



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 NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/229,906	07/11/2017	9706500	IPW2-USCN209711	6772

3624 7590 06/21/2017
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET, 18th Floor
PHILADELPHIA, PA 19103

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 0 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):

Nicholas W. Anderson, Exeter, UNITED KINGDOM;
Intellectual Ventures II LLC, Wilmington, DE

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 USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **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)

3624 7590 03/09/2017
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET, 18th Floor
PHILADELPHIA, PA 19103

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.

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.
15/229,906	08/05/2016	Nicholas W. Anderson	IPW2-USCN209711	6772

TITLE OF INVENTION: POWER CONTROL IN A WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	06/09/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
REGO, DOMINIC E	2647	455-522000

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,
- (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 Volpe and Koenig, P.C.

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)

Intellectual Ventures II LLC

Wilmington, Delaware

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 22-0493 (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 /Harry Vartanian/

Date June 9, 2017

Typed or printed name Harry Vartanian

Registration No. 56,787

Electronic Patent Application Fee Transmittal				
Application Number:		15229906		
Filing Date:		05-Aug-2016		
Title of Invention:		POWER CONTROL IN A WIRELESS NETWORK		
First Named Inventor/Applicant Name:		Nicholas W. Anderson		
Filer:		Harry Vartanian		
Attorney Docket Number:		IPW2-USCN209711		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description		Fee Code	Quantity	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
UTILITY APPL ISSUE FEE	1501	1	960	960
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				960

Electronic Acknowledgement Receipt	
EFS ID:	29447955
Application Number:	15229906
International Application Number:	
Confirmation Number:	6772
Title of Invention:	POWER CONTROL IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Nicholas W. Anderson
Customer Number:	3624
Filer:	Harry Vartanian/Elizabeth McGinty
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USCN209711
Receipt Date:	09-JUN-2017
Filing Date:	05-AUG-2016
Time Stamp:	14:30:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$960
RAM confirmation Number	061217INTEFSW14310900
Deposit Account	220493
Authorized User	Elizabeth McGinty
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees) 37 CFR 1.20 (Post Issuance fees) 37 CFR 1.21 (Miscellaneous fees and charges)					
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)	IPW2-USCN209711_-_Issue_Fee_Payment_-_20170609.PDF	1600524 e37abfd39e71f94559b344dda7a587990b3f5f63	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	31854 edcd2e7283c6a1c59bd350d3bacff32d5d3bb24b	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			1632378		
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.					



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www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

3624 7590 03/09/2017
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET, 18th Floor
PHILADELPHIA, PA 19103

EXAMINER

REGO, DOMINIC E

ART UNIT

PAPER NUMBER

2647

DATE MAILED: 03/09/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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15/229,906

08/05/2016

Nicholas W. Anderson

IPW2-USCN209711

6772

TITLE OF INVENTION: POWER CONTROL IN A WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	06/09/2017

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

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

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PHILADELPHIA, PA 19103

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Certificate of Mailing or Transmission

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/229,906	08/05/2016	Nicholas W. Anderson	IPW2-USCN209711	6772

TITLE OF INVENTION: POWER CONTROL IN A WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$960	\$0	\$0	\$960	06/09/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
REGO, DOMINIC E	2647	455-522000

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.

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/229,906	08/05/2016	Nicholas W. Anderson	IPW2-USCN209711	6772
3624 7590 03/09/2017 VOLPE AND KOENIG, P.C. UNITED PLAZA 30 SOUTH 17TH STREET, 18th Floor PHILADELPHIA, PA 19103			EXAMINER REGO, DOMINIC E	
			ART UNIT 2647	PAPER NUMBER

DATE MAILED: 03/09/2017

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. 15/229,906	Applicant(s) ANDERSON, NICHOLAS W.	
	Examiner DOMINIC REGO	Art Unit 2647	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 02/15/2017.
☐ 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 1-3,5-9,11-16,18-23,25 and 26. 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 _____. | |

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DETAILED ACTION

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

Allowable Subject Matter

2. Claims 1-3, 5-9, 11-16, 18-23, 25, and 26 are allowed for the same reasons presented in the Patented Application #13/727,153, Patent No. 9,055,586 and updated search report.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOMINIC REGO whose telephone number is (571)272-8132. The examiner can normally be reached on 8:30 am-5:00 pm.

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, Nay Maung can be reached on 571-272-7882. 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.

/DOMINIC REGO/
Primary Examiner, Art Unit 2647
Tel 571-272-8132

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L8	9	multi\$level near2 (transmi\$6 near power near control\$4 tpc) near2 command\$3	US-PGPUB; USPAT	OR	ON	2017/03/03 09:00
L9	9	8 AND ((H04W52/06 OR H04W52/08 OR H04W52/10 OR H04W52/12 OR H04W52/221 OR H04W52/24 OR H04W52/241 OR H04W52/242 OR H04W52/243 OR H04W72/0473 OR H04W72/1268 OR H04W72/1289).CPC.)	US-PGPUB; USPAT	OR	ON	2017/03/03 09:01
L10	8061	(transmi\$6 near power near control\$4 tpc) near2 command\$3	US-PGPUB; USPAT	OR	ON	2017/03/03 09:01
L11	3039	10 same resource\$1 near3 allocat\$3	US-PGPUB; USPAT	OR	ON	2017/03/03 09:06
L12	839	11 same physical near2 channel\$1	US-PGPUB; USPAT	OR	ON	2017/03/03 09:06
L13	1	12 same up same down	US-PGPUB; USPAT	OR	ON	2017/03/03 09:07
L14	2	12 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2017/03/03 09:08
L15	50980	(transmi\$6 transfer\$5 send\$3 forward\$3 deliver\$3 provid\$3 broad\$cast\$3 propagat\$3 fore\$cast\$3) near9 resourc\$3 with allocat\$3	US-PGPUB; USPAT	OR	ON	2017/03/03 09:08
L16	134	L15 with (value\$1 off\$set\$4) with (transmi\$6 near power near control\$4 tpc) near2 command\$3	US-PGPUB; USPAT	OR	ON	2017/03/03 09:08
L17	57	L15 with (value\$1 off\$set\$4) near7 (transmi\$6 near power near control\$4 tpc) near2 command\$3	US-PGPUB; USPAT	OR	ON	2017/03/03 09:09
L18	1	L17 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2017/03/03 09:09
L19	20	select\$3 with (value off\$set number) with (up down) with (transmi\$6 near power near control\$4 tpc) near2 command\$3	US-PGPUB; USPAT	OR	ON	2017/03/03 09:09
L20	6	L19 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2017/03/03 09:09
L21	37	(base adj2 station\$1 bts\$1 bs\$1 base\$station node-b access near2 (point terminal node) base near2 site bss eNB\$1) same select\$3 with (up down) with (transmi\$6 near power near control\$4 tpc) near2 command\$3	US-PGPUB; USPAT	OR	ON	2017/03/03 09:09
L22	6	L21 same resource\$1 with allocat\$3	US-	OR	ON	2017/03/03

			PGPUB; USPAT			09:09
L23	0	L22 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US- PGPUB; USPAT	OR	ON	2017/03/03 09:09
L24	6	L21 same resource\$1 with allocat\$3	US- PGPUB; USPAT	OR	ON	2017/03/03 09:09
L25	63	select\$3 near7 (value\$1 off\$set\$4) near7 (transmi\$6 near power near control\$4 tpc) near2 command\$3	US- PGPUB; USPAT	OR	ON	2017/03/03 09:10
L26	13	L25 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US- PGPUB; USPAT	OR	ON	2017/03/03 09:10
L27	13	26 AND ((H04W52/221 OR H04W52/24 OR H04W36/18 OR H04W52/0229 OR H04W52/08 OR H04W52/16 OR H04W52/226 OR H04W52/26 OR H04W52/262 OR H04W52/286 OR H04W52/325 OR H04W52/36 OR H04W52/40 OR H04W52/50 OR H04W52/04 OR H04W52/06 OR H04W52/10 OR H04W52/12 OR H04W52/14 OR H04W52/146 OR H04W52/241 OR H04W52/242 OR H04W52/243 OR H04W52/34 OR H04W52/362 OR H04W52/42 OR H04W52/56 OR H04W72/0473 OR H04W72/1268 OR H04W72/1289 OR G06F13/4072 OR G06F13/4081 OR G06F13/4291 OR G06K19/077 OR H04B7/264 OR H04B7/06 OR H04B7/0851 OR H04B7/0857 OR Y02B60/50 OR H01Q1/246 OR H01Q3/26 OR H01Q3/2605 OR H01Q3/30).CPC.)	US- PGPUB; USPAT	OR	ON	2017/03/03 09:11
L28	9	multi\$level near2 (transmi\$6 near power near control\$4 tpc) near2 command\$3	US- PGPUB; USPAT	OR	ON	2017/03/03 09:13
L29	9	28 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US- PGPUB; USPAT	OR	ON	2017/03/03 09:13
L30	17982	(down\$link forward\$link forward near2 link) near5 (physical near2 channel)	US- PGPUB; USPAT	OR	ON	2017/03/03 09:15
L31	4019	L30 same resource with allocat\$3	US- PGPUB; USPAT	OR	ON	2017/03/03 09:15
L32	880	L31 same (power near4 control\$4 with command\$3 tpc)	US- PGPUB; USPAT	OR	ON	2017/03/03 09:15
L33	2	L32 same (path\$loss path near2 loss)	US- PGPUB; USPAT	OR	ON	2017/03/03 09:15
L34	239	(transmi\$6 send\$3 forward\$3 deliver\$3 provid\$3 broad\$cast\$3) near6 (tpc transmi\$6 near2 power near2 command\$3) near5 schedul\$3 near2 information	US- PGPUB; USPAT	OR	ON	2017/03/03 09:15
L35	6	L34 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US- PGPUB; USPAT	OR	ON	2017/03/03 09:15
L36	15	multi\$level near3 (tpc transmi\$6 near2 power	US-	OR	ON	2017/03/03

		near2 command\$3)	PGPUB; USPAT			09:16
L37	10	L36 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US- PGPUB; USPAT	OR	ON	2017/03/03 09:16
L38	49	(different various multi\$3 many several numerous variety pluralit\$3 second third first fourth) near2 level near4 (tpc transmi\$6 near2 power near2 control\$4) near2 command\$3	US- PGPUB; USPAT	OR	ON	2017/03/03 09:16
L39	36	L38 same power near2 level	US- PGPUB; USPAT	OR	ON	2017/03/03 09:16
L40	2	L39 same (path\$loss path near2 loss)	US- PGPUB; USPAT	OR	ON	2017/03/03 09:16
L41	17982	(down\$link forward\$link forward near2 link) near5 (physical near2 channel)	US- PGPUB; USPAT	OR	ON	2017/03/03 09:17
L42	4019	L41 same resource with allocat\$3	US- PGPUB; USPAT	OR	ON	2017/03/03 09:17
L43	880	L42 same (power near4 control\$4 with command\$3 tpc)	US- PGPUB; USPAT	OR	ON	2017/03/03 09:17
L44	2	L43 same (path\$loss path near2 loss)	US- PGPUB; USPAT	OR	ON	2017/03/03 09:17

3/ 3/ 2017 9:24:37 AM

C:\ Users\ drego\ Documents\ EAST\ Workspaces\ 15229906.wsp

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	199	(nicholas near2 anderson).in.	US-PGPUB; USPAT	OR	ON	2017/03/03 08:39
L2	124	(intellectual near2 ventures near2 holding).as.	US-PGPUB; USPAT	OR	ON	2017/03/03 08:39
L3	4	(multi\$level near2 (transmi\$6 near power near control\$4 tpc) near2 command\$3).clm.	US-PGPUB; USPAT	OR	ON	2017/03/03 08:41
L4	4	1 and 3	US-PGPUB; USPAT	OR	ON	2017/03/03 08:42
L5	2	2 and 3	US-PGPUB; USPAT	OR	ON	2017/03/03 08:42
L6	2	((transmi\$6 near power near control\$4 tpc) near2 command\$3 same allocat\$3 with resourc\$1 same physical near2 channel).clm.	US-PGPUB; USPAT	OR	ON	2017/03/03 08:51
L7	1	((transmi\$6 near power near control\$4 tpc) near2 command\$3 same allocat\$3 with resourc\$1 same select\$3 near4 (parameter\$1 value\$1 off\$set)).clm.	US-PGPUB; USPAT	OR	ON	2017/03/03 08:52

3/ 3/ 2017 8:53:09 AM**C:\ Users\ drego\ Documents\ EAST\ Workspaces\ 15229906.wsp**

Search Notes 	Application/Control No. 15229906	Applicant(s)/Patent Under Reexamination ANDERSON, NICHOLAS W.
	Examiner DOMINIC REGO	Art Unit 2647

CPC- SEARCHED		
Symbol	Date	Examiner
H04W 52/242, 52/06, 52/08, 52/10, 52/12, 52/221, 52/24, 52/243, 52/241, 72/0473, 72/1268, 72/1289	3/3/2017	DR

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST, Inventor, and Assignee Search	9/9/2016	DR
H04W 52/242, 52/06, 52/08, 52/10, 52/12, 52/221, 52/24, 52/243, 52/241, 72/0473, 72/1268, 72/1289 (Text search only)	3/3/2017	DR
Updated above search	3/3/2017	DR

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	PGPUB Text Search-See Interference search history	3/3/2017	DR

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Receipt date: 11/04/2016

15229906 -- GAU: 2647

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)

Approved for use through 07/31/2012. OMB 0651-0031

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15229906
	Filing Date		2016-08-05
	First Named Inventor	Nicholas W. Anderson	
	Art Unit	2647	
	Examiner Name	Dominic E. Rego	
	Attorney Docket Number	IPW2-USCN209711	

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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
	1	5719583	B1	1998-02-17	Kanai	
	2	5887245	B1	1999-03-23	Lindroth et al.	
	3	6085106	B1	2000-07-04	Sedonaris et al.	
	4	6137993	B1	2000-10-24	Almgren et al.	
	5	6442398	B1	2002-08-27	Padovani et al.	
	6	6512931	B1	2003-01-28	Kim et al.	
	7	6597723	B1	2003-07-22	Zeira et al.	
	8	6628956	B2	2003-09-30	Bark et al.	

