of Reasons for Allowance |
| 3. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 7. ☐ Other _____. |
| 4. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____. | |

/RICKY NGO/
Supervisory Patent Examiner, Art Unit 2464

DETAILED ACTION

1. This communication is responsive to the communication filed on 01/19/2017.

Claims 45-49, 51-54, 56-80, 82-85 and 87-111 are pending. Claims 1-44, 50,55,81,86 were cancelled. Claims 45, 51-54,60-64,80,82-85,87 and 91-95 were amended. Claims 110 and 111 were added.

The present application is being examined under the pre-AIA first to invent provisions.

Allowable Subject Matter

2. Claims 45-49, 51-54, 56-80, 82-85 and 87-111 are allowed.

3. The following is a statement of reasons for the indication of allowable subject matter: Claim 45 and similar claims 80,110 and 111 are allowable over the prior art of record since the cited references taken individually or in combination fails particularly disclose: “ at least one receiver or transceiver for signal or data reception from one or more devices; at least one transmitter or transceiver for signal or data transmission to one or more devices, wherein the transceiver for signal or data reception and the transceiver for signal or data transmission may be the same or different; and a controller that is configured or configurable for operation in one or more wireless networks, said controller communicating with said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission, wherein at least one of said receiver or transceiver for signal or data

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reception and said transmitter or transceiver for signal or data transmission either or both transmit and receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more, wherein said broadband wireless repeater or relay is connected or connectable to one or more network backbones for connecting said one or more wireless networks with said one or more network backbones, and wherein said broadband wireless repeater or relay is used to support connectivity and/or position location capabilities for one or more mobile or portable devices, and wherein said controller is configured or configurable to perform or for performing at least one of: a) ignore or filter out at least some signal or data transmissions from one or more undesired transmitters, users, networks, data sources, or noise sources; and b) instruct one or more devices or networks to ignore or disregard at least some signal or data transmissions of one or more undesired transmitters, undesired users, undesired networks, or noise sources.”

It is noted the closest prior art, Evans et al disclose having a communication system a ultrawideband (UWB) node whereby the UWB node is configured as a gateway and receives data from at least one remote communicator (i.e. remoter device) via ultrawideband link. Evans et al. disclose having a UWB node comprise a transceiver with a transmitter portion used to transmit images to a remote computer. Evans et al disclose having a communication system a ultrawideband (UWB) node whereby the UWB node is configured as a gateway and receives data from at least one remote communicator (i.e. remoter device) via ultrawideband link. Evans et al. disclose having a UWB node comprised of a processor coupled to LAN adapter for communication in a

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LAN and configure to couple the UWB node to a wireless system. Evans et al. disclose having a processor couple to a transceiver of the UWB node. Evans et al. disclose having a UWB node connected to a broadband subsystem interpreted as a "network backbones" and a wireless subsystem. Evans et al. disclose having a UWB node 60 facilitate connectivity/ communication of the remote device within the wireless subsystem via UWB link to communicate with the application node within the broadband subsystem via broadband link.

However, Evans et al. and Miao fail to disclose or render obvious the above limitations as claimed.

Prior Art

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fontana (US Patent 6,054,950)

Spratt (US Patent 6,983,146)

Hector et al. (US Patent 7,269,427)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEWANDA SAMUEL whose telephone number is

Art Unit: 2464

(571)270-1213. The examiner can normally be reached on Monday- Thursday 8:30-5:30 EST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Q. Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DEWANDA SAMUEL/
Examiner, Art Unit 2464

/RICKY NGO/
Supervisory Patent Examiner, Art Unit 2464

Notice of References Cited	Application/Control No. 14/540,773		Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.	
	Examiner DEWANDA SAMUEL		Art Unit 2464	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-6,054,950 A	04-2000	Fontana; Robert J.	G01S5/14	342/463
*	B	US-6,983,146 B2	01-2006	Spratt; Michael P	G01S5/0009	455/41.2
*	C	US-7,269,427 B2	09-2007	Hector; Ralph Thomas	H04B1/7163	342/126
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

CPC- SEARCHED		
Symbol	Date	Examiner
H04B1/7163;H04B3/40	10/17/2016	DSamuel
H04W28/048	2/6/2017	DSamuel
H04B7/15542	2/6/2017	DSamuel

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
370	315,466,328	2/6/2017	DSamuel

SEARCH NOTES		
Search Notes	Date	Examiner
("self configurable" autonomous) same (relay repeater) same (controller processor)	10/17/2016	DSamuel
(MIMO "adaptive antenna technology") with (relay repeater extender booster)	10/16/2016	DSamuel
transceiver with (unwanted undesired) with (signal data)	10/16/2016	DSamuel
inventorship search	2/6/2017	DSamuel
((broadband) adj (relay gateway repeater extender booster))	2/6/2017	DSamuel

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
455	41.2	2/6/2017	DSamuel
375	240	2/6/2017	DSamuel

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<i>Index of Claims</i> 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA				☐ T.D.				☐ R.1.47			
CLAIM		DATE													
Final	Original	10/17/2016	02/06/2017												
	1	-	-												
	2	-	-												
	3	-	-												
	4	-	-												
	5	-	-												
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<i>Index of Claims</i> 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA				☐ T.D.				☐ R.1.47			
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	72	✓	=												

<i>Index of Claims</i> 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA				☐ T.D.				☐ R.1.47			
CLAIM		DATE													
Final	Original	10/17/2016	02/06/2017												
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	108	✓	=												

<i>Index of Claims</i> 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant				☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE							
Final	Original	10/17/2016	02/06/2017						
	109	✓	=						
	110		=						
	111		=						

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	0	455/41.2ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 07:46
L2	11951	455/41.2.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 07:46
L3	3261	375/240.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 07:47
L4	111	725/130.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 07:47
L5	0	(broadband adj wireless adj (repeater relay)) same receiver same trasceiver same signal same (data adj reception) same devices same (data adj transmission)same different same controller configured same operation same (wireless adj network) same instantaneous same (overall adj occupied adj bandwidth) same ("100" adj MHz) same (data adj transmission adj rate) same ("100" adj Megabits) same connected same (network backbones) same support same connectivity same (position adj location adj capabilities) same ((mobile portable) adj device) same ignore same filter same (undesired adj transmitters) same (user networks "data source" "noise sources") same instruct same devices same disregard.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 07:57
L14	199	("3150372" "5317323" "5506587" "5510800" "5661490" "5661492" "5748147").PN. OR ("6054950").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/02/06 08:19

L15	272	H04W28/048	US-PGPUB; USPAT; USOCR	OR	OFF	2017/02/06 08:23
L16	2233	H04B7/15542	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 08:23
L17	1005	((broadband) adj (relay gateway repeater extender booster))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 08:24
L18	9	L17 and 2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 08:24
L19	0	L17 and 3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 08:24
L20	0	L17 and 4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 08:24
L21	3	L17 and 15	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 08:24
L22	4	L17 and 16	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 08:24
L23	628	17 AND ((H04L67/10 OR H04L63/20 OR H04L63/02 OR H04L12/66 OR H04L63/0281 OR H04L63/10 OR H04L67/42 OR H04L67/12 OR H04L2012/2849 OR H04L65/1036 OR H04L67/16 OR H04L12/2838 OR H04L41/0816 OR H04L41/32 OR H04L41/5019 OR H04L47/2491 OR H04L65/1023 OR H04L65/103 OR	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 08:24

H04L65/4084 OR H04L12/1453 OR
H04L12/2801 OR H04L12/6402 OR
H04L29/06095 OR H04L45/302 OR
H04L47/805 OR H04L63/205 OR
H04L65/102 OR H04L65/1033 OR
H04L65/40 OR H04L67/104 OR
H04L67/1078 OR H04L67/1095 OR
H04L67/141 OR H04L67/2842 OR
H04L63/105 OR H04L12/2803 OR
H04L12/2818 OR H04L2012/285 OR
H04L43/08 OR H04L12/2816 OR
H04L12/2825 OR H04L65/1026 OR
H04L63/0227 OR H04L65/1069 OR
H04L67/22 OR H04L51/04 OR
H04L63/0236 OR H04L63/029 OR
H04L63/0407 OR H04L63/08 OR
H04L63/30 OR H04L67/14 OR
H04L67/306 OR H04L67/02 OR
H04L12/4633 OR H04L45/308 OR
H04L63/0892 OR H04L63/102 OR
H04L65/80 OR H04L2012/2841 OR
H04L29/06 OR H04L41/0893 OR
H04L43/0876 OR H04L49/90 OR
H04L61/20 OR H04L61/2596 OR
H04L61/3065 OR H04L61/6022 OR
H04L61/6068 OR H04L63/0245 OR
H04L63/0254 OR H04L63/04 OR
H04L63/164 OR H04L63/168 OR
H04L63/308 OR H04L65/1003 OR
H04L65/1006 OR H04L65/4007 OR
H04L65/4092 OR H04L67/06 OR
H04L67/1002 OR H04L67/1004 OR
H04L67/146 OR H04L69/16 OR
H04L69/22 OR H04L69/28 OR
H04L12/2812 OR H04L12/282 OR
H04L12/2834 OR H04L12/2863 OR
H04L29/12433 OR H04L29/12481 OR
H04L41/0806 OR H04L41/082 OR
H04L45/00 OR H04L45/38 OR
H04L45/50 OR H04L45/507 OR
H04L45/68 OR H04L45/74 OR
H04L47/24 OR H04L47/825 OR
H04L49/9005 OR H04L61/1511 OR
H04L61/2007 OR H04L61/2038 OR
H04L61/2539 OR H04L61/2557 OR
H04L63/0209 OR H04L63/0218 OR
H04L65/105 OR H04L65/605 OR
H04L65/608 OR H04L67/28 OR
H04L67/32 OR H04L67/322 OR
H04L12/12 OR H04L12/1827 OR
H04L12/2809 OR H04L12/281 OR
H04L12/283 OR H04L12/2836 OR
H04L12/2898 OR H04L12/40 OR
H04L12/4641 OR H04L12/5692 OR
H04L2209/24 OR H04L2209/80 OR
H04L2463/061 OR H04L2463/144 OR
H04L29/06027 OR H04L29/12047 OR
H04L29/12216 OR H04L29/12811 OR
H04L41/0233 OR H04L41/0659 OR
H04L41/0823 OR H04L41/083 OR
H04L41/0833 OR H04L41/14 OR
H04L41/16 OR H04L41/50 OR
H04L41/5051 OR H04L41/5054 OR
H04L43/062 OR H04L43/0882 OR

		H04L43/16 OR H04L45/306 OR H04L45/66 OR H04L45/72 OR H04L45/7453 OR H04L47/125 OR H04L47/14 OR H04L47/283 OR H04L47/522 OR H04L47/70 OR H04L47/72 OR H04L49/205 OR H04L49/3027 OR H04L61/15 OR H04L61/2015 OR H04L61/2514 OR H04L61/6009 OR H04L61/6077 OR H04L63/0823 OR H04L63/1416 OR H04L63/1441 OR H04L65/104 OR H04L65/60 OR H04L65/607 OR H04L67/2823 OR H04L67/288 OR H04L9/14 OR H04W12/08 OR H04W52/265 OR H04W4/008 OR H04W84/10 OR H04W84/12 OR H04W12/00 OR H04W12/06 OR H04W88/16 OR H04W92/02 OR H04W88/04 OR H04W88/06 OR H04W88/08 OR H04W24/02 OR H04W84/18 OR H04W8/26 OR H04W12/04 OR H04W16/14 OR H04W4/18 OR H04W76/02 OR H04W76/04 OR H04W88/10 OR H04W12/12 OR H04W16/10 OR H04W24/00 OR H04W24/08 OR H04W28/0236 OR H04W28/0263 OR H04W28/048 OR H04W28/10 OR H04W36/0055 OR H04W36/22 OR H04W48/18 OR H04W4/00 OR H04W4/02 OR H04W4/06 OR H04W4/12 OR H04W60/00 OR H04W72/04 OR H04W72/0426 OR H04W74/00 OR H04W76/022 OR H04W76/023 OR H04W84/005 OR H04W8/02 OR H04W8/18).CPC.)				
L24	5958	370/315.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 08:25
L25	671	H04B3/40	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 08:25
L26	437	25 AND ((H04B3/40 OR H04B3/466 OR H04B3/487 OR H04B2203/5425 OR H04B3/54 OR H04B2203/5495 OR H04B3/144 OR H04B17/3912 OR H04B1/581 OR H04B2203/5491 OR H04B3/23 OR H04B3/32 OR H04B3/44 OR H04B3/46).CPC.)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 08:26
L45	6008	370/466.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2017/02/06 08:28

			IBM_TDB			
L46	29105	370/328.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/02/06 08:28
S1	0	14/540773.app.	USPAT	OR	OFF	2016/09/28 12:55
S2	1	14/540773.app.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 12:57
S3	3	(ultrawideband adj transceiver) with repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:02
S4	4	(ultrawideband adj transceiver) and repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:02
S5	22	(ultra adj wideband adj transceiver) and repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:03
S6	42	(ultra adj wideband) with repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:03
S7	3	"8932754".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:05
S8	3	"8331854".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:05
S9	3	"7983613".pn.	US-PGPUB;	OR	OFF	2016/09/28

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			13:05
S10	3	"7676194".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:06
S11	50	("20020072357" "20020111137" "20020142767" "20020188530" "20020197990" "20020198977" "20030096578" "20030124976" "20050208889" "20060063484" "20060071776" "20060106961" "20080065416" "5634196" "5818821" "5898382" "5974236" "6110221" "6272640" "6373833" "6466766" "6505032" "6590545" "6718160" "6741834").PN. OR ("7676194").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:08
S12	112	("20020072357" "20020093928" "20020111137" "20020142767" "20020188530" "20020197990" "20020198977" "20030053521" "20030063597" "20030096578" "20030110157" "20030124976" "20030162504" "20030162528" "20030211828" "20030220075" "20040010605" "20040017306" "20040142680" "20040146092" "20040157550" "20040166802" "20040178928" "20040178942" "20040190594" "20040198260" "20040212537" "20040259494" "20050018640" "20050026563" "20050026661" "20050197121" "20050208889" "20060063484" "20060071776" "20060106961" "20060251148" "20060285577" "20080065416" "20080107162" "20080136644" "20120033714" "4298179" "4626845" "4659878" "4932049" "5012211" "5086506" "5592491" "5633876" "5634196" "5818821" "5844905" "5898382" "5974236" "6110221" "6186908" "6272640" "6348986" "6373833" "6466766" "6505032" "6590545" "6671351" "6718160" "6741834" "6754882" "6804739" "6806821" "6934511" "6952456" "7009573" "7289813" "7676194" "7787513" "7945215" "7958041" "7983613" "8041627" "8073458" "8077735" "8103798" "8139496" "8160599" "8175191" "8175612" "8233928" "8234208" "8249966" "8279823" "8290848" "8331854" "8380194"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:18

		"8406188" "8457644" "8483319" "8504087" "8509706" "8521636" "8526944" "8532686" "8559891" "8576817" "8577300" "8583157" "8644868" "8700077" "8755830" "8792901" "8804680" "8824970" "8831625").PN.				
S13	17	"20030096578"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:19
S14	1	"6505032".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:21
S15	170	("4641317" "4743906" "4813057" "4979186" "5345471" "5351053" "5363108" "5523760" "5533046" "5583892" "5589838" "5677927" "5687169" "5832035" "5901172" "6003092" "6026125" "6054950").PN. OR ("6505032").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:21
S16	193	("3150372" "5317323" "5506587" "5510800" "5661490" "5661492" "5748147").PN. OR ("6054950").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:24
S17	152	("3728632" "4641317" "4743906" "4813057" "4815106" "4864589" "4979186" "5051720" "5363108" "5491463" "5554968" "5677927" "5687169" "5729607" "5745837" "5774526" "5832035" "5864284" "5937342" "5940387" "5960031" "5963581" "5982276" "5995534" "6031862" "6040759" "6178217" "6281784" "6373377" "6430208" "6437832" "6497656" "6505032" "6549567" "6611223").PN. OR ("6782048").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:27
S18	88	("4642424" "5523760" "5687169" "5752976" "5842118" "5944659" "6300903").PN. OR ("6497656").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:31
S19	89	("4641317" "4813057" "4979186" "5237320" "5363108" "5572528" "5677927" "5687169" "5832035" "6009088" "6069883" "6202060" "6477156" "6487657" "6497656" "6522875" "6529484" "6629151" "6707424").PN. OR ("7027425").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:37
S20	11	("20030161279" "20040054905" "20050147071" "20050185669" "20050243787" "20070081505" "20090285189" "6497656" "7046716").PN. OR ("7907580").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:46
S21	42	("20020114035" "20020159502").PN. OR ("7046716").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:48
S22	92	("20020172147" "20030072382" "20050097427" "6744832" "6985434" "7031371" "7046716" "7095709").PN. OR ("7263133").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:50
S23	396	("20010000456" "20010016013" "20010020912" "20020001337"	US-PGPUB; USPAT;	OR	OFF	2016/09/28 13:54

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"20040204202"	"20040208243"		
"20040214541"	"20040233930"		
"20040249925"	"20040253955"		
"20040264583"	"20050018790"		
"20050026606"	"20050055595"		
"20050068918"	"20050090266"		
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"6788946"	"6807564"	"6823181"
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"6879842"	"6882313"	"6889135"
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"6928101"	"6954446"	"6961441"
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S24	11551	((ultra adj wide adj band) ultrawideband "ultra wideband" "wide band") and ("data rates" "burt rate" "high speed") and (mesh WIMAX "last mile MIMO" WLAN PAN WiFi) and wired	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 14:35
S25	3018	S24 and (repeater relay)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 14:36
S26	1750	S25 and bandwidth	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 14:37
S27	969	S25 and bandwidth and Fiber	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 14:38
S28	260	((ultra adj wide adj band) ultrawideband "ultra wideband" "wide band") with ("data rates" "burt rate" "high speed") with (mesh WIMAX "last mile MIMO" WLAN PAN WiFi) with (wired fiber)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2016/09/28 14:44

			IBM_TDB			
S29	46	("20020064221" "20030007214" "20030099015" "20030138061" "20030180049" "20030228005" "20030235236" "20040005016" "20040008617" "20040047313" "20040081402" "20040143428" "20040187156" "20040264974" "20050213974" "20050244158" "5332927" "5610907" "5621841" "5745627" "5754555" "5761351" "5773817" "5812081" "5917624" "5929538" "6147786" "6151144" "6160802" "6492904" "6493335" "6505032" "6512488" "6535331" "6549587" "6643417" "6721797" "6735238" "6757251" "6782048" "7103907").PN. OR ("7962042").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 14:53
S30	37	("20010036163" "20020186436" "20020191565" "20030016418" "20030157943" "20040057393" "20040198453" "20040219897" "20050003769" "20050078699" "20050147067" "20050172198" "20050226625" "20050243785" "20050270221" "20050282536" "20060165155" "20090046593" "5682256" "5809422" "5949564" "6154443" "6525855" "6781981" "6782048" "6788666" "6826163" "6826164" "6831901" "6963552" "7099308" "7236509" "7349478" "7359426" "7634250").PN. OR ("8050291").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 15:08
S31	2	("20020012336" "6032057").PN. OR ("9002261").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 16:13
S32	7	("2003/0235236").URPN.	USPAT	OR	OFF	2016/09/28 17:29
S33	46	("20020064221" "20030007214" "20030099015" "20030138061" "20030180049" "20030228005" "20030235236" "20040005016" "20040008617" "20040047313" "20040081402" "20040143428" "20040187156" "20040264974" "20050213974" "20050244158" "5332927" "5610907" "5621841" "5745627" "5754555" "5761351" "5773817" "5812081" "5917624" "5929538" "6147786" "6151144" "6160802" "6492904" "6493335" "6505032" "6512488" "6535331" "6549587" "6643417" "6721797" "6735238" "6757251" "6782048" "7103907").PN. OR ("7962042").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 17:30
S34	14	connecting with (wireless mobile RF radio cellular) with (wired) with ((ultra adj wide adj band) ultrawideband "ultra wideband" "wide band")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2016/09/28 18:42

			IBM_TDB			
S35	6	("20030081630" "20030212821" "20070189217" "20080224869" "20080232299").PN. OR ("7859989").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 18:43
S36	42	(ultra adj wideband) with repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 18:46
S37	6	("20060040615" "20070155314" "20080002652" "4901307" "8244175" "8489019").PN. OR ("9014622").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 18:46
S38	170	("4641317" "4743906" "4813057" "4979186" "5345471" "5351053" "5363108" "5523760" "5533046" "5583892" "5589838" "5677927" "5687169" "5832035" "5901172" "6003092" "6026125" "6054950").PN. OR ("6505032").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 18:51
S39	145	("3680121" "3687556" "3714573" "3789410" "3886553" "3953856" "4114155" "4161730" "4543580" "4916455" "5216429" "5317323").PN. OR ("5589838").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 18:53
S40	26	("20030119453" "20040032363" "20040070534" "20050282558" "3040315" "3150372" "3760414" "4016553" "4740792" "4797679" "5126746" "5285209" "5589838" "6002708" "6054950" "6133876" "6388618" "6700535" "6901264" "7050817").PN. OR ("7304609").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 18:55
S41	193	("3150372" "5317323" "5506587" "5510800" "5661490" "5661492" "5748147").PN. OR ("6054950").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 18:56
S42	209	("2671896" "2999128" "3587107" "3612899" "3659203" "3662316" "3668639" "3678204" "3705981" "3728632" "3739392" "3772697" "3794996" "3806795" "3878749" "3934252" "3995212" "4017854" "4072942" "4099118" "4152701" "4254418" "4344705" "4473906" "4506267" "4641317" "4651152" "4688041" "4695752" "4698633" "4743906" "4751515" "4813057" "4862174" "4907001" "4979186" "5057846" "5090024" "5095312" "5134408" "5146616" "5148174" "5153595" "5159343" "5177486" "5216429" "5216695" "5223838" "5227621" "5237586" "5239309" "5248975" "5274271" "5307079" "5307081" "5313056" "5319218" "5323169" "5332938" "5337054" "5345471" "5351053" "5352974" "5353301" "5359624" "5361070"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 19:01

		"5363108" "5365240" "5377225" "5381151" "5389939" "5422607" "5426618" "5455593" "5457394" "5465094" "5471162" "5479120" "5486833" "5493691" "5495499" "5510800" "5512834" "5517198" "5519342" "5519400" "5521600" "5523758" "5523760" "5525907" "5526299" "5533046" "5543799" "5563605" "5568522" "5573012" "5576627" "5581256" "5583892" "5586145" "5589838" "5592177" "5594456" "5596601" "5602964" "5609059" "5610611" "5610907" "5623511" "5627856" "5630216" "5633889" "5640419" "5648787" "5654978" "5659572" "5661385" "5661490" "5673050" "5673286" "5677927" "5682164" "5687169" "5748891" "5804921").PN. OR ("5832035" "5901172" "5956624" "5960031" "5963581" "5995534" "6003092" "6026125" "6031862" "6133876").PN. OR ("6700939").URPN.				
S43	65	("20010033610" "20020075972" "20020076193" "3668639" "3678204" "3728632" "4641317" "4979186" "5146616" "5363108" "5677927" "5687169" "5748891" "5920278" "6002708" "6026125" "6031862" "6178217" "6275544" "6281784" "6505032" "6526264" "6539213" "6754195" "6760300" "6853835" "6873611" "6898198" "7079827").PN. OR ("7339883").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 19:16
S44	28	("20030185233" "6522881" "6659947" "6661360" "6678535").PN. OR ("6873611").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 20:32
S45	21	("20030139180" "6230005" "6243581" "6466556" "6659947" "6708031" "6744753" "6850503" "6873611" "6876642").PN. OR ("7006481").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 20:35
S46	172	("20010055353" "20020018458" "20020131370" "20030054764" "3668639" "3678204" "3728632" "3875524" "4201892" "4232339" "4506267" "4574378" "4586177" "4587494" "4641317" "4644534" "4651152" "4672608" "4743906" "4763325" "4813057" "4887266" "4979186" "5134408" "5146616" "5148174" "5153595" "5159343" "5253202" "5274271" "5307079" "5307081" "5319218" "5334975" "5355374" "5363108" "5365240" "5473668" "5493691" "5519400" "5523758" "5537414" "5546022" "5586145" "5592177" "5594738" "5610907" "5627829" "5644576" "5675388" "5677927" "5687169" "5687200" "5715236" "5742592" "5748891" "5761197" "5790551"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 20:41

		"5812671" "5815537" "5832035" "5850422" "5886652" "5889767" "5901172" "5903605" "5909469" "5909491" "5920278" "5926501" "5940435" "5940452" "5952956" "5953344" "5960000" "5970062" "5977822" "6002708" "6014374" "6026125" "6031862" "6041051" "6055411" "6064697" "6067648" "6069887" "6091717" "6094464" "6097707" "6097766" "6115390" "6122291" "6133875" "6133876" "6161138" "6172965" "6177903" "6178217" "6181687" "6212230" "6226277" "6232910" "6236662" "6239741" "6243372" "6243583" "6246377" "6246702" "6275500" "6275544" "6278713" "6285662" "6285873" "6292153" "6300903" "6310865" "6324397" "6347084" "6351468" "6351652" "6385461" "6400308" "6424645").PN. OR ("6437832" "6449265" "6463042" "6477171" "6480505" "6492904" "6497656" "6505032" "6510150" "6519460" "6539213" "6549567" "6574266" "6597683" "6603818" "6621857" "6625229" "6628642" "6633558" "6668008" "6697382" "6704311" "6735238" "6735734" "6747959").PN. OR ("7088795").URPN.				
S47	22	(ultrawideband) with repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 21:48
S48	19	S47 and (provisioning monitoring)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 21:49
S49	34436	(ultra adj wideband)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 21:50
S50	7808	S49 and (provisioning monitoring)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 21:50
S51	3652	S49 and (provisioning monitoring) and (relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR;	OR	OFF	2016/09/28 21:51

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S52	86911	(provisioning monitoring) same (relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 21:51
S53	25	(ultra adj wideband) same (provisioning monitoring) same (relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 21:51
S54	0	S52 and (controller processor) and (newtork adj (provisioning monitoring))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 22:03
S55	3684	S52 and (controller processor) and (network adj (provisioning monitoring))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 22:03
S56	80	(ultra adj wideband) and S55	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 22:03
S57	80	S49 and S55	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 22:14
S58	2	"6497656".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 10:38
S59	88	("4642424" "5523760" "5687169" "5752976" "5842118" "5944659" "6300903").PN. OR ("6497656").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 10:40
S60	178	("20010054953" "20020024423" "20020076193" "20020116720" "20030031191" "20030202537" "20050131922" "3728632" "4641317" "4743906" "4813057"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 10:44

		"4815106" "4864589" "4979186" "5051720" "5278862" "5363108" "5485040" "5491463" "5523760" "5554968" "5677927" "5687169" "5729607" "5744526" "5745837" "5774526" "5822678" "5828946" "5832035" "5835054" "5864284" "5896556" "5937342" "5940387" "5944842" "5960031" "5963581" "5982276" "5995534" "6031862" "6040759" "6140911" "6178217" "6218979" "6275045" "6281784" "6373377" "6430208" "6437832" "6492897" "6492904" "6496104" "6497656" "6505032" "6529166" "6539068" "6549567" "6586999" "6611223" "6690247" "6721298").PN. OR ("7027483").URPN.				
S61	0	("100" adj more adj bandwidth) with (transmission adj rate)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 10:50
S62	0	("100" adj more adj bandwidth) with (transmission adj rate)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 10:51
S63	70	(MHz adj bandwidth) with (transmission adj rate)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 10:51
S64	34	(relay gateway repeater extender booster) and S63	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 10:52
S65	4	"7027425".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 11:28
S66	4	"7027483".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 11:30
S67	178	("20010054953" "20020024423" "20020076193" "20020116720"	US-PGPUB; USPAT;	OR	OFF	2016/10/16 11:33

		"20030031191" "20030202537" "20050131922" "3728632" "4641317" "4743906" "4813057" "4815106" "4864589" "4979186" "5051720" "5278862" "5363108" "5485040" "5491463" "5523760" "5554968" "5677927" "5687169" "5729607" "5744526" "5745837" "5774526" "5822678" "5828946" "5832035" "5835054" "5864284" "5896556" "5937342" "5940387" "5944842" "5960031" "5963581" "5982276" "5995534" "6031862" "6040759" "6140911" "6178217" "6218979" "6275045" "6281784" "6373377" "6430208" "6437832" "6492897" "6492904" "6496104" "6497656" "6505032" "6529166" "6539068" "6549567" "6586999" "6611223" "6690247" "6721298").PN. OR ("7027483").URPN.	USOCR			
S68	90	("20010011930" "20010054953" "20020024423" "20020075972" "20020076193" "20020097821" "20020191690" "20030031191" "20030129978" "20030202537" "20030228005" "20040125859" "20040136438" "20040142663" "20040174924" "20040198260" "20040233972" "20040233973" "20050047379" "20050069052" "20050131922" "3728632" "4641317" "4743906" "4815106" "4864589" "4979186" "5051720" "5278862" "5363108" "5485040" "5491463" "5523760" "5554968" "5677927" "5687169" "5729607" "5745837" "5774526" "5822678" "5828946" "5832035" "5835054" "5864284" "5896556" "5937342" "5940387" "5944842" "5960031" "5963581" "5982276" "5995534" "6031862" "6040759" "6140911" "6178217" "6218979" "6275045" "6281784" "6360075" "6373377" "6384773" "6430208" "6437832" "6441695" "6492897" "6492904" "6496104" "6497656" "6512474" "6515622" "6529166" "6539068" "6549567" "6571089" "6586999" "6611223" "6637033" "6678321" "6690247" "6721298" "6782048" "6847267" "6865256" "6909877" "6968130" "7013145" "7092693" "7167525").PN. OR ("7486742").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 11:42
S69	11	("20030161279" "20040054905" "20050147071" "20050185669" "20050243787" "20070081505" "20090285189" "6497656" "7046716").PN. OR ("7907580").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 11:45
S70	112	("20020072357" "20020093928" "20020111137" "20020142767" "20020188530" "20020197990"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 11:50

		"20020198977" "20030053521" "20030063597" "20030096578" "20030110157" "20030124976" "20030162504" "20030162528" "20030211828" "20030220075" "20040010605" "20040017306" "20040142680" "20040146092" "20040157550" "20040166802" "20040178928" "20040178942" "20040190594" "20040198260" "20040212537" "20040259494" "20050018640" "20050026563" "20050026661" "20050197121" "20050208889" "20060063484" "20060071776" "20060106961" "20060251148" "20060285577" "20080065416" "20080107162" "20080136644" "20120033714" "4298179" "4626845" "4659878" "4932049" "5012211" "5086506" "5592491" "5633876" "5634196" "5818821" "5844905" "5898382" "5974236" "6110221" "6186908" "6272640" "6348986" "6373833" "6466766" "6505032" "6590545" "6671351" "6718160" "6741834" "6754882" "6804739" "6806821" "6934511" "6952456" "7009573" "7289813" "7676194" "7787513" "7945215" "7958041" "7983613" "8041627" "8073458" "8077735" "8103798" "8139496" "8160599" "8175191" "8175612" "8233928" "8234208" "8249966" "8279823" "8290848" "8331854" "8380194" "8406188" "8457644" "8483319" "8504087" "8509706" "8521636" "8526944" "8532686" "8559891" "8576817" "8577300" "8583157" "8644868" "8700077" "8755830" "8792901" "8804680" "8824970" "8831625").PN.				
S71	170	("4641317" "4743906" "4813057" "4979186" "5345471" "5351053" "5363108" "5523760" "5533046" "5583892" "5589838" "5677927" "5687169" "5832035" "5901172" "6003092" "6026125" "6054950").PN. OR ("6505032").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 11:53
S72	193	("3150372" "5317323" "5506587" "5510800" "5661490" "5661492" "5748147").PN. OR ("6054950").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 11:55
S73	39	("5677927" "5768306" "6128331" "6154483" "6351246" "6493360" "6505032" "6603818" "6650693" "6700939" "6735238").PN. OR ("7079604").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 12:55
S74	23	("20020191568" "20030227961" "20030232612" "20040097204" "20040141559" "20070183535" "5648983" "6215814" "6266365" "6442193" "6456647" "6570918" "6853689" "6856646" "7079604"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 13:01

		"7116998" "7248622").PN. OR ("7356100").URPN.				
S75	0	((ultra adj broadband) adj (repeater relay))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 13:03
S76	0	((ultrabroadband) adj (repeater relay))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 13:03
S77	91	((broadband) adj (repeater relay))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 13:03
S78	990	((broadband) adj (relay gateway repeater extender booster))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 13:15
S79	1	2003-766291.NRAN.	DERWENT	OR	OFF	2016/10/16 13:18
S80	1027	((broadband) adj (bridge relay gateway repeater extender booster))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 13:26
S81	7	("20030083013" "6497656" "6771933" "7046691" "7058414").PN. OR ("7436850").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 13:26
S82	11	("20030161279" "20040054905" "20050147071" "20050185669" "20050243787" "20070081505" "20090285189" "6497656" "7046716").PN. OR ("7907580").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 13:28
S83	87235	(controller processor) with (ignore filter) with (signal data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:29
S84	33512	S83 and (provision\$3 monitoring\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2016/10/16 15:29