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Attorney Docket Number		IPW2-USCN209711	

9	6823194	B2	2004-11-23	Haim	
10	6983166	B2	2006-01-03	Shiu et al.	
11	7190688	B1	2007-03-13	Kamel et al.	
12	7277721	B2	2007-10-02	Okumura et al.	
13	8134994	B2	2012-03-13	Liu et al.	
14	5257283	A	1993-10-26	Gilhausen et al.	
15	8134994	B2	2012-03-13	Liu et al.	* English Equivalent of JP 2004-248247
16	6442398	B1	2002-08-27	Padovani et al.	
17	6512931	B1	2003-01-28	Kim et al.	*English Equivalent of CN1128515
18	6804512	B1	2004-10-12	Baker et al.	
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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
	1	20010036823	A1	2001-11-01	Van Lieshout et al.	
	2	20030032411	A1	2003-02-13	Kim et al.	
	3	20030103530	A1	2003-06-05	Durastante	
	4	20030134655	A1	2003-07-17	Chen et al.	
	5	20040137860	A1	2004-07-15	Oh et al.	
	6	20040141483	A1	2004-07-22	Zeira et al.	
	7	20040162093	A1	2004-08-19	Bevan et al.	
	8	20040171387	A1	2004-09-02	Miyoshi et al.	
	9	20040190485	A1	2004-09-30	Khan	* Corresponds to JP 2004-289842
	10	20040203987	A1	2004-10-14	Butala	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15229906
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11	20050003846	A1	2005-01-06	Anderson	
12	20050025056	A1	2005-02-03	Chen et al.	
13	20050041673	A1	2005-02-24	Jiang et al.	
14	20050130690	A1	2005-06-16	Shinozaki	
15	20050136961	A1	2005-06-23	Simonsson et al.	
16	20050176455	A1	2005-08-11	Krishnan et al.	
17	20050207359	A1	2005-09-22	Hwang et al.	
18	20070081492	A1	2007-04-12	Petrovic et al.	
19	20090028111	A1	2009-01-29	Chao et al.	
20	20050073973	A1	2005-04-07	LaRoia et al.	
21	20120113808	A1	2012-05-05	Washburn	

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	22	20130142217	A1	2013-06-06	Lomp	
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	1	1071227	EP	A2	2001-01-24	Usuda et al.		
	2	1176739	EP	A1	2002-01-30	Hayashi et al.		
	3	1367740	EP	A1	2003-12-03	Zeira et al.		
	4	2350522	GB	A1	2000-11-29	Hulbert et al.		
	5	2004040187	JP	A2	2004-02-05	Miya et al.		
	6	199631009	WO	A1	1996-10-03	Otten		
	7	199907105	WO	A2	1999-02-11	Larsen et al.		
	8	200057574	WO	A1	2000-09-28	Zeira et al.		

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9	200108322	WO	A1	2001-02-01	Simonsson et al.		
10	200184740	WO	A2	2001-11-08	Zeira et al.		
11	2003010903	WO	A1	2003-02-06	Okumura et al.		
12	2003036816	WO	A1	2003-05-01	Anderson		
13	1159720	CN	A	1997-09-17	Qualcomm, Inc.	*Abstract Translation provided	
14	91/07037	WO	A1	1991-05-16	Qualcomm, Inc.	*English Equivalent of CN 1159720	
15	2004248247	JP	A	2004-02-09	Lucent Technol Inc.	*English Translation of Abstract. US 8134994 is the English Equivalent	
16	2004289842	JP	A	2004-10-14	Lucent Technol Inc.	*English Translation of Abstract. US 20040190485 is the English Equivalent	
17	1128515	CN	C	2003-11-19	Samsung Electronics Co. Ltd.	English Abstract provided. *US6512931 is the English Equivalent	
18	1343400	CN	A	2002-04-03	InterDigital Tech Corp	English Abstract provided. *WO00/57574 is the English Equivalent	
19	00/57574	WO	A1	2000-09-28	Zeira et al.	*English Equivalent of CN1343400	

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	1	"Recommendation ITU-R M.1225: Guidelines for Evaluation of Radio Transmission Technologies for IMT-2000," International Telecommunication Union/ITU Radiocommunication Sector, January 1, 1997, Rec. ITU-R M.1225, pp. 1-61.	
	2	Communication pursuant to Article 94(3) EPC from European Patent Application No. 05 801 370.7-1246 dated December 30, 2009.	
	3	European Search Report Dated December 2, 2010 from European Application No. 10185576.5- 1246.	
	4	Great Britain Search Report mailed May 14, 2002, for Great Britain Application No. 0125504.1 filed October 24, 2001, 1 page.	
	5	International Search Report mailed December 22, 2005, for PCT Application No. PCT/EP2005/053931 filed August 10, 2005, 4 pages.	
	6	International Search Report mailed January 21, 2003, for PCT Application No. PCT/GB02/04811 filed October 24, 2002, 3 pages.	
	7	Office Action for Japanese Application No. 2007-525302, issued March 13, 2012 (A copy of the office action and its English machine translation have been provided).	
	8	THIRD GENERATION PARTNERSHIP PROJECT, Technical Specification Group Radio Access Network; Feasibility Study on Uplink Enhancements for UTRA TDD; (Release 6); 3GPP TR 25.804 V6.0.0 (2005-03)	
	9	NON-FINAL REJECTION, U.S. Patent Application No. 13/726,976, dated May 22, 2014.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15229906
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	First Named Inventor	Nicholas W. Anderson	
	Art Unit	2647	
	Examiner Name	Dominic E. Rego	
	Attorney Docket Number	IPW2-USCN209711	

10	OFFICE ACTION, Japanese Patent Application No. 2011-234218, dated December 6, 2012.
11	OFFICE ACTION, Japanese Patent Application No. 2011-234218, dated December 6, 2012.
12	NON-FINAL REJECTION, U.S. Patent Application No. 10/917,968, dated June 18, 2014.
13	FINAL REJECTION, U.S. Patent Application No. 10/917,968, dated January 8, 2010.
14	NON-FINAL REJECTION, U.S. Patent Application No. 10/917,968, dated March 31, 2009.
15	FINAL REJECTION, U.S. Patent Application No. 10/917,968, dated August 1, 2008.
16	REQUIREMENT FOR RESTRICTION/ELECTION, U.S. Patent Application No. 10/917,968, dated March 19, 2008.
17	NON-FINAL REJECTION, U.S. Patent Application No. 10/917,968, dated July 2, 2007.
18	OFFICE ACTION, Korean Patent Application No. 10-2007-7005478, dated December 21, 2011 with English Translation
19	NOTICE OF ALLOWANCE, Korean Patent Application No. 10-2007-7005478, dated June 7, 2012.
20	NOTICE OF ALLOWANCE, Korean Patent Application No. 10-2012-7004514, dated February 22, 2013.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15229906
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	First Named Inventor	Nicholas W. Anderson	
	Art Unit	2647	
	Examiner Name	Dominic E. Rego	
	Attorney Docket Number	IPW2-USCN209711	

21	NOTICE OF ALLOWANCE, Korean Patent Application No. 10-2012-7004519, dated December 26, 2012.
22	NOTICE OF ALLOWANCE, Korean Patent Application No. 10-2012-7004526, dated June 7, 2012.
23	NOTICE OF ALLOWANCE, Korean Patent Application No. 10-2012-7020771, dated January 30, 2013.
24	NON-FINAL REJECTION, U.S. Patent Application No. 14/713,719, dated June 30, 2015.
25	NOTICE OF ALLOWANCE, U.S. Patent Application No. 14/713,719, dated December 17, 2015.
26	NOTICE OF ALLOWANCE, U.S. Patent Application No. 14/713,719, dated March 30, 2016.

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EXAMINER SIGNATURE

Examiner Signature	/DOMINIC E REGO/	Date Considered	03/03/2017
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

Issue Classification 	Application/Control No. 15229906	Applicant(s)/Patent Under Reexamination ANDERSON, NICHOLAS W.	
	Examiner DOMINIC REGO	Art Unit 2647	

CPC						
Symbol				Type	Version	
H04W	52	/	242	F	2013-01-01	
H04W	52	/	06	I	2013-01-01	
H04W	52	/	08	A	2013-01-01	
H04W	52	/	10	A	2013-01-01	
H04W	52	/	12	A	2013-01-01	
H04W	52	/	221	I	2013-01-01	
H04W	52	/	24	I	2013-01-01	
H04W	52	/	243	I	2013-01-01	
H04W	72	/	0473	I	2013-01-01	
H04W	52	/	241	I	2013-01-01	
H04W	72	/	1268	I	2013-01-01	
H04W	72	/	1289	I	2013-01-01	
		/				
		/				
		/				

CPC Combination Sets						
Symbol			Type	Set	Ranking	Version

NONE		Total Claims Allowed:	
		22	
(Assistant Examiner)	(Date)		
/DOMINIC REGO/ Primary Examiner.Art Unit 2647	03/03/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification 	Application/Control No. 15229906	Applicant(s)/Patent Under Reexamination ANDERSON, NICHOLAS W.
	Examiner DOMINIC REGO	Art Unit 2647

US ORIGINAL CLASSIFICATION						INTERNATIONAL CLASSIFICATION													
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED								
455			522			H	0	4	B	7 / 00 (2006.01.01)									
CROSS REFERENCE(S)																			
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																		
455	68	69																	

NONE		Total Claims Allowed:	
		22	
(Assistant Examiner)	(Date)		
/DOMINIC REGO/ Primary Examiner.Art Unit 2647	03/03/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification 	Application/Control No. 15229906	Applicant(s)/Patent Under Reexamination ANDERSON, NICHOLAS W.
	Examiner DOMINIC REGO	Art Unit 2647

☐ 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	1		17												
2	2	15	18												
3	3	16	19												
	4	17	20												
4	5	18	21												
5	6	19	22												
6	7	20	23												
7	8		24												
8	9	21	25												
	10	22	26												
9	11														
10	12														
11	13														
12	14														
13	15														
14	16														

NONE		Total Claims Allowed:	
		22	
(Assistant Examiner)	(Date)		
/DOMINIC REGO/	03/03/2017	O.G. Print Claim(s)	O.G. Print Figure
Primary Examiner.Art Unit 2647		1	1
(Primary Examiner)	(Date)		

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.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 15/229,906	Filing Date 08/05/2016	☐ To be Mailed
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), (j), 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	02/15/2017	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 22	Minus	** 26	= 0	X \$80 =	0
	Independent (37 CFR 1.16(h))	* 4	Minus	***4	= 0	X \$420 =	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		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.							

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.

Doc Code: DIST.E.FILE Document Description: Electronic Terminal Disclaimer - Filed		PTO/SB/26 U.S. Patent and Trademark Office Department of Commerce
Electronic Petition Request	TERMINAL DISCLAIMER TO OBTAIN A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT	
Application Number	15229906	
Filing Date	05-Aug-2016	
First Named Inventor	Nicholas Anderson	
Attorney Docket Number	IPW2-USCN209711	
Title of Invention	POWER CONTROL IN A WIRELESS NETWORK	
☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action ☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.		
Owner	Percent Interest	
Intellectual Ventures II LLC	100%	
The owner(s) with percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of prior patent number(s) 9055586 as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns. In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later: - expires for failure to pay a maintenance fee; - is held unenforceable; - is found invalid by a court of competent jurisdiction; - is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321; - has all claims canceled by a reexamination certificate; - is reissued; or - is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer. ☒ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.		

☐ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.	
Applicant claims the following fee status:	
☐ Small Entity ☐ Micro Entity ☒ Regular Undiscounted	
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am:	
☒ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application Registration Number <u>56787</u>	
☐ A sole inventor ☐ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application ☐ A joint inventor; all of whom are signing this request	
Signature	/Harry Vartanian/
Name	Harry Vartanian

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
 Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Electronic Patent Application Fee Transmittal				
Application Number:		15229906		
Filing Date:		05-Aug-2016		
Title of Invention:		POWER CONTROL IN A WIRELESS NETWORK		
First Named Inventor/Applicant Name:		Nicholas W. Anderson		
Filer:		Harry Vartanian/Elizabeth McGinty		
Attorney Docket Number:		IPW2-USCN209711		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	160	160
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				160

Doc Code: DISQ.E.FILE
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 15229906

Filing Date: 05-Aug-2016

Applicant/Patent under Reexamination: Anderson

Electronic Terminal Disclaimer filed on February 15, 2017

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt	
EFS ID:	28365198
Application Number:	15229906
International Application Number:	
Confirmation Number:	6772
Title of Invention:	POWER CONTROL IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Nicholas W. Anderson
Customer Number:	3624
Filer:	Harry Vartanian/Elizabeth McGinty
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USCN209711
Receipt Date:	15-FEB-2017
Filing Date:	05-AUG-2016
Time Stamp:	16:33:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$160
RAM confirmation Number	021617INTEFSW16332901
Deposit Account	220493
Authorized User	Elizabeth McGinty
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees) 37 CFR 1.20 (Post Issuance fees) 37 CFR 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Electronic Terminal Disclaimer-Filed	eTerminal-Disclaimer.pdf	33560	no	2
			20c48df6b2548a7d4dfd977259e2c342ce46b370		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30563	no	2
			80ed665bc996089a6d4b4c9c46cf806ccc59222b		
Warnings:					
Information:					
Total Files Size (in bytes):			64123		
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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:

Nicholas W. Anderson

Application No.: 15/229,906

Confirmation No.: 6772

Filed: August 5, 2016

For: POWER CONTROL IN A
WIRELESS NETWORK

Group: 2647

Examiner: Dominic E. Rego

Our File: IPW2-USCN209711

Date: February 15, 2017

RESPONSE PURSUANT TO 37 C.F.R. § 1.111

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

This Response and Terminal Disclaimer are being filed in response to the Non-Final Office Action dated September 15, 2016 and is submitted in conjunction with an appropriate petition for extension of time.

Please amend the application without prejudice or disclaimer as follows:

|

4366676-1

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional) IPW2-USCN209711																																		
Application Number 15/229,906	Filed August 5, 2016																																			
For POWER CONTROL IN A WIRELESS NETWORK																																				
Art Unit 2647	Examiner Dominic E. Rego																																			
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application. The requested extension and fee are as follows (check time period desired and enter the appropriate fee below): <table style="width: 100%; border-collapse: collapse;"><thead><tr><th></th><th style="text-align: center;"><u>Fee</u></th><th style="text-align: center;"><u>Small Entity Fee</u></th><th style="text-align: center;"><u>Micro Entity Fee</u></th><th></th></tr></thead><tbody><tr><td>☐ One month (37 CFR 1.17(a)(1))</td><td style="text-align: center;">\$200</td><td style="text-align: center;">\$100</td><td style="text-align: center;">\$50</td><td>\$ _____</td></tr><tr><td>☒ Two months (37 CFR 1.17(a)(2))</td><td style="text-align: center;">\$600</td><td style="text-align: center;">\$300</td><td style="text-align: center;">\$150</td><td>\$ <u>600</u></td></tr><tr><td>☐ Three months (37 CFR 1.17(a)(3))</td><td style="text-align: center;">\$1,400</td><td style="text-align: center;">\$700</td><td style="text-align: center;">\$350</td><td>\$ _____</td></tr><tr><td>☐ Four months (37 CFR 1.17(a)(4))</td><td style="text-align: center;">\$2,200</td><td style="text-align: center;">\$1,100</td><td style="text-align: center;">\$550</td><td>\$ _____</td></tr><tr><td>☐ Five months (37 CFR 1.17(a)(5))</td><td style="text-align: center;">\$3,000</td><td style="text-align: center;">\$1,500</td><td style="text-align: center;">\$750</td><td>\$ _____</td></tr></tbody></table> ☐ 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. ☐ A check in the amount of the fee is enclosed. ☒ Payment by credit card. Form PTO-2038 is attached. ☐ The Director has already been authorized to charge fees in this application to a Deposit Account. ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number <u>220493</u>. ☒ Payment made via EFS-Web. 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. I am the ☐ applicant. ☒ attorney or agent of record. Registration number <u>56,787</u>. ☐ attorney or agent acting under 37 CFR 1.34. Registration number _____. <table style="width: 100%; border-collapse: collapse;"><tr><td style="width: 50%; vertical-align: bottom;"><u>/Harry Vartanian/</u> Signature</td><td style="width: 50%; vertical-align: bottom;"><u>February 15, 2017</u> Date</td></tr><tr><td style="vertical-align: bottom;"><u>Harry Vartanian</u> Typed or printed name</td><td style="vertical-align: bottom;"><u>215-568-6400</u> Telephone Number</td></tr></table> NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.				<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>		☐ One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ _____	☒ Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ <u>600</u>	☐ Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ _____	☐ Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____	☐ Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____	<u>/Harry Vartanian/</u> Signature	<u>February 15, 2017</u> Date	<u>Harry Vartanian</u> Typed or printed name	<u>215-568-6400</u> Telephone Number
	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>																																	
☐ One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ _____																																
☒ Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ <u>600</u>																																
☐ Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ _____																																
☐ Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____																																
☐ Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____																																
<u>/Harry Vartanian/</u> Signature	<u>February 15, 2017</u> Date																																			
<u>Harry Vartanian</u> Typed or printed name	<u>215-568-6400</u> Telephone Number																																			
☒ * Total of <u>1</u> forms are submitted.																																				

This collection of information is required by 37 CFR 1.136(a). 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 6 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: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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.

Electronic Patent Application Fee Transmittal				
Application Number:		15229906		
Filing Date:		05-Aug-2016		
Title of Invention:		POWER CONTROL IN A WIRELESS NETWORK		
First Named Inventor/Applicant Name:		Nicholas W. Anderson		
Filer:		Harry Vartanian		
Attorney Docket Number:		IPW2-USCN209711		
Filed as Large 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:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 2 months with \$0 paid	1252	1	600	600
Miscellaneous:				
Total in USD (\$)				600

Electronic Acknowledgement Receipt	
EFS ID:	28365337
Application Number:	15229906
International Application Number:	
Confirmation Number:	6772
Title of Invention:	POWER CONTROL IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Nicholas W. Anderson
Customer Number:	3624
Filer:	Harry Vartanian/Elizabeth McGinty
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USCN209711
Receipt Date:	15-FEB-2017
Filing Date:	05-AUG-2016
Time Stamp:	16:39:04
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 600
RAM confirmation Number	021617INTEFSW16402000
Deposit Account	220493
Authorized User	Elizabeth McGinty
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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IPW2-USCN209711_-_Response_to_NonFinal_-_20170215.PDF	134854	yes	12
			b73e6fb0501a2c0596b4272802a03506b42b5f86		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Applicant Arguments/Remarks Made in an Amendment		9	12	
	Claims		2	8	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
Warnings:					
Information:					
2	Extension of Time	IPW2-USCN209711_-_Extension_of_Time_-_20170215.PDF	163490	no	2
			0d88b0e92e4dd7ee84c25708fa63f22570609541		
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3	Fee Worksheet (SB06)	fee-info.pdf	30384	no	2
			026f8bc7399fc88eb29fe0840d918a52e9a737f5		
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New Applications Under 35 U.S.C. 111

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

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REMARKS/ARGUMENTS

After the foregoing Amendment, claims 1-3, 5-9, 11-16, 18-23, 25, and 26 are currently pending in this application. Claims 4, 10, 17 and 24 are canceled and claims 1, 7, 13, and 20 are amended.

Request for an Interview

A telephonic interview is requested with the Examiner to further discuss the 35 U.S.C. § 112 rejections.

Double Patenting Rejection

Claims 1-26 are provisionally rejected under the judicially created doctrine of nonstatutory double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 9,055,586. A Terminal Disclaimer is submitted herewith to overcome the nonstatutory double patenting rejection. Accordingly, withdrawal of the nonstatutory double patenting rejection is respectfully requested.

Claim Rejections - 35 U.S.C. § 112

Claims 1, 7, 13, and 20 are rejected under 35 U.S.C. § 112(a) or 35 U.S.C. § 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. In particular, support for the claimed feature "..... the processor is configured to select a value of a multi-level transmit power control (TPC) command

from a set of values that indicate a plurality of up amounts" is questioned. Although applicant respectfully disagrees with the propriety of the rejection, to advance prosecution the claims are amended. Support for this feature in amended claim 1 may at least be found in paragraphs [0059]-[0062]:

Second, an SNIR comparison loop is located in the network, such as in the Node-B. The SNIR comparison loop is driven by received SNIR metrics. A received SNIR is compared to a SNIR Target value, which is set by an outer loop. A comparison result leads to the signalling of a TPC command that is signalled to the UE to change its transmit power. **Binary signalling may be used, such that the TPC command indicates a change in transmission power by a fixed amount either up or down. Alternately, a multi-level TPC command may be used.**

Third, an outer loop is located in the network, such as in the Node-B or RNC. The outer loop is driven by the data error statistics observed on the uplink transmissions. The outer loop is responsible for setting an SNIR Target level for the SNIR comparison loop.

An optional auxiliary process in the UE adjusts the transmit power based upon: (a) γ_{SF} , the spreading factor (SF) of the physical channel; and (b) β_{TFC} , the selected transport format (TFC).

Thus, for the current frame k , the UE may calculate the transmit power $P_{Tx}(k)$ as shown below where K is the initial frame number determined when the power control process begins; TPC_i is -1 for a down TPC command, $+1$ for an up TPC command and 0 if no TPC command is received; and $step$ is the magnitude of the amount added to an accumulator upon receipt of each TPC command. The transmit power $P_{Tx}(k)$ may be updated for every frame period. Alternatively, the transmit power $P_{Tx}(k)$ may be updated each time a new TPC command is received. Alternatively, the transmit power $P_{Tx}(k)$ may be updated only when either a TPC command or a new power level is received from the network.

$$P_{Tx}(k) = P_{open(k)} + step \cdot \sum_{i=k-K}^k TPC_i + \gamma_{SF} + \beta_{TFC}$$

In the example given in paragraph [0059], a binary TPC command may comprise “a fixed amount either up or down.” However, a multi-level TPC command may have either at least two amounts/levels up or two amounts/levels down. Based on the arguments presented above, withdrawal of the rejection of claims 1, 7, 13, and 20 under 35 U.S.C. § 112(b) or 35 U.S.C. § 112 (pre-AIA), first paragraph, is respectfully requested.

Claims 1, 7, 13, and 20 are rejected under 35 U.S.C. § 112(b) or 35 U.S.C. § 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention. In particular, the meaning of “..... the processor is configured to select a value of a multi-level transmit power control (TPC) command from a set of values that indicate a plurality of up amounts” is requested. The response to this indefiniteness rejection is given above. Based on the arguments presented above, withdrawal of the rejection of claims 1, 7, 13, and 20 under 35 U.S.C. § 112(b) or 35 U.S.C. § 112 (pre-AIA), second paragraph, is respectfully requested.

Conclusion

It should also be noted that although arguments have been presented with respect to certain claims herein, the recited subject matter as well as various other subject matter and/or combinations of subject matter may be patentable for other reasons. Further, the failure to address any statement by the Examiner herein

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should not be interpreted as acquiescence or agreement with such statement. The Applicant expressly reserves the right to set forth additional and/or alternative reasons for patentability and/or allowance with the present application or in any other future proceeding, and to rebut any statement presented by the Examiner in this or other papers during prosecution of the present application.

If the Examiner believes that any additional minor formal matters need to be addressed in order to place this application in condition for allowance, or that a telephonic interview will help to materially advance the prosecution of this application, the Examiner is invited to contact the undersigned by telephone at the Examiner's convenience.

In view of the foregoing, Applicant respectfully submits that the present application, including claims 1-3, 5-9, 11-16, 18-23, 25, and 26, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

Intellectual Ventures II LLC

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Amendments to the Claims:

This listing of the claims will replace all prior versions of the claims in the application:

1. (Currently Amended) A network device comprising:

a transmitter;

a receiver;

a processor operatively coupled to the transmitter and the receiver; and

the processor is configured to select a value of a multi-level transmit power control (TPC) command from a set of values that includes at least two values up or at least two values down ~~indicate a plurality of up amounts;~~

wherein the processor is further configured to have the transmitter transmit, on a single physical channel, an allocation of an uplink resource and the multi-level TPC command having the selected value; and

wherein the receiver is configured to receive, from user equipment (UE), an uplink signal on the allocated uplink resource based on the transmitted allocation of the uplink resource and the multi-level TPC command.

2. (Original) The network device of claim 1, wherein the processor is further configured to have the transmitter transmit, to the UE, an indication as to whether accumulation of TPC commands is enabled.

3. (Original) The network device of claim 1, wherein the uplink signal is received on an uplink shared channel.

4. (Canceled)

5. (Original) The network device of claim 1, wherein the network device is any one of a Node-B or a base station.

6. (Original) The network device of claim 1, wherein the single physical channel is associated with a spreading factor or a code division multiple access (CDMA) code.

7. (Currently Amended) A method comprising:

selecting, by a network device, a value of a multi-level transmit power control (TPC) command from a set of values that includes at least two values up or at least two values down ~~indicate a plurality of up amounts;~~

transmitting, by the network device to a user equipment (UE) on a single physical channel, an allocation of an uplink resource and the multi-level TPC command having the selected value; and

receiving, by the network device from the UE, an uplink signal on the allocated uplink resource based on the transmitted allocation of the uplink resource and the multi-level TPC command.

8. (Original) The method of claim 7 further comprising transmitting, by the network device to the UE, an indication as to whether accumulation of TPC commands is enabled.

9. (Original) The method of claim 7, wherein the uplink signal is received on an uplink shared channel.

10. (Canceled)

11. (Original) The method of claim 7, wherein the network device is any one of a Node-B or a base station.

12. (Original) The method of claim 7, wherein the single physical channel is associated with a spreading factor or a code division multiple access (CDMA) code.

13. (Currently Amended) A user equipment (UE) comprising:
a transmitter;

a receiver;

a processor operatively coupled to the transmitter and the receiver; and

the processor and the receiver are configured to receive, on a single physical channel, an allocation of an uplink resource and a multi-level transmit power control (TPC) command;

wherein the processor is further configured to determine a transmission power level based on a value of the multi-level TPC command out of a plurality of potential values for the multi-level TPC command;

wherein the plurality of potential values for the multi-level TPC command includes at least two values up or at least two values down ~~indicate a plurality of up amounts~~; and

wherein the processor is configured to have the transmitter transmit an uplink signal on the allocated uplink resource at the determined transmission power level.

14. (Original) The UE of claim 13, wherein the processor is further configured to receive an indication as to whether accumulation of TPC commands is enabled.

15. (Original) The UE of claim 14, wherein the processor is further configured to accumulate the TPC command with another TPC command in response to enablement of accumulation of TPC commands.

16. (Original) The UE of claim 13, wherein the uplink signal is transmitted on an uplink shared channel.

17. (Canceled)

18. (Original) The UE of claim 13, wherein the UE is one of a code division multiple access (CDMA) UE or a time division duplex (TDD) UE.

19. (Original) The UE of claim 13, wherein the single physical channel is associated with a spreading factor or a code division multiple access (CDMA) code.

20. (Currently Amended) A method comprising:

receiving, by a user equipment (UE) on a single physical channel, an allocation of an uplink resource and a multi-level transmit power control (TPC) command;

determining, by the UE, a transmission power level based on a value of the multi-level TPC command out of a plurality of potential values for the multi-level TPC command;

wherein the plurality of potential values for the multi-level TPC command that includes at least two values up or at least two values down ~~indicate a plurality of up amounts~~; and

transmitting, by the UE, an uplink signal on the allocated uplink resource at the determined transmission power level.

21. (Original) The method of claim 20 further comprising receiving, by the UE, an indication as to whether accumulation of TPC commands is enabled.

22. (Original) The method of claim 21, further comprising accumulating, by the UE, the TPC command with another TPC command in response to enablement of accumulation of TPC commands.

23. (Original) The method of claim 20, wherein the uplink signal is transmitted on an uplink shared channel.

24. (Canceled)

25. (Original) The method of claim 20, wherein the UE is one of a code division multiple access (CDMA) UE or a time division duplex (TDD) UE.

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26. (Original) The method of claim 20, wherein the single physical channel is associated with a spreading factor or a code division multiple access (CDMA) code.



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/229,906	08/05/2016	Nicholas W. Anderson	IPW2-USCN209711

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PUBLICATION NOTICE



3624
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET, 18th Floor
PHILADELPHIA, PA 19103

Title:POWER CONTROL IN A WIRELESS NETWORK

Publication No.US-2016-0345273-A1

Publication Date:11/24/2016

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	Filing Date	2016-08-05
	First Named Inventor	Nicholas W. Anderson
	Art Unit	2647
	Examiner Name	Dominic E. Rego
	Attorney Docket Number	IPW2-USCN209711

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	Examiner Name	Dominic E. Rego	
	Attorney Docket Number	IPW2-USCN209711	

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24	NON-FINAL REJECTION, U.S. Patent Application No. 14/713,719, dated June 30, 2015.
25	NOTICE OF ALLOWANCE, U.S. Patent Application No. 14/713,719, dated December 17, 2015.
26	NOTICE OF ALLOWANCE, U.S. Patent Application No. 14/713,719, dated March 30, 2016.

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15229906
	Filing Date		2016-08-05
	First Named Inventor	Nicholas W. Anderson	
	Art Unit	2647	
	Examiner Name	Dominic E. Rego	
	Attorney Docket Number	IPW2-USCN209711	

CERTIFICATION STATEMENT

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.

☒ A certification statement is not submitted herewith.

SIGNATURE

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	/Harry Vartanian/	Date (YYYY-MM-DD)	2016-11-04
Name/Print	Harry Vartanian	Registration Number	56,787

This collection of information is required by 37 CFR 1.97 and 1.98. 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 1 hour 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.**

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 the Freedom of Information Act requires disclosure of these records.
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 inspections 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.