			IBM_TDB			
S85	3972	S84 and (ignore disregard) and (signal data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:30
S86	1416	S85 and (bridge relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:31
S87	1	2013-F51199.NRAN.	DERWENT	OR	OFF	2016/10/16 15:33
S88	3	"8923754".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:34
S89	3	"8331854".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:37
S90	6	"5012211".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:40
S91	547	transceiver with (unwanted undesired) with (signal data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:43
S92	114	S91 and (bridge relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:44
S93	35	("20020039383" "20070041434" "4317217" "4383331" "4453039" "4701935" "4905290" "5091952" "5168459" "5259033" "5323459" "5450456" "5559833" "5680467" "5748751" "5835848" "6269165" "6385435" "6999594" "7035321" "7043203" "7346311" "7398053").FN. OR ("7627287").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 15:52

S94	81	("4383331" "4475243" "4952193").PN. OR ("5835848").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 15:55
S95	110	("3728733" "3731315" "4032922" "4041389" "4099036" "4189675" "4198600" "4246585" "4317217" "4318104" "4338605" "4352202" "4407001" "4446463" "4701935" "4727590" "4777652" "4789993" "4843402" "4849763" "4849963" "4879711" "4973971" "4980665" "4994813" "5019793" "5054120" "5086302" "5089823" "5115514" "5128687" "5241410" "5321412" "5349694" "5351060" "5392054" "5444864" "5463401" "5485170" "5486835" "5512906" "5587715" "5589843" "5600333" "5633647" "5663736" "5754138" "5754139" "5758287" "5767807" "5805113" "5832365" "5835848" "5856804" "5937332" "5943618" "5963847" "6029048" "6043790" "6049315" "6078787" "6125109" "6128471" "6128557" "6198460" "6256484" "6285878" "6348986").PN. OR ("6731904").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 15:58
S96	74	("2635233" "2786133" "4661993" "5023930" "5559806").PN. OR ("5832365").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 16:02
S97	262	("4198600" "4367458" "4509199" "4539706" "4713809" "4750036" "4794649" "4835604" "4930118" "5038342" "5040175" "5181200" "5276703" "5321542" "5325419" "5349463" "5388102" "5400327" "5440613" "5452291" "5463623" "5473602" "5509028" "5515378" "5553126" "5555258" "5563889" "5564121" "5579308" "5592470" "5598412" "5608449" "5613191" "5630204" "5636211" "5638371" "5642151" "5642353" "5678177" "5684801" "5697063" "5708961" "5722041" "5726984" "5734643" "5742608" "5742640" "5745483" "5757792" "5771275" "5781856" "5784683" "5794116" "5796715" "5796727" "5805582" "5812541" "5812930" "5812933" "5815795" "5818512" "5818830" "5828658" "5832365" "5838226" "5845211" "5848054" "5850209" "5872784" "5873031" "5874903" "5875209" "5880721" "5880732" "5883884" "5886732" "5886989" "5892796" "5903293" "5903322" "5905719" "5907545" "5907794" "5915206" "5924022" "5930240" "5936949" "5936965" "5940387" "5940763" "5943046" "5943342" "5949790" "6038267" "6041065" "6097707" "6125109" "6377612").PN. OR	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 16:07

		("6690657").URPN.				
S98	142	("20020028655" "20020038459" "20020046285" "20020059614" "20020061743" "20020068592" "20020071658" "20020072329" "20020106119" "20020115409" "20020152303" "20020154055" "20020181189" "20020188955" "20030054827" "20030079016" "20030124977" "20030139150" "20030181162" "20030181229" "20030199247" "20030207684" "20030216144" "20030231774" "20030234804" "20040034865" "20040094194" "20040110469" "20040121648" "20040125820" "20040203694" "20040204102" "20050286448" "20060098592" "20060183421" "4539706" "5058199" "5129096" "5222246" "5408679" "5509028" "5574979" "5608412" "5640386" "5654747" "5732076" "5742680" "5815146" "5870665" "5890055" "5915020" "5959592" "6009060" "6092117" "6132306" "6148142" "6160993" "6166703" "6188571" "6205185" "6263503" "6323909" "6334045" "6347216" "6397038" "6404775" "6412112" "6424817" "6430233" "6473858" "6584080" "6597891" "6600730" "6614768" "6650869" "6671186" "6684058" "6690657" "6690926" "6728541" "6741841" "6745050" "6757913" "6788882" "6811113" "6832071" "6836658" "6842617" "6845090" "6847625" "6850285" "6853197" "6856786" "6886029" "6925285" "6968153" "7072627" "7215660" "7289478" "7366178").PN. OR ("7567527").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 16:10
S99	1	"20060063484"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 18:23
S100	35	("20020039383" "20070041434" "4317217" "4383331" "4453039" "4701935" "4905290" "5091952" "5168459" "5259033" "5323459" "5450456" "5559833" "5680467" "5748751" "5835848" "6269165" "6385435" "6999594" "7035321" "7043203" "7346311" "7398053").PN. OR ("7627287").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 18:27
S101	19	("4041389" "4704733" "4727590" "5179720" "6088592" "6731904").PN. OR ("6868254").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 18:45
S102	2493	(MIMO "adaptive antenna") with (bridge relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2016/10/16 20:51

			IBM_TDB			
S103	2415	(MIMO "adaptive antenna technology") with (bridge relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 20:51
S104	10	S103 and (self adj configurable)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 20:52
S105	8	("20080008126" "20080153431" "20090213765" "20090285147" "20110143658" "5880695" "7957702" "8331271").PN. OR ("8787214").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 20:52
S106	77	S103 and (autonomous)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 20:53
S107	3	"20050197121"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 20:59
S108	32	("20010049282" "20020147023" "5559865" "5577264" "5724660" "5815810" "5828958" "5835845" "5898922" "5926765" "5970408" "6097942" "6160804" "6272344" "6330446" "6424818" "6466785" "6466788" "6556831" "6646999" "6658250" "6707421" "6813501").PN. OR ("7072654").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 21:00
S109	1	"5634196".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 21:39
S110	1	"7962042".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 21:39
S111	359850	(Locat\$3 position) with (bridge relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 21:52
S112	18279	(Locat\$3 position) with (bridge relay gateway repeater extender booster) with (nodes devices)	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2016/10/16 21:53

			EPO; JPO; DERWENT; IBM_TDB			
S113	2710	(Locat\$3 position) with (bridge relay gateway repeater extender booster) with (proximity)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 21:53
S114	201	(Locat\$3 position) with (bridge relay gateway repeater extender booster) with (proximity) with (nodes devices)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 21:54
S115	480	((node device user) adj (ID idenyifier)) with (bridge relay gateway repeater extender booster) with (wireless cellular RF radio mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 22:11
S116	1258	((node device user) adj (ID identifier)) with (bridge relay gateway repeater extender booster) with (wireless cellular RF radio mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 22:12
S117	2161	(MIMO "adaptive antenna technology") with (relay repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 22:37
S118	9	("20020085643" "20050054318" "20050130587" "20060035605" "20070010196" "20080279135" "20090209212" "6466766").PN. OR ("8032080").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 22:44
S119	298	("20010028638" "20010031646" "20010040699" "20010050580" "20010050906" "20010054060" "20020004924" "20020018479" "20020018487" "20020034958" "20020045461" "20020061031" "20020072853" "20020089945" "20020101843" "20020102948" "20020109585" "20020115409" "20020119783" "20020136268" "20020141435" "20020146026" "20020155838" "20020159506" "20020163902" "20020177401" "20030008669" "20030026363" "20030063583" "20030124976" "20030139175" "20030148736" "20030179734" "20030185163" "20030211828" "20030235170" "20030236069" "20040001464"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 22:47

"20040029537"	"20040038707"	
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"20040056802"	"20040110469"	
"20040121648"	"20040131025"	
"20040146013"	"20040157551"	
"20040166802"	"20040176050"	
"20040198295"	"20040208258"	
"20040218683"	"20040229563"	
"20040235417"	"20040240426"	
"20040248581"	"20040264511"	
"20050014464"	"20050030891"	
"20050042999"	"20050130587"	
"20050190822"	"20050201315"	
"20050254442"	"20050256963"	
"20050286448"	"20060028388"	
"20060035643"	"20060040615"	
"20060041680"	"20060045193"	
"20060052066"	"20060052099"	
"20060056352"	"20060063484"	
"20060063485"	"20060067277"	
"20060072682"	"20060098592"	
"20060183421"	"20060203757"	
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"20070025486"	"20070032192"	
"20070121546"	"20070237181"	
"20070268846"	"20070286110"	
"20080057862"	"20080232438"	
"20080233942")	PN. OR	
("20080267156"	"20090135745"	
"20090190684"	"20090290526"	
"20100002620"	"3363250"	
"4000467"	"4001691"	"4061970"
"4081752"	"4124825"	"4204016"
"4334323"	"4368541"	"4509206"
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"4777653"	"4783843"	"4820568"
"4922259"	"5023930"	"5095528"
"5214788"	"5220562"	"5280480"
"5333175"	"5341364"	"5349463"
"5368897"	"5371734"	"5373503"
"5383144"	"5408197"	"5408618"
"5430726"	"5446770"	"5465251"
"5471642"	"5485486"	"5509028"
"5515376"	"5519619"	"5608755"
"5610916"	"5648984"	"5654979"
"5659879"	"5678177"	"5678198"
"5684801"	"5697052"	"5726980"
"5732334"	"5745846"	"5754540"
"5764636"	"5767788"	"5771174"
"5784683"	"5794145"	"5812933"
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"5857144"	"5862207"	"5875179"
"5883884"	"5884181"	"5890055"
"5903553"	"5907794"	"5963846"
"5963847"	"5987304"	"6005855"
"6005884"	"6014380"	"6032194"
"6061548"	"6088570"	"6101400"
"6108364"	"6128512"	"6128729"
"6141335"	"6163276"	"6188694"
"6188719"	"6195051"	"6202114"
"6215982"	"6219739"	"6222503"
"6272351"	"6285863"	"6298061"
"6304563"	"6304575"	"6331792"
"6339694"	"6342777"	"6363068"

		"6370185" "6370369" "6377612" "6377640" "6384765" "6385181" "6388995" "6393299" "6404775" "6441781" "6473131" "6480481" "6498804" "6501955" "6516438" "6535732" "6539028" "6539204").PN. OR ("6549542" "6549567" "6563468" "6574198" "6628624" "6664932" "6671502" "6684058" "6690657" "6694125" "6718160" "6728541" "6766113" "6781544" "6788256" "6880103" "6888809" "6888881" "6904266" "6906669" "6934511" "6934555" "6944139" "6957042" "6965568" "6983162" "6985516" "6990313" "7027418" "7027770" "7043203" "7050442" "7050452" "7058071" "7058368" "7065036" "7088734" "7103344" "7120930" "7123670" "7123676" "7132988" "7133391" "7133460" "7139527" "7167526" "7187904" "7193975" "7194275" "7200134" "7215964" "7233771" "7248645" "7254132" "7299005" "7315573" "7319714" "7321787" "7339926" "7352696" "7406060" "7409186" "7430397" "7450936" "7457587" "7463200" "7486929" "7577398" "7590145" "7623826" "7676194" "7729669" "8023885" "8027642" "8059727" "8111645" "8559379").PN. OR ("8774079").URPN.				
S120	44	("5943323" "5970410" "6038452" "6075989" "6088592" "6148422" "6404775" "6469984").PN. OR ("6718160").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 23:27
S121	169	("5640386" "5732076" "5878343").PN. OR ("6404775").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 23:36
S122	45	("20020015442" "20020090915" "20020131377" "20030012221" "20030054777" "5396653" "5436890" "5668837" "5796772" "5832389" "6014571" "6091715" "6091963" "6252909" "6262981" "6308048" "6334051" "6363262" "6404775" "6496546" "6574459" "6654428" "6674997" "6694373" "6707963" "6796555" "6816715" "6914950").PN. OR ("7203488").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/17 00:00
S123	6	(self adj configurable) same (relay repeater) same (controller processor)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 00:14
S124	298	("self configurable" autonomous) same (relay repeater) same (controller processor)	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2016/10/17 00:15

			EPO; JPO; DERWENT; IBM_TDB			
S125	3	"20030124976"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 00:39
S126	55	("20020086657" "20020164954" "20020173302" "6584080" "6711412" "6785341" "6888809").PN. OR ("7139527").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/17 00:43
S127	0	(network adj provisioning) same (relay repeater) same (controller processor)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:39
S128	15	(network adj provisioning) same (relay repeater) same (controller processor)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:39
S129	56	(network adj provisioning) same (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:43
S130	1893	provisioning same (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:45
S131	53723	(provisioning monitoring) same (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:46
S132	31109	(provisioning monitoring) with (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:46
S133	1443	S132 and broadband	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	OFF	2016/10/17 08:47

			DERWENT; IBM_TDB			
S134	6952	transceiver with (processor controller) with chip	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 09:34
S135	68	transceiver with (processor controller) with chip with (repeater relay)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 09:34
S136	61	transceiver with (processor controller) with integrated with (repeater relay)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 09:36
S137	466	transceiver same (processor controller) same integrated same (repeater relay)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 09:41
S138	2133	MIMO with (repeater relay)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:01
S139	25	MIMO with (repeater relay) with broadband	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:02
S140	466	S138 and broadband	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:02
S141	940	("self configurable" autonomous) with (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:18
S142	11169	("self configurable" autonomous) with (controller processor)	US-PGPUB; USPAT; USOCR;	OR	OFF	2016/10/17 10:31

			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S143	76	("self configurable" autonomous) with (controller processor)with (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:31
S144	1650	S142 and (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:35
S145	2	"6497656".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:54
S146	1770	H04B1/7163	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 11:46
S147	668	H04B3/40	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 11:47
S148	2710	(Locat\$3 position) with (bridge relay gateway repeater extender booster) with (proximity)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 11:48
S149	0	S148 and S146	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 11:48
S150	0	S148 and S147	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 11:48
S151	276	S148 AND ((H04W4/02 OR	US-PGPUB;	OR	OFF	2016/10/17

		H04W76/023 OR H04W88/04 OR H04W4/008 OR H04W4/021 OR H04W8/005 OR H04W84/18 OR H04W84/12 OR H04W4/08 OR H04W12/06 OR H04W40/22 OR H04W4/023 OR H04W4/025 OR H04W4/12 OR H04W16/26 OR H04W48/14 OR H04W4/001 OR H04W4/005 OR H04W4/043 OR H04W4/046 OR H04W88/06 OR H04W12/04 OR H04W12/10 OR H04W28/021 OR H04W36/0022 OR H04W36/0055 OR H04W36/0061 OR H04W36/0066 OR H04W36/0072 OR H04W36/08 OR H04W36/14 OR H04W36/32 OR H04W36/38 OR H04W40/02 OR H04W48/00 OR H04W48/08 OR H04W48/16 OR H04W4/022 OR H04W4/04 OR H04W4/06 OR H04W4/10 OR H04W4/14 OR H04W4/20 OR H04W52/0216 OR H04W52/265 OR H04W56/001 OR H04W72/00 OR H04W72/02 OR H04W72/10 OR H04W74/006 OR H04W76/005 OR H04W76/02 OR H04W76/021 OR H04W76/022 OR H04W76/043 OR H04W84/042 OR H04W84/20 OR H04W88/02 OR H04W88/085 OR H04W88/10 OR H04W88/16 OR H04W88/182 OR H04W8/02 OR H04W8/10 OR H04W8/14 OR H04W8/18 OR H04W8/186 OR H04W8/22 OR H04W92/18).CPC.)	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			11:48
S152	2	13/676207.app.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 12:23
S153	0	"13157789".app.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 12:23
S154	2	"13/157789".app.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 12:23
S155	2	12/689052.app.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 12:24

S156	2	10/919515.app.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 12:24
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Issue Classification 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.	
	Examiner DEWANDA SAMUEL	Art Unit 2464	

CPC						
Symbol					Type	Version
H04B		7		15542	F	2013-01-01
H04B		1		719	I	2013-01-01
H04W		4		18	A	2013-01-01
H04W		16		14	A	2013-01-01
H04W		24		00	A	2013-01-01
H04W		28		10	A	2013-01-01
H04W		88		04	I	2013-01-01
H04W		28		0236	I	2013-01-01
H04W		28		048	I	2013-01-01
H04W		12		08	I	2013-01-01
H04W		12		12	A	2013-01-01
H04W		12		00	A	2013-01-01
H04B		7		15521	I	2013-01-01
H04B		7		15557	I	2013-01-01
H04W		4		06	I	2013-01-01
H04W		24		08	I	2013-01-01
H04W		84		005	A	2013-01-01
H04W		84		18	A	2013-01-01
H04B		7		1555	I	2013-01-01

CPC Combination Sets							
Symbol				Type	Set	Ranking	Version

/DEWANDA SAMUEL/ Examiner.Art Unit 2464 (Assistant Examiner)	02/06/2017 (Date)	Total Claims Allowed: 63	
/RICKY NGO/ Supervisory Patent Examiner.Art Unit 2464 (Primary Examiner)	02/06/2017 (Date)	O.G. Print Claim(s) 45	O.G. Print Figure 7

Issue Classification 	Application/Control No. 14540773	Applicant(s)/Patent Under Reexamination RAPPAPORT, THEODORE S.
	Examiner DEWANDA SAMUEL	Art Unit 2464

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17		33	5	49	19	65		81	49	97		
	2		18		34		50	20	66	35	82	50	98		
	3		19		35	6	51	21	67	36	83	51	99		
	4		20		36	7	52	22	68	37	84	52	100		
	5		21		37	8	53	23	69	38	85	53	101		
	6		22		38	9	54	24	70		86	54	102		
	7		23		39		55	25	71	39	87	55	103		
	8		24		40	10	56	26	72	40	88	56	104		
	9		25		41	11	57	27	73	41	89	57	105		
	10		26		42	12	58	28	74	42	90	58	106		
	11		27		43	13	59	29	75	43	91	59	107		
	12		28		44	14	60	30	76	44	92	60	108		
	13		29	1	45	15	61	31	77	45	93	61	109		
	14		30	2	46	16	62	32	78	46	94	62	110		
	15		31	3	47	17	63	33	79	47	95	63	111		
	16		32	4	48	18	64	34	80	48	96				

/DEWANDA SAMUEL/ Examiner.Art Unit 2464 (Assistant Examiner)	02/06/2017 (Date)	Total Claims Allowed: 63	
/RICKY NGO/ Supervisory Patent Examiner.Art Unit 2464 (Primary Examiner)	02/06/2017 (Date)	O.G. Print Claim(s) 45	O.G. Print Figure 7

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/540,773	Filing Date 11/13/2014	☐ To be Mailed
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ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO**APPLICATION AS FILED – PART I**

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	01/19/2017	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 65	Minus	** 65	= 0	X \$40 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	X \$210 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
TOTAL ADD'L FEE						0	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$ =
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$ =
	☐ Application Size Fee (37 CFR 1.16(s))					
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
TOTAL ADD'L FEE						

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
DEBRA SAVOY

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of

Theodore Rappaport

Conf. No.: 3686

App. No.: 14/540,773

Group Art Unit: 2464

Filed: November 13, 2014

Examiner: Samuel

For BROADBAND REPEATER WITH SECURITY FOR
ULTRAWIDEBAND TECHNOLOGIES

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT UNDER 37 C.F.R. 1.111

Sir:

In response to the office action mailed October 20, 2016, please amend the above-identified patent application as follows:

Amendments to the Claims: begin on page 2

Remarks: begin on page 17

Amendments to the Claims:

Below is a complete listing of the claims including the status of each:

1-44. (canceled)

45. (currently amended) A broadband wireless repeater or relay, comprising:

at least one receiver or transceiver for signal or data reception from one or more devices;

at least one transmitter or transceiver for signal or data transmission to one or more devices,

wherein the transceiver for signal or data reception and the transceiver for signal or data transmission may be the same or different; and

a controller that is configured or configurable for operation in one or more wireless networks, said controller communicating with said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission,

wherein at least one of said receiver or transceiver for signal or data reception and said transmitter or transceiver for signal or data transmission either or both transmit and receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more,

wherein said broadband wireless repeater or relay is connected or connectable to one or more network backbones for connecting said one or more wireless networks with said one or more network backbones, ~~and~~

wherein said broadband wireless repeater or relay is used to support connectivity and/or position location capabilities for one or more mobile or portable devices, and

wherein said controller is configured or configurable to perform or for performing at least one of:

a) ignore or filter out at least some signal or data transmissions from one or more undesired transmitters, users, networks, data sources, or noise sources; and

b) instruct one or more devices or networks to ignore or disregard at least some signal or data transmissions of one or more undesired transmitters, undesired users, undesired networks, or noise sources.

46. (previously presented) The broadband wireless repeater or relay of claim 45, wherein at least one of said one or more network backbones to which said controller is connected or connectable is a wired backbone.

47. (previously presented) The broadband wireless repeater or relay of claim 46, wherein said wired backbone is selected from a group consisting of T1, T3, DSL, cable, cable modem, fiber, optical cable, copper lines, coax, phone, ethernet, and internet.

48. (previously presented) The broadband wireless repeater or relay of claim 45, wherein at least one of said one or more network backbones to which said controller is connected or connectable is a wireless backbone.

49. (previously presented) The broadband wireless repeater or relay of claim 48, wherein said wireless backbone is selected from a group consisting of last mile wireless service, mesh network, LMDS, MMDS, WiMax, 802.16, 802.20, 802.11a/b/g, 802.15.3.a, RF, and baseband.

50. (canceled)

51. (currently amended) The broadband wireless repeater or relay of claim ~~45~~ 50, wherein said controller is configured to or configurable to perform ~~performs~~ a).

52. (currently amended) The broadband wireless repeater or relay of claim ~~45~~ 50, wherein said controller is configured to or configurable to perform ~~performs~~ b).

53. (currently amended) The broadband wireless repeater or relay of claim ~~45~~ 50, wherein said controller ~~performs~~ is configured to or configurable to perform network provisioning or monitoring e).

54. (currently amended) The broadband wireless repeater or relay of claim 53, wherein the network provisioning or monitoring e) includes one or more of:

- i) bandwidth or delay provisioning of repeated or relayed transmissions,
- ii) application prioritization,
- iii) prioritizing, delaying or altering of data transmissions, traffic, or bandwidth, and
- iv) monitoring or measuring traffic from one or more devices, users or networks.

55. (canceled)

56. (currently amended) The broadband wireless repeater or relay of claim 45, wherein said controller is configured or configurable to perform or for performing all of:

- a) ~~ignore or filter out at least some signal or data transmissions from one or more undesired transmitters, users, networks, data sources, or noise sources;~~
- b) ~~instruct one or more devices or networks to ignore or disregard at least some signal or data transmissions of one or more undesired transmitters, undesired users, undesired networks, or noise sources; and~~
- c) network provisioning or monitoring.

57. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals or data operate in half duplex.

58. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals or data operate in full duplex.

59. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals or data operate in simplex.

60. (currently amended) The broadband wireless repeater or relay of claim 110 45, wherein said repeater or relay is configured such that said ~~when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100~~

~~MHz or more or have a data transmission rate of 100 Megabits per second or more~~ at least one of said one or more devices has a higher data rate than if said repeater or relay was not present in said network.

61. (currently amended) The broadband wireless repeater or relay of claim 110 45, wherein said repeater or relay is configured such that said ~~when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more~~ at least one of said one or more devices has a greater coverage distance than if said repeater or relay was not present in said network.

62. (currently amended) The broadband wireless repeater or relay of claim 110 45, wherein said repeater or relay is configured such that said ~~when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more~~ at least one of said one or more devices has ~~have~~ higher quality of transmission or reception than if said repeater or relay was not present in said network.

63. (currently amended) The broadband wireless repeater or relay of claim 110 45, wherein said repeater or relay is configured such that said ~~when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more~~ at least one of said one or more devices has less interference than if said repeater or relay was not present in said network.

64. (currently amended) The broadband wireless repeater or relay of claim 110 45, wherein said repeater or relay is configured such that said ~~when in one or more wireless networks which includes one or more devices which can transmit at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more~~ at least one of said one or more wireless networks has an improved ability to control its capacity than if said repeater or relay was not present in said one or more wireless networks.

65. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said signals or data received by said receiver or transceiver for receiving signals or data, or signals or data transmitted by said transmitter or transceiver for transmitting signals or data, or signals or data controlled by said controller include modified, stored, or delayed signals or data.

66. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said controller is configured to cause said at least one transmitter or transceiver for transmitting signals or data to transmit modified received data or transmissions to one or more devices at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more.

67. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said controller is configured to identify one or more devices in said one or more wireless networks.

68. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said repeater or relay employs MIMO or adaptive antenna technology.

69. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said controller is self-configurable.

70. (previously presented) The broadband wireless repeater or relay of claim 45, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks in a moving platform environment.

71. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said broadband wireless repeater or relay is configured to be integrated with or in communication with a vehicle, train, aircraft, or other moving platform.

72. (previously presented) The broadband wireless repeater or relay of claim 45, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks in an indoor environment.

73. (previously presented) The broadband wireless repeater or relay of claim 45, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks in an outdoor environment.

74. (previously presented) The broadband wireless repeater or relay of claim 45, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks selected from the group consisting of: a cellular network, an enterprise network, a wireless local area network, or a wireless personal area network.

75. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said repeater or relay is configured to be integrated with or in communication with a device selected from the group consisting of a television, a telephone, a cellphone, a computer, a camera, a video system, a monitor, a power plug, a wall outlet, a watch, a cable modem, a vehicle or other moving platform, a game console, and an ultrawideband transceiver or device.

76. (previously presented) The broadband wireless repeater or relay of claim 45, wherein one or more of said receiver or transceiver for signal or data reception, said transmitter or transceiver for signal or data transmission, and said controller is embedded in one or more integrated circuit chips.

77. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said broadband wireless repeater or relay is configured or configurable for monitoring or measuring traffic passed through, received by or transmitted by said broadband wireless repeater or relay.

78. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said broadband wireless repeater or relay is configured or configurable to modify at least some received signals or data from one or more devices, users or networks and transmit modified or delayed signals or data to at least one device, network or user via wireless communication.

79. (previously presented) The broadband wireless repeater or relay of claim 45, wherein said controller and one or more of said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission are integrated.

80. (currently amended) A broadband wireless repeater or relay, comprising:

at least one receiver or transceiver for signal or data reception from one or more devices;
at least one transmitter or transceiver for signal or data transmission to one or more

devices,

wherein the transceiver for signal or data reception and the transceiver for signal or data transmission may be the same or different; and

a controller that is configured or configurable for operation in one or more wireless networks, said controller communicating with said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission,

wherein at least one of said receiver or transceiver for signal or data reception and said transmitter or transceiver for signal or data transmission either or both transmit and receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more,

wherein said repeater or relay employs MIMO or adaptive antenna technology, ~~and~~

wherein said broadband wireless repeater or relay is used to support connectivity and/or position location capabilities for one or more mobile or portable devices, and

wherein said controller is configured or configurable to perform or for performing at least one of:

- a) ignore or filter out at least some signal or data transmissions from one or more undesired transmitters, users, networks, data sources, or noise sources; and

b) instruct one or more devices or networks to ignore or disregard at least some signal or data transmissions of one or more undesired transmitters, undesired users, undesired networks, or noise sources.

81. (canceled)

82. (currently amended) The broadband wireless repeater or relay of claim 80 ~~81~~, wherein said controller is configured or configurable to perform ~~performs~~ a).

83. (currently amended) The broadband wireless repeater or relay of claim 80 ~~81~~, wherein said controller is configured or configurable to perform ~~performs~~ b).

84. (currently amended) The broadband wireless repeater or relay of claim 80 ~~81~~, wherein said controller is configured or configurable to perform network provisioning or monitoring ~~performs~~ e).

85. (currently amended) The broadband wireless repeater or relay of claim 84, wherein the network provisioning or monitoring e) includes one or more of:

- i) bandwidth or delay provisioning of repeated or relayed transmissions,
- ii) application prioritization,
- iii) prioritizing, delaying or altering of data transmissions, traffic, or bandwidth, and
- iv) monitoring or measuring traffic from one or more devices, users or networks.

86. (canceled)

87. (currently amended) The broadband wireless repeater or relay of claim 80, wherein said controller is configured or configurable to perform or for performing all of:

- a) ~~ignore or filter out at least some signal or data transmissions from one or more undesired transmitters, users, networks, data sources, or noise sources;~~

- b) ~~instruct one or more devices or networks to ignore or disregard at least some signal or data transmissions of one or more undesired transmitters, undesired users, undesired networks, or noise sources; and~~
- c) network provisioning or monitoring.

88. (previously presented) The broadband wireless repeater or relay of claim 80, wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals or data operate in half duplex.

89. (previously presented) The broadband wireless repeater or relay of claim 80, wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals or data operate in full duplex.

90. (previously presented) The broadband wireless repeater or relay of claim 80, wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals or data operate in simplex.

91. (currently amended) The broadband wireless repeater or relay of claim 111 80, wherein said repeater or relay is configured such that said ~~when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more~~ at least one of said one or more devices has a higher data rate than if said repeater or relay was not present in said network.

92. (currently amended) The broadband wireless repeater or relay of claim 111 80, wherein said repeater or relay is configured such that said ~~when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more~~ at least one of said one or more devices has a greater coverage distance than if said repeater or relay was not present in said network.

93. (currently amended) The broadband wireless repeater or relay of claim 111 ~~80~~, wherein said repeater or relay is configured such that said ~~when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more~~ at least one of said one or more devices have higher quality of transmission or reception than if said repeater or relay was not present in said network.

94. (currently amended) The broadband wireless repeater or relay of claim 111 ~~80~~, wherein said repeater or relay is configured such that said ~~when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more~~ at least one of said one or more devices has less interference than if said repeater or relay was not present in said network.

95. (currently amended) The broadband wireless repeater or relay of claim 111 ~~80~~, wherein said repeater or relay is configured such that said ~~when in one or more wireless networks which includes one or more devices which can transmit at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more~~ at least one of said one or more wireless networks has an improved ability to control its capacity than if said repeater or relay was not present in said one or more wireless networks.

96. (previously presented) The broadband wireless repeater or relay of claim 80, wherein said signals or data received by said receiver or transceiver for receiving signals or data, or signals or data transmitted by said transmitter or transceiver for transmitting signals or data, or signals or data controlled by said controller include modified, stored, or delayed signals or data.

97. (previously presented) The broadband wireless repeater or relay of claim 80, wherein said controller is configured to cause said at least one transmitter or transceiver for transmitting signals or data to transmit modified received data or transmissions to one or more devices at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more.

98. (previously presented) The broadband wireless repeater or relay of claim 80, wherein said controller is configured to identify one or more devices in said one or more wireless networks.

99. (previously presented) The broadband wireless repeater or relay of claim 80, wherein said controller is self-configurable.

100. (previously presented) The broadband wireless repeater or relay of claim 80, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks in a moving platform environment.

101. (previously presented) The broadband wireless repeater or relay of claim 80, wherein said broadband wireless repeater or relay is configured to be integrated with or in communication with a vehicle, train, aircraft, or other moving platform.

102. (previously presented) The broadband wireless repeater or relay of claim 80, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks in an indoor environment.

103. (previously presented) The broadband wireless repeater or relay of claim 80, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks in an outdoor environment.

104. (previously presented) The broadband wireless repeater or relay of claim 80, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks selected from the group

consisting of: a cellular network, an enterprise network, a wireless local area network, or a wireless personal area network.

105. (previously presented) The broadband wireless repeater or relay of claim 80, wherein said repeater or relay is configured to be integrated with or in communication with a device selected from the group consisting of a television, a telephone, a cellphone, a computer, a camera, a video system, a monitor, a power plug, a wall outlet, a watch, a cable modem, a vehicle or other moving platform, a game console, and an ultrawideband transceiver or device.

106. (previously presented) The broadband wireless repeater or relay of claim 80, wherein one or more of said receiver or transceiver for signal or data reception, said transmitter or transceiver for signal or data transmission, and said controller is embedded in one or more integrated circuit chips.

107. (previously presented) The broadband wireless repeater or relay of claim 80, wherein said broadband wireless repeater or relay is configured or configurable for monitoring or measuring traffic passed through, received by or transmitted by said broadband wireless repeater or relay.

108. (previously presented) The broadband wireless repeater or relay of claim 80, wherein said broadband wireless repeater or relay is configured or configurable to modify at least some received signals or data from one or more devices, users or networks and transmit modified or delayed signals or data to at least one device, network or user via wireless communication.

109. (previously presented) The broadband wireless repeater or relay of claim 80, wherein said controller and one or more of said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission are integrated.