Electronic Acknowledgement Receipt	
EFS ID:	27417399
Application Number:	15229906
International Application Number:	
Confirmation Number:	6772
Title of Invention:	POWER CONTROL IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Nicholas W. Anderson
Customer Number:	3624
Filer:	Harry Vartanian/Carey Kulp
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USCN209711
Receipt Date:	04-NOV-2016
Filing Date:	05-AUG-2016
Time Stamp:	10:25:29
Application Type:	Utility under 35 USC 111(a)

Payment information:

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	Other Reference-Patent/App/Search documents	14_713719_NFR_6_30_15.pdf	593617 eac387a1044768c068abecfads20aebdbca25233	no	16

Warnings:

Information:					
2	Other Reference-Patent/App/Search documents	14_713719_NOA_3_30_16.pdf	399979	no	7
			151b032c3c1ff79ca3b7f706d4432adff422c868		
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	14_713719_NOA_12_17_15.pdf	400788	no	7
			87fe6fac59c8bad533b03ef8dab2fcb271a664bd		
Warnings:					
Information:					
4	Transmittal Letter	IDS.pdf	58963	no	2
			fd63557341416c9ed8468214f846732878c08eb		
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	SB08.pdf	712620	no	11
			f302cccc99eb931f6ae1a1a99998e35cefe39e1b		
Warnings:					
Information:					
Total Files Size (in bytes):				2165967	
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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:

Nicholas W. Anderson

Application No.: 15/229,906

Confirmation No.: 6772

Filed: August 5, 2016

For: POWER CONTROL IN A WIRELESS
NETWORK

Group: 2647

Examiner: Dominic E. Rego

Our File: IPW2-USCN209711

Date: November 4, 2016

INFORMATION DISCLOSURE STATEMENT

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

Further to Applicant's Duty of Disclosure pursuant to 37 C.F.R. § 1.56, Applicant wishes to bring to the Examiner's attention the material cited on the enclosed PTO Form SB-08.

Pursuant to 37 C.F.R. § 1.98(d) copies of documents cited in the parent application are not enclosed, but copies will be provided upon request. Documents that were not cited in the parent application are provided.

Applicant: Intellectual Ventures II LLC
Application No.: 15/229,906

It is respectfully requested that the Examiner consider these documents and return an initialed copy of the PTO Form SB-08 indicating consideration of the cited materials.

Respectfully submitted,

Intellectual Ventures II LLC

By: /Harry Vartanian/

Harry Vartanian
Registration No. 56,787
(215) 568-6400

Volpe and Koenig, P.C.
United Plaza
30 South 17th Street
Philadelphia, PA 19103

HV/PCK
Enclosures (4)



UNITED STATES PATENT AND TRADEMARK OFFICE

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/229,906	08/05/2016	Nicholas W. Anderson	IPW2-USCN209711	6772
3624 7590 09/15/2016 VOLPE AND KOENIG, P.C. UNITED PLAZA 30 SOUTH 17TH STREET, 18th Floor PHILADELPHIA, PA 19103			EXAMINER REGO, DOMINIC E	
			ART UNIT 2647	PAPER NUMBER
			NOTIFICATION DATE 09/15/2016	DELIVERY MODE ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

coffice@volpe-koenig.com

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

DETAILED ACTION

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

(a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1, 7, 13, and 20 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement.

The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for pre-AIA the inventor(s), at the time the application was filed, had possession of the claimed invention. The claimed limitations “.....the processor is configured to select a value of a multi-level transmit power control (TPC) command from a set of values that indicate a plurality of up amounts” are not found in the specification. When replying to this office action, Applicant needs to clearly explain where in the specification above limitations can be found.

4. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 7, 13, and 20 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention. Refer to the limitations of above claims, “multi-level transmit power control (TPC) command” in page 24, lines 5-6. Examiner states that above limitations are not comprehensive to facilitate prosecution of the case. Paragraph [0058] of Applicant's specification, states that “.....Alternatively, a multi-level TPC command may be used.” When replying to this office action, Applicant needs to clearly explain what it's mean by “a multi-level TPC command” since specification does not define further. Same argument applies to the limitations “...a set of values that indicate a plurality of up amount”. In paragraph [0058] of Applicant's specification, recites “...Binary signaling may used, such that the TPC command indicates a change in transmission power by a fixed amount either up or down. Alternately, a multi-level TPC command may be used”. When replying to this office action, Applicant needs to clearly explain what's it mean by “... a set of values that indicate a plurality of up amount”.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the claims at issue are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the reference application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit <http://www.uspto.gov/forms/>. The filing date of the application will determine what form should be used. A web-based eTerminal Disclaimer may be filled

out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to <http://www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp>.

Claims 1-26 are provisionally rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-14 of U.S. Patent #9,055,586. Although the claims at issue are not identical, they are not patentably distinct from each other because the subject matter of claims 1-26 of the pending Appl. No. 15/229,906 and the subject matter of claims 1-14 of U.S. Patent #9,055,586 disclose a similar scope of invention.

This is a provisional nonstatutory double patenting rejection because the patentably indistinct claims have not in fact been patented.

Instant Application	Patent 9,055,586, Application #13/727,153
1. A network device comprising: a transmitter; a receiver; a processor operatively coupled to the transmitter and the receiver; and the processor is configured to select a value of a multi-level transmit power control (TPC)	1. A method performed by a wireless network, the method comprising: transmitting, by the wireless network on a single downlink physical channel, a signal having both uplink resource allocation information and a multilevel transmit power command;

command from a set of values that indicate a plurality of up amounts; wherein the processor is further configured to have the transmitter transmit, on a single physical channel, an allocation of an uplink resource and the multi-level TPC command having the selected value; and wherein the receiver is configured to receive, from user equipment (UE), an uplink signal on the allocated uplink resource based on the transmitted allocation of the uplink resource and the multi-level TPC command.	receiving, by a user equipment (UE), the signal; transmitting, by the UE on an unlink channel, an uplink signal in association with the uplink resource allocation information, wherein a transmission power level of the uplink signal is based on the multilevel transmit power command, a determined pathloss, and a format of the uplink signal; and receiving, by the wireless network on the unlink channel, the uplink signal.
For claims 2-26	See claims 2-14

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DOMINIC REGO whose telephone number is (571)272-8132. The examiner can normally be reached on 8:30 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on 571-272-7882. 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.

/DOMINIC REGO/
Primary Examiner, Art Unit 2647
Tel 571-272-8132



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

BIB DATA SHEET

CONFIRMATION NO. 6772

SERIAL NUMBER 15/229,906	FILING or 371(c) DATE 08/05/2016 RULE	CLASS 455	GROUP ART UNIT 2647	ATTORNEY DOCKET NO. IPW2-USCN209711		
APPLICANTS Intellectual Ventures II LLC, Wilmington, DE INVENTORS Nicholas W. Anderson, Exeter, UNITED KINGDOM; ** CONTINUING DATA ***** This application is a CON of 14/713,719 05/15/2015 PAT 9414326 which is a CON of 13/727,153 12/26/2012 PAT 9055586 which is a CON of 10/917,968 08/12/2004 PAT 8897828 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 08/17/2016						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and Acknowledged <u>/DOMINIC E REGO/</u> Examiner's Signature		☐ Met after Allowance Initials	STATE OR COUNTRY UNITED KINGDOM	SHEETS DRAWINGS 4	TOTAL CLAIMS 26	INDEPENDENT CLAIMS 4
ADDRESS VOLPE AND KOENIG, P.C. UNITED PLAZA 30 SOUTH 17TH STREET, 18th Floor PHILADELPHIA, PA 19103 UNITED STATES						
TITLE POWER CONTROL IN A WIRELESS NETWORK						
FILING FEE RECEIVED 2500	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		

<i>Index of Claims</i> 	Application/Control No. 15229906	Applicant(s)/Patent Under Reexamination ANDERSON, NICHOLAS W.
	Examiner DOMINIC REGO	Art Unit 2647

✓	Rejected
=	Allowed

-	Cancelled
÷	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47										
CLAIM		DATE								
Final	Original	09/10/2016								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
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	22	✓								
	23	✓								
	24	✓								
	25	✓								
	26	✓								

EAST Search History**EAST Search History (Prior Art)**

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S156	194	(nicholas near2 anderson).in.	US-PGPUB; USPAT	OR	ON	2016/09/10 17:36
S157	118	(intellectual near2 ventures near2 holding).as.	US-PGPUB; USPAT	OR	ON	2016/09/10 17:36
S160	3	(multi\$level near2 (transmi\$6 near power near control\$4 tpc) near2 command\$3).clm.	US-PGPUB; USPAT	OR	ON	2016/09/10 19:12
S161	101	(select\$3 with (transmi\$6 near power near control\$4 tpc) near2 command\$3).clm.	US-PGPUB; USPAT	OR	ON	2016/09/10 19:19
S162	0	S156 and S161	US-PGPUB; USPAT	OR	ON	2016/09/10 19:20
S163	0	S157 and S161	US-PGPUB; USPAT	OR	ON	2016/09/10 19:20
S164	26	(resource\$1 same allocat\$3 same (up\$link reverse) same (transmi\$6 near power near control\$4 tpc) near2 command\$3).clm.	US-PGPUB; USPAT	OR	ON	2016/09/10 19:22
S165	1	S156 and S164	US-PGPUB; USPAT	OR	ON	2016/09/10 19:22
S166	1	S157 and S164	US-PGPUB; USPAT	OR	ON	2016/09/10 19:23
S167	8	multi\$level near2 (transmi\$6 near power near control\$4 tpc) near2 command\$3	US-PGPUB; USPAT	OR	ON	2016/09/10 19:23
S168	8	S167 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2016/09/10 19:23
S170	57	select\$3 near7 (value\$1 off\$set\$4) near7 (transmi\$6 near power near control\$4 tpc) near2 command\$3	US-PGPUB; USPAT	OR	ON	2016/09/10 19:25
S171	12	S170 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2016/09/10 19:25
S172	34	(base adj2 station\$1 bts\$1 bs\$1 base\$station node-b access near2 (point terminal node) base near2 site bss eNB\$1) same select\$3 with (up down) with (transmi\$6 near power near control\$4 tpc) near2 command\$3	US-PGPUB; USPAT	OR	ON	2016/09/10 20:01
S173	6	S172 same resource\$1 with allocat\$3	US-PGPUB; USPAT	OR	ON	2016/09/10 20:02

S174	0	S173 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2016/09/10 20:02
S175	17	select\$3 with (value off\$set number) with (up down) with (transmi\$6 near power near control\$4 tpc) near2 command\$3	US-PGPUB; USPAT	OR	ON	2016/09/10 20:04
S176	0	S175 same resource\$1 with allocat\$3	US-PGPUB; USPAT	OR	ON	2016/09/10 20:04
S177	5	S175 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2016/09/10 20:04
S178	47019	(transmi\$6 transfer\$5 send\$3 forward\$3 deliver\$3 provid\$3 broad\$cast\$3 propagat\$3 fore\$cast\$3) near9 resourc\$3 with allocat\$3	US-PGPUB; USPAT	OR	ON	2016/09/10 20:29
S179	49	S178 with (value\$1 off\$set\$4) near7 (transmi\$6 near power near control\$4 tpc) near2 command\$3	US-PGPUB; USPAT	OR	ON	2016/09/10 20:30
S180	0	S179 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2016/09/10 20:30
S181	111	S178 with (value\$1 off\$set\$4) with (transmi\$6 near power near control\$4 tpc) near2 command\$3	US-PGPUB; USPAT	OR	ON	2016/09/10 20:31
S182	0	S181 and (@ad <= "20040812" @rlad <= "20040812" @pd <= "20040812")	US-PGPUB; USPAT	OR	ON	2016/09/10 20:31

9/11/2016 10:17:18 AM

C:\Users\drego\Documents\EAST\Workspaces\14713719.wsp

Search Notes 	Application/Control No. 15229906	Applicant(s)/Patent Under Reexamination ANDERSON, NICHOLAS W.
	Examiner DOMINIC REGO	Art Unit 2647

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

SEARCH NOTES		
Search Notes	Date	Examiner
EAST, Inventor, and Assignee Search	9/9/2016	DR

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/229,906				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OR 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			N/A	280			
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	600			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720			
TOTAL CLAIMS (37 CFR 1.16(i))	26	minus 20 = *	6			x 80 =	480			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4	minus 3 = *	1			x 420 =	420			
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		TOTAL	2500			
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	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	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	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.										



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
15/229,906	08/05/2016	2649	2500	IPW2-USCN209711	26	4

CONFIRMATION NO. 6772

FILING RECEIPT



0000000083171239

3624
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET, 18th Floor
PHILADELPHIA, PA 19103

Date Mailed: 08/19/2016

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)

Nicholas W. Anderson, Exeter, UNITED KINGDOM;

Applicant(s)

Intellectual Ventures II LLC, Wilmington, DE

Assignment For Published Patent Application

Intellectual Ventures II LLC, Wilmington, DE

Power of Attorney: The patent practitioners associated with Customer Number 3624**Domestic Priority data as claimed by applicant**

This application is a CON of 14/713,719 05/15/2015 PAT 9414326
which is a CON of 13/727,153 12/26/2012 PAT 9055586
which is a CON of 10/917,968 08/12/2004 PAT 8897828

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:** Yes

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: 08/17/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/229,906**

Projected Publication Date: 11/24/2016

Non-Publication Request: No

Early Publication Request: No
Title

POWER CONTROL IN A WIRELESS NETWORK

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
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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).

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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

☒

Practitioners associated with Customer Number:

3624

OR

☐

Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

☒

The address associated with Customer Number:

3624

OR

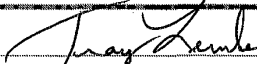
☐	Firm or Individual Name			
	Address			
	City	State	Zip	
	Country			
	Telephone	Email		

Assignee Name and Address: Intellectual Ventures II LLC
2711 Centerville Road, Suite 400
Wilmington, DE 19808

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of The practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

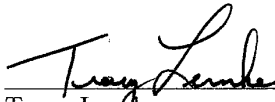
Signature		Date	4/18/16
Name	Tracy Lemke	Telephone	
Title	Authorized Person for Intellectual Ventures II LLC		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. 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 36 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 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.

DECLARATION REGARDING AUTHORITY TO SIGN
ON BEHALF OF A LEGAL ENTITY
37 C.F.R. 3.73(c)(1)

I, Tracy Lemke (whose title is supplied below), hereby declare that I am authorized to sign documents on behalf of Intellectual Ventures II LLC.



Tracy Lemke

Authorized Person for Intellectual Ventures II LLC

2/17/14
Date

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Intellectual Ventures II LLC

Application No./Patent No.: _____ Filed/Issue Date: August 5, 2016

Titled: POWER CONTROL IN A WIRELESS NETWORK

Intellectual Ventures II LLC, a limited liability company

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is ____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Nicholas William Anderson To: IPWireless, Inc.

The document was recorded in the United States Patent and Trademark Office at
Reel 015474, Frame 0248, or for which a copy thereof is attached.

2. From: IPWireless, Inc. To: Northrop Grumman Information Technology, Inc.

The document was recorded in the United States Patent and Trademark Office at
Reel 022102, Frame 0891, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(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.

STATEMENT UNDER 37 CFR 3.73(c)3. From: Northrop Grumman Information Technology, Inc. To: IPWireless, Inc.

The document was recorded in the United States Patent and Trademark Office at
 Reel 024006, Frame 0144, or for which a copy thereof is attached.

4. From: IPWireless, Inc. To: Wireless Technology Solutions LLC

The document was recorded in the United States Patent and Trademark Office at
 Reel 024305, Frame 0492, or for which a copy thereof is attached.

5. From: Wireless Technology Solutions LLC To: IPWireless, Inc.

The document was recorded in the United States Patent and Trademark Office at
 Reel 027910, Frame 649, or for which a copy thereof is attached.

6. From: IPWireless, Inc. To: Intellectual Ventures Holding 81 LLC

The document was recorded in the United States Patent and Trademark Office at
 Reel 036159, Frame 0531, or for which a copy thereof is attached.

☒ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Harry Vartanian/

Signature

Harry Vartanian

Printed or Typed Name

August 5, 2016

Date

Reg. No. 56,787

Title or Registration 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.

STATEMENT UNDER 37 CFR 3.73(c) CONTINUED

Applicant/Patent Owner: Intellectual Ventures II LLC

Application No./Patent No.: _____

Filed/Issue Date: August 5, 2016

Titled: POWER CONTROL IN A WIRELESS NETWORK

4. **From:** Intellectual Ventures Holding 81 LLC **To:** Intellectual Ventures II LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 036477 , Frame 0340

5. **From:** _____ **To:** _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____ , Frame _____

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		POWER CONTROL IN A WIRELESS NETWORK		
First Named Inventor/Applicant Name:		Nicholas W. Anderson		
Filer:		Harry Vartanian/Elizabeth McGinty		
Attorney Docket Number:		IPW2-USCN209711		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	280	280
Utility Search Fee	1111	1	600	600
Utility Examination Fee	1311	1	720	720
Pages:				
Claims:				
Claims in Excess of 20	1202	6	80	480
Independent claims in excess of 3	1201	1	420	420
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2500

Electronic Acknowledgement Receipt	
EFS ID:	26563024
Application Number:	15229906
International Application Number:	
Confirmation Number:	6772
Title of Invention:	POWER CONTROL IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Nicholas W. Anderson
Customer Number:	3624
Filer:	Harry Vartanian/Elizabeth McGinty
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USCN209711
Receipt Date:	05-AUG-2016
Filing Date:	
Time Stamp:	16:29:35
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$2500
RAM confirmation Number	080816INTEFSW16313400
Deposit Account	8084
Authorized User	Elizabeth McGinty
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)					
37 CFR 1.20 (Post Issuance fees)					
37 CFR 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IPW2-USCN209711 - Application-20160805.PDF	174660	yes	29
			7ec324f648e45b2016f2324f7cec9d8b8372add7		
	Multipart Description/PDF files in .zip description				
	Document Description		Start		End
	Specification		1		23
	Claims		24		28
	Abstract		29		29
Warnings:					
Information:					
2	Drawings-only black and white line drawings	IPW2-USCN209711 - Drawings-20160805.PDF	76657	no	4
			a2249054461699e4b97ae2f3b0b5410df161cd99		
Warnings:					
Information:					
3	Application Data Sheet	IPW2-USCN209711 - ADS-20160805.PDF	1823329	no	8
			639fa20c4fd35c39e690751cd5d1c7a34d123de2		
Warnings:					
Information:					
4	Oath or Declaration filed	IPW2-USCN209711 - ParentSignedDeclaration-Anderson-20150515.PDF	1541934	no	1
			e61c60b7d4d484e83029c93c81bc07a228a7b79b		
Warnings:					
Information:					
5	Power of Attorney	IPW2-1A-IV_II_LLC_US_AIA_POA-signed-20160418.PDF	147900	no	1
			2c090f3174f817f623e9222cb7241d55a509d07c		

Warnings:					
Information:					
6	Assignee showing of ownership per 37 CFR 3.73	IPW2-1A-IV_II_LLC_US_AIA_DRATS-signed-20140217.PDF	23893	no	1
			baad8a561897131ec12e9b99f64f3a11486d823e		
Warnings:					
Information:					
7	Assignee showing of ownership per 37 CFR 3.73	IPW2-USCN209711-373cStatement-20160805.PDF	125911	no	3
			4b24ba88c390b671b00ebf0ec4d39fbfd008e6fd		
Warnings:					
Information:					
8	Assignee showing of ownership per 37 CFR 3.73	IPW2-USCN209711-373c_continued-20160805.PDF	55230	no	1
			347b7d52c66de3b86989caff5f97f45fca874214		
Warnings:					
Information:					
9	Fee Worksheet (SB06)	fee-info.pdf	38229	no	2
			eb9185ac968e2e3b9e87b2f2479c69c13ba5a874		
Warnings:					
Information:					
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POWER CONTROL IN A WIRELESS NETWORK

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation of U.S. Patent Application Serial No. 14/713,719, filed May 15, 2015, which is a continuation of U.S. Patent Application Serial No. 13/727,153, filed December 26, 2012, which issued as U.S. Patent No. 9,055,586 on June 9, 2015, which is a continuation of U.S. Patent Application Serial No. 10/917,968, filed August 12, 2004, which issued as U.S. Patent No. 8,897,828 on November 25, 2014, which are both incorporated by reference as if fully set forth.

[0002] This application is related to U.S. Patent Application Serial No. 13/726,976, filed December 26, 2012, which issued as U.S. Patent No. 8,983,522 on March 17, 2015.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0003] This invention relates to power control in a mobile radio system or wireless communication system, and more particularly, to controlling received power levels in a code division multiple access (CDMA) radio system.

2. Description of the Prior Art

[0004] Typically, radio signals transmitted with increased power result in fewer errors when received than signals transmitted with decreased power. Unfortunately, signals transmitted with excessive power may interfere with the reception of other signals sharing the radio link. Wireless communication systems employ power control schemes to maintain a target error rate of a signal received on a radio link.

[0005] If a received signal includes a rate of errors far above a target error rate, the received signal may result in an undesirable effect on a delivered service.

For example, excessive errors may lead to broken voice during voice calls, low throughput over data links, and glitches in displayed video signals. On the other hand, if the received signal includes a rate of errors well below the target error rate, the mobile radio system is not efficiently using its radio resources. A very low error rate may mean that a signal is transmitted with an excessive level of power and that user could be provided a higher data rate. Alternatively, if the power level of a signal is sufficiently reduced, additional users may be serviced. If data rates are increased, a user may receive a higher level of service. Therefore, if a target error rate for each user is met within a tolerance threshold, a radio resource may be more optimally used.

[0006] A wireless communication system often employ one of either an open loop scheme or a closed loop scheme to control uplink transmit power of a mobile radio. Uplink typically refers to the radio link from a mobile radio to a base station, where as the downlink typically refers to the link from the base station to the mobile radio. A mobile radio is not necessarily mobile and may also be referred to as a mobile, a user, user equipment (UE), a terminal or terminal equipment. A base station may also be referred to as a Node-B.

[0007] The error rate is related to a received signal to noise-plus-interference ratio (SNIR); a higher SNIR generally results in a lower error rate; and conversely, a lower SNIR generally results in a higher error rate. The exact relationship between SNIR and error rate, however, is often a function of several factors including radio channel type and the speed at which a mobile is travelling.

[0008] A target error rate is often reached using a two stage process, which includes an outer loop and an inner loop. A first process may operate as an outer loop and may be tasked to adjust a target received SNIR (SNIR Target). This first process tracks changes in the relationship between SNIR and error rate. The outer loop sets an SNIR Target that is generally used several times by the inner loop. Periodically, the outer loop may adjust or update this SNIR Target used by the

inner loop. For example, if an actual error rate exceeds a desired error rate, the outer loop may increase the value of the SNIR Target.

[0009] A second process operates as an inner loop and tries to force the link to exhibit the SNIR Target determined by the outer loop. The inner loop may operate by closed loop or by open loop means.

[0010] In the open loop method of the inner loop process, a UE uses an SNIR Target value that is derived by the network and signalled to the UE. The inner loop running in the UE attempts to maintain the SNIR Target. The UE uses the information signalled to it and monitors the received strength of signals it receives to determine a power level at which it will transmit. Advantageously, this open loop method compensates for fast channel fading by determining the path loss on a per frame bases and by adjusting the transmit power accordingly. Unfortunately, this open loop method is relatively slow at compensating for changes due to interfering signals from other transmitters.

[0011] In the closed loop method of the inner loop process, a closed loop scheme operates to match an SNIR Target. A received SNIR measurement is made by the network on an uplink signal. The SNIR measurement is compared within the network to the SNIR Target value. The inner loop drives the system to match the SNIR Target by issuing transmit power control commands from the network to a UE. The commands instruct the UE to increase or decrease its transmitted power by a predetermined step dB amount. Unfortunately, such closed loop methods demand a very high command update rate to adequately compensate for fast channel fading because of the single-dB-step commands used. At slower update rates, fast channel fading is not tracked adequately since a large number of iterations and long delays are needed to compensate for a change in power that is substantially larger than the dB-step value.

[0012] Both the closed loop scheme and the open loop scheme have their disadvantages. Therefore, an improved method and system are needed that better balances the conflicting goals of reducing errors in a received signal while also

reducing interference imposed on signals received at other receivers. An improved method and system are also needed to better reduce the overall residual SNIR fluctuations experienced by each users signal at a receiver.

BRIEF SUMMARY OF THE INVENTION

[0013] Some embodiments provide a method of power control in a radio communications system, the method comprising: determining a path loss of a radio channel between a base station and a remote transceiver; receiving a transmit power control (TPC) command transmitted to the remote transceiver from the base station; and calculating a transmit power level for the remote transceiver based on the path loss and the TPC command.

[0014] Some embodiments provide a method of power control in a radio communications system, the method comprising: receiving a signal at a second transceiver transmitted from a first transceiver; measuring a power level of the received signal; receiving a transmit power control (TPC) command at the second transceiver transmitted from the first transceiver; and calculating a transmit power level for the second transceiver based on the power level of the received signal and the TPC command.

[0015] Some embodiments provide a method of uplink power control in a CDMA radio communications system, the method comprising: receiving an uplink signal; determining an error metric of the uplink signal; updating an SNIR target based on the error metric; measuring a received SNIR of the uplink signal; comparing the measured received SNIR with the SNIR target; assigning a first value to a step indicator if the measured received SNIR is greater than the SNIR target, and assigning a second value to a step indicator if the measured received SNIR is less than the SNIR target; transmitting a transmit power control (TPC) command instructing a transmitter to adjust an uplink transmit power level based on the step indicator; receiving the TPC command including the step indicator; accumulating the step indicator value; broadcasting a downlink signal including an

indication of a downlink power level, wherein the signal is transmitted at the downlink power level; measuring the received power of the downlink signal; and setting a transmit power level base on the received power level, the indication of the downlink power level, and the accumulated step indicator value.

[0016] Some embodiments provide a method comprising: measuring a power level of a received signal; receiving a transmit power control (TPC) command; and calculating a transmit power level based on the power level of the received signal and the TPC command.

[0017] Some embodiments provide a radio comprising: a receiver including an output to provide a measured received power level; an accumulator having an input for accepting step increase and decrease instructions and an output providing a sum of past step instructions; a power level setting circuit coupled to the accumulator output and coupled to the receiver output, wherein the power level setting circuit sets a transmit power bases on the accumulator output and the measured received power level; and a transmitter, wherein the transmitter transmits a signal at the set transmit power.

[0018] Other features and aspects of the invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawings which illustrate, by way of example, the features in accordance with embodiments of the invention. The summary is not intended to limit the scope of the invention, which is defined solely by the claims attached hereto.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] FIGURE 1 shows a block diagram of a wireless communication system.

[0020] FIGURE 2 illustrates a wireless communication system using an open loop scheme.

[0021] FIGURE 3 illustrates a wireless communication system using a closed loop scheme.

[0022] FIGURE 4 illustrates a wireless communication system using elements of both open loop and closed loop schemes, in accordance with the present invention.

[0023] FIGURES 5A, 5B and 5C each illustrate a simulated probability density function of the received SNIR in the network.

DETAILED DESCRIPTION OF THE INVENTION

[0024] In the following description, reference is made to the accompanying drawings which illustrate several embodiments of the present invention. It is understood that other embodiments may be utilized and mechanical, compositional, structural, electrical and operational changes may be made without departing from the spirit and scope of the present disclosure. The following detailed description is not to be taken in a limiting sense, and the scope of the embodiments of the present invention is defined by the claims of the issued patent.

[0025] Some portions of the detailed description which follows are presented in terms of procedures, steps, logic blocks, processing, and other symbolic representations of operations on data bits that can be performed on computer memory. A procedure, computer executed step, logic block, process etc., are here conceived to be a self-consistent sequence of steps or instructions leading to a desired result. The steps are those utilizing physical manipulations of physical quantities. These quantities can take the form of electrical, magnetic, or radio signals capable of being stored, transferred, combined, compared, and otherwise manipulated in a computer system. These signals may be referred to at times as bits, values, elements, symbols, characters, terms, numbers, or the like. Each step may be performed by hardware, software, firmware, or combinations thereof.

[0026] FIGURE 1 shows a block diagram of a wireless communication system. A network 100 may include one or more base station controllers 110, such as a radio network controller (RNC), and one or more base stations 120 and 130, such as a Node-B, wherein each Node-B is connected to an RNC. The network 100

communicates with one or more users 140, 150 through a channel 160, also referred to as a radio link, created between a base station and a user.

[0027] Two mechanisms are primarily responsible for changes in the SNIR of a signal travelling through a radio link.

[0028] First, changes in the channel affect the SNIR. The instantaneous path loss between a base station and a user may vary as the user changes position or the user's environment changes. Rapid changes may occur as a result of a transmitted signal combining constructively and destructively as the signal travels along multiple paths from a base station and to the user. Additionally, slower changes may occur due to attenuation of the radio waves with increased distance between the base station and the user. Slower changes may also occur due to signal obstruction by buildings, vehicles and hills.

[0029] Second, signals from other transmitters affect the SNIR. For example, signals intended for other mobile radios or other base stations may increase interference in the radio link and thus reduce a received signal's SNIR.

[0030] In Time Division Duplex (TDD) systems, both uplink and downlink share the same carrier frequency. Due to this reciprocity in the links, path loss measurements made on the downlink by a mobile radio may be used estimate the path loss on the uplink. That is, a measured downlink path loss may be used to estimate the uplink path loss. The estimated uplink path loss will be less reliable with the passing of time but may be adequate within a frame period. Therefore, a mobile radio may determine a transmit power level for an uplink transition that compensates for an estimated uplink path loss, thereby providing a received signal to a base station at an expected input power level.

[0031] Downlink path loss measurements may be facilitated by a beacon channel, which is transmitted from a base station at a reference power level. A mobile radio is informed of the actual transmit power level being used by the base station for the beacon channel. In addition to knowing the actual transmit power level of a beacon channel, the mobile radio may measure a received signal power

level. By measuring the received signal power level, the mobile radio can compute a downlink path loss as the difference between the actual transmit power level and the received signal power level. Thus, the mobile radio is able to estimate the uplink path loss in a channel between the base station and the mobile radio and properly set its uplink transmit power level.