110. (new) A broadband wireless repeater or relay, comprising:

- at least one receiver or transceiver for signal or data reception from one or more devices;
- at least one transmitter or transceiver for signal or data transmission to one or more devices,

wherein the transceiver for signal or data reception and the transceiver for signal or data transmission may be the same or different; and

a controller that is configured or configurable for operation in one or more wireless networks, said controller communicating with said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission,

wherein at least one of said receiver or transceiver for signal or data reception and said transmitter or transceiver for signal or data transmission either or both transmit and receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more,

wherein said broadband wireless repeater or relay is connected or connectable to one or more network backbones for connecting said one or more wireless networks with said one or more network backbones,

wherein said broadband wireless repeater or relay is used to support connectivity and/or position location capabilities for one or more mobile or portable devices,

wherein said repeater or relay is configured such that when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more at least one of said one or more devices has at least one of

- a higher data rate,
- a greater coverage distance,
- higher quality of transmission or reception,
- less interference, and
- an improved ability to control its capacity,

than if said repeater or relay was not present in said network.

111. (new) A broadband wireless repeater or relay, comprising:

at least one receiver or transceiver for signal or data reception from one or more devices;

at least one transmitter or transceiver for signal or data transmission to one or more devices,

wherein the transceiver for signal or data reception and the transceiver for signal or data transmission may be the same or different; and

a controller that is configured or configurable for operation in one or more wireless networks, said controller communicating with said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission,

wherein at least one of said receiver or transceiver for signal or data reception and said transmitter or transceiver for signal or data transmission either or both transmit and receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more,

wherein said repeater or relay employs MIMO or adaptive antenna technology,

wherein said broadband wireless repeater or relay is used to support connectivity and/or position location capabilities for one or more mobile or portable devices, and

wherein said repeater or relay is configured such that when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more at least one of said one or more devices has at least one of

a higher data rate,

a greater coverage distance,

higher quality of transmission or reception,

less interference, and

an improved ability to control its capacity,

than if said repeater or relay was not present in said network.

REMARKS

The amendment places the application in *prima facie* condition for allowance. The amendments made herein place all claimed subject matter identified as allowable in the previous action in condition for allowance, and modify the claims such that rejected subject matter is excluded. The applicant reserves the right to pursue the claims in un-amended form, or other claims supported by the patent specification in one or more continuing applications.

Claims 50, 55, 81 and 86 are canceled. Claims 45, 51-54, 56, 60-64, 80, 82-85, 87, and 91-95 are amended. Claims 110 and 111 are added. As amended, the application includes claims 45-49, 51-54, 56-80, 81-85, and 87-111. The Commissioner is authorized to charge attorney's deposit account 50-2041 (Whitham, Curtis & Cook) for one additional independent claim.

Claims 51 and 52 were identified as being allowable. In response, the subject matter from claims 51 and 52 were incorporated into independent claim 45. In order to maintain proper dependent form, claims 51-54 and 56 were amended. It is noted that with the amendment, claim 50 and allowable claim 55 were similar; therefore, claim 55 was canceled. All other claims which depend from claim 45 are allowable for at least the same reasons claims 51 and 52 are allowable.

Similarly, claims 82 and 83 were identified as being allowable. In response, the subject matter from claims 82 and 83 were incorporated into independent claim 80. In order to maintain proper dependent form, claims 82-85 and 87 were amended. It is noted that with the amendment claim 81 and allowable claim 86 were similar; therefore, claim 86 was canceled. All other claims which depend from 80 are allowable for at least the same reasons claims 82 and 83 are allowable.

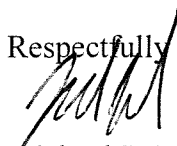
Claims 60-64 were also identified as being allowable. In response, new claim 110 is added which presents a Markush group with the features of claims 60-64, and claims 60-64 were amended to depend from claim 110.

Similarly, claims 91-95 were identified as being allowable. In response, new claim 111 is added which presents a Markush group with the features of claims 91-95, and claims 91-95 were amended to depend from claim 111.

In view of the above, claims 45-49, 51-54, 56-80, 82-85, and 87-111 are in immediate condition for allowance. Reconsideration and allowance at an early date is requested.

A provisional petition is hereby made for any extension of time necessary for the continued pendency during the life of this application. Please charge any fees for such provisional petition and any deficiencies in fees and credit any overpayment of fees for the petition or for entry of this amendment to Attorney's Deposit Account No. 50-2041.

Respectfully submitted,



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Customer Number 30743

Electronic Acknowledgement Receipt

EFS ID:	28113599
Application Number:	14540773
International Application Number:	
Confirmation Number:	3686
Title of Invention:	Intelligent broadband relay for wireless networks for connectivity to mobile or portable devices
First Named Inventor/Applicant Name:	Theodore S. Rappaport
Customer Number:	30743
Filer:	Michael E. Whitham
Filer Authorized By:	
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Receipt Date:	19-JAN-2017
Filing Date:	13-NOV-2014
Time Stamp:	18:14:09
Application Type:	Utility under 35 USC 111(a)

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Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		08610001c7_1_19_17.pdf	635895	yes	17
			b33e7b1e7b81477e922fecbe5f980fba9ae6a83		

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	15
	Applicant Arguments/Remarks Made in an Amendment	16	17
Warnings:			
Information:			
Total Files Size (in bytes):		635895	
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/540,773	11/13/2014	Theodore S. Rappaport	08610001C7	3686

30743 7590 10/20/2016
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RESTON, VA 20190

EXAMINER

SAMUEL, DEWANDA A

ART UNIT	PAPER NUMBER
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2464

MAIL DATE	DELIVERY MODE
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10/20/2016

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 14/540,773	Applicant(s) RAPPAPORT, THEODORE S.	
	Examiner DEWANDA SAMUEL	Art Unit 2464	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 November 2014.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

- 5) ☒ Claim(s) 45-109 is/are pending in the application.
5a) Of the above claim(s) 1-43 is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 45-50,53,54,57-59,65-81,84,85,88-90 and 96-109 is/are rejected.
- 8) ☒ Claim(s) 51,52,55,56,60-64,82,83,86,87 and 91-95 is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some** c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)
Paper No(s)/Mail Date 01/09/2015
- 3) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 4) ☐ Other: ____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

Claim Rejections - 35 USC § 103

2. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 45-49,57-59–65,66,70-75,78,88-90,96,97,10-105,108 and 109 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Patent 6,497,656) in view of Miao (US Patent 7,046,716).

With regard to claims 45 and 80, Evans et al teach **a broadband wireless repeater or relay, comprising: at least one receiver or transceiver for signal or data reception from one or more devices (Evans et al disclose having a communication system a ultrawideband (UWB) node 60 interpreted as a “ broadband wireless repeater “ whereby the UWB node 60 is configured as a gateway and receives data from at least one remote communicator 80 (i.e. remoter device 70) via ultrawideband link 15, see col. 4 lines 7-55) ;at least one transmitter or transceiver for signal or data transmission to one or more devices (Evans et al. disclose having a UWB node 60 comprise a transceiver 30 with a transmitter portion 1700 used to transmit**

images to a remote computer, see col. 6 lines 46-67), wherein the transceiver for signal or data reception and the transceiver for signal or data transmission may be the same or different(**Evans et al disclose having a communication system a ultrawideband (UWB) node 60 interpreted as a “ broadband wireless repeater “ whereby the UWB node 60 is configured as a gateway and receives data from at least one remote communicator 80 (i.e. remoter device 70) via ultrawideband link 15, see col. 4 lines 7-55); and a controller that is configured or configurable for operation in one or more wireless networks (Evans et al. disclose having a UWB node 60 comprised of a processor 31 coupled to LAN adapter 20 for communication in a LAN and configure to couple the UWB node 60 to a wireless system , see fig. 1 and col. 5 lines 20-33)**, said controller communicating with said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission,(**Evans et al. disclose having a processor 31 couple to a transceiver 30 of the UWB node 60 , see fig.2)**, wherein said broadband wireless repeater or relay is connected or connectable to one or more network backbones for connecting said one or more wireless networks with said one or more network backbones (**Evans et al. disclose having a UWB node 60 connected to a broadband subsystem interpreted as a” network backbones” and a wireless subsystem, see fig. 1)**, and wherein said broadband wireless repeater or relay is used to support connectivity capabilities for one or more mobile or portable devices (**Evans et al. disclose having a UWB node 60 facilitate connectivity/ communication of the remote device 70 within the wireless subsystem via UWB**

link 15 to communicate with the application node 41 within the broadband subsystem 50 via broadband link 51, see fig.1).

Evans et al. do not explicitly teach wherein at least one of said receiver or transceiver for signal or data reception and said transmitter or transceiver for signal or data transmission either or both transmit and receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more. In the same or similar field of endeavor, Miao teach wherein at least one of said receiver or transceiver for signal or data reception and said transmitter or transceiver for signal or data transmission either or both transmit and receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more(**Miao discloses having dual-mode UWB and WLAN 802.11a communication transceiver 100 whereby the transceiver 100 can both transmit and receive speech , audio , images and video and data information for the indoor and / or outdoor wireless broadband communications, see col. 4 lines 53-67. Miao discloses during utrawideband mode (UWB) the UWB transmitter 200 receives user data bits 210 with information data rate at 223.4375 Mbps interpreted as "transmission rate", see col.5 lines 21-67. Miao disclose having each channel frequency bandwidth is 650 MHz interpreted as “ occupied bandwidth”, see col.7 lines 18-67).**

At the time the invention was made, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to incorporate an operational

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bandwidth and information data rate which is taught by Miao into the communication system of Evans et al. Doing so would modify the communication system of Evans et al. to include an operational bandwidth and information data rate which is taught by Miao in order to optimized the transmission of data whereby increasing good throughput.

With regard to claim 46, Evans et al. further teach wherein at least one of said one or more network backbones to which said controller is connected or connectable is a wired backbone (**Evans et al. disclose having a UWB node 60 comprised a processor coupled to a LAN adapter connected to broadband subsystem 50 via broadband link 51, see fig. 2).**

With regard to claim 47, Evans et al. further disclose wherein said wired backbone is selected from a group consisting of Ethernet (**Evans et al. disclose having a broadband subsystem 50 is configured in accordance with a typical Ethernet link protocol such as 100BaseTx (Ethernet) protocol, see col.4 lines 15-24).**

With regard to claim 48, Evans et al. further teach wherein at least one of said one or more network backbones to which said controller is connected or connectable is a wireless backbone(**Evans et al. disclose having a UWB node 60 comprised a processor coupled to a wireless subsystem 16, see fig.1).**

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With regard to claim 49, Evans et al. further teach wherein said wireless backbone is selected from a group consisting of last mile wireless service, mesh network, LMDS, MMDS, WiMax, 802.16, 802.20, 802.11a/b/g, 802.15.3.a, RF, and baseband (**Evans et al. disclose having a wireless subsystem 16 communicating to a UWB node 60 in order to communicate to the application node in in the broadband subsystem , see fig . 1).**

With regard to claims 57 and 88, Evans et al. further teach wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals (**Evans et al. disclose having a UWB node 60 includes a first UWB transceiver which has the capability to transmit and receive information via UWB link 15 and broadband link 51, see col. 2 lines 43-51 and fig. 1).**

With regard to claims 58 and 89, Evans et al. further teach wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals (**Evans et al. disclose having a UWB node 60 includes a first UWB transceiver which has the capability to transmit and receive information via UWB link 15 and broadband link 51, see col. 2 lines 43-51 and fig. 1).**

With regard to claims 59 and 90, Evans et al. further teach wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals (**Evans et al. disclose having a UWB node 60 includes a first UWB transceiver which has the capability to transmit and receive information via UWB link 15 and broadband link 51, see col. 2 lines 43-51 and fig. 1).**

With regard to claims 65 and 96, Evans et al. further teach wherein said signals or data received by said receiver or transceiver for receiving signals or data (**Evans et al. disclose having a UWB node 60 comprise a transceiver 30 with a receiver portion 1701 configured to receive a propagated impulse radio signal 1724 interpreted as “receiving signals” transmitted by transceiver 90 of the remote communicator 80, see col.5 lines 34-67)**, or signals or data transmitted by said transmitter or transceiver for transmitting signals or data (**Evans et al. disclose having a UWB node 60 comprise a transceiver 30 with a transmitter portion 1700 used to transmit images to a remote computer, see col. 6 lines 46-67)** , or signals or data controlled by said controller include modified (**Evans et al. disclose processor 31 is programmed to process data such that the application information is provided to the LAN adapter 20 in a format that is usable by the LAN adapter 20 , see col.5 lines 59-67. It is viewed by the Examiner the processor 31 changing the application information into a usable format is modification of data).**

With regard to claims 66 and 97, Evans et al. do not explicitly teach wherein said controller is configured to cause said at least one transmitter or transceiver for transmitting signals or data to transmit modified received data or transmissions to one or more devices at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more. In the same or similar field of endeavor, Miao teaches wherein said controller is configured to cause said at least one transmitter or transceiver for transmitting signals or data to transmit modified received data or transmissions to one or more devices at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more **(Miao discloses having dual-mode UWB and WLAN 802.11a communication transceiver 100 whereby the transceiver 100 can both transmit and receive speech , audio , images and video and data information for the indoor and / or outdoor wireless broadband communications, see col. 4 lines 53-67. Miao discloses during ultrawideband mode (UWB) the UWB transmitter 200 receives user data bits 210 with information data rate at 223.4375 Mbps interpreted as "transmission rate", see col.5 lines 21-67. Miao disclose having each channel frequency bandwidth is 650 MHz interpreted as " occupied bandwidth", see col.7 lines 18-67).**

With regard to claims 70 and 100, Evans et al. further teach wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission (**Evans et al. disclose having a UWB**

node 60 comprise a transceiver 30 with a receiver portion 1701 configured to receive a propagated impulse radio signal 1724 interpreted as “ receiving signals” transmitted by transceiver 90 of the remote communicator 80, see col.5 lines 34-67. Evans et al. disclose having a UWB node 60 comprise a transceiver 30 with a transmitter portion 1700 used to transmit images to a remote computer, see col. 6 lines 46-67).

With regard to claims 71 and 101, Evans et al. further teach wherein said broadband wireless repeater or relay is configured to be integrated with or in communication with a vehicle, train, aircraft, or other moving platform (Evans et al. disclose the UWB node 60 configured to be in communication and/or support a tag interpreted as a “other moving platform” which is a remote device 70, see col.5 lines 50-58).

With regard to claims 72 and 102, Evans et al. further teach wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission (Evans et al. disclose having a UWB node 60 comprise a transceiver 30 with a receiver portion 1701 configured to receive a propagated impulse radio signal 1724 interpreted as “ receiving signals” transmitted by transceiver 90 of the remote communicator 80, see col.5 lines 34-67. Evans et al. disclose having a UWB node 60 comprise a transceiver 30 with a transmitter portion 1700 used to transmit images to a remote computer, see col. 6 lines 46-67).

With regard to claims 73 and 103, Evans et al. further teach wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission(**Evans et al. disclose having a UWB node 60 comprise a transceiver 30 with a receiver portion 1701 configured to receive a propagated impulse radio signal 1724 interpreted as “ receiving signals” transmitted by transceiver 90 of the remote communicator 80, see col.5 lines 34-67. Evans et al. disclose having a UWB node 60 comprise a transceiver 30 with a transmitter portion 1700 used to transmit images to a remote computer, see col. 6 lines 46-67).**

With regard to claim 74 and 104, Evans et al. further teach wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks selected from the group consisting of: a wireless local area network, or a wireless personal area network (**Evans et al. disclose having a UWB node 60 has the capability to operate in a wireless system whereby the UWB node 60 in communication remote device 70 in the wireless system, see fig.1).**

With regard to claims 75 and 105, Evans et al. further teach wherein said repeater or relay is configured to be integrated with or in communication with a device selected from

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the group consisting of , a computer, a monitor, and an ultrawideband transceiver or device (**Evans et al. disclose UWB node 60 in communication remote device 70 (i.e. monitor) coupled to a remote transceiver 90, and communication of application node 40 (i.e. computer) , see fig.1).**

With regard to claims 78 and 108, Evans et al. further teach wherein said broadband wireless repeater or relay is configured or configurable to modify at least some received signals or data from one or more devices, users or networks and transmit modified or delayed signals or data to at least one device, network or user via wireless communication (**Evans et al. disclose having a UWB node 60 comprise a transceiver 30 with a receiver portion 1701 configured to receive a propagated impulse radio signal 1724 interpreted as “ receiving signals” transmitted by transceiver 90 of the remote communicator 80, see col.5 lines 34-67. Evans et al. disclose processor 31 is programmed to process data such that the application information is provided to the LAN adapter 20 in a format that is usable by the LAN adapter 20 , see col.5 lines 59-67. It is viewed by the Examiner the processor 31 changing the application information into a usable format is modification of data).**

With regard to claims 79 and 109, Evans et al. further teach wherein said controller and one or more of said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission are

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integrated (**Evans et al. disclose having a UWB transceiver 30 comprised of a receiver portion 1701 and transmitter 1700, see col.5 lines 34-43).**

4. Claims 50,53,54,77,81,84,85,107 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Patent 6,497,656) and of Miao (US Patent 7,046,716) as applied to claim 45 above, and further in view of Suonvieri (US Patent 6,768,897).

With regard to claims 50 and 81, Evans et al. do not explicitly teach wherein said controller is configured or configurable to perform or for performing at least one of: c) monitoring. In the same or similar field of endeavor, Suonvieri teaches c) monitoring (**Suonvieri discloses having repeater comprised of monitoring means for monitoring radio signals , see col.2 lines 1-22. Suonvieri further discloses the repeater 302 uses the monitoring means 404 for receiving the control channel signals 170A, see col.5 lines 64-67).**

At the time the invention was made, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to incorporate a monitoring means which is taught by Suonvieri into the UWB node of Evans et al. Doing so would modify the UWB node of Evans et al. to include monitoring means which is taught by Suonvieri in order to detect erroneous or correct information within the UWB node whereby increasing reliability of information being processed.

With regard to claims 53 and 84, Evans et al. do not explicitly teach wherein said controller performs c). In the same or similar filed of endeavor, Suonvieri teaches wherein said controller performs c) **(Suonvieri discloses having repeater comprised of monitoring means for monitoring radio signals , see col.2 lines 1-22. Suonvieri further discloses the repeater 302 uses the monitoring means 404 for receiving the control channel signals 170A, see col.5 lines 64-67).**

At the time the invention was made, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to incorporate a monitoring means which is taught by Suonvieri into the UWB node of Evans et al. Doing so would modify the UWB node of Evans et al. to include monitoring means which is taught by Suonvieri in order to detect erroneous or correct information within the UWB node whereby increasing reliability of inflammation being processed.

With regard to claims 54 and 85, Evans et al. do not explicitly teach wherein c) includes one or more of: iv) monitoring or measuring traffic from one or more devices, users or networks. In the same or similar field of endeavor, Suonvieri teaches wherein c) includes one or more of: iv) monitoring or measuring traffic from one or more devices, users or networks **(Suonvieri discloses having repeater comprised of monitoring means for monitoring radio signals , see col.2 lines 1-22. Suonvieri further discloses the repeater 302 uses the monitoring means 404 for monitoring the radio signals 170A transmitted by at least one base station, see col.5 lines 32-40).**

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At the time the invention was made, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to incorporate a monitoring means which is taught by Suonvieri into the UWB node of Evans et al. Doing so would modify the UWB node of Evans et al. to include monitoring means which is taught by Suonvieri in order to detect erroneous or correct information within the UWB node whereby increasing reliability of information being processed.

With regard to claims 77 and 107, Evans et al. do not explicitly teach wherein said broadband wireless repeater or relay is configured or configurable for monitoring traffic passed through, received by or transmitted by said broadband wireless repeater or relay. In the same or similar field of endeavor, Suonvieri teaches wherein said broadband wireless repeater or relay is configured or configurable for monitoring traffic passed through, received by or transmitted by said broadband wireless repeater or relay **(Suonvieri discloses having repeater comprised of monitoring means for monitoring radio signals , see col.2 lines 1-22. Suonvieri further discloses the repeater 302 uses the monitoring means 404 for monitoring the radio signals 170A transmitted by at least one base station, see col.5 lines 32-40).**

At the time the invention was made, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to incorporate a monitoring means which is taught by Suonvieri into the UWB node of Evans et al. Doing so would modify the UWB node of Evans et al. to include monitoring means which is taught by Suonvieri

in order to detect erroneous or correct information within the UWB node whereby increasing reliability of information being processed.

5. Claims 67 and 98 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Patent 6,497,656) and of Miao (US Patent 7,046,716) as applied to claim 45 above, and further in view of Christensen et al. (PG PUB 2002/0044042).

With regard to claims 67 and 98, Evans et al. do not explicitly teach wherein said controller is configured to identify one or more devices in said one or more wireless networks. In the same or similar field of endeavor, Christensen et al. teach wherein said controller is configured to identify one or more devices in said one or more wireless networks (**Christensen et al. disclose having a wireless home automation system, see Abstract. Christensen et al. disclose having a controller comprised a memory holding device ID's, see page 7 para[0127]-[0132]**).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to incorporate a memory for device ID's which is taught by Christensen et al. into the UWB node of Evans et al. Doing so would modify the UWB node of Evans et al. to include a memory for device ID's which is taught by Christensen et al. in order to track devices associated with the device ID's within the system whereby increasing reliability.

6. Claim 68 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Patent 6,497,656) and of Miao (US Patent 7,046,716) as applied to claim 45 above, and further in view of Agee et al. (PG PUB 2004/0095907).

With regard to claim 68, Evans et al. do not explicitly teach wherein said repeater or relay employs MIMO or adaptive antenna technology. In the same or similar field of endeavor, Agee et al. teach wherein said repeater or relay employs MIMO (**Agee et al. disclose having a MIMO network includes relay nodes, see fig. 18 and page 19 para[0213]**).

At the time the invention was made, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to incorporate MIMO network which is taught by Agee et al. into the communication system of Evans et al. Doing so would modify the communication system of Evans et al. to include MIMO network which is taught by Agee et al. to efficiently accommodate multiple devices within the communication system.

7. Claims 69 and 99 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Patent 6,497,656) and of Miao (US Patent 7,046,716) as applied to claim 45 above, and further in view of Moorwood et al. (US Patent 5,293,375).

With regard to claims 69 and 99, Evans et al. do not explicitly teach wherein said controller is self- configurable. In the same or similar field of endeavor, Moorwood et al. wherein said controller is self- configurable teach (**Moorwood et al. discloses having repeater interface controller , see fig. 5. Moorwood et al. further disclose the repeater interface controller have autonomous functionality, see col.24 lines 59-67).**

At the time the invention was made, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to incorporate a repeater interface controller which is taught by Moorwood et al. into the UWB node of Evans et al. Doing so would modify the UWB node of Evans et al. to include a repeater interface controller which is taught by Moorwood et al. in order to optimize the functionality of the UWB node whereby the ability to be autonomous reduces processing time.

8. Claims 76 and 106 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Evans et al. (US Patent 6,497,656) and of Miao (US Patent 7,046,716) as applied to claim 45 above, and further in view of Liu et al. (US Patent 5,754,540).

With regard to claims 76 and 106, wherein one or more of said receiver or transceiver for signal or data reception, said transmitter or transceiver for signal or data transmission, and said controller is embedded in one or more integrated circuit chips. In the same or similar field of endeavor, Liu et al. teach wherein one or more of said

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receiver or transceiver for signal or data reception, said transmitter or transceiver for signal or data transmission, and said controller is embedded in one or more integrated circuit chips (**Liu et al. disclose having an integrated circuit multiport repeater, see col. 3 lines 29-38. Liu et al. further teach each port devices on the integrated circuit repeater comprises transceiver integrated circuits, see fig. 1 and col. 5 lines 60-67 and col. 6 lines 1-5. Liu et al. disclose having media independent interface controllers , see col.12 lines 60-67).**

At the time the invention was made, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to incorporate an integrated circuit multiport repeater which is taught by Liu et al. into the UWB node of Evans et al. Doing so would modify the UWB node of Evans et al. to include an integrated circuit multiport repeater which is taught by Liu et al. in order to reduce the number of components within the UWB node whereby efficiently utilizing resources.

Allowable Subject Matter

9. Claims 51, 52, 55,56, 60-64, 82, 83,86, 87, 91-95 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior Art

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fette et al (PG PUB 2004/0264403)

Sanhoff (US Patent 6,782,048)

Fullerton et al. (US Patent 7,027,425)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEWANDA SAMUEL whose telephone number is (571)270-1213. The examiner can normally be reached on Monday- Thursday 8:30-5:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Q. Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DEWANDA SAMUEL/
Examiner, Art Unit 2464

/RICKY NGO/

Supervisory Patent Examiner, Art Unit 2464

Notice of References Cited	Application/Control No. 14/540,773		Applicant(s)/Patent Under Reexamination RAPAPORT, THEODORE S.	
	Examiner DEWANDA SAMUEL		Art Unit 2464	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-6,497,656 B1	12-2002	Evans; Scott Charles	H04B1/7163	128/903
*	B	US-7,046,716 B1	05-2006	Miao; George J.	H04B1/406	370/208
*	C	US-5,754,540 A	05-1998	Liu; Chang-Chi	H04B3/36	370/279
*	D	US-5,293,375 A	03-1994	Moorwood; Charles A.	H04L12/44	370/408
*	E	US-2004/0095907 A1	05-2004	Agee, Brian G.	H04B7/0417	370/334
*	F	US-2002/0044042 A1	04-2002	Christensen, Carlos Melia	G05B15/02	340/3.54
*	G	US-6,768,897 B1	07-2004	Suonvieri; Jukka	H04B17/382	455/10
*	H	US-2004/0264403 A1	12-2004	Fette, Bruce Alan	H04B7/04	370/328
*	I	US-6,782,048 B2	08-2004	Santhoff; John	H04B1/7163	375/240
*	J	US-7,027,425 B1	04-2006	Fullerton; Larry W.	G01S5/02	370/338
	K	US-				
	L	US-				
	M	US-				

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L6	0	(network adj provisioning) same (relay repeater) same (controller processor)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:39
L7	15	(network adj provisioning) same (relay repeater) same (controller processor)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:39
L8	56	(network adj provisioning) same (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:43
L9	1893	provisioning same (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:45
L10	53723	(provisioning monitoring) same (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:46
L11	31109	(provisioning monitoring) with (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:46
L12	1443	11 and broadband	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 08:47
L13	6952	transceiver with (processor controller)	US-PGPUB;	OR	OFF	2016/10/17

		with chip	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			09:34
L14	68	transceiver with (processor controller) with chip with (repeater relay)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 09:34
L15	61	transceiver with (processor controller) with integrated with (repeater relay)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 09:36
L16	466	transceiver same (processor controller) same integrated same (repeater relay)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 09:41
L17	2133	MIMO with (repeater relay)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:01
L18	25	MIMO with (repeater relay) with broadband	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:02
L19	466	17 and broadband	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:02
L20	940	("self configurable" autonomous) with (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:18
L21	11169	("self configurable" autonomous) with (controller processor)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2016/10/17 10:31

			IBM_TDB			
L22	76	("self configurable" autonomous) with (controller processor)with (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:31
L23	1650	21 and (relay repeater)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:35
L24	2	"6497656".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 10:54
L25	1770	H04B1/7163	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 11:46
L26	668	H04B3/40	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 11:47
L27	2710	(Locat\$3 position) with (bridge relay gateway repeater extender booster) with (proximity)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 11:48
L28	0	L27 and 25	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 11:48
L29	0	L27 and 26	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 11:48
L30	276	27 AND ((H04W4/02 OR H04W76/023 OR H04W88/04 OR H04W4/008 OR H04W4/021 OR H04W8/005 OR H04W84/18 OR H04W84/12 OR	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2016/10/17 11:48

		H04W4/08 OR H04W12/06 OR H04W40/22 OR H04W4/023 OR H04W4/025 OR H04W4/12 OR H04W16/26 OR H04W48/14 OR H04W4/001 OR H04W4/005 OR H04W4/043 OR H04W4/046 OR H04W88/06 OR H04W12/04 OR H04W12/10 OR H04W28/021 OR H04W36/0022 OR H04W36/0055 OR H04W36/0061 OR H04W36/0066 OR H04W36/0072 OR H04W36/08 OR H04W36/14 OR H04W36/32 OR H04W36/38 OR H04W40/02 OR H04W48/00 OR H04W48/08 OR H04W48/16 OR H04W4/022 OR H04W4/04 OR H04W4/06 OR H04W4/10 OR H04W4/14 OR H04W4/20 OR H04W52/0216 OR H04W52/265 OR H04W56/001 OR H04W72/00 OR H04W72/02 OR H04W72/10 OR H04W74/006 OR H04W76/005 OR H04W76/02 OR H04W76/021 OR H04W76/022 OR H04W76/043 OR H04W84/042 OR H04W84/20 OR H04W88/02 OR H04W88/085 OR H04W88/10 OR H04W88/16 OR H04W88/182 OR H04W8/02 OR H04W8/10 OR H04W8/14 OR H04W8/18 OR H04W8/186 OR H04W8/22 OR H04W92/18).CPC.)	EPO; JPO; DERWENT; IBM_TDB			
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S2	1	14/540773.app.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 12:57
S3	3	(ultrawideband adj transceiver) with repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:02
S4	4	(ultrawideband adj transceiver) and repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:02
S5	22	(ultra adj wideband adj transceiver) and repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:03
S6	42	(ultra adj wideband) with repeater	US-PGPUB;	OR	OFF	2016/09/28

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			13:03
S7	3	"8932754".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:05
S8	3	"8331854".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:05
S9	3	"7983613".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:05
S10	3	"7676194".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 13:06
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S16	193	("3150372" "5317323" "5506587" "5510800" "5661490" "5661492" "5748147").PN. OR ("6054950").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:24
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S18	88	("4642424" "5523760" "5687169" "5752976" "5842118" "5944659" "6300903").PN. OR ("6497656").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:31
S19	89	("4641317" "4813057" "4979186"	US-PGPUB;	OR	OFF	2016/09/28

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S20	11	("20030161279" "20040054905" "20050147071" "20050185669" "20050243787" "20070081505" "20090285189" "6497656" "7046716").PN. OR ("7907580").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:46
S21	42	("20020114035" "20020159502").PN. OR ("7046716").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:48
S22	92	("20020172147" "20030072382" "20050097427" "6744832" "6985434" "7031371" "7046716" "7095709").PN. OR ("7263133").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:50
S23	396	("20010000456" "20010016013" "20010020912" "20020001337" "20020032875" "20020063622" "20020082665" "20020085641" "20020086684" "20020188575" "20020193108" "20030003874" "20030025599" "20030048834" "20030063683" "20030069043" "20030097049" "20030114158" "20030120742" "20030129964" "20030130009" "20030134664" "20030147471" "20030179833" "20030220835" "20030235167" "20040013166" "20040017858" "20040023686" "20040081248" "20040142658" "20040174429" "20040176049" "20040196923" "20040203377" "20040203715" "20040204202" "20040208243" "20040214541" "20040233930" "20040249925" "20040253955" "20040264583" "20050018790" "20050026606" "20050055595" "20050068918" "20050090266" "20050093584" "20050094589" "20050097595" "20050119025" "20050153732" "20050175116" "20050181810" "20050185699" "20050185700" "20050202809" "20050226340" "20050228300" "20050232135" "20050250531" "20050255826" "20050275549" "20050282588" "20050288975" "20060010203" "20060050625" "20060057987" "20060072646" "20060072647" "20060072684" "20060075108" "20060083320" "20060087432" "20060088121" "20060089792" "20060122481" "20060135183" "20060146913" "20060259942" "20060270421" "20060274838" "20060280199" "20060293078" "20070010245" "20070030116" "20070032220" "20070032246" "20070032250"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 13:54

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"20070171852"	"20070171874"	
"20070202802"	"20070202890"	
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"20080056399"	"20080057886"	
"20080062856"	"20080120673"	
"20080161043"	"20080181151"	
"20080188240"	"20080205535"	
"20080212656"	"20080214164"	
"20080219362"	"20080219385"	
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"20080253353"	"20080281585"	
"20080298275"	"20090061852"	
"20090066667"	"20090076803"	
"20090092114"	"20090098852"	
"20090181640"	"20090240308"	
"20090247187"	"20090270113"	
"20090310591"	"20100007711"	
"20100029284"	"20100064025"	
"20100067595"	"20100124920"	
"20100208852"	"20110277000"	
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"4567602"	"4584880"	"4644565"
"4720839"	"4742532"	"4745628"
"4852090"	"4945549"	"4962510"
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"5299228"	"5313173"	"5345439"
"5359521"	"5430416"	"5479448"
"5488631"	"5491457"	"5497777"
"5535432"	"5539730"	"5550881"
"5564076"	"5572516"	"5596333"
"5608722"	"5640413"	"5663757"
"5668880"	"5722068"	"5745480"
"5757858"	"5761621"	"5778024"
"5784402"	"5794159"	"5815525"
"5818827"	"5842140"	"5850392"
"5903592"	"5909435"	"5909460"
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"6008703"	"6014551"	"6035212"
"6037991"	"6055425"	"6067018"
"6075973"	"6078576"	"6088585"
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"6466163"	"6470055"	"6522895"
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S24	11551	((ultra adj wide adj band) ultrawideband "ultra wideband" "wide band") and ("data rates" "burt rate" "high speed") and (mesh WIMAX "last mile MIMO" WLAN PAN WiFi) and wired	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 14:35
S25	3018	S24 and (repeater relay)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 14:36