[0032] The path loss calculation may be updated as often as a beacon signal is transmitted and received. In a UTRA TDD system in compliance with the third generation partnership project (3GPP) specifications, a beacon signal is transmitted either once or twice every 10 milliseconds (ms). If an uplink transmission follows a beacon transmission within a relatively short period of time, a mobile radio can compensate for the fast fluctuations (fast-fading) in a radio channel. Such is the case for mobiles travelling at slow to moderate speeds if a beacon signal is transmitted either once or twice every 10 ms and the uplink transmissions occur in the intervening period.

[0033] Additionally, a radio channel may be adversely affected by changes in interference levels over time. These temporal interference changes may be accommodated by a base station, measuring and communicating interference levels seen in each uplink timeslot. In a UTRA TDD system, a table having values of the measured interference for each timeslot may be broadcast to all users via a Broadcast Channel (BCH). The broadcasted information may be updated approximately every 16 frames (160 ms) depending upon the system configuration. In other embodiments, a mobile radio may receive this interference table as a signalled message directed to the individual mobile radio.

[0034] The 3GPP specifications describe two separate schemes for power control of uplink channels: an open loop scheme and a closed loop scheme. For example, in 3GPP 3.84 Megachips per second (Mcps) TDD systems, open loop power control is specified for all uplink channels. In 3GPP 1.28 Mcps TDD systems, open loop power control is specified only for physical random access channels (PRACH).

Also defined by 3GPP is an implementation of a closed loop power control scheme. For example, see 3GPP recommendations for UTRA TDD systems operating at 1.28 Mcps for non-PRACH uplink channels.

[0035] In a wireless communication system using an open loop scheme, a network and UE use an outer loop to update and signal to the UE an SNIR Target value, thereby influencing the UE's transmit power. The network updates the SNIR Target value to be signalled based upon an observed error rate on the uplink. Once received, the mobile radio takes into account the signalled SNIR Target value when deriving a transmit power level that it will apply to the next uplink signal transmitted.

[0036] In a 3GPP 3.84 Mcps system incorporating an open loop scheme, a network instructs the UE with an SNIR Target value. The network also signals its beacon transmit power level and may also provide a measure of uplink interference for each timeslot as measured by the network. The UE receives an input signal that is typically a combination of attenuated versions of the network signal, which passed through a radio channel, along with interfering signals from other transmitters. The UE measures the received power level of the attenuated network signal and determines a path loss of the radio channel. The UE also decodes the signalled SNIR Target value from the network signal. The UE computes a transmit power level based on the SNIR Target value, the determined path loss and, if available, the uplink interference measurements.

[0037] FIGURE 2 illustrates a wireless communication system using an open loop scheme. A UE transmits 200 user data at a determined transmit power level. An uplink signal 202, which includes user data 204, propagates through the radio link. The network receives an attenuated version of the transmitted signal. The network measures 207 an uplink interference value and determines 206 an error metric of the uplink signal. The network may use the measured uplink interference value to update 208 an interference measurement table. The interference

measurement table may include average measured interference levels for each uplink timeslot.

[0038] The network also uses the error metric to update 210 an SNIR Target value. The network transmits 212 SNIR Target in a signalling message on the downlink 214, which includes the SNIR Target 216. The UE receives and saves 220 the SNIR Target. The network also broadcasts 222 a beacon signal on the downlink 224. The downlink 224 propagates the signal, which includes an indication of the beacon power level 226, over the radio link. The network may also broadcast the interference measurements 228. The UE measures 230 the received power level and saves 232 the interference measurements for later processing.

[0039] With the measured power level and the signalled beacon power level, the UE may determine a path loss. The UE may use the saved received SNIR Target 216, the saved received interference measurements 228 and the computed path loss to set 234 a transmit power level. This transmit power level may be used by transmitter 200 to set the power level of transmitted user data 204 on the uplink 202.

[0040] The 3GPP specifications also define a closed loop scheme. For example, a 3GPP 1.28 Mcps system employs a closed loop scheme using an outer loop and an inner loop. The closed loop TPC scheme is the primary power control mechanism used for all non-PRACH channels in a 1.28 Mcps TDD system. The closed loop TPC scheme is not currently employed for the uplink of 3.84 Mcps TDD systems.

[0041] The outer loop determines an SNIR Target value and the inner loop uses the SNIR Target value. The outer loop includes network components that determine an error metric, such as a bit error rate, a block error rate or a CRC error count, on uplink traffic from UEs. This error metric is used to set and update an SNIR Target value. An inner loop includes network components that use the SNIR Target value computed and set by the outer loop. The network measures a received SNIR value of the uplink signal.

[0042] Next, a comparator determines whether the measured SNIR value is greater than or less than the SNIR Target value. If the measured SNIR value is greater than the SNIR Target value, the network signals a transmit power control (TPC) command on the downlink instructing the UE to reduce its current transmitter power by a step value (e.g., 1 dB). On the other hand, if the measured SNIR value is less than the SNIR Target value, the network signals a TPC command instructing the UE to increase its current transmitter power by the step dB value.

[0043] In a system employing only a closed loop power control scheme, several TPC commands may be necessary to properly bring the UE's transmitted power in line with the SNIR Target value. For example, if a path loss increases from one frame to the next by 15 dB, the system will take 15 TPC commands to compensate for the 15 dB fade. A UE accumulates the increase and decrease TPC commands to determine a proper uplink transmit power level. By increasing and decrease uplink power levels of each UE, a network attempts to control the power level of each UE such that the ratio of the received uplink energy level per transmitted bit to the spectral density of the noise and interference signals is a constant value. This TPC command adjustment process is performed for each UE in a cell. The constant value, however, may be non-uniform among the UEs depending upon the configuration of the system.

[0044] In a closed loop TPC scheme, the inner loop SNIR is maintained via a closed loop method using binary feedback. The feedback indicates either power up or power down. Every time a TPC command is received an integrator in the UE is used within the inner loop to update the UE transmit power by a step amount $\pm\Delta$ dB. The TPC commands themselves are derived by the network and are signalled to the UE via a downlink channel. When calculating the proper TPC command to send, the network measures the received SNIR and compares this measured value to an SNIR Target value. If the SNIR is too low, an up command is sent. If the SNIR is too high, a down command is sent. The target SNIR value is updated by

the outer loop based upon the observed error performance of the link. In this way, both the inner and outer feedback loops are closed by the TPC signalling.

[0045] FIGURE 3 illustrates a wireless communication system using a closed loop scheme. The closed loop scheme includes an outer loop in which a UE transmits 300 user data over the radio link in an uplink signal 302 that contain the user data 304. The network determines 306 an error metric of the received uplink signal. Using the error metric, the network computes and updates 308 an SNIR Target value.

[0046] The closed loop scheme also includes an inner loop in which the network measures 310 the received SNIR of the uplink signal 302. The network compares 312 the measured SNIR with the SNIR Target determined in the outer loop. The inner loop generates and transmits 314 a TPC command based on the comparison 312. A downlink signal 316 carries the TPC command 318 over the radio link. The UE accumulates 320 the TPC commands and uses the accumulated TPC commands to set 322 a transmit power for future uplink transmissions 300.

[0047] A mobile radio system employing either an open loop scheme or a closed loop scheme has its advantages and disadvantages.

[0048] The open loop scheme advantageously adapts quickly to path loss changes. If the path loss is observed to have worsened, for example by 15 dB in one 10 ms interval, the transmit power may be adjusted accordingly. A further advantage is that the open loop may continue to be partially updated in the absence of user-specific feedback signalling. For example, when a UE does not receive updated SNIR Target values, the outer loop pauses but changes in the path loss may continue to be tracked.

[0049] Disadvantageously, the timeslot interference level update rate in an open loop system is relatively slow. Therefore, a system using an open loop scheme is slower to adapt to interference changes than a system using the closed loop scheme. A further disadvantage of the open loop scheme is that interference is

considered to be the same for all UEs in a particular uplink timeslot. That is, each UE assigned to a timeslot uses the same interference measurement signalled by the base station on the BCH. A commonly used interference measurement table makes assumptions about the statistical nature of the interference and does not consider the individual cross-correlation properties of the uplink channelization codes. It is thus left to the outer loop to compensate for these effects, but unfortunately on a slow basis.

[0050] Conversely, the closed loop only scheme is less able to adapt to fast path loss changes because the closed loop can only move by a step Δ dB during each update. Thus, if the path loss has changed between updates by 15 dB and the step Δ dB value is only 1 dB, the closed loop is not able to adjust quickly since it can move only by 1 dB during each cycle. Therefore, for the same update rate (e.g., once per 10 ms), a closed loop TPC scheme is less able to track the fast fading observed in common mobile radio channels. Furthermore, the closed loop may not be updated during a pause in transmission of the TPC commands.

[0051] Advantageously, the closed loop is relatively quick to respond to uplink interference changes since both path loss and interference are accommodated by the same loop. The closed loop scheme using TPC commands has a further advantage in that it allows for per-user interference adaptation, in contrast to the open loop scheme, which broadcasts an average interference table for each timeslot.

[0052] In accordance with the present invention, aspects of both an open loop scheme and a closed loop scheme are strategically combined to form a power control method. Some embodiments of the present invention advantageously combine elements of both open loop and closed loop schemes to control power levels, thereby avoiding one or more of the disadvantages associated with either of the separately used schemes.

[0053] In accordance with some embodiments of the present invention, a UE incorporates the TPC structure of a closed loop scheme and the path loss estimation structure of an open loop scheme. Some embodiments of the present invention

allow for both relatively quick adaptation to fast fading and also allow for per-user interference adaptation, and retain the ability to partially update the power control loop even in the temporary absence of TPC commands.

[0054] Some embodiments of the present invention require modifications to one or more elements of a standard mobile radio system. For example, some embodiments require changes to just a UE, while other embodiments require modifications to just the network. Embodiments that modify a UE but not the network allow the UE of the present invention to operate with legacy base stations. Similarly, embodiments that modify the network but not the UE allow the network of the present invention to operate with legacy UEs. Still other embodiments of the present invention require modification to both the network and the UE. Embodiments modifying standard network elements may include changes to just a base station but not a radio network

controller (RNC). Other embodiments modify both a base station and an RNC.

[0055] Some embodiments of the present invention, incorporate a loop having three components: an open loop component located in the UE, an SNIR comparison loop located in the network, and an SNIR update component also located in the network.

[0056] First, an open loop component may be located in the UE and driven by measured beacon received power levels and path loss calculations. This loop tries to adapt to all instantaneous path loss changes on a per-beacon transmission basis. The partial power calculated by this loop is a function of the beacon signal transmission power (P_{Tx}) and the beacon received signal code power (RSCP) and is denoted $P_{open}(k)$, where k represents the current frame number. P_{Tx} is known to the UE and derived from the base station signalled power level (428, FIGURE 4) and the measured power level for frame k , ($RSCP(k)$), may be determined by the UE receiver (432, FIGURE 4). $P_{open}(k)$ may also be a function of a constant value (C) to ensure that the transmission arrives at an appropriate power level.

$$P_{open}(k) = P_{Tx} - RSCP(k) + C$$

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[0057] Second, an SNIR comparison loop is located in the network, such as in the Node-B. The SNIR comparison loop is driven by received SNIR metrics. A received SNIR is compared to a SNIR Target value, which is set by an outer loop. A comparison result leads to the signalling of a TPC command that is signalled to the UE to change its transmit power. Binary signalling may be used, such that the TPC command indicates a change in transmission power by a fixed amount either up or down. Alternately, a multi-level TPC command may be used.

[0058] Third, an outer loop is located in the network, such as in the Node-B or RNC. The outer loop is driven by the data error statistics observed on the uplink transmissions. The outer loop is responsible for setting an SNIR Target level for the SNIR comparison loop.

[0059] An optional auxiliary process in the UE adjusts the transmit power based upon: (a) γ_{SF} , the spreading factor (SF) of the physical channel; and (b) β_{TFC} , the selected transport format (TFC).

[0060] Thus, for the current frame k , the UE may calculate the transmit power $P_{Tx}(k)$ as shown below where K is the initial frame number determined when the power control process begins; TPC_i is -1 for a down TPC command, $+1$ for an up TPC command and 0 if no TPC command is received; and $step$ is the magnitude of the amount added to an accumulator upon receipt of each TPC command. The transmit power $P_{Tx}(k)$ may be updated for every frame period. Alternatively, the transmit power $P_{Tx}(k)$ may be updated each time a new TPC command is received. Alternatively, the transmit power $P_{Tx}(k)$ may be updated only when either a TPC command or a new power level is received from the network.

$$P_{Tx}(k) = P_{open(k)} + step \cdot \sum_{i=k-K}^k TPC_i + \gamma_{SF} + \beta_{TFC}$$

[0061] An embodiment of a power control scheme, in accordance with the present invention, is shown diagrammatically in FIGURE 4. The γ_{SF} and β_{TFC} adjustment factors are not shown for diagrammatical clarity.

[0062] FIGURE 4 illustrates a wireless communication system using elements of both open loop and closed loop schemes, in accordance with the present invention. A UE transmits 400 user data at a determined transmit power level. An uplink signal 402, which includes the user data 404, propagates through the radio link. The network receives an attenuated version of the transmitted signal.

[0063] The network determines 406 an error metric of the uplink signal 402. Optionally, the network measures an uplink interference level and may update 422 an interference measurement table. Data measured or computed from uplink measurements may be entered into the interference measurement table. The interference measurement table may include average measured interference levels for each uplink timeslot. Within the network the error metric may be used to update 408 an SNIR Target value.

[0064] The network also transmits 424 a beacon signal. The downlink signal 426, which includes an indication of the beacon transmit power level 428, propagates over the radio link. Optionally, the network may broadcast the interference measurements 430. The UE saves 432 the signalled power level, measures the received power level and, if available, saves 434 the interference measurements for later processing.

[0065] As in a closed loop scheme, a UE transmits 400 user data over the radio link in an uplink signal 402 that contain the user data 404. The network determines 406 an error metric of the received uplink signal. Using the error metric, the network computes and updates 408 an SNIR Target value.

[0066] The network also measures 410 the received SNIR of the uplink signal 402. The network compares 412 the measured SNIR with the determined SNIR Target. The network generates and transmits 414 a TPC command based on the comparison 412. A downlink signal 416 carries the TPC command 418 over the radio link. The UE accumulates 420 the TPC commands and uses the accumulated TPC commands in part to set 436 the transmit power level for future uplink transmissions 400.

[0067] As in an open loop scheme, with the measured power level and the signalled beacon power level, the UE may determine a path loss $P_{open}(k)$. The UE may use the saved received interference measurements $I(k)$ to adjust the transmission power following a pause in transmission or following a pause in receipt of TPC commands. The UE may use the accumulated TPC commands

$\sum_{i=k-K}^k TPC_i$ the computed path loss $P_{open}(k)$, adjustment factors γ_{SF} & β_{TFC} and

optionally, adjustments based upon $I(k)$ to set a transmit power level. This transmit power level $P_{Tx}(k)$ may be used to set the uplink power level of transmitted user data on the uplink.

[0068] The downlink signal, which contains the power level and may contain the interference measurements, is broadcast in a cell. Previous UEs using a closed loop scheme do not use measurements of the downlink received power while monitoring the power level signalling in a beacon broadcast to set the uplink transmission power. Similarly, previous UEs using a closed loop scheme do not compute or do not use computations of the downlink path loss while processing TPC commands. A previous UE simply follows the TPC commands as it is instructed to set its transmit power level. If a network instructs a known UE to increase its transmit power by one step amount, the previous UE shall increase its power level by one step amount.

[0069] In accordance to the present invention, a UE may receive a TPC command instructing it to change its transmit power by one step level in a particular direction, but the UE may actually change its transmit power level by a different amount or in fact an amount in the opposite direction. The UE uses the TPC only as a factor in determining whether to increase transmit power level, decrease transmit power level or leave the transmit power level unchanged.

[0070] For example, assume a UE just transmitted a burst to a Node-B at 20 dBm over a radio link with a path loss of 110 dB. The received power at the Node-B receiver would be -90 dBm, which is the difference between 20 dBm and a loss of

110 dB. Next, assume the Node-B wants to receive an uplink signal from the UE at -89 dBm. The Node-B would signal and the UE would receive a TPC command instructing the UE to increase the uplink transmit power level by 1 dB. Also assume that the path loss improves from the previous frame to this frame by +10 dB (e.g., from 110 dB to 100 dB).

[0071] A previous UE would transmit the next burst at +21 dBm, which is the sum of the previous level (+20 dBm) and the step increase (1 dB). The transmitted +21 dBm signal would probably reach the Node-B at -79 dBm, a signal level that is +10 dB too great because the channel improvement was not taken into account.

[0072] In accordance with the present invention, a UE would account for the new path loss. The previous transmit power level of +20 dBm would be decreased by +10 dB to account for the improved channel path loss of +10 dB. The resulting transmit power level would then be +10 dBm. The UE also accounts for the TPC command by adjusting the transmit power level by the desired step of +1 dB, resulting in a new transmit power level of +11 dBm, which both accounts for the improved channel (+10 dB) and accommodates the Node-B's desire to have a received signal with a step increase (+1 dB). The +11 dBm would reach the Node-B at the desired level of -89 dBm if the channel pathloss estimate was accurate. As shown in this example, the transmit power level dropped 9 dB (from +20 dBm to +11 dBm) even though the Node-B TPC command instructed an increase of 1 dB.

[0073] Therefore, even though a UE receives a network TPC command instructing it to step up or down its uplink transmit power by 1 dB, the UE may actually change the transmit power level by a different amount. In fact, the UE transmit power level may change in a direction opposite of the TPC command as exemplified above.

[0074] During a period of inactivity on the uplink 402, TPC commands 418 may not have been received by the UE. The UE transmit power level for a subsequent initial transmission 400 may be determined using current updates of the open loop component. That is, the initial transmit power level may be

-18-

determined based on the beacon power level 428, the measured 432 received power level, and optionally the interference measurements 430. The open loop component does not require feedback, thus may continue to be updated every beacon transmission even during the uplink transmission pause.

[0075] The history stored in the TPC accumulator may be stale. In some circumstances the history may be considered useful and is not reset. Alternatively, the accumulated TPC history could be used to set the uplink transmit power level but with some excess power margin added to ensure a clean start to the loop. Alternatively, the UE may decide to discard the accumulated TPC history and to reset it to a default or initial value. The default or initial value may optionally be based upon a received interference measurement table 430.

[0076] The ability of the open loop component to compensate for fast fading is a function of the channel speed and the delay between the beacon timeslot and the uplink timeslots. Open loop control is often effective at pedestrian speeds as well as at higher speeds if the uplink slots are placed close in time to the beacon. At high mobile speeds, it is likely that power control performance will be improved if beacon RSCP filtering is enabled at the UE. The UE is responsible for detecting whether or not filtering should be applied to the open loop component. Automatic detection of the channel speed may be performed by the UE in order to control the enabling of RSCP filtering. In some embodiments of the present invention, a UE disables a combined open loop/closed loop scheme operating in accordance with the present invention when a UE passes a threshold value indicative of mobile speed.

[0077] Simulations have been performed to illustrate the performance advantages of some embodiments of the present invention. The radio channel simulated here represents an ITU indoor to outdoor and pedestrian model B channel as described in ITU-R M.1225 Guidelines for Evaluation of Radio Transmission Technologies for IMT-2000. The outer loop SNIR target was based upon a 1% error rate. A residual SNIR error term observed at the base station was monitored.

[0078] FIGURES 5A, 5B and 5C each illustrate a simulated probability density function of the received SNIR in the network. In each of the simulations, approximately 10,000 received SNIR values are sampled. Simulation results for each scenario are grouped and collected into bins. The vertical axis shows a number of occurrences for a particular range (bin) of received SNIR values. A sampled received SNIR value that fall within a range defined by a bin is counted as an occurrence for that bin.

[0079] FIGURE 5A shows simulation results for a system using only an open loop scheme. In this plot, the bin width is approximately 0.42 dB. The simulation results show a system good at tracking fast fading in the channel, but not as able to track the interference variations included in the simulation. These values are only updated at the UE via signalling every 160 ms. As such, the error term shows considerable variance at the receiver.

[0080] FIGURE 5B shows simulation results for a system using only a closed loop scheme. In this plot, the bin width is approximately 0.48 dB. The simulation results show a system better able to track the interference changes, but not as able to track the path loss due to being limited in response to the TPC command +/- 1 dB step size.

[0081] FIGURE 5C shows simulation results for a system combining aspects of both open and closed loop schemes (as shown in FIGURE 4). In this plot, the bin width is approximately 0.24 dB. The simulation results show a system able to respond to both path loss and interference changes. Additionally, the residual SNIR error term shows less variance. The plot shows that the variance of this distribution is considerably reduced for the combined power control scheme.

[0082] For the above simulations (using the same fading and interference profiles for each loop method), the following mean transmit powers were obtained:

Power Control Method	Mean Transmit Power for 1% BLER

Open Loop: (FIGURE 2)	5.76 dB
Closed Loop: (FIGURE 3)	5.48 dB
Combined Loops: (FIGURE 4)	3.59 dB

Table 1 – Performance of Power Control Schemes

[0083] For the simulated channel and interference scenario, the combined scheme is able to maintain a 1% block error rate (BLER) using 2.17 dB less power than the open loop scheme and 1.89 dB less power than the closed loop scheme. In a real system, this power saving may equate to greater cell coverage, higher uplink capacity and throughput, and increased battery life. The magnitude of the gains may change with different channel speeds, types and interference profiles but the performance of the combined should be better than both the open loop and closed loop schemes when used individually.

[0084] In terms of signalling overhead, the combined scheme helps to avoid a need to signal SNIR Target and interference levels on downlink channels, and has a similar signalling efficiency as the closed loop scheme. In some embodiments, the signalling efficiency is 1 bit per update.

[0085] In a system using the combined power control scheme, a new physical channel on the downlink may be used to carry fast allocation and scheduling information to a user, thereby informing the UE of the uplink resources that it may use. This new physical channel could also be used as the feedback channel for the combined power control scheme. For example, an allocation/scheduling channel could carry TPC commands. Alternatively, the combined scheme may be applied to existing channel types (dedicated or shared uplink physical channels) for UTRA TDD as well as to other TDD systems.

[0086] Some embodiments of the present invention control uplink power levels and may be incorporated into a UE with supporting features incorporated into a base station. For example, a Node-B or RNC may be implemented with a new parameter, either included in a signalling command or a broadcast message, where the new parameter instructs a UE to enable or disable the setting of uplink

transmit power level based on both the path loss estimation and the TPC commands. A parameter may indicate whether a UE is to use open loop power control, closed loop power control or a combined scheme.

[0087] Some embodiments of the present invention operate with a downlink signal including both a TPC command and an indication of the downlink transmit power level. In these embodiments, the downlink signal provides both downlinks 416 and 430 (FIGURE 4) in one signal. A UE may receive one physical channel that it decodes for TPC commands, decodes for downlink power level indications, and measures for received power levels. In these embodiments, the UE measures a power level of a received signal, receives a TPC command, and calculates a transmit power level based on the power level of the received signal and the TPC command.

[0088] While the invention has been described in terms of particular embodiments and illustrative figures, those of ordinary skill in the art will recognize that the invention is not limited to the embodiments or figures described. For example, the combined uplink power control scheme described above may be implemented a mirror image for controlling downlink power. In this case, functions performed by the UE for a combined uplink scheme may be performed by the network. Similarly, functions performed by the network for the combined uplink scheme may be performed by the UE.

[0089] The figures provided are merely representational and may not be drawn to scale. Certain proportions thereof may be exaggerated, while others may be minimized. The figures are intended to illustrate various implementations of the invention that can be understood and appropriately carried out by those of ordinary skill in the art.

[0090] Therefore, it should be understood that the invention can be practiced with modification and alteration within the spirit and scope of the appended claims. The description is not intended to be exhaustive or to limit the invention to the precise form disclosed. It should be understood that the invention can be practiced

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with modification and alteration and that the invention be limited only by the claims and the equivalents thereof.

* * *

CLAIMS

What is claimed is:

1. A network device comprising:
a transmitter;
a receiver;
a processor operatively coupled to the transmitter and the receiver; and
the processor is configured to select a value of a multi-level transmit power control (TPC) command from a set of values that indicate a plurality of up amounts;
wherein the processor is further configured to have the transmitter transmit, on a single physical channel, an allocation of an uplink resource and the multi-level TPC command having the selected value; and
wherein the receiver is configured to receive, from user equipment (UE), an uplink signal on the allocated uplink resource based on the transmitted allocation of the uplink resource and the multi-level TPC command.
2. The network device of claim 1, wherein the processor is further configured to have the transmitter transmit, to the UE, an indication as to whether accumulation of TPC commands is enabled.
3. The network device of claim 1, wherein the uplink signal is received on an uplink shared channel.
4. The network device of claim 1, wherein the set of values further indicate a plurality of down amounts.
5. The network device of claim 1, wherein the network device is any one of a Node-B or a base station.
6. The network device of claim 1, wherein the single physical channel is

associated with a spreading factor or a code division multiple access (CDMA) code.

7. A method comprising:

selecting, by a network device, a value of a multi-level transmit power control (TPC) command from a set of values that indicate a plurality of up amounts;

transmitting, by the network device to a user equipment (UE) on a single physical channel, an allocation of an uplink resource and the multi-level TPC command having the selected value; and

receiving, by the network device from the UE, an uplink signal on the allocated uplink resource based on the transmitted allocation of the uplink resource and the multi-level TPC command.

8. The method of claim 7 further comprising transmitting, by the network device to the UE, an indication as to whether accumulation of TPC commands is enabled.

9. The method of claim 7, wherein the uplink signal is received on an uplink shared channel.

10. The method of claim 7, wherein the set of values further indicate a plurality of down amounts.

11. The method of claim 7, wherein the network device is any one of a Node-B or a base station.

12. The method of claim 7, wherein the single physical channel is associated with a spreading factor or a code division multiple access (CDMA) code.

13. A user equipment (UE) comprising:

a transmitter;

a receiver;

a processor operatively coupled to the transmitter and the receiver; and

the processor and the receiver are configured to receive, on a single physical channel, an allocation of an uplink resource and a multi-level transmit power control (TPC) command;

wherein the processor is further configured to determine a transmission power level based on a value of the multi-level TPC command out of a plurality of potential values for the multi-level TPC command;

wherein the plurality of potential values for the multi-level TPC command indicate a plurality of up amounts; and

wherein the processor is configured to have the transmitter transmit an uplink signal on the allocated uplink resource at the determined transmission power level.

14. The UE of claim 13, wherein the processor is further configured to receive an indication as to whether accumulation of TPC commands is enabled.

15. The UE of claim 14, wherein the processor is further configured to accumulate the TPC command with another TPC command in response to enablement of accumulation of TPC commands.

16. The UE of claim 13, wherein the uplink signal is transmitted on an uplink shared channel.

17. The UE of claim 13, wherein the plurality of potential values further indicate a plurality of down amounts.

18. The UE of claim 13, wherein the UE is one of a code division multiple

access (CDMA) UE or a time division duplex (TDD) UE.

19. The UE of claim 13, wherein the single physical channel is associated with a spreading factor or a code division multiple access (CDMA) code.

20. A method comprising:

receiving, by a user equipment (UE) on a single physical channel, an allocation of an uplink resource and a multi-level transmit power control (TPC) command;

determining, by the UE, a transmission power level based on a value of the multi-level TPC command out of a plurality of potential values for the multi-level TPC command;

wherein the plurality of potential values for the multi-level TPC command indicate a plurality of up amounts; and

transmitting, by the UE, an uplink signal on the allocated uplink resource at the determined transmission power level.

21. The method of claim 20 further comprising receiving, by the UE, an indication as to whether accumulation of TPC commands is enabled.

22. The method of claim 21, further comprising accumulating, by the UE, the TPC command with another TPC command in response to enablement of accumulation of TPC commands.

23. The method of claim 20, wherein the uplink signal is transmitted on an uplink shared channel.

24. The method of claim 20, wherein the plurality of potential values further indicate a plurality of down amounts.

25. The method of claim 20, wherein the UE is one of a code division multiple access (CDMA) UE or a time division duplex (TDD) UE.

26. The method of claim 20, wherein the single physical channel is associated with a spreading factor or a code division multiple access (CDMA) code.

ABSTRACT

A network device may select a value of a multi-level transmit power control (TPC) command from a set of values that indicate up amounts. The network device may transmit on a single physical channel an allocation of an uplink resource and the multi-level TPC command having the selected value.