S26	1750	S25 and bandwidth	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 14:37
S27	969	S25 and bandwidth and Fiber	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 14:38
S28	260	((ultra adj wide adj band) ultrawideband "ultra wideband" "wide band") with ("data rates" "burt rate" "high speed") with (mesh WIMAX "last mile MIMO" WLAN PAN WiFi) with (wired fiber)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 14:44
S29	46	("20020064221" "20030007214" "20030099015" "20030138061" "20030180049" "20030228005" "20030235236" "20040005016" "20040008617" "20040047313" "20040081402" "20040143428" "20040187156" "20040264974" "20050213974" "20050244158" "5332927" "5610907" "5621841" "5745627" "5754555" "5761351" "5773817" "5812081" "5917624" "5929538" "6147786" "6151144" "6160802" "6492904" "6493335" "6505032" "6512488" "6535331" "6549587" "6643417" "6721797" "6735238" "6757251" "6782048" "7103907").PN. OR ("7962042").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 14:53
S30	37	("20010036163" "20020186436" "20020191565" "20030016418" "20030157943" "20040057393" "20040198453" "20040219897" "20050003769" "20050078699" "20050147067" "20050172198" "20050226625" "20050243785" "20050270221" "20050282536" "20060165155" "20090046593" "5682256" "5809422" "5949564" "6154443" "6525855" "6781981" "6782048" "6788666" "6826163" "6826164" "6831901" "6963552" "7099308" "7236509" "7349478" "7359426" "7634250").PN. OR ("8050291").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 15:08
S31	2	("20020012336" "6032057").PN. OR ("9002261").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 16:13
S32	7	("2003/0235236").URPN.	USPAT	OR	OFF	2016/09/28 17:29
S33	46	("20020064221" "20030007214" "20030099015" "20030138061" "20030180049" "20030228005"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 17:30

		"20030235236" "20040005016" "20040008617" "20040047313" "20040081402" "20040143428" "20040187156" "20040264974" "20050213974" "20050244158" "5332927" "5610907" "5621841" "5745627" "5754555" "5761351" "5773817" "5812081" "5917624" "5929538" "6147786" "6151144" "6160802" "6492904" "6493335" "6505032" "6512488" "6535331" "6549587" "6643417" "6721797" "6735238" "6757251" "6782048" "7103907").PN. OR ("7962042").URPN.				
S34	14	connecting with (wireless mobile RF radio cellular) with (wired) with ((ultra adj wide adj band) ultrawideband "ultra wideband" "wide band")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 18:42
S35	6	("20030081630" "20030212821" "20070189217" "20080224869" "20080232299").PN. OR ("7859989").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 18:43
S36	42	(ultra adj wideband) with repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 18:46
S37	6	("20060040615" "20070155314" "20080002652" "4901307" "8244175" "8489019").PN. OR ("9014622").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 18:46
S38	170	("4641317" "4743906" "4813057" "4979186" "5345471" "5351053" "5363108" "5523760" "5533046" "5583892" "5589838" "5677927" "5687169" "5832035" "5901172" "6003092" "6026125" "6054950").PN. OR ("6505032").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 18:51
S39	145	("3680121" "3687556" "3714573" "3789410" "3886553" "3953856" "4114155" "4161730" "4543580" "4916455" "5216429" "5317323").PN. OR ("5589838").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 18:53
S40	26	("20030119453" "20040032363" "20040070534" "20050282558" "3040315" "3150372" "3760414" "4016553" "4740792" "4797679" "5126746" "5285209" "5589838" "6002708" "6054950" "6133876" "6388618" "6700535" "6901264" "7050817").PN. OR ("7304609").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 18:55
S41	193	("3150372" "5317323" "5506587" "5510800" "5661490" "5661492" "5748147").PN. OR ("6054950").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 18:56
S42	209	("2671896" "2999128" "3587107" "3612899" "3659203" "3662316"	US-PGPUB; USPAT;	OR	OFF	2016/09/28 19:01

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S43	65	("20010033610" "20020075972" "20020076193" "3668639" "3678204" "3728632" "4641317" "4979186" "5146616" "5363108" "5677927" "5687169" "5748891" "5920278" "6002708" "6026125" "6031862" "6178217" "6275544" "6281784" "6505032" "6526264" "6539213" "6754195" "6760300" "6853835" "6873611" "6898198" "7079827").PN. OR ("7339883").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 19:16
S44	28	("20030185233" "6522881" "6659947" "6661360" "6678535").PN. OR ("6873611").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 20:32
S45	21	("20030139180" "6230005" "6243581" "6466556" "6659947" "6708031" "6744753" "6850503" "6873611" "6876642").PN. OR ("7006481").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 20:35

S46	172	("20010055353" "20020018458" "20020131370" "20030054764" "3668639" "3678204" "3728632" "3875524" "4201892" "4232339" "4506267" "4574378" "4586177" "4587494" "4641317" "4644534" "4651152" "4672608" "4743906" "4763325" "4813057" "4887266" "4979186" "5134408" "5146616" "5148174" "5153595" "5159343" "5253202" "5274271" "5307079" "5307081" "5319218" "5334975" "5355374" "5363108" "5365240" "5473668" "5493691" "5519400" "5523758" "5537414" "5546022" "5586145" "5592177" "5594738" "5610907" "5627829" "5644576" "5675388" "5677927" "5687169" "5687200" "5715236" "5742592" "5748891" "5761197" "5790551" "5812671" "5815537" "5832035" "5850422" "5886652" "5889767" "5901172" "5903605" "5909469" "5909491" "5920278" "5926501" "5940435" "5940452" "5952956" "5953344" "5960000" "5970062" "5977822" "6002708" "6014374" "6026125" "6031862" "6041051" "6055411" "6064697" "6067648" "6069887" "6091717" "6094464" "6097707" "6097766" "6115390" "6122291" "6133875" "6133876" "6161138" "6172965" "6177903" "6178217" "6181687" "6212230" "6226277" "6232910" "6236662" "6239741" "6243372" "6243583" "6246377" "6246702" "6275500" "6275544" "6278713" "6285662" "6285873" "6292153" "6300903" "6310865" "6324397" "6347084" "6351468" "6351652" "6385461" "6400308" "6424645").PN. OR ("6437832" "6449265" "6463042" "6477171" "6480505" "6492904" "6497656" "6505032" "6510150" "6519460" "6539213" "6549567" "6574266" "6597683" "6603818" "6621857" "6625229" "6628642" "6633558" "6668008" "6697382" "6704311" "6735238" "6735734" "6747959").PN. OR ("7088795").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/09/28 20:41
S47	22	(ultrawideband) with repeater	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 21:48
S48	19	S47 and (provisioning monitoring)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2016/09/28 21:49

			IBM_TDB			
S49	34436	(ultra adj wideband)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 21:50
S50	7808	S49 and (provisioning monitoring)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 21:50
S51	3652	S49 and (provisioning monitoring) and (relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 21:51
S52	86911	(provisioning monitoring) same (relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 21:51
S53	25	(ultra adj wideband) same (provisioning monitoring) same (relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 21:51
S54	0	S52 and (controller processor) and (newtork adj (provisioning monitoring))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 22:03
S55	3684	S52 and (controller processor) and (network adj (provisioning monitoring))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 22:03
S56	80	(ultra adj wideband) and S55	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/09/28 22:03
S57	80	S49 and S55	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2016/09/28 22:14

			EPO; JPO; DERWENT; IBM_TDB			
S58	2	"6497656".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 10:38
S59	88	("4642424" "5523760" "5687169" "5752976" "5842118" "5944659" "6300903").PN. OR ("6497656").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 10:40
S60	178	("20010054953" "20020024423" "20020076193" "20020116720" "20030031191" "20030202537" "20050131922" "3728632" "4641317" "4743906" "4813057" "4815106" "4864589" "4979186" "5051720" "5278862" "5363108" "5485040" "5491463" "5523760" "5554968" "5677927" "5687169" "5729607" "5744526" "5745837" "5774526" "5822678" "5828946" "5832035" "5835054" "5864284" "5896556" "5937342" "5940387" "5944842" "5960031" "5963581" "5982276" "5995534" "6031862" "6040759" "6140911" "6178217" "6218979" "6275045" "6281784" "6373377" "6430208" "6437832" "6492897" "6492904" "6496104" "6497656" "6505032" "6529166" "6539068" "6549567" "6586999" "6611223" "6690247" "6721298").PN. OR ("7027483").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 10:44
S61	0	("100" adj more adj bandwidth) with (transmission adj rate)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 10:50
S62	0	("100" adj more adj bandwidth) with (transmission adj rate)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 10:51
S63	70	(MHz adj bandwidth) with (transmission adj rate)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 10:51
S64	34	(relay gateway repeater extender booster) and S63	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	OFF	2016/10/16 10:52

			DERWENT; IBM_TDB			
S65	4	"7027425".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 11:28
S66	4	"7027483".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 11:30
S67	178	("20010054953" "20020024423" "20020076193" "20020116720" "20030031191" "20030202537" "20050131922" "3728632" "4641317" "4743906" "4813057" "4815106" "4864589" "4979186" "5051720" "5278862" "5363108" "5485040" "5491463" "5523760" "5554968" "5677927" "5687169" "5729607" "5744526" "5745837" "5774526" "5822678" "5828946" "5832035" "5835054" "5864284" "5896556" "5937342" "5940387" "5944842" "5960031" "5963581" "5982276" "5995534" "6031862" "6040759" "6140911" "6178217" "6218979" "6275045" "6281784" "6373377" "6430208" "6437832" "6492897" "6492904" "6496104" "6497656" "6505032" "6529166" "6539068" "6549567" "6586999" "6611223" "6690247" "6721298").PN. OR ("7027483").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 11:33
S68	90	("20010011930" "20010054953" "20020024423" "20020075972" "20020076193" "20020097821" "20020191690" "20030031191" "20030129978" "20030202537" "20030228005" "20040125859" "20040136438" "20040142663" "20040174924" "20040198260" "20040233972" "20040233973" "20050047379" "20050069052" "20050131922" "3728632" "4641317" "4743906" "4815106" "4864589" "4979186" "5051720" "5278862" "5363108" "5485040" "5491463" "5523760" "5554968" "5677927" "5687169" "5729607" "5745837" "5774526" "5822678" "5828946" "5832035" "5835054" "5864284" "5896556" "5937342" "5940387" "5944842" "5960031" "5963581" "5982276" "5995534" "6031862" "6040759" "6140911" "6178217" "6218979" "6275045" "6281784" "6360075" "6373377"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 11:42

		"6384773" "6430208" "6437832" "6441695" "6492897" "6492904" "6496104" "6497656" "6512474" "6515622" "6529166" "6539068" "6549567" "6571089" "6586999" "6611223" "6637033" "6678321" "6690247" "6721298" "6782048" "6847267" "6865256" "6909877" "6968130" "7013145" "7092693" "7167525"). PN. OR ("7486742").URPN.				
S69	11	("20030161279" "20040054905" "20050147071" "20050185669" "20050243787" "20070081505" "20090285189" "6497656" "7046716"). PN. OR ("7907580").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 11:45
S70	112	("20020072357" "20020093928" "20020111137" "20020142767" "20020188530" "20020197990" "20020198977" "20030053521" "20030063597" "20030096578" "20030110157" "20030124976" "20030162504" "20030162528" "20030211828" "20030220075" "20040010605" "20040017306" "20040142680" "20040146092" "20040157550" "20040166802" "20040178928" "20040178942" "20040190594" "20040198260" "20040212537" "20040259494" "20050018640" "20050026563" "20050026661" "20050197121" "20050208889" "20060063484" "20060071776" "20060106961" "20060251148" "20060285577" "20080065416" "20080107162" "20080136644" "20120033714" "4298179" "4626845" "4659878" "4932049" "5012211" "5086506" "5592491" "5633876" "5634196" "5818821" "5844905" "5898382" "5974236" "6110221" "6186908" "6272640" "6348986" "6373833" "6466766" "6505032" "6590545" "6671351" "6718160" "6741834" "6754882" "6804739" "6806821" "6934511" "6952456" "7009573" "7289813" "7676194" "7787513" "7945215" "7958041" "7983613" "8041627" "8073458" "8077735" "8103798" "8139496" "8160599" "8175191" "8175612" "8233928" "8234208" "8249966" "8279823" "8290848" "8331854" "8380194" "8406188" "8457644" "8483319" "8504087" "8509706" "8521636" "8526944" "8532686" "8559891" "8576817" "8577300" "8583157" "8644868" "8700077" "8755830" "8792901" "8804680" "8824970" "8831625"). PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 11:50
S71	170	("4641317" "4743906" "4813057" "4979186" "5345471" "5351053" "5363108" "5523760" "5533046"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 11:53

		"5583892" "5589838" "5677927" "5687169" "5832035" "5901172" "6003092" "6026125" "6054950").PN. OR ("605032").URPN.				
S72	193	("3150372" "5317323" "5506587" "5510800" "5661490" "5661492" "5748147").PN. OR ("6054950").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 11:55
S73	39	("5677927" "5768306" "6128331" "6154483" "6351246" "6493360" "6505032" "6603818" "6650693" "6700939" "6735238").PN. OR ("7079604").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 12:55
S74	23	("20020191568" "20030227961" "20030232612" "20040097204" "20040141559" "20070183535" "5648983" "6215814" "6266365" "6442193" "6456647" "6570918" "6853689" "6856646" "7079604" "7116998" "7248622").PN. OR ("7356100").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 13:01
S75	0	((ultra adj broadband) adj (repeater relay))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 13:03
S76	0	((ultrabroadband) adj (repeater relay))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 13:03
S77	91	(((broadband) adj (repeater relay))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 13:03
S78	990	(((broadband) adj (relay gateway repeater extender booster))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 13:15
S79	1	2003-766291.NRAN.	DERWENT	OR	OFF	2016/10/16 13:18
S80	1027	(((broadband) adj (bridge relay gateway repeater extender booster))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 13:26
S81	7	("20030083013" "6497656" "6771933" "7046691" "7058414").PN. OR ("7436850").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 13:26

S82	11	("20030161279" "20040054905" "20050147071" "20050185669" "20050243787" "20070081505" "20090285189" "6497656" "7046716").PN. OR ("7907580").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 13:28
S83	87235	(controller processor) with (ignore filter) with (signal data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:29
S84	33512	S83 and (provision\$3 monitoring\$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:29
S85	3972	S84 and (ignore disregard) and (signal data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:30
S86	1416	S85 and (bridge relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:31
S87	1	2013-F51199.NRAN.	DERWENT	OR	OFF	2016/10/16 15:33
S88	3	"8923754".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:34
S89	3	"8331854".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:37
S90	6	"5012211".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:40
S91	547	transceiver with (unwanted undesired) with (signal data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	OFF	2016/10/16 15:43

			DERWENT; IBM_TDB			
S92	114	S91 and (bridge relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 15:44
S93	35	("20020039383" "20070041434" "4317217" "4383331" "4453039" "4701935" "4905290" "5091952" "5168459" "5259033" "5323459" "5450456" "5559833" "5680467" "5748751" "5835848" "6269165" "6385435" "6999594" "7035321" "7043203" "7346311" "7398053").PN. OR ("7627287").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 15:52
S94	81	("4383331" "4475243" "4952193").PN. OR ("5835848").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 15:55
S95	110	("3728733" "3731315" "4032922" "4041389" "4099036" "4189675" "4198600" "4246585" "4317217" "4318104" "4338605" "4352202" "4407001" "4446463" "4701935" "4727590" "4777652" "4789993" "4843402" "4849763" "4849963" "4879711" "4973971" "4980665" "4994813" "5019793" "5054120" "5086302" "5089823" "5115514" "5128687" "5241410" "5321412" "5349694" "5351060" "5392054" "5444864" "5463401" "5485170" "5486835" "5512906" "5587715" "5589843" "5600333" "5633647" "5663736" "5754138" "5754139" "5758287" "5767807" "5805113" "5832365" "5835848" "5856804" "5937332" "5943618" "5963847" "6029048" "6043790" "6049315" "6078787" "6125109" "6128471" "6128557" "6198460" "6256484" "6285878" "6348986").PN. OR ("6731904").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 15:58
S96	74	("2635233" "2786133" "4661993" "5023930" "5559806").PN. OR ("5832365").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 16:02
S97	262	("4198600" "4367458" "4509199" "4539706" "4713809" "4750036" "4794649" "4835604" "4930118" "5038342" "5040175" "5181200" "5276703" "5321542" "5325419" "5349463" "5388102" "5400327" "5440613" "5452291" "5463623" "5473602" "5509028" "5515378" "5553126" "5555258" "5563889" "5564121" "5579308" "5592470" "5598412" "5608449" "5613191" "5630204" "5636211" "5638371" "5642151" "5642353" "5678177" "5684801" "5697063" "5708961"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 16:07

		"5722041" "5726984" "5734643" "5742608" "5742640" "5745483" "5757792" "5771275" "5781856" "5784683" "5794116" "5796715" "5796727" "5805582" "5812541" "5812930" "5812933" "5815795" "5818512" "5818830" "5828658" "5832365" "5838226" "5845211" "5848054" "5850209" "5872784" "5873031" "5874903" "5875209" "5880721" "5880732" "5883884" "5886732" "5886989" "5892796" "5903293" "5903322" "5905719" "5907545" "5907794" "5915206" "5924022" "5930240" "5936949" "5936965" "5940387" "5940763" "5943046" "5943342" "5949790" "6038267" "6041065" "6097707" "6125109" "6377612").PN. OR ("6690657").URPN.				
S98	142	("20020028655" "20020038459" "20020046285" "20020059614" "20020061743" "20020068592" "20020071658" "20020072329" "20020106119" "20020115409" "20020152303" "20020154055" "20020181189" "20020188955" "20030054827" "20030079016" "20030124977" "20030139150" "20030181162" "20030181229" "20030199247" "20030207684" "20030216144" "20030231774" "20030234804" "20040034865" "20040094194" "20040110469" "20040121648" "20040125820" "20040203694" "20040204102" "20050286448" "20060098592" "20060183421" "4539706" "5058199" "5129096" "5222246" "5408679" "5509028" "5574979" "5608412" "5640386" "5654747" "5732076" "5742680" "5815146" "5870665" "5890055" "5915020" "5959592" "6009060" "6092117" "6132306" "6148142" "6160993" "6166703" "6188571" "6205185" "6263503" "6323909" "6334045" "6347216" "6397038" "6404775" "6412112" "6424817" "6430233" "6473858" "6584080" "6597891" "6600730" "6614768" "6650869" "6671186" "6684058" "6690657" "6690926" "6728541" "6741841" "6745050" "6757913" "6788882" "6811113" "6832071" "6836658" "6842617" "6845090" "6847625" "6850285" "6853197" "6856786" "6886029" "6925285" "6968153" "7072627" "7215660" "7289478" "7366178").PN. OR ("7567527").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 16:10
S99	1	"20060063484"	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 18:23

S100	35	("20020039383" "20070041434" "4317217" "4383331" "4453039" "4701935" "4905290" "5091952" "5168459" "5259033" "5323459" "5450456" "5559833" "5680467" "5748751" "5835848" "6269165" "6385435" "6999594" "7035321" "7043203" "7346311" "7398053").PN. OR ("7627287").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 18:27
S101	19	("4041389" "4704733" "4727590" "5179720" "6088592" "6731904").PN. OR ("6868254").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 18:45
S102	2493	(MI MO "adaptive antenna") with (bridge relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 20:51
S103	2415	(MI MO "adaptive antenna technology") with (bridge relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 20:51
S104	10	S103 and (self adj configurable)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 20:52
S105	8	("20080008126" "20080153431" "20090213765" "20090285147" "20110143658" "5880695" "7957702" "8331271").PN. OR ("8787214").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 20:52
S106	77	S103 and (autonomous)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 20:53
S107	3	"20050197121"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 20:59
S108	32	("20010049282" "20020147023" "5559865" "5577264" "5724660" "5815810" "5828958" "5835845" "5898922" "5926765" "5970408" "6097942" "6160804" "6272344" "6330446" "6424818" "6466785" "6466788" "6556831" "6646999" "6658250" "6707421" "6813501").PN. OR ("7072654").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 21:00

S109	1	"5634196".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 21:39
S110	1	"7962042".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 21:39
S111	359850	(Locat\$3 position) with (bridge relay gateway repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 21:52
S112	18279	(Locat\$3 position) with (bridge relay gateway repeater extender booster) with (nodes devices)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 21:53
S113	2710	(Locat\$3 position) with (bridge relay gateway repeater extender booster) with (proximity)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 21:53
S114	201	(Locat\$3 position) with (bridge relay gateway repeater extender booster) with (proximity) with (nodes devices)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 21:54
S115	480	((node device user) adj (ID idenyfier)) with (bridge relay gateway repeater extender booster) with (wireless cellular RF radio mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 22:11
S116	1258	((node device user) adj (ID identifier)) with (bridge relay gateway repeater extender booster) with (wireless cellular RF radio mobile)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 22:12
S117	2161	(MIMO "adaptive antenna technology") with (relay repeater extender booster)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/16 22:37
S118	9	("20020085643" "20050054318" "20050130587" "20060035605" "20070010196" "20080279135" "20090209212" "6466766").PN. OR ("8032080").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2016/10/16 22:44

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S124	298	("self configurable" autonomous) same (relay repeater) same (controller processor)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2016/10/17 00:15
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✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant			☐ CPA			☐ T.D.			☐ R.1.47		
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☐ Claims renumbered in the same order as presented by applicant		☐ CPA		☐ T.D.		☐ R.1.47			
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Final	Original	10/17/2016							
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CONFIRMATION NO. 3686

SERIAL NUMBER 14/540,773	FILING or 371(c) DATE 11/13/2014 RULE	CLASS 370	GROUP ART UNIT 2464	ATTORNEY DOCKET NO. 08610001C7	
APPLICANTS INVENTORS Theodore S. Rappaport, Riner, VA; ** CONTINUING DATA ***** This application is a CON of 13/676,207 11/14/2012 PAT 8923754 * which is a CON of 13/157,789 06/10/2011 PAT 8331854 which is a CON of 12/689,052 01/18/2010 PAT 7983613 which is a CON of 10/919,515 08/17/2004 PAT 7676194 which claims benefit of 60/498,324 08/28/2003 and claims benefit of 60/496,913 08/22/2003 (*)Data provided by applicant is not consistent with PTO records. ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** ** SMALL ENTITY ** 11/28/2014					
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and /DEWANDA A SAMUEL/ Acknowledged Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY VA	SHEETS DRAWINGS 6	TOTAL CLAIMS 65	INDEPENDENT CLAIMS 2
ADDRESS WHITHAM, CURTIS & COOK, P.C. 11491 SUNSET HILLS ROAD SUITE 340 RESTON, VA 20190 UNITED STATES					
TITLE Intelligent broadband relay for wireless networks for connectivity to mobile or portable devices					
FILING FEE RECEIVED 2530	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	3	8073458	B2	2011-12-06	Chang et al.	
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18	8532686	B2	2013-09-10	Schmidt et al.	
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	24	8755830	B2	2014-06-17	Roberts et al.	
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	26	8804680	B2	2014-08-12	Schmidt et al.	
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	32	8175191	B2	2012-05-08	Tang et al.	
	33	7945215	B2	2011-05-17	Adaptrum INC.	
	34	7289813	B2	2007-10-30	Karaoguz	
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	38	5012211	A	1991-04-30	Hughes Aircraft Co.	
	39	4626845	A	1986-12-02	Epic Systems INC.	
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	41	6952456	B1	2005-10-04	Pulse Link INC.	

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	2	20020093928	A1	2002-07-18	Motorola INC.	

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**INFORMATION DISCLOSURE
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(Not for submission under 37 CFR 1.99)

Application Number	14540773
Filing Date	2014-11-13
First Named Inventor	Rappaport
Art Unit	2649
Examiner Name	
Attorney Docket Number	08610001C7

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4	5208138	JP	B2	2013-06-12	Spectrum Bridge INC.	☐
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	1	E. H. DRUCKER, "Development and Application of a Cellular Repeater," Proceedings of IEEE Vehicular Technology Conference, June 1988, pages 321-325.	☐
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Name/Print	Michael E. Whitham	Registration Number	32635

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	Examiner DEWANDA SAMUEL	Art Unit 2464

CPC- SEARCHED		
Symbol	Date	Examiner
H04B1/7163;H04B3/40	10/17/2016	DSamuel

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
("self configurable" autonomous) same (relay repeater) same (controller processor)	10/17/2016	DSamuel
(MIMO "adaptive antenna technology") with (relay repeater extender booster)	10/16/2016	DSamuel
transceiver with (unwanted undesired) with (signal data)	10/16/2016	DSamuel

INTERFERENCE SEARCH			
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/540,773	11/13/2014	Theodore S. Rappaport	08610001C7

CONFIRMATION NO. 3686

PUBLICATION NOTICE



OC00000073920511

30743
WHITHAM, CURTIS & CHRISTOFFERSON & COOK, P.C.
11491 SUNSET HILLS ROAD
SUITE 340
RESTON, VA 20190

Title:Intelligent broadband relay for wireless networks for connectivity to mobile or portable devices

Publication No.US-2015-0071164-A1

Publication Date:03/12/2015

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	Filing Date		2014-11-13
	First Named Inventor	Rappaport	
	Art Unit	2649	
	Examiner Name		
	Attorney Docket Number	08610001C7	

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	1	7958041	B2	2011-06-07	Spectrum Bridge INC.	
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STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		14540773
Filing Date		2014-11-13
First Named Inventor	Rappaport	
Art Unit		2649
Examiner Name		
Attorney Docket Number		08610001C7

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STATEMENT BY APPLICANT**
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Application Number	14540773
Filing Date	2014-11-13
First Named Inventor	Rappaport
Art Unit	2649
Examiner Name	
Attorney Docket Number	08610001C7

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² i	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	2476773	GB	A	2011-07-06	Spectrum Bridge INC.		☐
	2	2483183	GB	A	2012-02-29	Spectrum Bridge INC.		☐

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	14540773
Filing Date	2014-11-13
First Named Inventor	Rappaport
Art Unit	2649
Examiner Name	
Attorney Docket Number	08610001C7

3	2491319	GB	A	2012-11-28	Spectrum Bridge INC.		☐
4	5208138	JP	B2	2013-06-12	Spectrum Bridge INC.		☐
5	5576521	JP	B2	2014-08-20	Spectrum Bridge INC.		☐
6	2008222837	AU	A1	2008-09-12	Anansi Networks INC.		☐

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NON-PATENT LITERATURE DOCUMENTS

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	E. H. DRUCKER, "Development and Application of a Cellular Repeater," Proceedings of IEEE Vehicular Technology Conference, June 1988, pages 321-325.	☐
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STATEMENT BY APPLICANT**
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Application Number	14540773
Filing Date	2014-11-13
First Named Inventor	Rappaport
Art Unit	2649
Examiner Name	
Attorney Docket Number	08610001C7

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Filing Date	2014-11-13
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Examiner Name	
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Application Number		14540773
Filing Date		2014-11-13
First Named Inventor	Rappaport	
Art Unit	2649	
Examiner Name		
Attorney Docket Number	08610001C7	

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STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	14540773
Filing Date	2014-11-13
First Named Inventor	Rappaport
Art Unit	2649
Examiner Name	
Attorney Docket Number	08610001C7

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Michael E. Whitham/	Date (YYYY-MM-DD)	2015-01-07
Name/Print	Michael E. Whitham	Registration Number	32635

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(21) Application No: 1119779.5
(22) Date of Filing: 02.04.2010
Date Lodged: 16.11.2011
(30) Priority Data:
(31) 12423094 (32) 14.04.2009 (33) US
(86) International Application Data:
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(87) International Publication Data:
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H04W 72/00 (2009.01) H04H 20/42 (2008.01)
H04H 20/72 (2008.01) H04W 16/14 (2009.01)
H04W 72/04 (2009.01)
(56) Documents Cited by ISA:
US 5729531 A US 20080221951 A1
(58) Field of Search by ISA:
INT CL H04W
Other: USPC 455/450, 454

(71) Applicant(s):
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(72) Inventor(s):
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(74) Agent and/or Address for Service:
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40-43 Chancery Lane, LONDON, WC2A 1JA,
United Kingdom

(54) Title of the Invention: **System and method for managing spectrum allocation**
Abstract Title: **System and method for managing spectrum allocation**

(57) A registration system for secondary radio systems that use spectrum that is interleaved with spectrum used by primary radio systems may include an interface to communicate with the secondary radio systems over a network. The registration system also may receive a registration request from a requesting one of the secondary radio systems and generate a spectrum certificate for the requesting secondary radio system. The spectrum certificate may contain a channel map identifying available channels that may be used for wireless communications activity of the requesting secondary radio system and may contain, for each available channel, a guidance indicator that identifies relative channel desirability to the requesting secondary radio system.

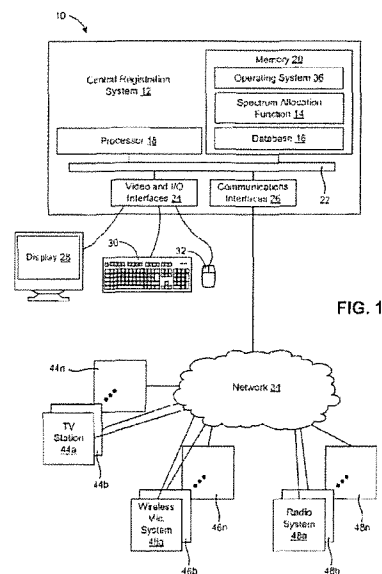


FIG. 1

GB 2483183 A

(21) Application No: 1217013.0
(22) Date of Filing: 16.02.2011
Date Lodged: 24.09.2012
(30) Priority Data:
(31) 12709557 (32) 22.02.2010 (33) US
(86) International Application Data:
PCT/US2011/024984 En 16.02.2011
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(51) INT CL:
H04W 16/14 (2009.01) H04W 72/04 (2009.01)
(56) Documents Cited by ISA:
US2008/108365 A1
US2009/0131014 A1
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US2008/0268892 A1
US2006/0160543 A1
US2009/0312028 A1
(58) Field of Search by ISA:
INT CL H04Q, H04W

(71) Applicant(s):
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(72) Inventor(s):
Peter Stanforth

(74) Agent and/or Address for Service:
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8th Floor, 140 London Wall, LONDON, EC2Y 5DN,
United Kingdom

(54) Title of the Invention: **System and method for spectrum sharing among plural wireless radio networks**
Abstract Title: **System and method for spectrum sharing among plural wireless radio networks**

(57) Spectrum that overlaps in time, geography and frequency is allocated to more than one radio network. The networks share the spectrum by employing spectrum sharing in accordance with spectrum sharing control data to avoid collisions between the transmissions of the networks.

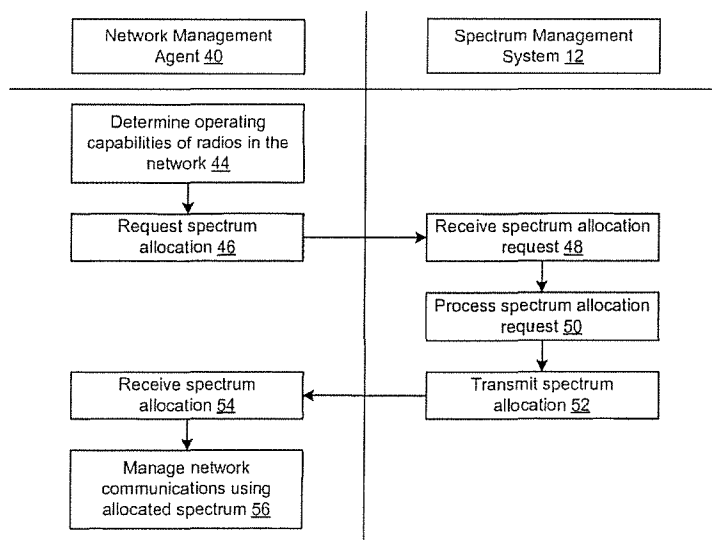


FIG. 2

GB 2491319 A

(19) 日本国特許庁(JP)

(12) 公開特許公報(A)

(11) 特許出願公開番号

特開2013-145564

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(43) 公開日 平成25年7月25日(2013.7.25)

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	G06Q 30/06 110Z	

審査請求 有 請求項の数 16 O L 外国語出願 (全 59 頁)

(21) 出願番号	特願2013-30373 (P2013-30373)	(71) 出願人	509249748
(22) 出願日	平成25年2月19日 (2013.2.19)		スペクトラム ブリッジ, インコーポレ
(62) 分割の表示	特願2009-552849 (P2009-552849)		イテッド
原出願日	平成20年3月5日 (2008.3.5)		アメリカ合衆国 フロリダ州 32746
(31) 優先権主張番号	60/893, 221		, レイク メアリー, グリーンウッド
(32) 優先日	平成19年3月6日 (2007.3.6)		ブルバード 1064, スイート
(33) 優先権主張国	米国 (US)	(74) 代理人	100076428
(31) 優先権主張番号	60/941, 863		弁理士 大塚 康徳
(32) 優先日	平成19年6月4日 (2007.6.4)	(74) 代理人	100112508
(33) 優先権主張国	米国 (US)		弁理士 高柳 司郎
		(74) 代理人	100115071
			弁理士 大塚 康弘
		(74) 代理人	100116894
			弁理士 木村 秀二

最終頁に続く

(54) 【発明の名称】 スペクトル管理のシステム及び方法

(57) 【要約】 (修正有)

【課題】 スペクトル使用権が1つのグループから別のグループに一時的に譲渡される方法を改善する。

【解決手段】 システム100は、1つ以上のスペクトルユーザシステム102、1つ以上のスペクトル保有者システム104及びスペクトルブローカシステム106を含む。ブローカシステム106は、スペクトルユーザシステム102のスペクトル使用要求とスペクトル保有者システム104の使用可能なスペクトルとをマッチングさせる。

【選択図】 図10

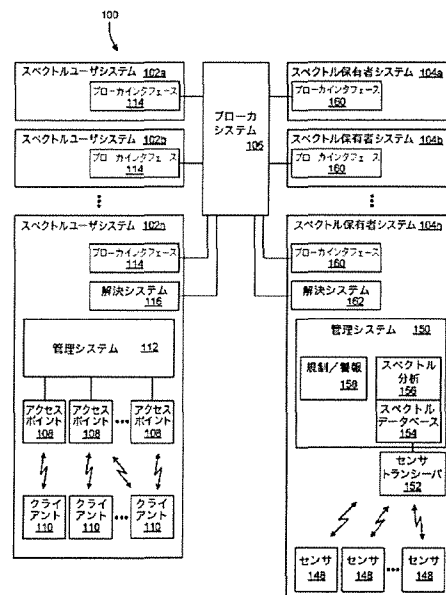


FIG. 10

(19) AUSTRALIAN PATENT OFFICE

(54) Title
System and method for spectrum management

(51)⁶ International Patent Classification(s)
G06Q 50/00 20060101AFI2008102
(2006.01) 3BHUS
G06Q 50/00 PCT/US2008/055861

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60/893,221	2007.03.06	US
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(43) Publication Date : 2008.09.12

(71) Applicant(s)
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(74) Agent/Attorney
Griffith Hack, Level 29, Northpoint 100 Miller Street, North Sydney, NSW, 2060

Electronic Acknowledgement Receipt

EFS ID:	21164471
Application Number:	14540773
International Application Number:	
Confirmation Number:	3686
Title of Invention:	Intelligent broadband relay for wireless networks for connectivity to mobile or portable devices
First Named Inventor/Applicant Name:	Theodore S. Rappaport
Customer Number:	30743
Filer:	Michael E. Whitham/Jarod Handler
Filer Authorized By:	Michael E. Whitham
Attorney Docket Number:	08610001C7
Receipt Date:	09-JAN-2015
Filing Date:	13-NOV-2014
Time Stamp:	10:05:54
Application Type:	Utility under 35 USC 111(a)

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Warnings:					
Information:					
3	Foreign Reference	08610001C8_forref1.pdf	39811	no	1
			7e7981b19f96c4eee2e5484c12de8c7bd0f4b330		
Warnings:					
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4	Foreign Reference	08610001C8_forref2.pdf	33032	no	1
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5	Foreign Reference	08610001C8_forref3.pdf	38333	no	1
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6	Foreign Reference	08610001C8_forref4.pdf	43267	no	1
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Warnings:					
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National Stage of an International Application under 35 U.S.C. 371

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New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of
Rappaport

Confirmation No.: 3686

Serial No.: 14/540,773

Group Art Unit: 2649

Filed: Concurrently

Examiner: not assigned

For: BROADBAND REPEATER WITH SECURITY FOR ULTRAWIDEBAND
TECHNOLOGIES

INFORMATION DISCLOSURE STATEMENT

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P.O. Box 1450
Alexandria 22313-1450

Sir:

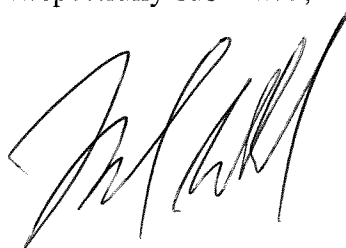
Under the provisions of 37 C.F.R. 1.97 through 1.99 and pursuant to applicant's duty of disclosure under 37 C.F.R. 1.56, applicant respectfully brings the following documents, listed on the attached form PTO/SB/08a, to the attention of the Examiner in charge of the above-identified application. The references cited in the attached PTO/SB/08a are readily available to the Examiner in co-pending U.S. Application Ser. No 13/676,246, filed on November 14, 2012, U.S. Application Ser. No. 13/157,789, filed on June 10, 2011, now USP 8,337,854 issued December 11, 2012, U.S. Application Ser. No. 12/689,052, filed on January 18, 2010, now USP 7,983,613 issued July 19, 2011, and U.S. Application Ser. No. 10/919,515, filed on August 17, 2004, now USP 7,676,194 issued March 9, 2010.

Thus, according to the rules of practice, these references are not provided herein, but are listed on the PTO/SB/08a form and should be considered by the Examiner. If the Examiner is unable to obtain the listed references, applicant will gladly provide such references upon notification by the Examiner in charge of the examination of the above-identified application.

These citations do not constitute an admission that the references are relevant or material to the claims. They are only cited as constituting related art of which the applicant is aware.

It is respectfully requested that the listed references be considered by the Examiner and formally made of record in this application.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'M. Whitham', with a stylized, cursive script.

Michael E. Whitham

Registration No.: 32,635

Date: January 8, 2015

Whitham, Curtis, Christofferson & Cook, PC

11491 Sunset Hills Road - #340

Reston, VA 20190

703/787-94000

Customer No. 30743



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
14/540,773	11/13/2014	2649	2530	08610001C5	65	2

CONFIRMATION NO. 3686

30743

WHITHAM, CURTIS & CHRISTOFFERSON & COOK, P.C.
11491 SUNSET HILLS ROAD
SUITE 340
RESTON, VA 20190

FILING RECEIPT



Date Mailed: 12/01/2014

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Theodore S. Rappaport, Riner, VA;

Applicant(s)

Theodore S. Rappaport, Riner, VA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 13/676,207 11/14/2012 *
which is a CON of 13/157,789 06/10/2011 PAT 8331854
which is a CON of 12/689,052 01/18/2010 PAT 7983613
which is a CON of 10/919,515 08/17/2004 PAT 7676194
which claims benefit of 60/498,324 08/28/2003
and claims benefit of 60/496,913 08/22/2003

(*)Data provided by applicant is not consistent with PTO records.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 11/28/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/540,773**

Projected Publication Date: 03/12/2015

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

Intelligent broadband relay for wireless networks for connectivity to mobile or portable devices

Preliminary Class

455

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 14/540,773	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(j))	65	minus 20 = *	45	x 40 =	1800		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3 = *		x 210 =	0.00		
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				0.00		
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					0.00		
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL	2530
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =		x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =		x =
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
				TOTAL ADD'L FEE		TOTAL ADD'L FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =		x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =		x =
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
				TOTAL ADD'L FEE		TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.							

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of

Theodore Rappaport

Conf. No.: 3686

App. No.: 14/540,773

Group Art Unit: Not assigned

Filed: November 13, 2014

Examiner: Not assigned

For BROADBAND REPEATER WITH SECURITY FOR
ULTRA WIDEBAND TECHNOLOGIES

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Sir:

Prior to proceeding to examination on the merits, please amend the above-identified patent application as follows:

Amendments to the Specification: begin on page 2.

Amendments to the Claims: No amendments to the claims are made by this Amendment.

Remarks: begin on page 3.

Amendments to the Specification:

Please amend the specification as follows:

Amend the title at page 1 lines 1-2 of the specification as follows:

~~BROADBAND REPEATER WITH SECURITY FOR ULTRAWIDEBAND TECHNOLOGIES~~
INTELLIGENT BROADBAND RELAY FOR WIRELESS NETWORKS FOR
CONNECTIVITY TO MOBILE OR PORTABLE DEVICES

Amend the section of “Cross-Reference to Related Applications” provided at page 1 lines 6-10 as follows:

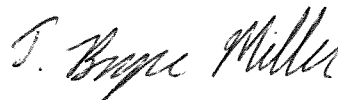
This application is a continuation application of U.S. App. No. 13/676,207 filed Nov. 14, 2012, which is a continuation of U.S. App. No. 13/157,789 filed Jun. 10, 2011, now U.S. Pat. No. 8,331,854, which is a continuation of U.S. App. No. 12/689,052 filed Jan. 18, 2010, now U.S. Pat. No. 7,983,613, which is a continuation of U.S. App. No. 10/919,515 filed Aug. 17, 2004, now U.S. Pat. No. 7,676,194, and ~~This application~~ claims priority to U.S. Provisional Application 60/496,913 filed August 22, 2003, and U.S. Provisional Application 60/498,324 filed August 28, 2003, and the complete contents of both provisional applications [[is]] are herein incorporated by reference.

REMARKS

The title and Cross-Reference to Related Applications have been updated. No new matter has been introduced.

A provisional petition is hereby made for any extension of time necessary for the continued pendency during the life of this application. Please charge any fees for such provisional petition and any deficiencies in fees and credit any overpayment of fees for the petition or for entry of this amendment to Attorney's Deposit Account No. 50-2041.

Respectfully submitted,

A handwritten signature in cursive script, reading "T. Bryce Miller".

T. Bryce Miller
Reg. No. 72,545

Whitman, Curtis, Christofferson and Cook, P.C.
11491 Sunset Hills Road, Suite 340

Reston, VA 20190
Tel. (703) 787-9400
Fax. (703) 787-7557

Customer Number 30743

Electronic Acknowledgement Receipt

EFS ID:	20697004
Application Number:	14540773
International Application Number:	
Confirmation Number:	3686
Title of Invention:	Broadband Repeater with Security for Ultrawideband Technologies
First Named Inventor/Applicant Name:	Theodore S. Rappaport
Customer Number:	30743
Filer:	Timothy Bryce Miller
Filer Authorized By:	
Attorney Docket Number:	0861000C7
Receipt Date:	14-NOV-2014
Filing Date:	
Time Stamp:	11:08:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		08610001C7_prelimAmend_2014-11-14.pdf	67285 f5ece148ee76725ed5957eec3eb424ed0e7f6ec5	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Preliminary Amendment	1	1
	Specification	2	2
	Applicant Arguments/Remarks Made in an Amendment	3	3
Warnings:			
Information:			
Total Files Size (in bytes):		67285	
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.			

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/540,773	Filing Date 11/13/2014	☐ To be Mailed
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ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	11/13/2014	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 65	Minus	** 65	= 0	X \$40 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X \$210 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
TOTAL ADD'L FEE						0	

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	11/14/2014	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 65	Minus	** 65	= 0	X \$40 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	X \$210 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
TOTAL ADD'L FEE						0	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/TAMMY L. ACREE/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995 no persons are required to respond to a collection of information unless it displays a valid OMB control number

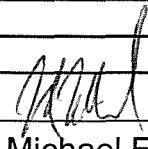
UTILITY PATENT APPLICATION TRANSMITTAL <i>(Only for new nonprovisional applications under 37 CFR 1.53(b))</i>	Attorney Docket No.	08610001C7
	First Named Inventor	Theodore S. Rappaport
	Title	Broadband Repeater with Security for Ultrawideband Technologies
	Express Mail Label No.	

APPLICATION ELEMENTS <i>See MPEP chapter 600 concerning utility patent application contents.</i>	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450
☒ Fee Transmittal Form (PTO/SB/17 or equivalent) ☒ Applicant asserts small entity status. See 37 CFR 1.27 ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent. ☒ Specification [Total Pages <u>46</u>] Both the claims and abstract must start on a new page. (See MPEP § 608.01(a) for information on the preferred arrangement) ☐ Drawing(s) (35 U.S.C. 113) [Total Sheets <u>6</u>] ☐ Inventor's Oath or Declaration [Total Pages <u>1</u>] (including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e)) ☐ Newly executed (original or copy) ☐ A copy from a prior application (37 CFR 1.63(d)) ☒ Application Data Sheet * See note below. See 37 CFR 1.76 (PTO/AIA/14 or equivalent) ☐ CD-ROM or CD-R in duplicate, large table, or Computer Program (Appendix) ☐ Landscape Table on CD ☐ Nucleotide and/or Amino Acid Sequence Submission (if applicable, items a. – c. are required) ☐ Computer Readable Form (CRF) ☐ Specification Sequence Listing on: ☐ CD-ROM or CD-R (2 copies); or ☐ Paper ☐ Statements verifying identity of above copies	ACCOMPANYING APPLICATION PAPERS ☐ Assignment Papers (cover sheet & document(s)) Name of Assignee _____ ☐ 37 CFR 3.73(c) Statement ☐ Power of Attorney (when there is an assignee) ☐ English Translation Document (if applicable) ☐ Information Disclosure Statement (PTO/SB/08 or PTO-1449) ☐ Copies of citations attached ☒ Preliminary Amendment ☐ Return Receipt Postcard (MPEP § 503) (Should be specifically itemized) ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) ☐ Nonpublication Request Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent. ☐ Other: _____

***Note:** (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 must be included in an Application Data Sheet (ADS).
 (2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

☒ The address associated with Customer Number: 30743 OR ☐ Correspondence address below

Name					
Address					
City	State	Zip Code			
Country	Telephone	Email			
Signature			Date	<u>11/13/14</u>	
Name (Print/Type)	Michael E. Whitham		Registration No. (Attorney/Agent)	32635	

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Under the Paperwork Reduction Act of 1995 no persons are required to respond to a collection of information unless it displays a valid OMB control number

FEE TRANSMITTAL

Complete if known

☒ Applicant asserts small entity status. See 37 CFR 1.27. ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.	Application Number	
	Filing Date	
	First Named Inventor	Theodore S. Rappaport
	Examiner Name	
	Art Unit	
TOTAL AMOUNT OF PAYMENT	(\$)	2530.00
	Practitioner Docket No.	08610001C7

METHOD OF PAYMENT (check all that apply)
☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☒ Deposit Account Deposit Account Number: 502041 Deposit Account Name: Whitham Curtis Christofferson & Cook, PC

For the above-identified deposit account, the Director is hereby authorized to (check all that apply):

☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee

☐ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayment of fee(s)
WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES** (U = undiscounted fee; S = small entity fee; M = micro entity fee)

Application Type	FILING FEES			SEARCH FEES			EXAMINATION FEES			Fees Paid (\$)
	U (\$)	S (\$)	M (\$)	U (\$)	S (\$)	M (\$)	U (\$)	S (\$)	M (\$)	
Utility	280	140*	70	600	300	150	720	360	180	730
Design	180	90	45	120	60	30	460	230	115	
Plant	180	90	45	380	190	95	580	290	145	
Reissue	280	140	70	600	300	150	2,160	1,080	540	
Provisional	260	130	65	0	0	0	0	0	0	

* The \$140 small entity status filing fee for a utility application is further reduced to \$70 for a small entity status applicant who files the application via EFS-Web.

2. EXCESS CLAIM FEES

Fee Description	Undiscounted Fee (\$)	Small Entity Fee (\$)	Micro Entity Fee (\$)
Each claim over 20 (including Reissues)	80	40	20
Each independent claim over 3 (including Reissues)	420	210	105
Multiple dependent claims	780	390	195
Total Claims			
65 - 20 or HP = 45 x 40 = 1800			
HP = highest number of total claims paid for, if greater than 20.			
Indep. Claims			
2 - 3 or HP = 0 x =			
HP = highest number of independent claims paid for, if greater than 3.			

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$400 (\$200 for small entity) (\$100 for micro entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
- 100 =	/ 50 =	(round up to a whole number) x	=	

4. OTHER FEE(S)

Non-English specification, \$130 fee (no small or micro entity discount)

Non-electronic filing fee under 37 CFR 1.16(t) for a utility application, \$400 fee (\$200 small or micro entity)

Other (e.g., late filing surcharge):

SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 32635	Telephone 703/787-9400
Name (Print/Type)	Michael E. Whitham	Date	11/13/14

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	08610001C: 7
		Application Number	
Title of Invention	BROADBAND REPEATER WITH SECURITY FOR ULTRAWIDEBAND TECHNOLOGIES		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--

Inventor Information:

Inventor 1 Remove				
Legal Name				
Prefix	Given Name	Middle Name	Family Name	Suffix
Dr.	Theodore	S.	Rappaport	
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service				
City	Riner	State/Province	VA	Country of Residence US
Mailing Address of Inventor:				
Address 1	P.O. Box 888			
Address 2				
City	Riner	State/Province	VA	
Postal Code	24149	Country i	US	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add				

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).	
☐ An Address is being provided for the correspondence information of this application.	
Customer Number	30743
Email Address	action@wcc-ip.com Add Email Remove Email

Application Information:

Title of the Invention	BROADBAND REPEATER WITH SECURITY FOR ULTRAWIDEBAND TECHNOLOGIES		
Attorney Docket Number	08610001C5	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	6	Suggested Figure for Publication (if any)	Samung Ex. 1004

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	08610001C. 7
		Application Number	
Title of Invention	BROADBAND REPEATER WITH SECURITY FOR ULTRAWIDEBAND TECHNOLOGIES		

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	30743		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the application number blank.

Prior Application Status	Pending	Remove			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
	Continuation of	13676207	2013-11-14		
Prior Application Status	Patented	Remove			
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13676207	Continuation of	13157789	2011-06-10	8331854	2013-12-11
Prior Application Status	Patented	Remove			

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	08610001C-7
		Application Number	
Title of Invention	BROADBAND REPEATER WITH SECURITY FOR ULTRAWIDEBAND TECHNOLOGIES		

13157789	Continuation of	12689052	2010-01-18	7983613	2011-06-19
Prior Application Status		Patented	Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
12689052	Continuation of	10919515	2004-08-17	7676194	2010-03-09
Prior Application Status		Expired	Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
10919515	non provisional of	60498324	2003-08-28		
Prior Application Status		Expired	Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)		
10919515	non provisional of	60496913	2003-08-22		

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

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Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	08610001C ~~7~~
		Application Number	
Title of Invention	BROADBAND REPEATER WITH SECURITY FOR ULTRAWIDEBAND TECHNOLOGIES		

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices
If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application. In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application. In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	08610001C7
		Application Number	
Title of Invention	BROADBAND REPEATER WITH SECURITY FOR ULTRAWIDEBAND TECHNOLOGIES		

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

- ☐ Assignee
 ☐ Legal Representative under 35 U.S.C. 117
☐ Person to whom the inventor is obligated to assign.
 ☐ Person who shows sufficient proprietary interest

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Assignee is an Organization check here. ☐

Prefix	Given Name	Middle Name	Family Name	Suffix

Mailing Address Information:

Address 1			
Address 2			
City		State/Province	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

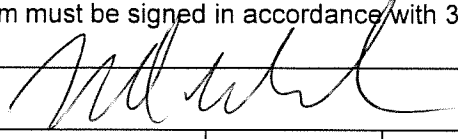
Application Data Sheet 37 CFR 1.76		Attorney Docket Number	08610001C:7
		Application Number	
Title of Invention	BROADBAND REPEATER WITH SECURITY FOR ULTRAWIDEBAND TECHNOLOGIES		

Assignee Information including Non-Applicant Assignee Information:

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If the Assignee or Non-Applicant Assignee is an Organization check here. ☐				
Prefix	Given Name	Middle Name	Family Name	Suffix
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1				
Address 2				
City		State/Province		
Country i		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.				

Signature:

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Signature				Date (YYYY-MM-DD)	2014-11-14
First Name	Michael E.	Last Name	Whitham	Registration Number	32635
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BROADBAND REPEATER WITH SECURITY FOR
ULTRAWIDEBAND TECHNOLOGIES

CROSS-REFERENCE TO RELATED APPLICATIONS

5 This application claims priority to U.S. Provisional
Application 60/496,913 filed August 22, 2003, and U.S.
Provisional Application 60/498,324 filed August 28, 2003, and
the complete contents of both applications is herein
10 incorporated by reference.

DESCRIPTION

BACKGROUND OF THE INVENTION

15 *Field of the Invention*

The present invention generally relates to electronic
signal and data repeaters and, more particularly, to a repeater
20 to be used in conjunction with ultrawideband technologies.

Background Description

In the coming years, ultrawideband (UWB) transmission
25 technologies will dominate high data rate communications in the
last 10 - 1000 meters of wireless/portable access to a
telecommunications grid. With the huge data rates and position
location capabilities afforded by UWB, offices, homes, and
small environments such as doctors offices, vehicles, or small
30 buildings will rely on UWB communication devices for
connections between consumer electronic devices and computer
devices.

As UWB devices proliferate, it will be possible to
provide immense data rates, at burst rates up to 480 Megabits
35 per second and even greater, in order to create a wireless
Universal Serial Bus (USB) capability or home/enterprise
networking capability. This will allow cameras, cellphones,
computers, and computer and home entertainment and video

systems to have very good and fast data rate transmissions in small (say 10 to 50 feet or greater) distances. The great data rates of UWB will open up an entire new world of high speed personal area networks which currently does not exist.

- 5 Companies such as Time Domain, Xtreme Spectrum Inc, Motorola, Intel and Texas Instruments, are likely to be leading manufacturers or developers of products for UWB communications.

In typical doctors offices, homes, apartment buildings, and large warehouses and store rooms, etc, today there are
10 Wireless (WiFi) access points that can be connected to the ethernet backbone in order to provide WLAN access and internet access to computer platforms. The backbone medium is typically Cat-3 or Cat-5 cabling that has 10baseT, 100baseT or 1 GHz ethernet signaling, and higher. In the future, this backbone
15 may be wireless, for example, where cable companies or telephone/wireless/internet service providers may use mesh networks, WiMax, or last mile MIMO modem devices that bring broadband video, audio, and data/internet traffic to homes from lampposts or street corners. Satellite radio and fiber cable
20 are also viable methods of delivering the backbone plant to buildings and cars.

Today, the expense of the WiFi access points is on the order of one to several hundred dollars when the hardware and installation is factored in. These access points provide the
25 ability of multiple WLAN users (typically computer or PDA users) to gain portable access the internet, and hot spots such as those implemented by Schlotzskys Deli and Starbucks are becoming popular throughout the world. However, these WiFi access points are made to allow users to access the internet,
30 which is a different use and approach than is likely to emerge with UWB networks, which connect devices together in close-in

networks.

Ultrawideband technologies are about to become mainstream, and are described in US patent application 20030096578, published May 22, 2003, by John McCorkle, et. al. of Xtreme Spectrum, Inc., US Patent 6,505,032 (the patent publication and U.S. patent being herein incorporated by reference), as well as in "Recent Applications of Ultra Wideband Radar and Communications Systems", by Robert Fonatna of Multispectral Solutions, Inc. The IEEE 802.15.3 standards bodies have been developing Physical (PHY) and MAC layer standards for dynamic channel selection and repeater service for UWB, which falls under the general IEEE 802.15.3 standards body.

As explained in the powerpoint presentation by Nishant Kumar, of Virginia Tech's MPRG, as well as in the IEEE standards proceedings, the IEEE 802.15.3 MAC operation provides for repeater service request and repeater service grant commands. Devices use passive scanning to listen for beacon frames or for any nearby user device. If there are not nearby devices which are radiating, a device may establish its own piconet. There are a number of frame and superframe structures, and subsections which permit various types of access, such as contention based schemes using, for example, carrier sense multiple access (CSMA), as well as guaranteed time slots for asynchronous or isochronous data streams and management time slots.

While the MAC standard suggests repeater service to be used by IEEE 802.15.3 devices when the links between devices are not satisfactory, these types of links can only be established if there is sufficient time available in the channel seen by one of the devices which is involved in the

repeating operation. As proliferation of UWB devices is likely to be rapid, there is likely to be contention such that the current mode of MAC repeater operation, envisioned by the presently proposed 802.15.3 standard, is not adequate to
5 provide one or more of sufficient security, proper traffic filtering, bandwidth provisioning, network management features, or flexibility of networks that can be installed or controlled easily by a consumer. That is to say, the current repeater operation contemplated by 802.15.3 and proposed UWB devices is
10 based on the assumption that a single chip can perform necessary repeater functions, but this functionality alone will not be adequate for the rapid emergence of UWB and the onslaught of wireless data that is certain to occur.

Currently, IEEE 802.15.3a , the Ultrawideband Physical
15 Layer standard committee, is working on creating a standard that may either be Multiband OFDM transmission (MBOA), with 500 MHz channels, or a Direct Sequence Spread Spectrum impulse radio standard that has broader channel bandwidths (UWB Forum). Ratification of one or both of these standards may
20 occur by the end of 2004, as described in a recent paper submitted to High Frequency Electronics, coauthored by the present inventor.

The High-Tech article by Woz Ahmed and Bipin Parmar (the Chilli) provides a glimpse at the various activities in the
25 Ultrawideband standard bodies. Ultra-Wideband Technology was also discussed in the New Technology Bulletin in March 2001, Vol. 1, Issue 7, before the multiband OFDM proposal was created. In fact, Time Domain's Paul Withington presented the talk "Time Modulated Ultra-Wideband" to the Federal Wireless
30 User's Forum in May 2001. As described by Robert X. Cringely in his August 8, 2002 article, "Good News!", it was mentioned that

Xtreme Spectrum had already produced a working UWB chip capable of 100 megabits per second over 10 meters, and the article further explained the idea of mesh networking, which will provide efficient network paths that allow very high data rates across the internet for remote downloading of files.

In "Ultrawideband.ca Mesh Networking Explained", Ultrawideband.ca explains they have software that allows a user to install, on their PC, a MeshBoot disk which attempts to find internet gateways at particular Internet Protocol addresses using a DHCP client. If no gateway can be found, the software causes the users' PC to simply serve as a wireless repeater-cell. This type of operation is controlled by the software on the CD, and requires installation by the user. In future years, there are parallels that can be drawn between some of the features and functionality in the MeshBoot software for Internet use, and the capabilities that will be required to be embedded in network hardware, rather than provided on a CD for installation on PCs, in order to support massive amounts of traffic in and around homes and offices (Rather than on the world-wide web or internet).

Repeaters are well known in the art, and they have been manufactured for decades in the cellular and PCS industries, and more recently, a company in Melbourne FL, WiDeFi has developed WiFi repeaters for the IEEE 802.11a/b marketplace (See WiDeFi web pages describing their patent pending designs for range and bridge extension for Wireless LAN standards). Buffalo Technology announced a bridge and repeater product for IEEE 802.11g wireless LAN WiFi standard on June 17, 2003 (See SmallNet Builder website page), and indicated that its repeater provides point-to-point or 6 station point-to-multi-point operation. Buffalo indicated it had security features such as WiFi Protected Access (WPA), WEP, Password protection, and MAC address association control. It uses a browser based interface

for configuration, and has a 10/100 Ethernet LAN connection port, and sells for the suggested price of \$149. SMC Networks introduced, on June 6, 2003, its SMC2671W 2.4 GHz 11 Mbps Wireless Ethernet Adapter, which provides an interface between the wired internet backbone and the wireless LAN network. It also has wireless repeater capabilities for WLAN range extension, and has both Ad-Hoc (peer-to-peer) and Infrastructure (client to AP) operating modes, WEP encryption, WPA, MAC Address filtering, and SSID Broadcast Disable. It uses a web browser or Window-based administration software for configuration. Andrew Corporation makes classic PCS/Cellular repeaters, such as the fully integrated PROPAGATOR repeater shown on its webpage. The repeater uses standard 110VAC power and has a single package for all signal processing components. Qualcomm has recently developed repeater technology for CDMA.

SUMMARY OF THE INVENTION

This document describes a new type of wireless network device that will be required as wideband UWB devices proliferate rapidly. In anticipation of the increased traffic, ubiquity, security and bandwidth provisioning needs of future UWB devices, we disclose a low cost repeater/transceiver that is tailored for easy and rapid deployment to facilitate the interconnection of network devices using ultrawideband radio, which will likely be standardized by or before 2005. Ultrawideband is meant here to be any type of electromagnetic signals that have an instantaneous or overall occupied bandwidth of 100 MHz or more and that are used to communicate or to position-locate between 2 or more devices. Such wide bandwidths, when considered to have the same RF power transmitter levels as today's wireless devices, require receivers to be within much closer propagation distances than conventional cellular/PCS and WiFi networks, due to the fundamentals of the Power-Bandwidth product. That is, for a given RF transmit power level, a larger passband (e.g. RF

channel) bandwidth generally implies a proportionally higher noise floor power level, which requires UWB devices generally to be physically closer in distant to each other in order to obtain a sufficiently strong signal to noise ratio (SNR) when
5 compared to equal power devices with smaller passband bandwidths. Thus, repeaters will become necessary to connect devices over greater distances than the range of a single UWB device.

10 UWB adoption is likely to be rapid, and just as spam e-mail occurs today with increased frequency on the internet, wireless UWB devices will be subject to tremendous and increased amount of interference, spam traffic, and RF interferences, as well as security attacks by rouge or spoofed
15 message sources or unwanted transmitters. Proper repeater functionality will require the ability to detect and process such unwanted traffic in a personal or local area network, as well as to report back attempted breaches of security or interference sources to a network controller or host device
20 which is connected to the internet (for example, the home computer, the media center, game console, or a remotely located server or security server that may be in a different neighborhood or city but which is connected via Internet). The need to properly process, filter, ensure security, and provide
25 sufficient or prioritized bandwidth will also emerge because of - future wireless networks that will allow devices in the home or office to remain connected to the outdoor wireless network through roaming systems and protocols, as proposed by Dong-Ho Cho in US Patent Application 2002 0198977 Published December
30 26, 2002, and other networks such as those described by Rappaport in "Wireless Communications: Principles and Practice", 2/e, c. 2002 and the invited 50th anniversary paper by Rappaport, et. al., Wireless Communications: Past Events and

Future Perspectives, June 2002, IEEE Communications Magazine.

In future UWB applications in the home or office, it is likely that only one or two devices, such as a computer, a server, or a television set or game console, will need to be
5 connected to the ethernet/internet backbone (the plant that comes in to the home or office or car, etc.), while many other devices, such as home entertainment systems, telephones, portable computers, video monitors, and
display/video/audio/entertainment devices in the home or office
10 will be untethered within the same room or within several tens of meters of these "fixed" or stationary internet-connected devices. Of course, these fixed devices connected to the plant may also be portable or mobile, in fact, as wireless proliferates. In hospitals, hotels, or homes and offices and
15 businesses, the UWB technologies will open up an entirely new way of communicating high data rates, and will create entirely new architectures for communications within small spaces (e.g., homes, apartment buildings, cars, stores, offices, etc.). In vehicles, trains, aircraft, and other moving platforms, one can
20 envision a single or a few main devices connected to an outside wireless internet connection, while in the vehicle itself, piconets will be formed between UWB devices.

The invention described here is a low cost ultrawideband repeater device, which allows a home or office user to rapidly
25 deploy a repeater which can extend the range of these UWB piconets, so that a home or business owner does not have to install wiring such as Cat -5 cable throughout an office or home. Instead of wires which carry the internet traffic from today's cable or T1 or DSL jack to a particular device, the UWB
30 repeater invented here will allow just one or a handful of internet-connected devices to serve as the "internet source"

for a local wireless network, and the disclosed invention will better enable that "source" to serve as the local hub or access point for a whole host of portable or fixed UWB devices in a home or office.

5 It is thus the goals of the present invention to meet at least some or all of the following objectives, which are specified subsequently in this application:

 It is an object of the invention to provide a method and system that allows the Internet, Cable TV, satellite,
10 telephone, or other communications sources to be connected from the external wired or wireless plant and distributed by UWB radio within an indoor or in-vehicle environment.

 It is yet another object of the invention to provide a method and system that enables ultrawideband radio signals to
15 be repeated by a UWB radio device within an indoor or in-vehicle environment.

 It is yet another object of the invention to provide a method and system that enables ultrawideband radio signals and baseband signals carried on wires to be connected together in a
20 single device, while allowing UWB radio signals to be repeated in the RF spectrum and baseband signals to be routed on wires within an indoor or in-vehicle environment.

- It is yet another object of the invention to provide a method and system that provides the selective screening of data
25 received over UWB radio or baseband, where such selective screening of data is based upon the received UWB data or upon preprogrammed control instructions provided by the desired network or from a desired source.

It is yet another object of the invention to provide a method and system that provides the selective screening of data received over UWB radio or baseband, where such selective screening of data is based upon the received UWB data or upon
5 preprogrammed control instructions provided by the desired network or from a desired source.

It is yet another object of the invention to provide a method and system that provides the selective screening of data received over UWB radio or baseband, where such selective
10 screening of data ignores, rejects, or kills received UWB data that is from undesired networks or from undesired sources.