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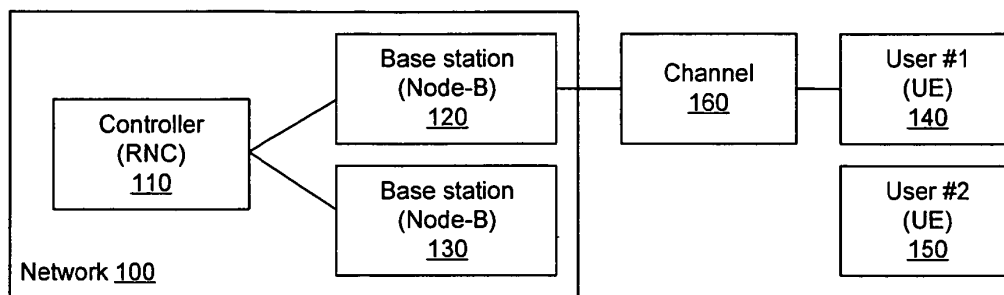


FIGURE 1

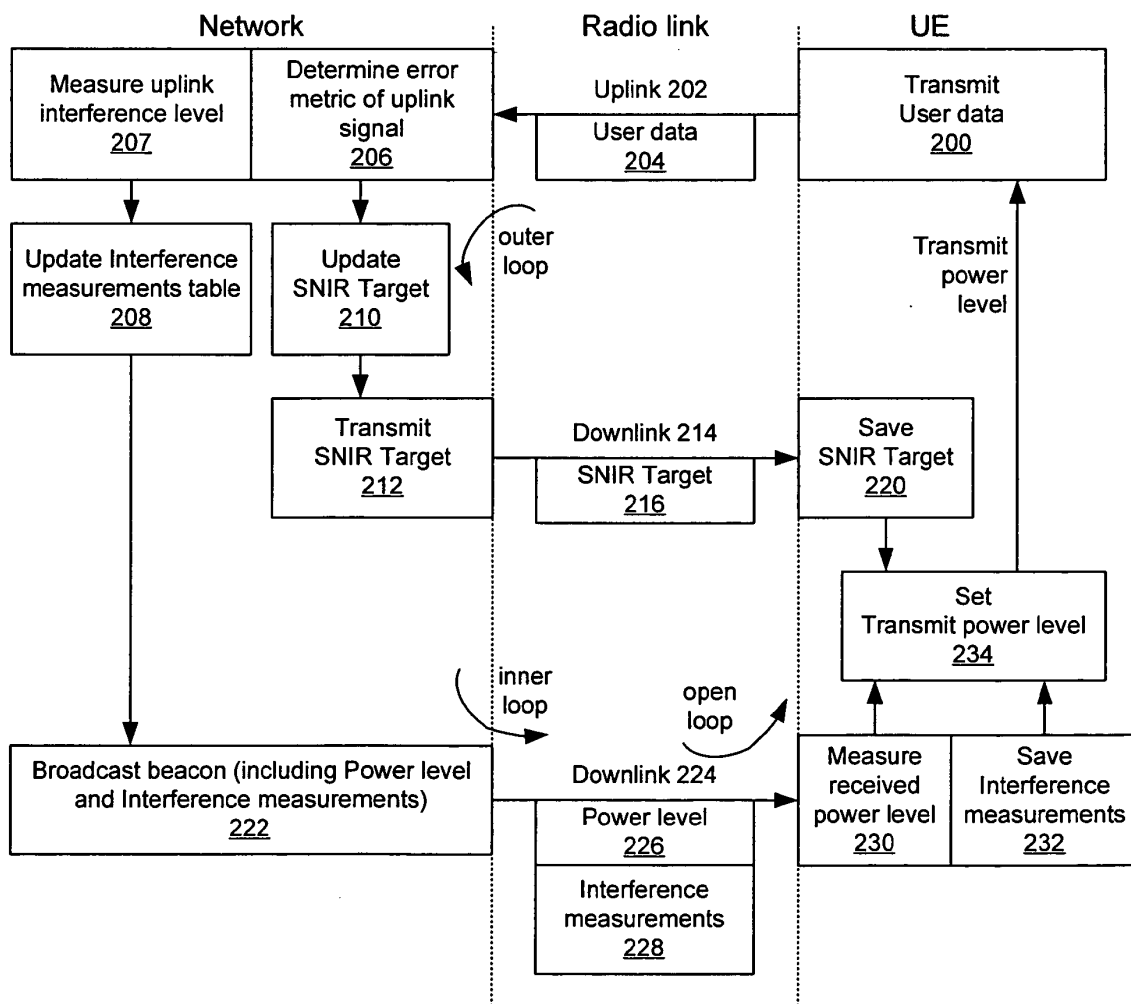


FIGURE 2

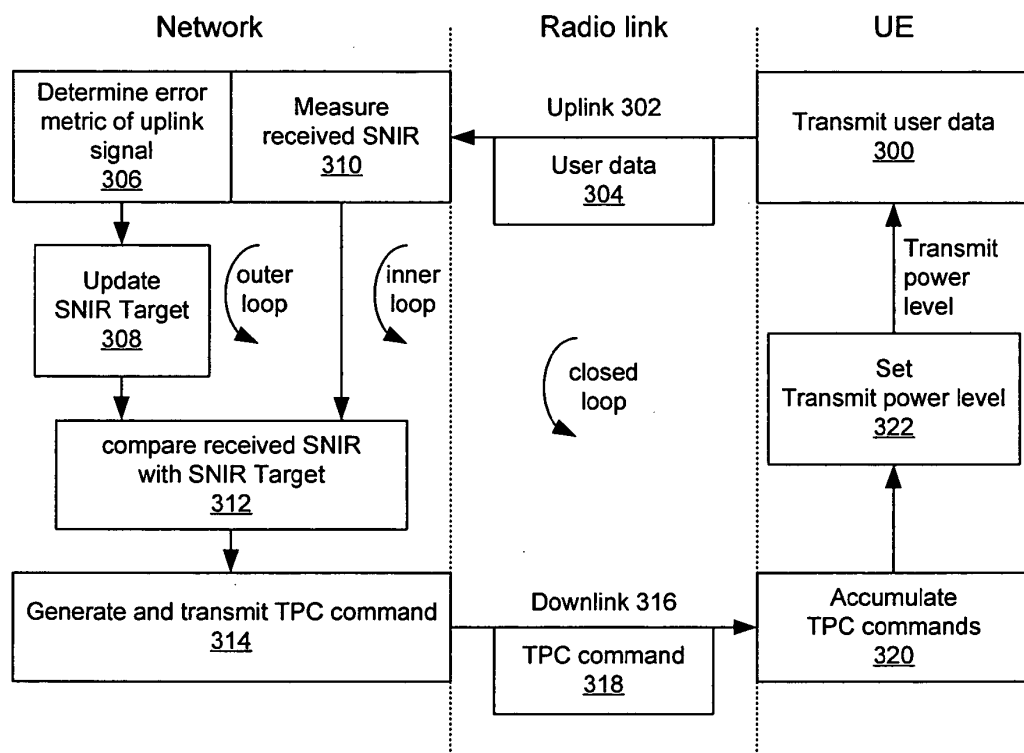


FIGURE 3

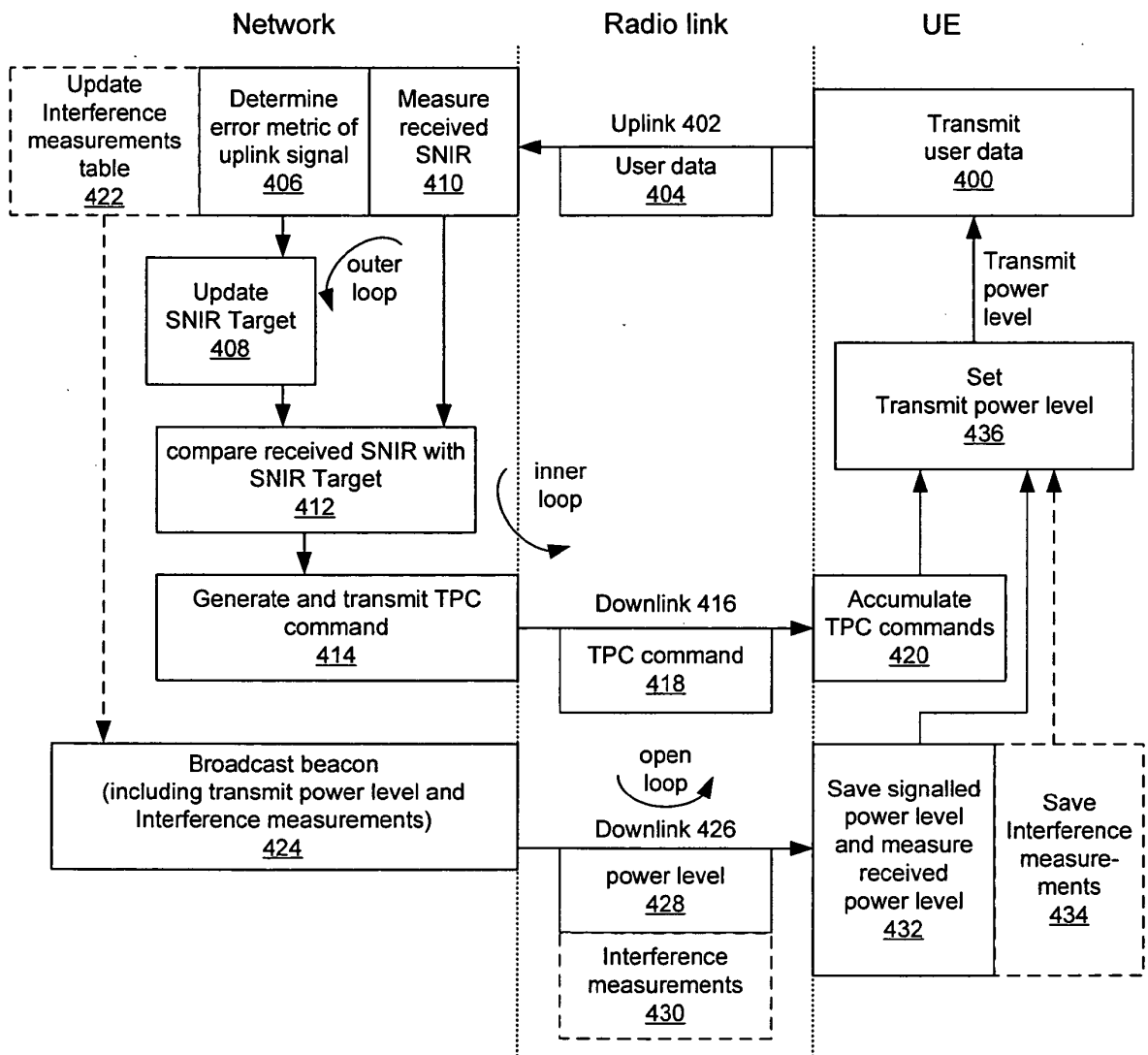


FIGURE 4

FIGURE
5A

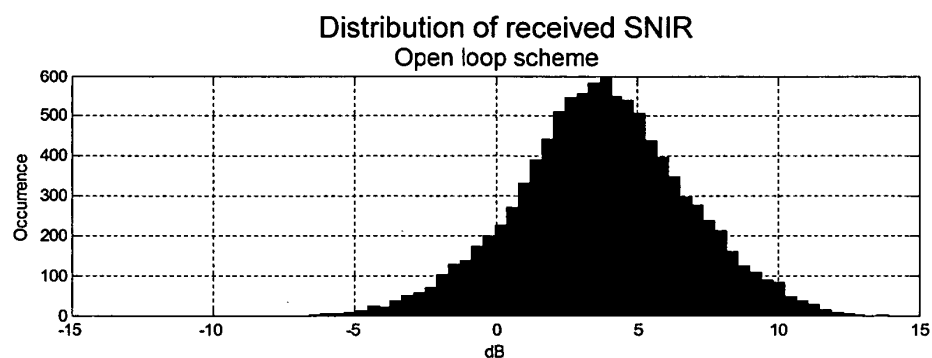


FIGURE
5B

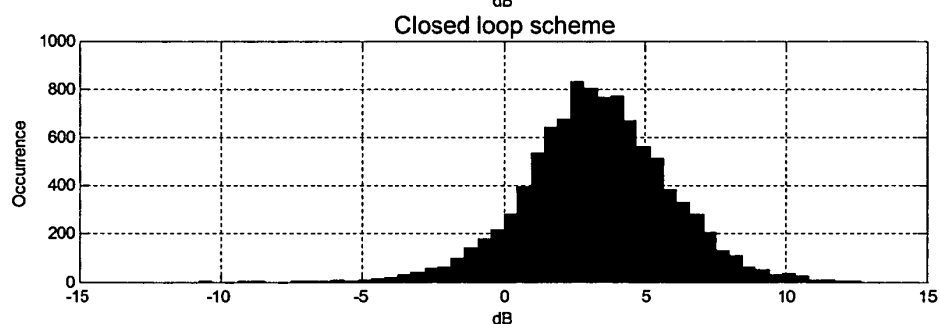
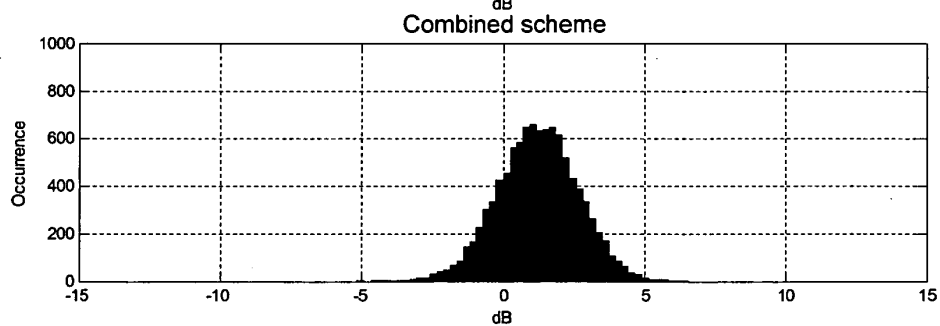


FIGURE
5C



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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IPW2-USCN209711
		Application Number	
Title of Invention	POWER CONTROL IN A WIRELESS NETWORK		
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.)
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Application Information:

Title of the Invention	POWER CONTROL IN A WIRELESS NETWORK		
Attorney Docket Number	IPW2-USCN209711	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	4	Suggested Figure for Publication (if any)	3

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Title of Invention	POWER CONTROL IN A WIRELESS NETWORK		

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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

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

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When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	14713719	2015-05-15

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number		IPW2-USCN209711	
		Application Number			
Title of Invention	POWER CONTROL IN A WIRELESS NETWORK				
Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14713719	Continuation of	13727153	2012-12-26	9055586	2015-06-09
Prior Application Status	Patented				Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13727153	Continuation of	10917968	2004-08-12	8897828	2014-11-25
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			Remove
Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)
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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.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IPW2-USCN209711
		Application Number	
Title of Invention	POWER CONTROL IN A WIRELESS NETWORK		

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IPW2-USCN209711
		Application Number	
Title of Invention	POWER CONTROL IN A WIRELESS NETWORK		

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IPW2-USCN209711
		Application Number	
Title of Invention	POWER CONTROL IN A WIRELESS NETWORK		

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See 37 CFR 1.4(d) for the manner of making signatures and certifications.

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First Name	Harry	Last Name	Vartanian	Registration Number	56787
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IPW2-USCN209711
		Application Number	
Title of Invention	POWER CONTROL IN A WIRELESS NETWORK		

This collection of information is required by 37 CFR 1.76. 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 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet 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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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.

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

Title of Invention	POWER CONTROL IN A WIRELESS NETWORK
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 <u>13/727,153</u> filed on <u>December 26, 2012</u> 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 to support 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 CFR 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 CFR 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	Nicholas W. ANDERSON
Date (Optional)	19 th March 2013
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/01 form for each additional inventor.	

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. 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 1 minute 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 1460, Alexandria, VA 22313-1460. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1460, Alexandria, VA 22313-1460.

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