It is yet another object of the invention to provide a method and system that provides the selective modification of data received over UWB radio or baseband, and provides said
15 modified data for retransmission on UWB radio frequencies, or for storage.

It is yet another object of the invention to provide a method and system that ignores, rejects, or kills received UWB data that is from undesired networks or from undesired sources.

20 It is yet another object of the invention to provide a method and system that provides selective and adaptive priorities on UWB messages that are to be repeated or stored.

It is yet another object of the invention to provide a method and system of monitoring network traffic statistics over
25 a UWB network, and to report such statistics to a central host - controlling unit or to the plant.

It is yet another object of the invention to provide a method and system of maintaining a UWB network, through the periodic reporting of traffic conditions, user numbers, user
30 locations, statistics, interference levels, and IDs observed.

It is yet another object of the invention to provide a method and system that provides for flexible and adaptive data processing for real time detection, flexible transmission rates, different PHY and MAC implementations, adaptive ID or

watermark transmissions, transmissions pertaining to network quality, network activity, or security breaches, position location transmissions, or repeat or beacon transmission at preset intervals.

5 It is yet another object of the invention to provide a method and system that provides an adaptive UWB radio interface, depending on the priority of the message, or the instantaneous radio channel conditions, interference conditions, or undesired traffic in the network.

10 It is yet another object of the invention to provide a method and system that provides for the use of adaptable, steerable, electronic phasing, or MIMO (multiple-input multiple-output) antennas with UWB networks to improve wireless network performance.

15 BRIEF DESCRIPTION OF THE DRAWINGS

 The foregoing and other objects, aspects and advantages will be better understood from the following detailed description of the preferred embodiments of the invention with
20 reference to the drawings, in which:

 Figure 1 illustrates a Personal Area Network in a home, business, vehicle, or some other personal environment consisting of a host device and a number of portable devices,
25 each equipped with UWB technology.

 Figure 2 illustrates a Personal Area Network in a close-in space, consisting of a host device, a number of portable devices, all equipped with UWB technology, and the disclosed UWB repeater invention, as well as an undesired neighboring
30 transmitter.

 Figure 3 illustrates a block diagram of the UWB repeater.

Figure 4 illustrates another embodiment of the UWB repeater, using a more integrated approach with more reliance upon signal processing and software.

Figure 5 illustrates an architectural diagram of the UWB
5 repeater operation with security and filtering.

Figure 6 illustrates the UWB repeater using combined RF and baseband signaling capabilities.

Figure 7 illustrates a flow diagram of UWB repeater processing.

10 Figure 8 illustrates the current invention as embedded in an AC outlet.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

15 The Ultrawideband repeater disclosed here serves to "repeat" data signals coming from one or many devices so that other devices, located farther away from the "source" will be able to access the internet, Cable TV, Satellite source,
20 phone/DSL line, or other broadband "plant" source via the repeater. This will obviate the need for any wiring whatsoever in homes and offices, and will enable rapid deployment of networks that perform properly and adapt to traffic loading, spam, interference, and desired characteristics of the plant
25 provider of the network owner (e.g. home owner, enterprise owner, vehicle owner). The repeater will provide for additional coverage and will enable high data rate channels to work in confined environments more efficiently and more reliably than stock UWB equipment currently being offered by the marketplace.
30 The invention here offers advantages, flexibility, and improved performance and security than the currently proposed IEEE 802.15.3 activities which call for "repeater service" as part of the MAC definition.

The disclosed Ultrawideband repeater has the additional important and novel capabilities of being able to filter and process data, and to provide for the storage, processing, and forwarding of received data at the input, and also allows for the suppression or "killing" of data that is not part of the desired network or which may be from undesired users, spammers, or interference sources. Also, the ability of the device to prioritize traffic access and flows, based on application requirements, make this invention a powerful device used to enable high bandwidth personal area networks, where a number of wireless devices in a home or office or car all share the same UWB spectrum without requiring wiring, but which may have different real time requirements, different priorities and bandwidth requirements, and different security requirements. Thus, the intelligence of the repeater, afforded by processing, storage, and antenna/RF control is a marked improvement over what is currently contemplated or known.

The invention differs from prior art because, among a number of reasons, of the much greater bandwidth of UWB compared with current wireless devices, and the presently unforeseen challenges and unmet solutions that UWB will encounter because of the massive amounts of wireless traffic that will occur. The invented repeater and associated architecture solves a critical and unmet need for future high speed UWB networks, and provides needed network coverage, performance, security, filtering, addressability, configuration, and connectivity for a home or business or vehicle personal area network. The invention provides needed network infrastructure to provide coverage where only one or a few sources can be linked to the ethernet or another telecommunications backbone (e.g., a central server/hub, or a "plant", which may be an optical cable source, RF, coax, baseband, satellite signaling, etc.) At the same time, the disclosed invention provides embedded security and traffic intelligence, and the ability to interpret, modify, and selectively filter wireless traffic for the benefit of the network user. In addition, the disclosed invention works with both wireless UWB transmissions, as well as with standard

baseband wiring-types of data transmissions, allowing the invention to be addressable by and responsive to wired networks as well as the wireless networks. In fact, the present invention allows for the fusing of wireless and wired network components so that they may be commingled and served by a single plant or server, within the same network. Thus, the invention facilitates new capabilities in connecting UWB equipped devices through a repeater operation for many other devices that may exist in a room or office or building or vehicle. In this way, for example, a doctor's office complex would only need to have a single computer, say the receptionist's desk computer or a media center, which might be connected to the internet, cable TV, copper line, or satellite station, and this single computer could serve as the host computer or server to the office network. If this receptionist's desk computer or a media center is equipped with a UWB radio, and all other devices, for example, portable computers, pen tablets, gaming devices, video monitors, or Voice over IP portable communicator devices used in the office, were configured to be on the same network (piconet) as this desk computer, then our invention would allow coverage and data transmission throughout the entire office complex, rather than being limited in range to 10 or 20 feet as would be the case for a single point-to-point communication between 2 UWB devices. Wired network devices could also be connected and served on the same network, serviced by the same plant, using the disclosed invention. Also, at the same time, the described invention provides a low cost way of providing massive data transfers, with bandwidth prioritization and security, network monitoring, and "network learning" and spam filtering not currently available in today's wireless devices. Thus, the invention helps improve and facilitate wireless high speed networking, for both mobile/portable and fixed applications, in environments such as stores, homes, apartments, cars, and factories, etc. where broadband data communications between devices, and access to the plant by several networked devices is necessary.

Figure 1 shows the internet connection 10 coming into the

home or office, which may be data only, or analog voice and data, where this "backbone" connection may be provided using wires or fiber (such as T1, T3, DSL, cable, cable modem, OC3, etc.) or wireless (last mile wireless service, mesh networks, LMDS, MMDS, WiMax, Satellite, 802.16, 802.20, 802.11a/b/g, or some other wireless distribution mechanism, such as 802.15.3.a, etc.). Once in the home or office (or vehicle, etc.), a host device 12, such as personal computer or server, or building router (a personal computer, as an example, is shown in Figure 1) is connected to the backbone. The host device 12 is further equipped with a UWB transceiver 14, which may be integrated, stand alone, plug-in, or part of a multi-band, multi-mode radio that is either discrete or embedded within a microprocessor chip, or which is connected to, attachable to, insertable into, or integrated within the host device. Plug-in cards, discrete components, embedded devices and other such embodiments are contemplated. Once connected to the backbone internet and the UWB transceiver 14, the host device 12 is able to facilitate communication to other UWB devices in the home or office. For example, in Figure 1, provided that the distance is short enough and the local interference is low enough, it is possible for the UWB Transceiver on the host device to support meaningful communications to a UWB-equipped Portable Table computer 16, a UWB-equipped television set 18, a UWB-equipped telephone 20, and even a UWB-equipped wrist watch 22, as examples but not limitations to viable uses of UWB wireless technology for personal area networks. As explained in the prior art, UWB possess sufficiently high bandwidth that new services, such as ranging or position location are easily incorporated with high speed communications, and the current invention considers supporting the myriad of applications and implementations of UWB devices. Using the standards proposed in the IEEE 802.15.3 committees, it is known that it would be possible to configure Personal Area Networks such as shown in Figure 1 using UWB, all without wiring up the local area.

Note, however, from Figure 1, that the distances (d_1 , d_2 , d_3 , d_4) between devices vary, and the local environment may have walls or metal partitions that cause signals to decay or

fade (not shown). Thus, it is possible that the host device 12, which is typically (but not necessarily) fixed, may not be close enough to all locations where portable users of the UWB network which to operate from at a particular instant of time.

5 Furthermore, since the signal power falls off with distance, UWB transceivers that are further away from the host 12 will be more susceptible to interference from undesired users or noise sources (not shown), and will also be more susceptible to security breaches or spam attacks by undesired transmitters

10 (not shown). Battery life of portable devices will also be shorter for those which have to provide sufficient bandwidths over longer distances (higher power consumption).

Now consider Figure 2, where the same UWB network of Figure 1 now contains the invention, the UWB Repeater 24. With

15 placement of the UWB repeater 24, the distances between the host 12 and the repeater 24 are shorter than the distances between the host and other users. Thus, the repeater is able to provide the ability to extend range to outlying users, which will be important to maintain high data rates in interference

20 or crowded spectral situations. Furthermore, the repeater 24 is also able to receive the transmissions from the undesired transmitter, and may be equipped to ignore the undesired transmission, as well as instruct other users of the network to ignore the undesired transmission, thus improving personal area

25 network performance. With the invention used in the Personal Area Network, battery life of portable devices may be extended, as well.

The repeater 24 of Figure 2, in order to work properly, requires careful signal processing that is able to null out

30 noise and interference across the very wide bandwidth used by UWB (such as noise from an undesired transmitter or attacker 26). In addition, the repeater must provide significant isolation between the input and the output, typically 40 to 50 dB minimum and more if possible, in order to prevent

35 oscillation and feed forward interference. A wide range of techniques to perform such electrical performance are well understood by those skilled in the art of RF circuit and filter

design. In addition, the UWB repeater 24 must faithfully re-transmit both the forward and reverse paths of a two way communication, and must provide uniform/even group delay across most, if not all, the occupied bandwidth of UWB.

5 As shown in Figure 3, to possibly achieve fastest time to market, would be to implement this invention by using two UWB chips or devices 28 and 28'. These may be standard UWB modem devices, with sufficiently fast controlling and memory circuitry that creates a data bridge 30 between the two UWB
10 chips. These two chips, and the controlling/memory circuitry bridge 30, are built and encapsulated in a housing or chamber 32 which has good electromagnetic isolation between the input side (the side in which signals needing to be repeated are entering) and the output side (the side in which signals that
15 are being repeated are regenerated and reradiated). Power (either AC or DC) from a source 31 for the repeater can be provided from a battery or an outlet. Also, an RF switch for switching/processing antennas may be integrated in the controller circuitry, or may be a separate, discrete component
20 or series of components, such as a butler matrix circuit, simple RF single-pull multiple-throw, or phase shifter network for phased array antennas, or a wide range of well known antenna switching or phasing/processing mechanisms. While Figure 3 shows a preferred embodiment, it should be clear that
25 the entire assembly could be implemented in a different manner, for example using mixed-signal circuitry and included on a single chip, or a hybrid chip could be used and packaged as a single device, or discrete RF/baseband ICs could be developed and used. The ability to control RF antenna signals, coupled
30 with baseband processing, would allow many well known Multiple Input Multiple Output (MIMO) antenna technologies to be used to improve link quality. It also should be clear that each of the antennas (32, 34, and 36 shown in Figures 3, and 38 and 40
shown in Figure 4) may be a single antenna, multiple antennas,
35 antenna arrays, and may take on many different physical forms.

Each physical side of the UWB repeater invention may at one time serve as the input and another time serve as the

output, as the invention offers simplex, half duplex, or full duplex capability. It should be understood that each side of the invention could itself use MIMO antennas or phased/steerable antennas. Similarly, the forward or reverse signal path may use either side of the UWB repeater. Antennas, such as those developed by Prof. Hao Ling at the WNCG at University of Texas, and by Warren Stutzman of Virginia Tech, allow wideband UWB transmissions with some directionality, and these are easily sprayed on or built from metal stock using metallic film on plastic cases. Dielectric antennas, or antennas with inherent notching capabilities, may also be incorporated as is known in the prior art. The directionality helps with isolation between the input and output of the repeater. Further, the repeater may use multiple antennas, in a sector arrangement, that can automatically be sensed and switched by the UWB devices and/or the controller circuitry, in order to focus energy in directions of where devices needing to be transmitted through the repeater are located. This could be used on both or either transmit or receive operations. A wideband RF switch, which may be a MEMS device such as contemplated by Hughes Electronics or Teravicta of Austin, TX, is part of the circuitry contained within the repeater, so that various antenna selections are made. Alternately, RF switches can be avoided and RF processing may be used to provide Maximum Ratio Combining, Linear Combining, Equal Weight Combining, or MIMO implementations, all which are well understood by those skilled in the art, may be made. Other low-cost RF switches could be employed, as well, for antenna phasing/steering and selection, and the switch could actually be incorporated in future UWB chipsets or other integrated circuitry in various ways known now and in the future.

As shown in Figure 4, an alternative approach to creating the UWB repeater invention, rather than using two stock UWB devices with some additional control and memory logic for data processing, signal processing, and antenna switching or diversity/beam forming, would be to use a true bent-pipe repeater approach, where all signals at the input are simply re-radiated at the output. Note that the very wide bandwidths involved with UWB make this approach more difficult today, yet

viable in a low noise environment that does not have swamping. Even in higher noise environments, DSP noise cancellation and wideband compensation such as phase linear processing, and careful isolation and compensation across the wideband spectrum
5 could be employed. This type of DSP processing will be available in reasonably low cost platforms within the next several years.

Alternatively, Figure 4 represents an application specific integrated circuit 42 made of Si, SiGe, GaAs, or other
10 known materials either within a chip, a system on a chip, or discrete circuitry, could be fabricated to implement an integrated repeater with processing circuits for data processing that provides network security and data buffering as well as desired bandwidth provisioning for different
15 applications passing through the repeater. Clearly, an integrated antenna would be a less expensive per-part product price, once the design was perfected, and a single antenna repeater with near omni-directional radiation pattern offers lower costs to manufacture, and would be more preferable for
20 generic in-home or office use. As noted in Figure 3, power (either AC or DC) can be provided by a source 31, such as a batter or outlet.

Note that instead of using multiple antennas and having two "sides" (an input and an output) as shown in Fig. 4, the
25 UWB repeater could instead use a single antenna, and could use a vast memory (either onboard in chip or external to the RF or processing circuitry) to simply buffer and retransmit the received data. This would induce a greater delay in the repeated signal, but would provide a less expensive form
30 factor, due to fewer antennas, would offer smaller size, and would save costs due to the lack of expense incurred with an RF switch for the antennas. In addition, a store and forward approach embodiment such as contemplated in this paragraph would remove isolation concerns that provide design challenges
35 in bent-pipe or simultaneous receive/transmit repeaters.

A key part of this invention, which is now described, is the data processing capabilities afforded by the UWB Repeater disclosed herein. Figure 5 illustrates the architecture of the invention, which includes RF component 50 and 50', baseband

component 52 and 52', pipeline component 54 and 54', memory 56, and a controller 58 with an integrated or separate processor component 60. Each of these architectural components may be used for both the received (incoming) and repeated (outgoing) signals, or may be replicated so that one set of components is used for the incoming side and one set of components is used for the output side. (e.g., see Figures 3 and 4 and alternate embodiments described). The pipeline, processing, control circuitry and memory may be the same entity (e.g. all contained within a microprocessor, a DSP engine, or microcontroller, for example), and it may also be the same physical circuit or chip that also contains also the baseband and RF components. Alternatively, the memory (or any one of the other components, or combinations of components) may be in a separate chip or device. Note that the architectural components shown in Figure 5 may be of a wide range of varieties and physical structures that may be on chip or on a separate chip or substrates, or may be distributed in different pieces of equipment or embedded in other components or circuit boards, or embedded in firmware, software, or operating system software, not shown explicitly. It is clear that multiple processors and multiple replications or parallel implementations of the embodiment shown in Figure 5 may be practiced. Alternatively, the pipeline processors or memory (or other components) shown in Figure 5 may actually be the same physical device, and may only require a single device for handling both input and output functions. While the architecture shown in Figure 5 is a preferred embodiment, the functionality of the architecture, described below, may be implemented in alternate embodiments with varying approaches to providing the functional architecture, which are not meant to be excluded or limited herein. It should be clear that well-known signaling details, such as clock signals, analog and digital voltage sources, and power supplies, etc., while not explicitly shown in Figure 5, are known to one of ordinary skill to be a required part of any functional device, and the sources of such signals could be provided in a distributed fashion or represented within any one of the architectural components during normal operation.

Note that the architecture of Figure 5, when equipped with a sufficiently powerful baseband component 52 and 52', allows the UWB repeater to be used in a hybrid wireless-wireline network, where input signals may be applied directly to the baseband component 52, and output signals may be sent out the baseband component 52', for example, using standard Ethernet, DSL, ATM, SoNET, or other standard baseband signaling format. When implemented using parallel components (e.g. parallel baseband and pipeline functions or multithread processing or fast time slicing), the architecture of the invention allows for both RF UWB signals and baseband signals to be received at the input-side, and both RF and baseband signaling to be transmitted at the output-side, due to the fact that the baseband processor is able to implement both wireline PHY and MAC standards, as well as wireless UWB standards (or a universal PHY/MAC). This is shown in Figure 6.

The ability to handle both wireless network and wired network traffic is a valuable capability, as it allows the disclosed UWB transceiver/repeater 62 to not only function in an all-wireless network, but allows it to be connected in a hybrid network, where wired devices and wireless devices may all be connected together through the invention, making it easier for the consumer to connect multiple devices in a home, for example, or to connect all devices (both wired and wireless) to a single plant connection 63 (an internet plug, for example) in the home (thus, the invention not only provides repeater functionality, but also itself may be connected to an Internet/DSL/Cable/Satellite/Wireless backbone plant or server). It is possible that both input signals at RF and input signals at baseband could arrive at the invention simultaneously, and may be properly processed and filtered and buffered and routed to provide network connectivity to other devices and the plant or server, as well as providing additional sources of data for traffic statistics, security, monitoring, and network maintenance chores. This architecture enables a low cost, flexible UWB repeater to serve as a junction box, connecting both wired and wireless devices to the same network, and optionally to the backbone plant, as well (See Figure 6).

Figure 7 shows a flow chart of the processing steps preferably performed by the invention, it being understood that the order of these steps may be varied. The controller component of the UWB Repeater/Transceiver architecture first
5 acquires network information and/or desired performance criteria at step 64. That is to say, the controller component of the disclosed UWB repeater must be given explicit or implicit operating instructions, either from the plant, from
10 the network itself, from one or more components in the network, from the owner or operator of the network, or from a rule-base developed from past history of the repeater itself, or from the particular device or devices the invention is intended to communicate with within the network. When embedded in a consumer electronic device, such as a PC, a car, or a home
15 media center, the controller component may be accessed by a very simple user interface provided for the user, that allows the user to enter in one or more of a network ID (his or her own password or desired name, etc.), a listing of equipment to be configured, a count of equipment that they own, a listing of
20 computer applications to be used in the network, a rough coverage area of particular wireless devices or components she wishes to have connected on the network, or other such data necessary to provide a rough guideline of the network operational characteristics desired by the user.

25 To be clear, however, an alternative embodiment would require no user interaction, as the home media device or the UWB repeater device itself may have a unique serial number ID associated with it, or may have some embedded data, or a table look up for a particular application, and this may be used (in
30 connection with other data, such as provided by the plant) as the basis to launch transmissions in the network to detect and "train" all other UWB devices in the home network to assure they are properly connected to the network, all without any intervention or knowledge by the user.

35 Once it knows the "parameters" or "openness of the network" and knows the characteristics or ID's of those devices that "belong" on the wireless network, the controller component is able to then provide low-level instructions for the proper functioning of the UWB repeater. In this manner, the

controller component establishes initial operation mode settings for the repeater at step 66, so that the busses are properly configured and the architectural components are preset to properly respond to various signals or conditions received
5 from the UWB input-side, the plant, the wired network, or from the host device, etc. In other words, preset conditions (initial operation mode settings) may instruct the repeater to perform certain functions in a wide range of scenarios. For example, the initial operational mode settings may instruct the
10 repeater to provide: (A) normal repeater functions (bent-pipe operation) with no storage functionality when the RF channel is clean and no spammer or interferer is detected at the input side of the UWB repeater, (B) to provide no repeater function when spam is detected, and (C) to report traffic statistics to
15 the strongest or closest network component when a particular command is received over-the-air or on the baseband network. This is meant to simply illustrate the processing logic which is possible, and is merely a representative example not intended to limit the possible set of logic tables and
20 condition mappings that are possible. It is clear that command and control logic can be created to provide sufficient flexibility and breadth of preset conditions. Further examples are given throughout the text below. It should be clear that for rapid flexibility and adaptability, preset conditions for
25 several operational scenarios provides a low-overhead way of assuring the architectural components have access to the busses and to each other, in an efficient manner, when a key event (a trigger event) occurs due to a received signal or due to a need to transmit.

30 The controller component receives and sends electronic signals via one or more busses from one or more of the RF, baseband, memory, pipeline, and processor components. The controller has connection with the other components of the transceiver architecture, and facilitates instructions that may
35 be read or written between each of the components over a bus (for example, I2C bus or new higher speed busses). Thus, communication of instructions and control signals and information may be written or read between the components, using either serial or parallel and unidirectional or

bidirectional bus structures. The controller component is able to address each other component of the architecture within the UWB repeater, and then has the ability to read or write control data to each component as shown in step 68, in order to

5 establish or learn operating conditions from the received input signals or plant, to instruct devices with preset instructions, or to provide instructions that have been established by the network or user or application that is being received or transmitted by the invention. The proper configuration and

10 access to the busses is preprogrammed (preset) for specific operational instructions depending on the operational conditions encountered by the repeater. That is, each component, based on received signals and the computations performed during normal preset programmed operation which

15 proceeds according to step 70, knows through preset instructions how it should send signals to the controller or to the other architectural components, for proper desired operation in various operational conditions.

A trigger event 72 occurs when there is a perceptible

20 change or instruction, obtained through either the data received over the air on the UWB radio channel(s), or through the wired baseband network, or through instructions issued by the host unit housing the invention 74, or through data received from the plant 76. The order of these and possibly

25 other trigger events caused by the repeater reacting to particular received data or host device, plant, or server instructions, could be different from that shown in Figure 7. A trigger event may also occur when the transmitter is instructed or preprogrammed to transmit data (not shown in Figure 7 flow

30 diagram). Trigger events are due to signaling which is found to trip a condition or to signify a change in the current operation condition, or may occur due to preprogrammed, timing-based instructions previously instructed and preset by the controller component. Depending on the interpretation of the

35 trigger event (performed by the controller architecture in conjunction with other architectural elements), the UWB repeater may simply continue to operate with the preset mode settings as originally programmed (with the same preset operational conditions), or a new course of action may need to

be taken, in which the trigger event causes the controller architecture to consider providing new preset instructions for various operational conditions going forward.

5 The controller architecture determines at step 78 if such new preset instructions are needed, based on the computational results of the pipeline and processing components, in conjunction with memory, and may use one or more rule-based algorithms that tracks history, or may simply follow instructions specified by the network user, the host device, 10 the plant, or the repeater itself. As described in more detail below, trigger events (e.g., 72, 74, 76, etc.) occur when there is a change in the network, and may be due to the reception of undesired data at the UWB input-side, undesired data on the baseband network, errant or counterfeited or spoofed ID's, 15 watermarks, or a wide range of important conditions that indicate a change in network performance, the user's application, security conditions, signal or data integrity of desired transmissions, or the presence of jammers, hackers, or interferers.

20 As an example of how a trigger event may be detected, and to understand why the controller may wish to assign a different set of preset instructions for operational conditions going forward after a particular trigger event, consider the example of a UWB repeater functioning in a benign RF environment 25 without interference. The device is receiving transmissions from desired in-network components and is retransmitting them, per the normal operational instructions. Now, assume a spammer or hacker attempts to jam or intrude on the network. The disclosed invention is able to detect the demodulated signal 30 using the processing power pipeline processor in conjunction with memory and the processor, that the intruder is not a valid in-network component, and in fact may further check the intruder's ID or characteristics to find a match with an "unwanted" list of known attackers housed in memory. This 35 detection of the intruder is a trigger event. Now, consider the case where the preset operational instructions simply called for the repeater to stop retransmitting the intruder's transmission when an intruder is detected. Now, because the hacker appeared on the "unwanted" list in memory, this intruder

may be deemed to be a serious problem, in which case the controller architecture has the opportunity to alter the preset instructions for operational conditions going forward, as is done in step 80, and it may be advisable to now alert other devices and the host computer of the presence of the hacker whenever it is detected going forward. The new preset instructions passed from the controller component to the other architectural components may now be such that if the hacker transmission is identified again at the input-side of the repeater the repeater doesn't stop retransmitting (as before), but now the repeater rebroadcasts a warning message, an alert message, or a message to the network that instructs all other users of the hacker. It should be clear that various techniques known now or in the future to protect from spamming and to avoid unwanted intrusions may be incorporated into the invention using the processing techniques described here.

Using the system and method described here, network usage, network statistics, network provisioning information, or network security status for particular users, devices, applications, transmissions, or ID's would be known, measured or detected, and can be stored and communicated to a network server, another network component, a device controller, or through the plant using techniques known now or in the future.

The controller component updates the preset instructions for operational conditions at step 80, and provides actual control of RF and baseband signals, at a relatively slow rate (slow relative to the individual per-bit durations of the multi-megabit per second data rate received and sent by the invention over the air). Slow tasks for 100 Megabit per second data transmission for example, would require processing and control signaling on the order of a microsecond or so, as opposed to fast real-time data processing that would require speeds on the order of 10 nanoseconds or faster (such fast processing is handled by the pipeline and processing components, and the baseband and RF components). It should be clear that slow and fast are relative, and that this should in no way be limiting, since real time and "near" real time speeds shall change over time, application, and technology. Slow tasks handled by the controller component include enabling the

adaptive signal processing, so that the initial antenna configurations may adapt to interference from a new transmitting source, or halting the transmission of an undesired signal, or the halting of spam over packet duration or multiple packet duration intervals (rather than bit duration intervals), or determining and invoking new instructions for operational conditions, or instructing memory or computation operations to begin or end, or instructing various warning or response messages or traffic statistics to be computed or reported. The actual computational chores invoked by these instructional messages by the controller architecture may happen at much faster rates. For example, the controller architecture is required to issue control signals to allow for antenna pointing, steering/phasing, MIMO adaptation to be invoked, and once the controller component enables this functionality to the appropriate architectural components, the on-going processing and signal manipulations and adaptations occur at much faster speeds.

The controller architecture provides preset instructions for operational conditions to various components, as well as enabling what operations they should perform ahead of time of the actual trigger event (e.g., the pipeline devices would be instructed the network ID or watermark to search for, or the particular error control coding or MAC or PHY that is to be used). The controller architecture also provides operational instructions to the memory, for gathering of data and statistics, as well as providing event-driven (trigger-driven) instructions for handling the gating of packets and data. Also, the controller allows the processor to communicate the results of its computations to other architectural components, or translates the results (with the aid of the processor) into control signals. Clearly, for implementing security features and software radio/antenna pointing chores, signal results must be detected and computational problems must be solved by the Pipeline and Processor components, as well as baseband and RF components, as described below, and the results of these solved computations must be used to continually drive the proper performance of the device without delays imposed by the controller component. The controller thus provides the initial

and overall approval, and then simply facilitates the communication of such commands and instructions, and ensures the busses connecting the components are properly aligned for the specific tasks that need to occur for particular fast and
5 slow processing and data passing chores.

As shown in Figure 7, the UWB repeater continues to process in the manner described above, in a continual loop as shown in step 82, until an instruction to terminate operation is received as shown in step 84 (either received from a data
10 source - wired or over the air, or from the plant, or the host device, or from the controller architecture, or the power supply is simply turned off to the device), at which point the processing is completed as noted in step 86

To describe the architecture of the invention in more
15 detail, and to provide further examples to illuminate Figures 6 and 7, the following detailed description is useful.

Memory may take a wide range of forms as understood by those skilled in the art, including high speed RAM, DRAM, Flash chips, memory sticks, removable disks, etc, and this memory may
20 be programmable, static, dynamic, random access, optically-processed, etc. such that vast amounts of data received at the input of the invention may at any time be stored, buffered, processed, interpreted, or retransmitted. The power required for the memory may be supplied by the same power supply that
25 powers the processor and RF components, or it may be a separately provided DC or AC power supply, depending on the particular implementation or structure. For example, if the disclosed UWB Transceiver were embedded in a plug-in memory stick, it would likely receive power and data flows from the
30 standard USB expansion slot, whereas if the invention were embedded within a PC or Media Entertainment Center, the pipeline processor, memory and UWB RF and baseband circuitry might be embedded in a chip or an assembly on the mother board of the PC, itself, thereby obtaining power from the internal PC
35 supply. Memory is used by the present invention to store one or more of received data, forwarded data, to hold data strings or compressed versions of such strings needed by the controller or processor, to store execution instructions of the processor or controller, to store watermarks, identification data,

(ID's), PHY or MAC instructions, other software radio instructions, calibration settings, table-look-up data for modulation, demodulation, coding, antenna pointing, antenna phasing, coding and decoding, processed data statistics, or any
5 other data that needs to be stored and retrieved later. Memory may actually be comprised of different technologies, with different power levels, sizes, speeds, etc. whereas some part of memory is used for very fast storing and recalling, and the other part of memory is for longer term storage that does not
10 have to be accessed very quickly.

The pipeline component processes data on a bit by bit or word by word basis, and thus has an extremely fast ability to process or make decisions on applied data. They have special architecture and house their own memory, and are designed
15 specifically for rapid real-time data-streaming processing. The Pipeline component is able to implement real-time processing algorithms (such as coding, etc.) or compare or process inputted data to a preset pattern of data in a very streamlined, fast manner (e.g. it can function as a digital
20 matched filter, or correlator, an error correction coder or decoder, a check sum counter, or provide other fast, bit-by-bit computational functions that provide very rapid processing typically required in broadband communications), thereby allowing the device to know whether patterns of data are
25 properly tagged or apportioned. Stripping of headers in packets, finding ID's of words or bit-sequences in data streams, detecting or correcting bit errors, verifying or inserting watermarks in data transmissions, detecting security information, such as keys, passwords, handshake data, etc. are
30 typical tasks performed by the Pipeline. The Controller is able to instruct the Pipeline component as to which data should be checked, and may also provide timing or observation interval information, as well.

Furthermore, the pipeline process is instructed to
35 correct errors or insert ID's or watermarks or security data on transmissions, if it has been so instructed to by the controller. This is a powerful feature that allows the device to modify the data for retransmission in the network. For example, if the invention is used in a home network, a

particular home network ID or watermark or key code may be assigned (inserted into the data) of all desired home network transmissions, and the Pipeline component on the input-side of the repeater may be instructed by the Controller to constantly
5 search for this ID or watermark or key code to be received in order to determine the received signal is "desirable" or valid and that it should be repeated for retransmission. If errors occur, the invention may modify the received data stream for error correction. Alternatively, the network may need to change
10 the watermark or ID or key code of the received data, and the invention is able to make such alterations to received data, and retransmit the altered data.

Also, the pipeline component may be constantly be searching for "critical" or "unwanted" or bad transmissions,
15 which have data streams, ID's, erroneous crypto words, or other identifying data segments or information that is stored or updated in memory and which can be compared to received data. Such critical or unwanted transmissions may be indicative of an attack or unwanted spam or an emergency reason to stop
20 transmitting, and upon receipt of such data, the invention may, under previously set directions of the controller component, send an alarm message or urgent traffic message, or may send a message for network shutdown or device shutdown.

Depending on the type of network, the desired security,
25 the particular protocol or common air interface, PHY, MAC, the particular watermark or ID, etc., it may be desired for the received signal to be immediately retransmitted (repeated) at the output-side of the repeater with minimal delay, in which case the controller would have directed the pipeline component
30 to pass the data immediately to the baseband modulator on the output side of the repeater. (In this case, the pipeline components may have modified the data to correct errors, insert ID's, insert position or time stamp information, pass along network statistics or traffic/spam/utilization data, or other
35 important network -specific data that is to be carried and repeated for the particular application or particular network implementation). This streamlined operation avoids delays in reading and writing to and from memory, and would provide an extremely fast retransmit time, while allowing modification or

repair of received data. Alternatively, while the data is sent to the output-side, it may also be stored in the memory simultaneously (most likely through a memory pre-buffer that is used to capture all the data in parallel as it is sent to the transmitter, but with a sufficiently deep buffer that allows the transmitted data to be cached and stored to memory which operates at slower speeds than over-the-air RF transmissions - this is not shown but understood to one skilled in the art). Furthermore, the controller may have provided instructions to the pipeline device that upon one or more particular received data streams (for example, data streams that have been associated with Spam, peer-to-peer, or undesired transmissions, and which were stored in memory and earlier communicated to the pipeline device and stored there), the pipeline device is not connected directly to the baseband component of the output side, but instead the data passed by the pipeline component is stored directly to memory, or is simply ignored. In this manner, the invention is able to detect and filter unwanted RF data. The device may also have a reradiate mode, where received RF data stream is demodulated, pipelined, stored in memory or modified with a network ID, watermark, or counter, and then rebroadcast back to the originating RF source. This would be valuable for position location determination using time delay and/or signal strength measurement or prediction (as explained in many well known references, including work by Bahl, Rappaport, US Wireless, etc.), auditing of the network to determine how many devices are on the network, and with what ID's or watermarks or codes, determining propagation times, or used as part of a network throughput measurement scheme or traffic monitoring capability, etc.

- The controller component thus works to ensure the Pipeline component and the memory and the Processor component, and the busses are properly configured to handle the desired chores. Received data is received at RF, demodulated at Baseband, and passed to the pipeline component, and the preprogrammed pipeline processing component thus works with the controller and the memory to either store (and not retransmit) the received data, store and forward (e.g. retransmit) the received data through the baseband and RF components on the

output-side of the repeater, or alternatively the repeater may ignore the received data and not store it, or store the received data and retransmit it back to the originating source. Alternatively, the received data may be stored and
5 retransmitted out of one or more antennas, including the antenna which originally received the received data. Furthermore, the data may be modified by the pipeline processing circuitry (or by the processor and memory) once its received, for example, to strip off unwanted or hostile data
10 contained in the received data stream at the input of the repeater, or to add bit or packet changes in the packet data structure to implement ID or security or validation or bandwidth priority information in the repeated data which is radiated out of the repeater. Thus, the UWB repeater has the
15 ability to monitor data which it receives, as well as to store it, forward it, return it, or modify it. All the while, the memory, working in conjunction with the processor, may use a different or same thread to build statistics and observe particular behaviors of the traffic, including the ability to
20 sniff the packets and determine desired and undesired users, attacks on the home or vehicle or enterprise network. Thus modification of the MAC and IP layers, based on the flow of data or the availability of errors or desired QoS detected by the controller, is contemplated and capable with the invention.

25 It should be clear that the above description and following preferred embodiment emphasizes modification of a received signal and the associated processing steps prior to retransmission out of the UWB repeater. However, it should also be clear that similar functionality and capabilities may be
30 achieved for the transmitted signal itself, where the same architectural components may be used to similarly process, modify, store, retransmit, or ignore signals that are otherwise intended to be sent to the output side of the device. Also, prepared messages or messages based on the computation of
35 statistics or memory contents, messages based on alarms, network activity, the errors or transmissions or security breaches or ID's detected on the input-side of the repeater, or messages that are meant to synchronize for timing, positioning, or used to simply communicate the repeater's health, status, or

alarm status (due to spamming or RF overload or interference, for example) may be sent by using the memory and based on results computed from the processor component or controller component. Such messages or data transmissions may be read out
5 of memory, or processed through the pipeline component, passed to the baseband and RF components for transmissions to the output-side of the repeater. This enables the invention to provide beacon signals and messages regarding traffic, security, spam alert, alarm, position location, network use or,
10 other preset messages for use in various applications, independent of the exact data being received at the moment by the input-side of the invention.

The capability of the UWB repeater to process and to modify the bit streams sent and received is powerful, as future
15 security methodologies will rely on streamlined processing to implement rapid/dynamic key changes, dynamic network ID or watermark changes, and to allow authentication and validation. Emerging security standards, such as IEEE 802.11i, which use dynamic keys and strong codes, as well as EAP, 801.1X, WPA,
20 and future security techniques that may encompass both indoor and outdoor networks, will be able to be used by the disclosed invention, due to the capabilities of the processing and the modification capabilities of streams flowing in and out of the repeater. Furthermore, the repeater itself will be addressable
25 on the personal area network, allowing the host/master "source" device, such as the office PC or TV console, to inquire, control, and to gather characteristics of piconet users, their traffic, attacks, throughput performance, coverage performance, or unintended or intended usage through the repeater. For
30 example, the host could access the memory of the UWB repeater for detailed data, as well as collect statistics gathered and processed and stored by the UWB repeater, so that the human user of the network could gather a report of activity. Getting reports back from the UWB repeater can be done over the same
35 Personal area network (PAN) that is used for wireless connectivity, or could be carried out using a wired network, if the invention happened to also be connected to a wired backbone, such as Cat-5 Cable (As described subsequently, the UWB repeater invention may have internet connection jacks that

would allow it to also be connected to a wired infrastructure).

Furthermore, without human intervention, the host could gather data from the UWB device, and use that knowledge for real time or near real time control for providing security, changes in security keys or protocols, changes in bandwidth provisioning, and could even provide a termination of the home network from the internet, in order to prevent the home network from being attacked or compromised.

The ability of the UWB repeater to process data and gather traffic and network conditions, including bandwidth provisioning data and security-related data, will be extremely useful in appliances that serve as in-home or in-office network controllers and interfaces, where the Internet is connected and then served wirelessly throughout a building. The UWB Repeater disclosed here would be fully compatible with RADIUS servers, and in fact could help provide the connectivity required for home devices to gain access to the Internet, as disclosed earlier. A web-enabled interface, or windows, or some other PC or Tivo/TV/VCR/Cable Modem/Satellite type programming interface could be supplied to program and control, as well as gather data from, the UWB repeater disclosed here.

The controller uses memory, such as flash, dram, PROM, and a wide range of other possibilities, based on speed, price, form factor and availability, to support the processing and buffer-and-forward operations. Coupled with the computational capabilities of the processor and pipeline components, and given the functionality of the baseband and RF components, one can readily see that a powerful network security capability can be implemented while simultaneously providing broader, reliable network coverage.

Consider one embodiment of the memory portion of this invention to be like today's Memory Sticks that currently have 60 MB of memory (but will have much more in the future) and plug into a PC port for power -- the invention could have the same form factor, for example, as a plug in memory stick today, where the UWB repeater invention, including memory, is simply plugged into an access port on a PC or other home appliance. The UWB repeater, if in the form of a plug in "stick", could also enable the equipped device (which could be the source/host

device, or some other device in the PAN) to connect via the UWB home network, while supporting the repeater operation within the PAN, while providing the capabilities of identifying the types of traffic and priorities which should be given such traffic within the PAN. Also, network management protocols and external devices and software, such as that located on the host PC, may query and retrieve the gathered data at the UWB repeater, and may adjust or control the UWB repeater processing modes (via the controller component) for particular desired network goals - such as greater security, more stringent prioritization on traffic, or even complete reboot/restart of processing in the UWB repeater. It is obvious to one skilled in the art that the UWB repeater could operate in concert with other devices, such as the host or other users of the Personal Area Network (e.g. home network) in order to provide distributed communication and command and control functions between the UWB repeater and other devices. In fact, it should be clear that the architectural structure of the UWB repeater may be distributed between hardware, embedded software, and an operating system which ships separately from the hardware, such as Windows or Linux, so that mass-produced UWB repeaters could be embedded or easily attached to existing appliances or computers.

The repeater may also have security provisioning such as an "authentication" or validation, as well as non-eradication function. Depending on the particular network scenario, network assignment steps can ensure the UWB repeater is being used to "repeat" signals from only those devices which are intended to be repeated within the home or office. This functionality could be done at layer 1 (PHY) with identification or authentication code sent over the air and detected by the Repeater, or performed at layer 2 (MAC) with handshake with other devices on the network, or a combination of layers being used for the security or authentication step, but this just as easily could be performed at higher layers, even performed up at the application layer (such as with VPN, web login, telephone dial, or some other computer-controlled authentication implemented automatically by one or more devices on the network, or implemented by the user on a

software interface, computer program, web site, or data entry method that connects to the home/office UWB network). Also, just as today's IEEE 802.11 bridge/repeater products, the UWB repeater may be equipped with MAC address association control, and could easily have one or more integrated wired Ethernet port connections for use on a standard wired Ethernet connection (not shown in figures). These techniques are well understood by those knowledgeable in IEEE 802.11a/b/g and 802.15.3a/b standards activities, which have become widely popular in recent years, and the present invention, while not required by such standards, could implement such standards if the baseband and RF architectural components were properly configured to conform to the MAC and PHY standards.

For example, a preferred embodiment of this invention has the UWB transceiver/repeater 88 be mounted in an AC outlet for wall use or for barrier-strip extension cord use (See Figure 8). Alternatively, the device could be integrated in a consumer electronic device (a cellphone, or PC, or a home entertainment center, for example), and would be controlled by or interact with a software program running on a home computer or a game console or TV (a "host"). The host would allow the person using the home/business/vehicle network to type in or use a remote control or mouse device to connect his or her own home/office network, and the network would use UWB devices to communicate with each other to provide the network, and in doing this manual configuration, the user is able to input identifiers, such as product name or manufacturing codes or some other identifier of other appliances for the home network that the user is able to enter. This operation may also occur automatically, without manual intervention by the user, by the self-configuring Personal Area network "waking up" and reading the serial numbers/device codes through the airwaves automatically, and finding the UWB repeater.

Returning to the manual example of a home network appliance, in doing this data entry, the user is implicitly setting up security features which allow the myriad devices in the home to know they are on the desired network, and the UWB repeater is then able to know, through shared knowledge of this security information, which devices should be "repeated" and

which devices (say from a neighboring building) should be "ignored" and not repeated. In this example, the UWB repeater could be embedded within the PC or cable TV product, or it could be communicated to wirelessly or via cable by the home computer or cable TV product, or it even could serve as the host, itself, where it is connected to the internet using wireless or wired means. Of course, one skilled in the art would understand the invention could also having no security or more limited security, where some or all messages within earshot would be repeated by the UWB repeater, or whereby some messages would not be repeated due to inherent knowledge of local devices and their valid signaling or data transmission. Also, it is clear that much simpler, automated, or built in configuration capabilities for specification of network parameters or operational conditions could be supplied, say within an operating system, or embedded in software or hard codes in a consumer device, itself.

In addition to security features disclosed above, the ability of the UWB Repeater to sense real-time data transmissions, such as network ID's or bit-streams associated with security or keys, allows any application to provide its own data coding, carried above the MAC and PHY layers, to enable particular desired features of network provisioning and bandwidth provisioning controls, so that some users (such as portable email or low rate data or low rate audio) are allocated some delay, or less important priority, in being retransmitted than are high priority data, such as video data or voice over IP telephony, or high bandwidth messaging or urgent information which has less tolerance to delay. This quality of service (QOS) intelligence could be identified within the MAC, PHY of standardized UWB equipment, but also can be inserted and detected by the disclosed invention when such signaling appears in the IP layer and/or other higher layers of the application data that is transmitted over the network. Thus, the invention allows electronics makers to create their own higher layer UWB protocol, or even a universal PHY and MAC layer, using standardized components, which also allows the UWB Repeater to prioritize and provision certain repeated data over other repeated data, by simply exploiting the fact that each

UWB repeater device is able to detect actual data and can operate on such data using the architecture described above (see Figures 5 and 7). For example, data bits which alert the repeater and the network to the particular type of user/device can be used to help prioritize the UWB repeater's processing of the data which is to be repeated. In fact, the UWB repeater could be used in network test, where the memory and controlling circuits are used to induce a fixed, known, preset, or desired delay on particular traffic which is received by the repeater, in order to test "ringing of the network" or to determine if attackers or interference are correlated with the operation/transmissions of particular devices on the PAN.

The form factor of the UWB repeater may take on a wide range of sizes, shapes, and mounting/fixture options. This repeater could be installed or embedded in PCs, servers, or appliances, or it could be a stand alone device that could be purchased and placed in any home or office, embedded within a fire alarm, air freshener, night light, or phone. Alternatively, it could be a plug-in device, much like plug-in chassis cards are used today to enable WLAN access or modem access in PCs.

Figure 8 illustrates a preferred embodiment of the invention, embedded within an AC Power strip. The AC strip could be built into the wall or purchased as an extension cord in hardware stores, etc. Note that the power strip has standard AC wiring to connect to the home or office AC power, but also has a connection to the "plant". This plant connection 94, which is optional in the practice of the invention, may be a physical connection, such as through a cable that connects the UWB transceiver to an Ethernet port, Cable TV outlet, DSL outlet, etc., or this port connection may be a wireless connection (for wireless access, the embedded UWB transceiver might be connected to a WiMax radio or Mesh Network transceiver, enabling wireless to come in to the UWB transceiver and be redistributed through the repeating function. Alternatively, the plant connection may be optional or unused, and the UWB transceiver simply implements the repeating and security functions described herein. This is an example of one of the myriad of form factors that can be used.

One could use the invention as part of AC extension cords, photocopiers, game consoles, television/video displays, video consoles, hospital video equipment, multimedia centers, air fresheners, fire alarms, etc. Fixtures, colors, shapes, and sizes may be very similar to fire alarms or air fresheners that plug into AC outlets in the home, or are wired into a car DC power supply, and the repeater device may also become embedded in objects that are typically carried around the home or office, such as but not excluding cordless phones, cell phones, portable computers, home stereos, TVs, pet collars, tennis shoes, and a wide range of portable, common devices that when moved could provide a wide array of range extension and coverage improvements of UWB devices. In fact, devices which integrate video, gaming, audio, and computing will likely benefit greatly from the disclosed invention. This invention may be a stand alone plug-in device, or may be embedded in AC outlets, receptacle extensions, and could become part of future phones or AC extension cords. The positioning and ranging capabilities of UWB make this applicable to tracking children and pets, or finding vehicles in large parking lots, as well.

It will be clear to one skilled in the art that the above disclosed invention may be applied in a wide range of applications and configurations as captured in the scope of the appended claims. Furthermore, the specification is not limited to a particular radio air interface standard or radio PHY or MAC definition or implementation.

CLAIMS

I claim:

1. A broadband wireless repeater, comprising:

at least one receiver for receiving electronic signals at least some of which are sent by one or more ultrawideband devices, and at least one transmitter for transmitting received, modified, or stored electronic signals or data, wherein said at least one receiver and at least one transmitter may be separate components or be combined as a transceiver, and wherein said at least one receiver and at least one transmitter may be dedicated receive only and transmit only or may function alternatively as a receiver and as a transmitter; and

a controller, which is either pre-programmed or programmable with network information, which controls the screening of data received by said at least one receiver, and either passes, ignores, rejects, redirects, modifies, or kills received data, said controller providing such data screening in order to differentiate between desired and undesired data for network security, network management, or interference mitigation purposes,

said controller controlling reception of electronic signals or data by said at least one receiver and transmission by said at least one transmitter,

said controller further providing for the collecting, reporting, or storing of network usage, network statistics, or network information.

2. The broadband repeater of claim 1 wherein said network information includes IDs for each of the components to be used in a network.

3. The broadband repeater of claim 1 wherein said network

information includes IDs for users permitted to be used in a network.

4. The broadband repeater of claim 1 wherein said network information includes a specified coverage area for wireless devices to permit use of a network.

5. The broadband repeater of claim 1 wherein said network information includes specified applications permitted to be used in a network.

6. The broadband repeater of claim 1 further comprising a buffer memory for storing received electronic signals for processing by said controller.

7. The broadband repeater of claim 1 wherein said at least one receiver receives electronic signals by either or both a wireless communication or a wired link.

8. The broadband repeater of claim 1 wherein said at least one transmitter transmits electronic signals by wireless communication.

9. The broadband repeater of claim 1 wherein said at least one transmitter transmits electronic signals by wired link.

10. The broadband repeater of claim 1 wherein said at least one transmitter transmits electronic signals by either or both wireless communication or by wired link.

11. The broadband repeater of claim 1 wherein said at least one receiver and said at least one transmitter and said

controller are associated with an AC outlet or a wall fixture.

12. The broadband repeater of claim 1 wherein said controller permits network information to be modified.

13. The broadband repeater of claim 1 wherein said controller uses adaptive or steerable antennas or MIMO technologies to control the direction or coverage zones of transmissions or reception.

14. The broadband repeater of claim 1 wherein said controller permits support of position location capabilities for use by a network.

15. The broadband repeater of claim 1 wherein said controller directs undesired user or intruder information to be passed to other components of a network from said at least one transmitter using either wireless or wired connectivity.

16. The broadband repeater of claim 1 where network provisioning information is passed to or pre-programmed with said controller, for purposes of network traffic provisioning, wherein said controller uses said provisioning information to prioritize either or both reception of data and transmission of data to or from said repeater.

17. The broadband repeater of claim 1 wherein said transmitter and said receiver have reversible input/output directions.

18. A broadband wireless repeater, comprising:

at least one receiver for receiving electronic signals
at least some of which are sent by one or more ultrawideband

devices, and at least one transmitter for transmitting received, modified, or stored electronic signals or data, wherein said at least one receiver and at least one transmitter may be separate components or be combined as a transceiver, and wherein said at least one receiver and at least one transmitter may be dedicated receive only and transmit only or may function alternatively as a receiver and as a transmitter; and

a controller which is either pre-programmed or programmable with provisioning information for purposes of network traffic provisioning, wherein said controller uses said provisioning information to prioritize either or both reception of data by said at least one receiver and transmission of data by said at least one transmitter, said controller controlling reception of electronic signals or data by said at least one receiver and transmission of electronic signals or data by said at least one transmitter.

19. The broadband repeater of claim 18 wherein said provisioning information prioritizes by network user.

20. The broadband repeater of claim 18 wherein said provisioning information prioritizes by type of data being received by said at least one receiver.

21. The broadband repeater of claim 18 wherein said provisioning information prioritizes by type of data being transmitted by said at least one transmitter.

22. The broadband repeater of claim 18 wherein said provisioning information prioritizes by the particular type of application being used by one or more users of the network and

being received by said at least one receiver.

23. The broadband repeater of claim 18 wherein said provisioning information prioritizes by the particular type of application being used by one or more users of the network being transmitted by said at least one transmitter.

24. The broadband repeater of claim 18 further comprising a buffer memory for storing received electronic signals or data for processing by said controller.

25. The broadband repeater of claim 18 wherein said at least one receiver receives electronic signals or data by either or both a wireless communication or a wired link.

26. The broadband repeater of claim 18 wherein said at least one transmitter transmits electronic signals or data by wireless communication.

27. The broadband repeater of claim 18 wherein said at least one transmitter transmits electronic signals or data by wired link.

28. The broadband repeater of claim 18 wherein said at least one transmitter transmits electronic signals or data by either or both wireless communication or by wired link.

29. The broadband repeater of claim 18 wherein said at least one receiver and said at least one transmitter and said controller are associated with an AC outlet or a wall fixture.

30. The broadband repeater of claim 18 wherein said controller

permits provisioning information to be modified.

31. The broadband repeater of claim 18 wherein said provisioning information supplied to said controller is communicated using either a wireless or wired link.

32. The broadband repeater of claim 31 wherein said provisioning information is further supplied to said controller by over-the-air ultrawideband signaling.

33. The broadband repeater of claim 31, wherein said provisioning information is further supplied to said controller by a wired connection from another device.

34. The broadband repeater of claim 18 wherein said controller uses adaptive or steerable antennas or MIMO technologies to control the direction or coverage zones of transmissions or reception.

35. The broadband repeater of claim 18 wherein said controller permits support of position location capabilities for use by a network

36. The broadband repeater of claim 18 wherein said controller directs undesired user or intruder information to be passed to other components of a network from said at least one transmitter using either wireless or wired connectivity.

37. The broadband repeater of claim 18 wherein said transmitter and said receiver have reversible input/output directions.

38. A broadband wireless repeater, comprising:

at least one receiver for receiving electronic signals at least some of which are sent by one or more ultrawideband devices, and at least one transmitter for transmitting received, modified, or stored electronic signals or data, wherein said at least one receiver and at least one transmitter may be separate components or be combined as a transceiver, and wherein said at least one receiver and at least one transmitter may be dedicated receive only and transmit only or may function alternatively as a receiver and as a transmitter; and

a controller which is either pre-programmed or programmable to collect traffic information or security information related to received and transmitted data, said controller controlling reception of electronic signals or data by said at least one receiver and transmission by said at least one transmitter.

39. The broadband repeater of claim 38 further comprising a means for exporting traffic information or security information to one or more computer processors or devices.

40. The broadband repeater of claim 38 further comprising means for adjusting one or more operations of said controller based on said traffic information or security information.

41. A broadband repeater, comprising:

- at least one receiver for receiving electronic signals at least some of which are sent by one or more ultrawideband devices and at least some of said signals being sent by a wired link, and at least one transmitter for transmitting received, modified, or stored electronic signals or data, wherein said at least one receiver and at least one transmitter may be separate components or be combined as a transceiver, and wherein said at

least one receiver and at least one transmitter may be dedicated receive only and transmit only or may function alternatively as a receiver and as a transmitter; and

a controller for controlling reception of electronic signals by said at least one receiver and transmission by said at least one transmitter,

wherein said controller supports a hub or router function to allow for the commingling of both wireless and wired traffic within said broadband repeater.

42. The broadband repeater of claim 1 wherein either pre-programmed or programmable network information supplied to said controller is communicated using either a wireless or wired link.

43. The broadband repeater of claim 42 wherein said network information is further supplied to said controller by over-the-air ultrawideband signaling.

44. The broadband repeater of claim 42, wherein said network information is further supplied to said controller by a wired connection from another device.

BROADBAND REPEATER WITH SECURITY FOR ULTRAWIDEBAND TECHNOLOGIES

ABSTRACT OF THE DISCLOSURE

5 An ultrawideband radio transceiver/repeater provides a
low cost infrastructure solution that merges wireless and wired
network devices while providing connection to the plant,
flexible repeater capabilities, network security, traffic
monitoring and provisioning, and traffic flow control for wired
10 and wireless connectivity of devices or networks. The
ultrawideband radio transceiver/repeater can be implemented in
discrete, integrated, distributed or embedded forms.

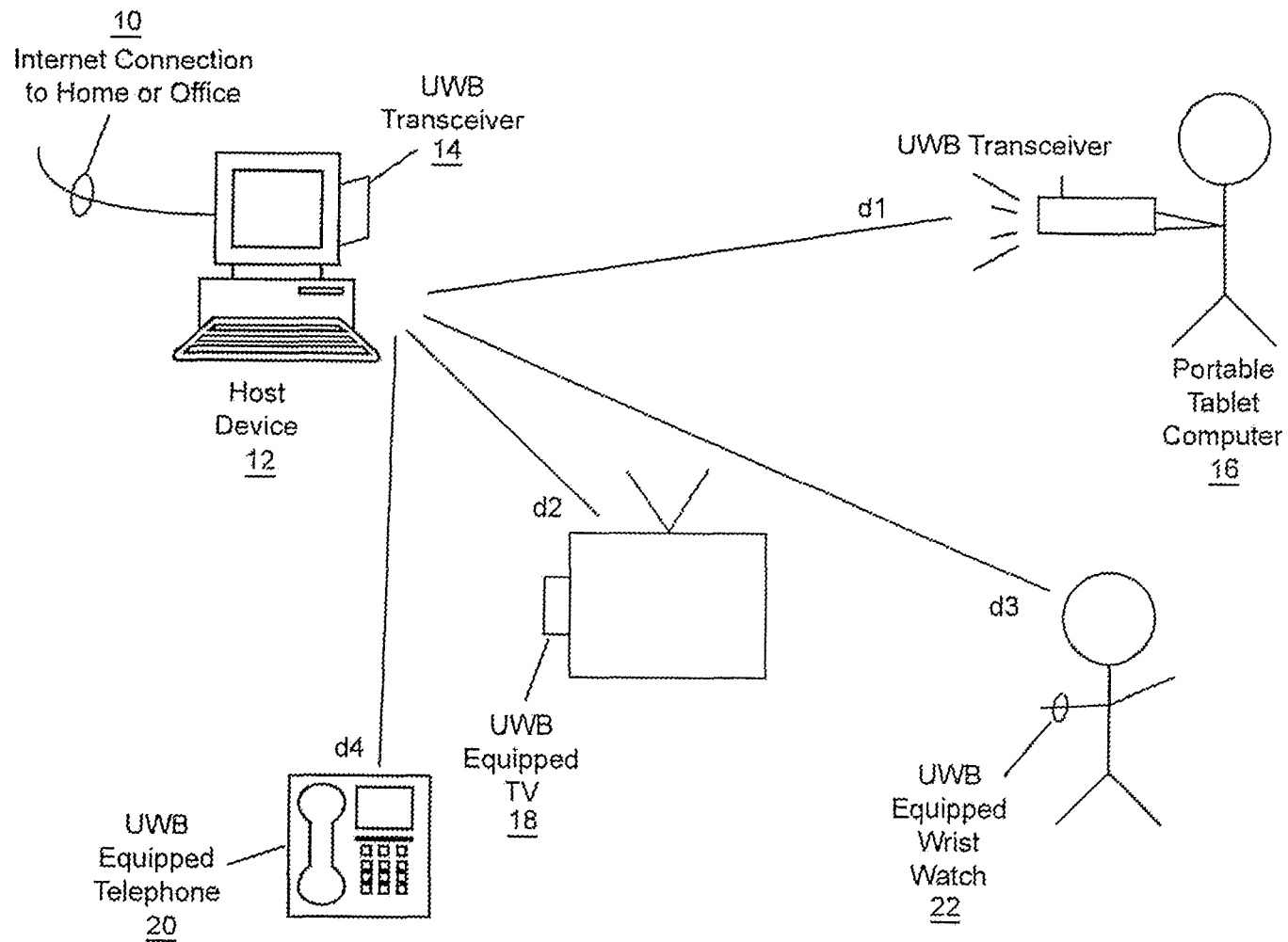


Figure 1

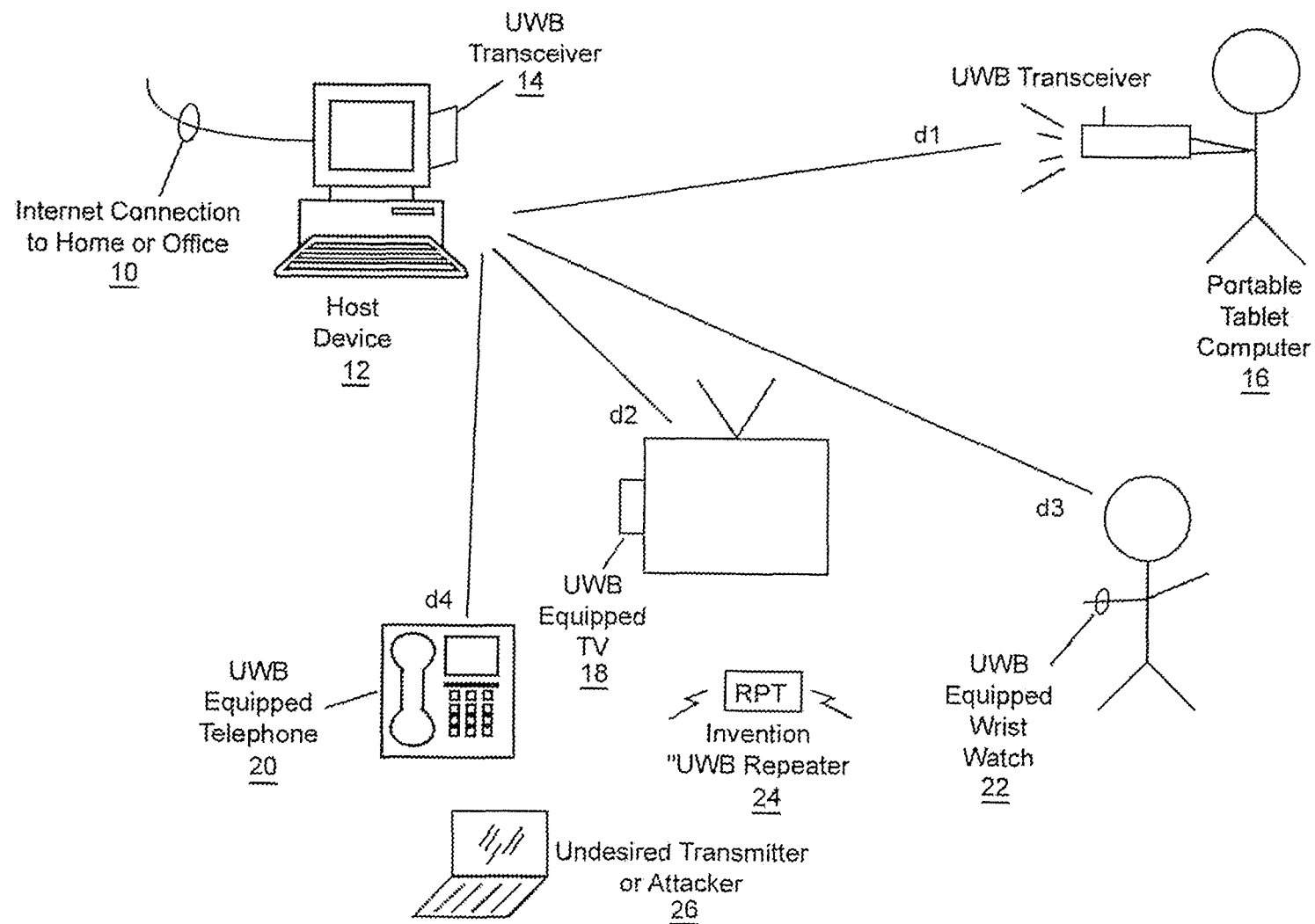


Figure 2

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3/6

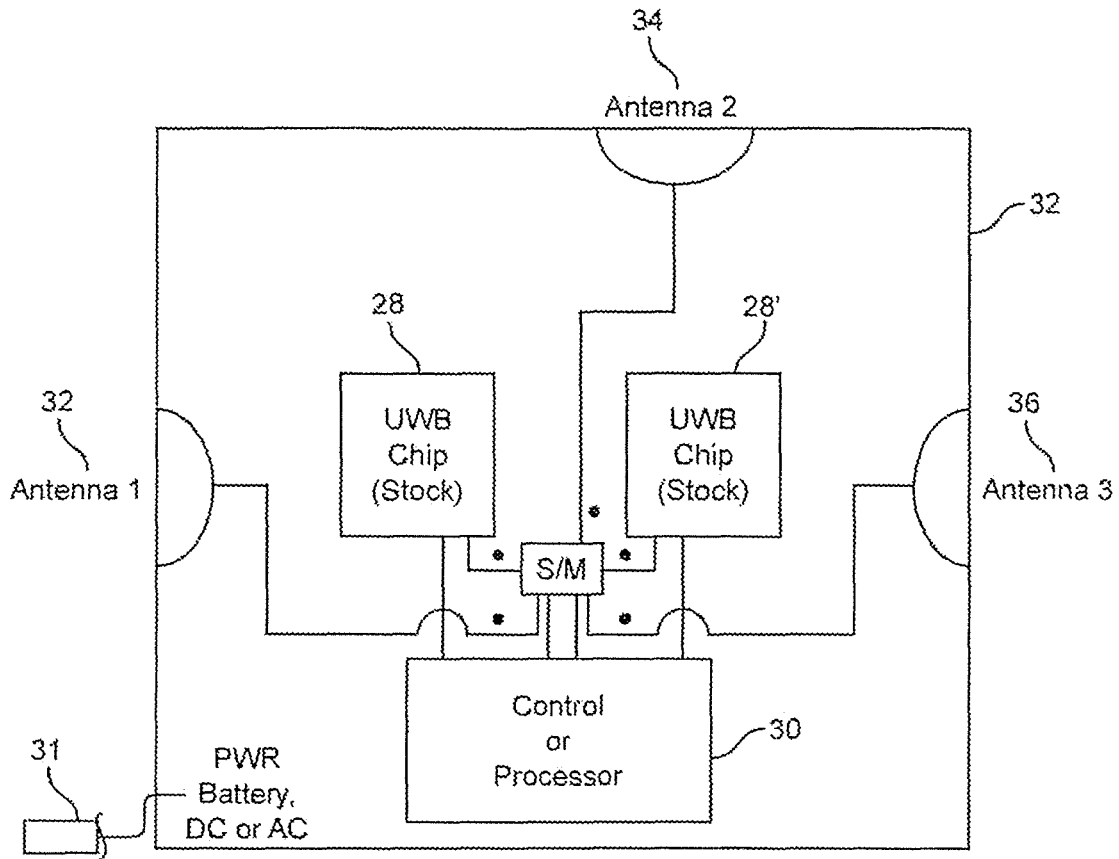


Figure 3

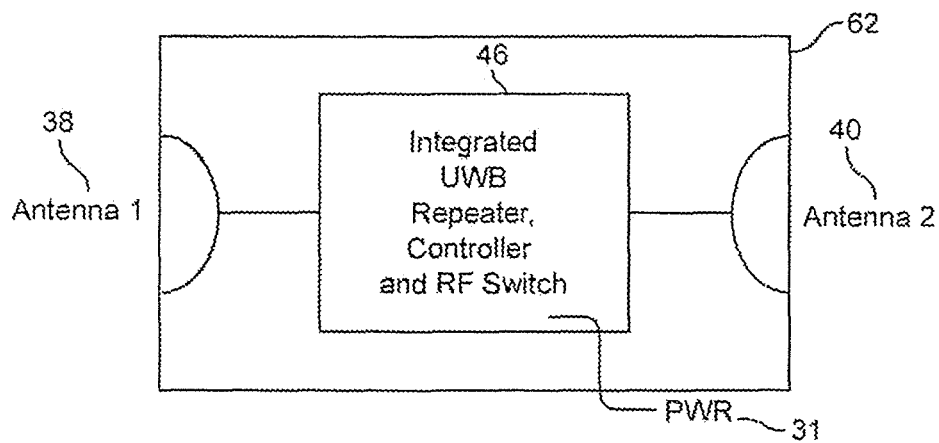


Figure 4

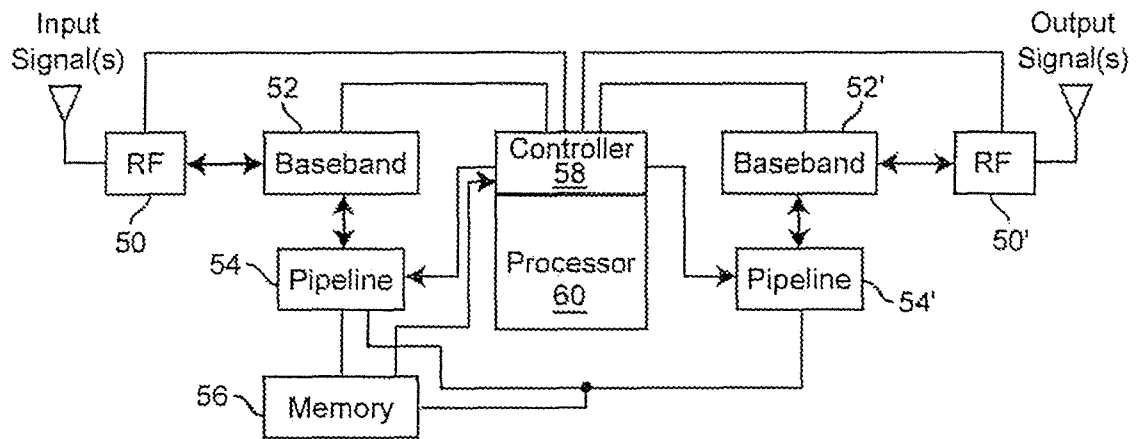


Figure 5

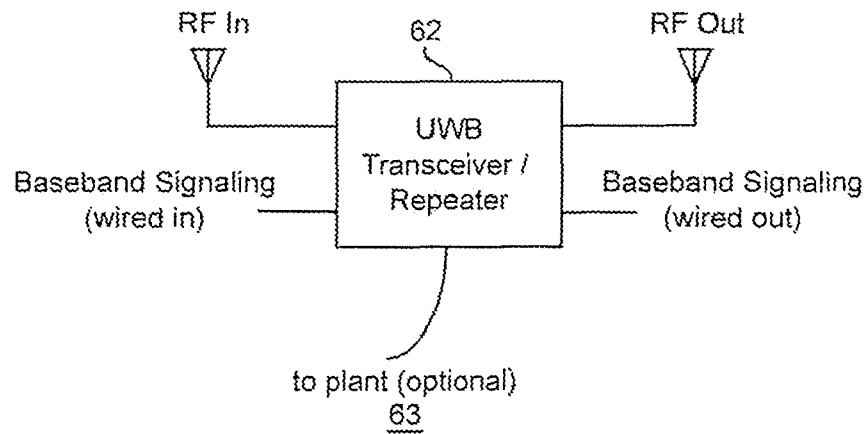


Figure 6

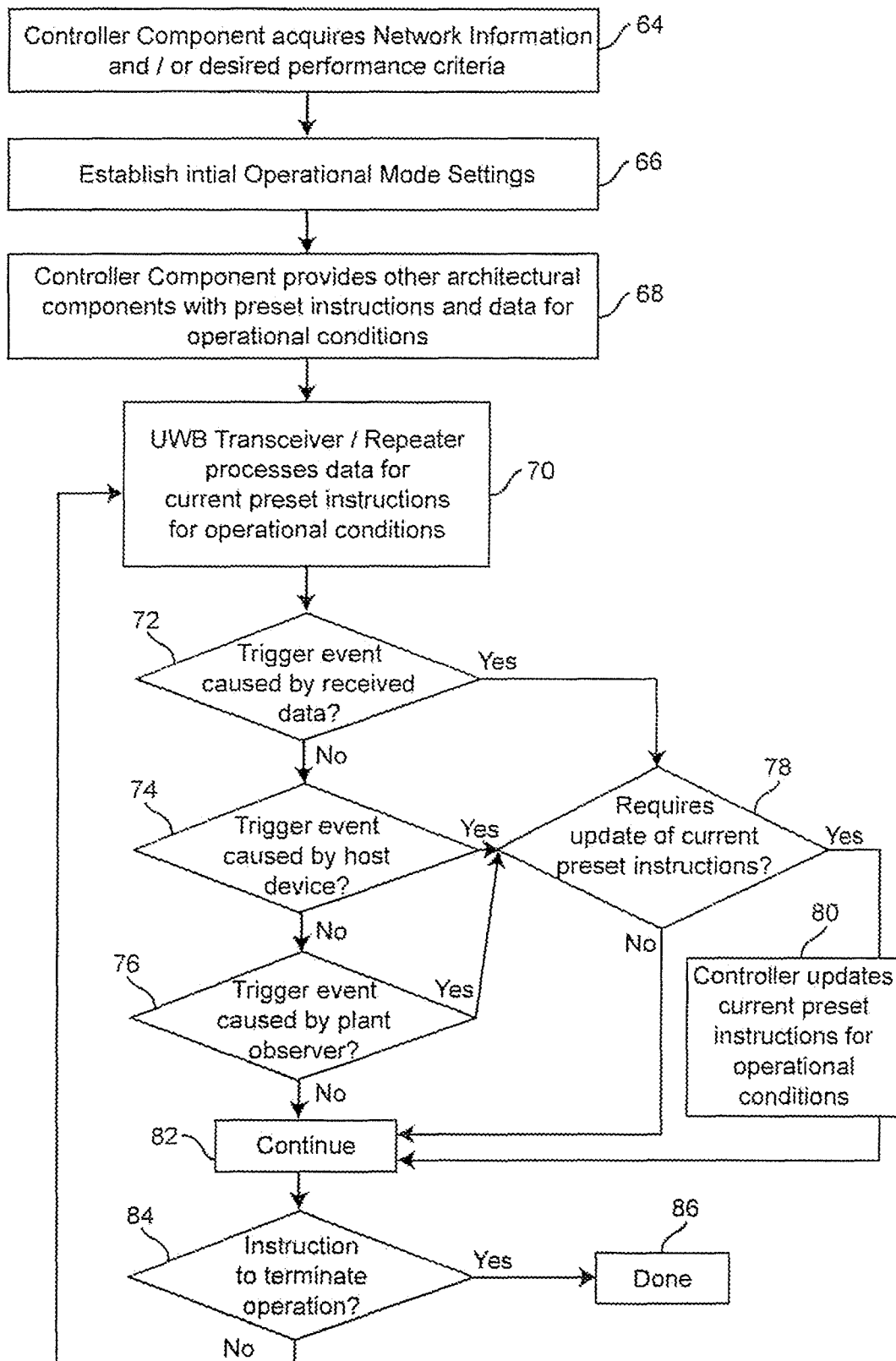


Figure 7

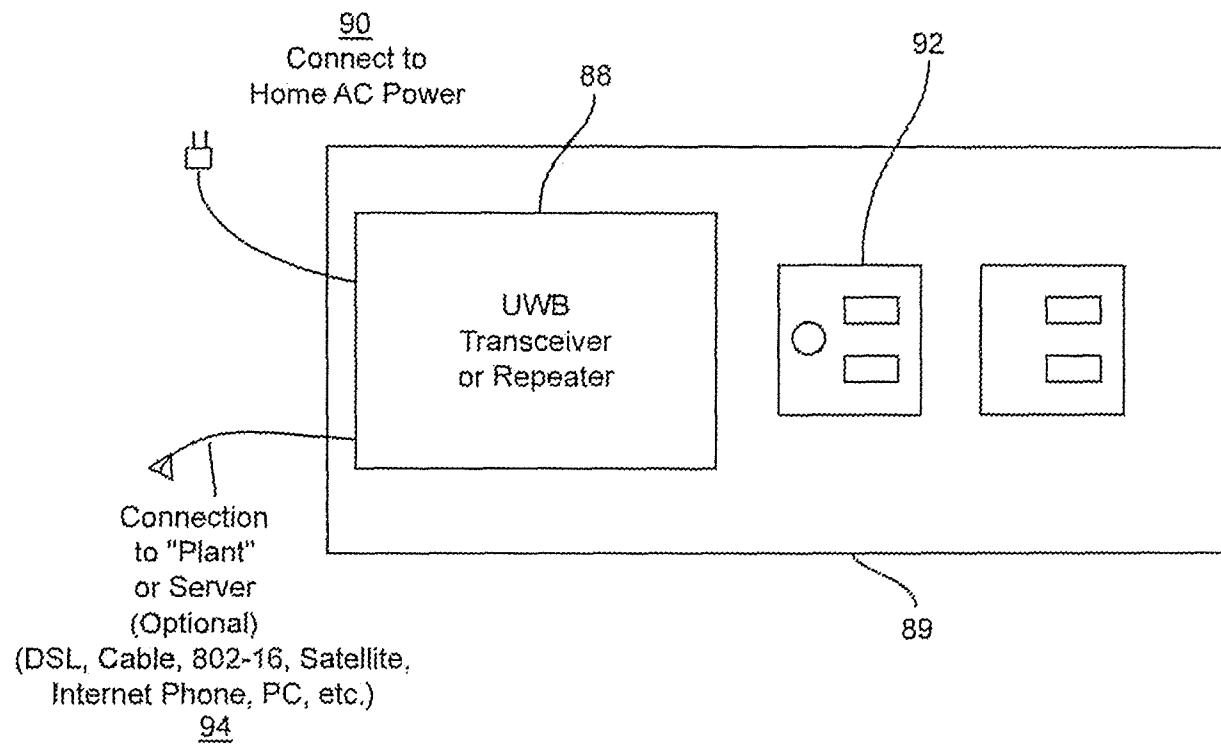


Figure 8

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**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)**Title of
Invention

BROADBAND REPEATER WITH SECURITY FOR ULTRAWIDEBAND

As the below named inventor, I hereby declare that:

This declaration
is directed to:

The attached application, or



United States application or PCT international application number _____

filed on _____

The above-identified application was made or authorized to be made by me

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001
by fine or imprisonment of not more than five (5) years, or both.**WARNING:**

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO in support of a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 C.F.R. 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 C.F.R. 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Theodore S. Rappaport

Date (Optional): _____

Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent) including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/USPTO form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 C.F.R. 1.63. The information is required to obtain or retain a benefit by the public, which is to the benefit of the USPTO in processing an application. Confidentiality is governed by 35 U.S.C. 122 and 37 C.F.R. 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the information provided. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETION FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing this form, call 1-800-PTO-9128 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of

Theodore Rappaport

Conf. No.: Not assigned

App. No.: Not assigned

Group Art Unit: Not assigned

Filed: Concurrently Herewith

Examiner: Not assigned

For BROADBAND REPEATER WITH SECURITY FOR
ULTRAWIDEBAND TECHNOLOGIES

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Sir:

Prior to calculating the filing fee and proceeding to examination on the merits, please amend the above-identified patent application as follows:

Amendments to the Claims: begin on page 2.

Remarks: begin on page 14.

Listing of Claims:

The following is a complete listing of all claims in the application, with an indication of the status of each:

1-44. (canceled)

45. (new) A broadband wireless repeater or relay, comprising:

at least one receiver or transceiver for signal or data reception from one or more devices;

at least one transmitter or transceiver for signal or data transmission to one or more devices,

wherein the transceiver for signal or data reception and the transceiver for signal or data transmission may be the same or different; and

a controller that is configured or configurable for operation in one or more wireless networks, said controller communicating with said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission,

wherein at least one of said receiver or transceiver for signal or data reception and said transmitter or transceiver for signal or data transmission either or both transmit and receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more,

wherein said broadband wireless repeater or relay is connected or connectable to one or more network backbones for connecting said one or more wireless networks with said one or more network backbones, and

wherein said broadband wireless repeater or relay is used to support connectivity and/or position location capabilities for one or more mobile or portable devices.

46. (new) The broadband wireless repeater or relay of claim 45, wherein at least one of said one or more network backbones to which said controller is connected or connectable is a wired backbone.

47. (new) The broadband wireless repeater or relay of claim 46, wherein said wired backbone is selected from a group consisting of T1, T3, DSL, cable, cable modem, fiber, optical cable, copper lines, coax, phone, ethernet, and internet.

48. (new) The broadband wireless repeater or relay of claim 45, wherein at least one of said one or more network backbones to which said controller is connected or connectable is a wireless backbone.

49. (new) The broadband wireless repeater or relay of claim 48, wherein said wireless backbone is selected from a group consisting of last mile wireless service, mesh network, LMDS, MMDS, WiMax, 802.16, 802.20, 802.11a/b/g, 802.15.3.a, RF, and baseband.

50. (new) The broadband wireless repeater or relay of claim 45, wherein said controller is configured or configurable to perform or for performing at least one of:

- a) ignore or filter out at least some signal or data transmissions from one or more undesired transmitters, users, networks, data sources, or noise sources;
- b) instruct one or more devices or networks to ignore or disregard at least some signal or data transmissions of one or more undesired transmitters, undesired users, undesired networks, or noise sources; and
- c) network provisioning or monitoring.

51. (new) The broadband wireless repeater or relay of claim 50, wherein said controller performs a).

52. (new) The broadband wireless repeater or relay of claim 50, wherein said controller performs b).

53. (new) The broadband wireless repeater or relay of claim 50, wherein said controller performs c).

54. (new) The broadband wireless repeater or relay of claim 53, wherein c) includes one or more of:

- i) bandwidth or delay provisioning of repeated or relayed transmissions,
- ii) application prioritization,
- iii) prioritizing, delaying or altering of data transmissions, traffic, or bandwidth, and
- iv) monitoring or measuring traffic from one or more devices, users or networks.

55. (new) The broadband wireless repeater or relay of claim 45, wherein said controller is configured or configurable to perform or for performing a plurality of:

- a) ignore or filter out at least some signal or data transmissions from one or more undesired transmitters, users, networks, data sources, or noise sources;
- b) instruct one or more devices or networks to ignore or disregard at least some signal or data transmissions of one or more undesired transmitters, undesired users, undesired networks, or noise sources; and
- c) network provisioning or monitoring.

56. (new) The broadband wireless repeater or relay of claim 45, wherein said controller is configured or configurable to perform or for performing all of:

- a) ignore or filter out at least some signal or data transmissions from one or more undesired transmitters, users, networks, data sources, or noise sources;
- b) instruct one or more devices or networks to ignore or disregard at least some signal or data transmissions of one or more undesired transmitters, undesired users, undesired networks, or noise sources; and
- c) network provisioning or monitoring.

57. (new) The broadband wireless repeater or relay of claim 45, wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals or data operate in half duplex.

58. (new) The broadband wireless repeater or relay of claim 45, wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals or data operate in full duplex.

59. (new) The broadband wireless repeater or relay of claim 45, wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals or data operate in simplex.

60. (new) The broadband wireless repeater or relay of claim 45, wherein said repeater or relay is configured such that when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more at least one of said one or more devices has a higher data rate than if said repeater or relay was not present in said network.

61. (new) The broadband wireless repeater or relay of claim 45, wherein said repeater or relay is configured such that when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more at least one of said one or more devices has a greater coverage distance than if said repeater or relay was not present in said network.

62. (new) The broadband wireless repeater or relay of claim 45, wherein said repeater or relay is configured such that when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more at least one of said one or more devices have higher quality of transmission or reception than if said repeater or relay was not present in said network.

63. (new) The broadband wireless repeater or relay of claim 45, wherein said repeater or relay is configured such that when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data

transmission rate of 100 Megabits per second or more at least one of said one or more devices has less interference than if said repeater or relay was not present in said network.

64. (new) The broadband wireless repeater or relay of claim 45, wherein said repeater or relay is configured such that when in one or more wireless networks which includes one or more devices which can transmit at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more at least one of said one or more wireless networks has an improved ability to control its capacity than if said repeater or relay was not present in said one or more wireless networks.

65. (new) The broadband wireless repeater or relay of claim 45, wherein said signals or data received by said receiver or transceiver for receiving signals or data, or signals or data transmitted by said transmitter or transceiver for transmitting signals or data, or signals or data controlled by said controller include modified, stored, or delayed signals or data.

66. (new) The broadband wireless repeater or relay of claim 45, wherein said controller is configured to cause said at least one transmitter or transceiver for transmitting signals or data to transmit modified received data or transmissions to one or more devices at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more.

67. (new) The broadband wireless repeater or relay of claim 45, wherein said controller is configured to identify one or more devices in said one or more wireless networks.

68. (new) The broadband wireless repeater or relay of claim 45, wherein said repeater or relay employs MIMO or adaptive antenna technology.

69. (new) The broadband wireless repeater or relay of claim 45, wherein said controller is self-configurable.

70. (new) The broadband wireless repeater or relay of claim 45, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks in a moving platform environment.

71. (new) The broadband wireless repeater or relay of claim 45, wherein said broadband wireless repeater or relay is configured to be integrated with or in communication with a vehicle, train, aircraft, or other moving platform.

72. (new) The broadband wireless repeater or relay of claim 45, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks in an indoor environment.

73. (new) The broadband wireless repeater or relay of claim 45, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks in an outdoor environment.

74. (new) The broadband wireless repeater or relay of claim 45, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks selected from the group consisting of: a cellular network, an enterprise network, a wireless local area network, or a wireless personal area network.

75. (new) The broadband wireless repeater or relay of claim 45, wherein said repeater or relay is configured to be integrated with or in communication with a device selected from the group consisting of a television, a telephone, a cellphone, a computer, a camera, a video system, a monitor, a power plug, a wall outlet, a watch, a cable modem, a vehicle or other moving platform, a game console, and an ultrawideband transceiver or device.

76. (new) The broadband wireless repeater or relay of claim 45, wherein one or more of said receiver or transceiver for signal or data reception, said transmitter or transceiver for signal or data transmission, and said controller is embedded in one or more integrated circuit chips.

77. (new) The broadband wireless repeater or relay of claim 45, wherein said broadband wireless repeater or relay is configured or configurable for monitoring or measuring traffic passed through, received by or transmitted by said broadband wireless repeater or relay.

78. (new) The broadband wireless repeater or relay of claim 45, wherein said broadband wireless repeater or relay is configured or configurable to modify at least some received signals or data from one or more devices, users or networks and transmit modified or delayed signals or data to at least one device, network or user via wireless communication.

79. (new) The broadband wireless repeater or relay of claim 45, wherein said controller and one or more of said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission are integrated.

80. (new) A broadband wireless repeater or relay, comprising:

at least one receiver or transceiver for signal or data reception from one or more devices;

at least one transmitter or transceiver for signal or data transmission to one or more devices,

wherein the transceiver for signal or data reception and the transceiver for signal or data transmission may be the same or different; and

a controller that is configured or configurable for operation in one or more wireless networks, said controller communicating with said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission,

wherein at least one of said receiver or transceiver for signal or data reception and said transmitter or transceiver for signal or data transmission either or both transmit and receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more,

wherein said repeater or relay employs MIMO or adaptive antenna technology, and

wherein said broadband wireless repeater or relay is used to support connectivity and/or position location capabilities for one or more mobile or portable devices.

81. (new) The broadband wireless repeater or relay of claim 80, wherein said controller is configured or configurable to perform or for performing at least one of:

- a) ignore or filter out at least some signal or data transmissions from one or more undesired transmitters, users, networks, data sources, or noise sources;
- b) instruct one or more devices or networks to ignore or disregard at least some signal or data transmissions of one or more undesired transmitters, undesired users, undesired networks, or noise sources; and
- c) network provisioning or monitoring.

82. (new) The broadband wireless repeater or relay of claim 81, wherein said controller performs a).

83. (new) The broadband wireless repeater or relay of claim 81, wherein said controller performs b).

84. (new) The broadband wireless repeater or relay of claim 81, wherein said controller performs c).

85. (new) The broadband wireless repeater or relay of claim 84, wherein c) includes one or more of:

- i) bandwidth or delay provisioning of repeated or relayed transmissions,
- ii) application prioritization,
- iii) prioritizing, delaying or altering of data transmissions, traffic, or bandwidth, and
- iv) monitoring or measuring traffic from one or more devices, users or networks.

86. (new) The broadband wireless repeater or relay of claim 80, wherein said controller is configured or configurable to perform or for performing a plurality of:

- a) ignore or filter out at least some signal or data transmissions from one or more undesired transmitters, users, networks, data sources, or noise sources;
- b) instruct one or more devices or networks to ignore or disregard at least some signal or data transmissions of one or more undesired transmitters, undesired users, undesired networks, or noise sources; and
- c) network provisioning or monitoring.

87. (new) The broadband wireless repeater or relay of claim 80, wherein said controller is configured or configurable to perform or for performing all of:

- a) ignore or filter out at least some signal or data transmissions from one or more undesired transmitters, users, networks, data sources, or noise sources;
- b) instruct one or more devices or networks to ignore or disregard at least some signal or data transmissions of one or more undesired transmitters, undesired users, undesired networks, or noise sources; and
- c) network provisioning or monitoring.

88. (new) The broadband wireless repeater or relay of claim 80, wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals or data operate in half duplex.

89. (new) The broadband wireless repeater or relay of claim 80, wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals or data operate in full duplex.

90. (new) The broadband wireless repeater or relay of claim 80, wherein said at least one receiver or transceiver for receiving signals or data and said at least one transmitter or transceiver for transmitting signals or data operate in simplex.

91. (new) The broadband wireless repeater or relay of claim 80, wherein said repeater or relay is configured such that when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data

transmission rate of 100 Megabits per second or more at least one of said one or more devices has a higher data rate than if said repeater or relay was not present in said network.

92. (new) The broadband wireless repeater or relay of claim 80, wherein said repeater or relay is configured such that when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more at least one of said one or more devices has a greater coverage distance than if said repeater or relay was not present in said network.

93. (new) The broadband wireless repeater or relay of claim 80, wherein said repeater or relay is configured such that when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more at least one of said one or more devices have higher quality of transmission or reception than if said repeater or relay was not present in said network.

94. (new) The broadband wireless repeater or relay of claim 80, wherein said repeater or relay is configured such that when in a network which includes one or more devices which can transmit or receive at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more at least one of said one or more devices has less interference than if said repeater or relay was not present in said network.

95. (new) The broadband wireless repeater or relay of claim 80, wherein said repeater or relay is configured such that when in one or more wireless networks which includes one or more devices which can transmit at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more at least one of said one or more wireless networks has an improved ability to control its capacity than if said repeater or relay was not present in said one or more wireless networks.

96. (new) The broadband wireless repeater or relay of claim 80, wherein said signals or data received by said receiver or transceiver for receiving signals or data, or signals or data

transmitted by said transmitter or transceiver for transmitting signals or data, or signals or data controlled by said controller include modified, stored, or delayed signals or data.

97. (new) The broadband wireless repeater or relay of claim 80, wherein said controller is configured to cause said at least one transmitter or transceiver for transmitting signals or data to transmit modified received data or transmissions to one or more devices at an instantaneous or overall occupied bandwidth of 100 MHz or more or have a data transmission rate of 100 Megabits per second or more.

98. (new) The broadband wireless repeater or relay of claim 80, wherein said controller is configured to identify one or more devices in said one or more wireless networks.

99. (new) The broadband wireless repeater or relay of claim 80, wherein said controller is self-configurable.

100. (new) The broadband wireless repeater or relay of claim 80, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks in a moving platform environment.

101. (new) The broadband wireless repeater or relay of claim 80, wherein said broadband wireless repeater or relay is configured to be integrated with or in communication with a vehicle, train, aircraft, or other moving platform.

102. (new) The broadband wireless repeater or relay of claim 80, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks in an indoor environment.

103. (new) The broadband wireless repeater or relay of claim 80, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver

for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks in an outdoor environment.

104. (new) The broadband wireless repeater or relay of claim 80, wherein at least one of said receiver or transceiver for signal or data reception, at least one of said transmitter or transceiver for signal or data transmission, or said controller is configured for operation in at least one of said one or more wireless networks selected from the group consisting of: a cellular network, an enterprise network, a wireless local area network, or a wireless personal area network.

105. (new) The broadband wireless repeater or relay of claim 80, wherein said repeater or relay is configured to be integrated with or in communication with a device selected from the group consisting of a television, a telephone, a cellphone, a computer, a camera, a video system, a monitor, a power plug, a wall outlet, a watch, a cable modem, a vehicle or other moving platform, a game console, and an ultrawideband transceiver or device.

106. (new) The broadband wireless repeater or relay of claim 80, wherein one or more of said receiver or transceiver for signal or data reception, said transmitter or transceiver for signal or data transmission, and said controller is embedded in one or more integrated circuit chips.

107. (new) The broadband wireless repeater or relay of claim 80, wherein said broadband wireless repeater or relay is configured or configurable for monitoring or measuring traffic passed through, received by or transmitted by said broadband wireless repeater or relay.

108. (new) The broadband wireless repeater or relay of claim 80, wherein said broadband wireless repeater or relay is configured or configurable to modify at least some received signals or data from one or more devices, users or networks and transmit modified or delayed signals or data to at least one device, network or user via wireless communication.

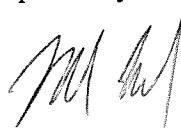
109. (new) The broadband wireless repeater or relay of claim 80, wherein said controller and one or more of said at least one receiver or transceiver for signal or data reception and said at least one transmitter or transceiver for signal or data transmission are integrated.

REMARKS

Claims 1-44 have been canceled. New claims 45-109 have been added. Support for the above claims includes, for example, allowed claims in the parent application (App. No. 13/676,207) and paragraphs [0018], [0046], [0047], [0056], and [0058], and Figure 8 of the parent application publication (Pub. No. 2013/0088963). No new matter has been introduced.

A provisional petition is hereby made for any extension of time necessary for the continued pendency during the life of this application. Please charge any fees for such provisional petition and any deficiencies in fees and credit any overpayment of fees for the petition or for entry of this amendment to Attorney's Deposit Account No. 50-2041.

Respectfully submitted,



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Customer Number 30743

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	Broadband Repeater with Security for Ultrawideband Technologies			
First Named Inventor/Applicant Name:	Theodore S. Rappaport			
Filer:	Michael E. Whitham/karen lumpkins			
Attorney Docket Number:	0861000C7			
Filed as Small Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Pages:				
Claims:				
Claims in excess of 20	2202	45	40	1800
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2530

Electronic Acknowledgement Receipt

EFS ID:	20692111
Application Number:	14540773
International Application Number:	
Confirmation Number:	3686
Title of Invention:	Broadband Repeater with Security for Ultrawideband Technologies
First Named Inventor/Applicant Name:	Theodore S. Rappaport
Customer Number:	30743
Filer:	Michael E. Whitham/karen lumpkins
Filer Authorized By:	Michael E. Whitham
Attorney Docket Number:	0861000C7
Receipt Date:	13-NOV-2014
Filing Date:	
Time Stamp:	16:59:24
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$2530
RAM confirmation Number	3777
Deposit Account	502041
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part	Pages Samsung Ex 1004 Part 7 of 9 (fr appl 4 Page 290 of 294
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1	Transmittal of New Application	0861000C7-transmittal1.pdf	451799	no	8
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Warnings:					
Information:					
2		0861000C7-appln.pdf	1915178	yes	55
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	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	39	
	Claims		40	47	
	Abstract		48	48	
	Drawings-only black and white line drawings		49	54	
	Oath or Declaration filed		55	55	
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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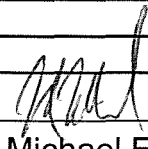
UTILITY PATENT APPLICATION TRANSMITTAL <i>(Only for new nonprovisional applications under 37 CFR 1.53(b))</i>	Attorney Docket No.	08610001C7
	First Named Inventor	Theodore S. Rappaport
	Title	Broadband Repeater with Security for Ultrawideband Technologies
	Express Mail Label No.	

APPLICATION ELEMENTS <i>See MPEP chapter 600 concerning utility patent application contents.</i>	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450
☒ Fee Transmittal Form (PTO/SB/17 or equivalent) ☒ Applicant asserts small entity status. See 37 CFR 1.27 ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent. ☒ Specification [Total Pages <u>46</u>] Both the claims and abstract must start on a new page. (See MPEP § 608.01(a) for information on the preferred arrangement) ☐ Drawing(s) (35 U.S.C. 113) [Total Sheets <u>6</u>] ☐ Inventor's Oath or Declaration [Total Pages <u>1</u>] (including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e)) ☐ Newly executed (original or copy) ☐ A copy from a prior application (37 CFR 1.63(d)) ☒ Application Data Sheet * See note below. See 37 CFR 1.76 (PTO/AIA/14 or equivalent) ☐ CD-ROM or CD-R in duplicate, large table, or Computer Program (Appendix) ☐ Landscape Table on CD ☐ Nucleotide and/or Amino Acid Sequence Submission (if applicable, items a. – c. are required) ☐ Computer Readable Form (CRF) ☐ Specification Sequence Listing on: ☐ CD-ROM or CD-R (2 copies); or ☐ Paper ☐ Statements verifying identity of above copies	ACCOMPANYING APPLICATION PAPERS ☐ Assignment Papers (cover sheet & document(s)) Name of Assignee _____ ☐ 37 CFR 3.73(c) Statement (when there is an assignee) ☐ Power of Attorney ☐ English Translation Document (if applicable) ☐ Information Disclosure Statement (PTO/SB/08 or PTO-1449) ☐ Copies of citations attached ☒ Preliminary Amendment ☐ Return Receipt Postcard (MPEP § 503) (Should be specifically itemized) ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) ☐ Nonpublication Request Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent. ☐ Other: _____ _____ _____ _____

***Note:** (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 must be included in an Application Data Sheet (ADS).
 (2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

☒ The address associated with Customer Number: 30743 OR ☐ Correspondence address below

Name					
Address					
City	State	Zip Code			
Country	Telephone	Email			
Signature			Date	11/13/14	
Name (Print/Type)	Michael E. Whitham		Registration No. (Attorney/Agent)	32635	

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Under the Paperwork Reduction Act of 1995 no persons are required to respond to a collection of information unless it displays a valid OMB control number

FEE TRANSMITTAL

Complete if known

☒ Applicant asserts small entity status. See 37 CFR 1.27. ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.	Application Number	
	Filing Date	
	First Named Inventor	Theodore S. Rappaport
	Examiner Name	
	Art Unit	
TOTAL AMOUNT OF PAYMENT	(\$)	2530.00
	Practitioner Docket No.	08610001C7

METHOD OF PAYMENT (check all that apply)
☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☒ Deposit Account Deposit Account Number: 502041 Deposit Account Name: Whitham Curtis Christofferson & Cook, PC

For the above-identified deposit account, the Director is hereby authorized to (check all that apply):

☒ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, except for the filing fee

☐ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17 ☐ Credit any overpayment of fee(s)
WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES** (U = undiscounted fee; S = small entity fee; M = micro entity fee)

Application Type	FILING FEES			SEARCH FEES			EXAMINATION FEES			Fees Paid (\$)
	U (\$)	S (\$)	M (\$)	U (\$)	S (\$)	M (\$)	U (\$)	S (\$)	M (\$)	
Utility	280	140*	70	600	300	150	720	360	180	730
Design	180	90	45	120	60	30	460	230	115	
Plant	180	90	45	380	190	95	580	290	145	
Reissue	280	140	70	600	300	150	2,160	1,080	540	
Provisional	260	130	65	0	0	0	0	0	0	

* The \$140 small entity status filing fee for a utility application is further reduced to \$70 for a small entity status applicant who files the application via EFS-Web.

2. EXCESS CLAIM FEES

Fee Description	Undiscounted Fee (\$)	Small Entity Fee (\$)	Micro Entity Fee (\$)
Each claim over 20 (including Reissues)	80	40	20
Each independent claim over 3 (including Reissues)	420	210	105
Multiple dependent claims	780	390	195
Total Claims			
65 - 20 or HP = 45 x 40 = 1800			
HP = highest number of total claims paid for, if greater than 20.			
Indep. Claims			
2 - 3 or HP = 0 x =			
HP = highest number of independent claims paid for, if greater than 3.			

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$400 (\$200 for small entity) (\$100 for micro entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
- 100 =	/ 50 =	(round up to a whole number) x	=	

4. OTHER FEE(S)

Non-English specification, \$130 fee (no small or micro entity discount)

Non-electronic filing fee under 37 CFR 1.16(t) for a utility application, \$400 fee (\$200 small or micro entity)

Other (e.g., late filing surcharge):

SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 32635	Telephone 703/787-9400
Name (Print/Type)	Michael E. Whitham	Date	11/13/14

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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