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Table with 5 columns: APPLICATION NO., ISSUE DATE, PATENT NO., ATTORNEY DOCKET NO., CONFIRMATION NO.
Row 1: 14/480,584, 04/28/2015, 9019946, 04245.000900.1, 5617

5514 7590 04/08/2015
FITZPATRICK CELLA HARPER & SCINTO
1290 Avenue of the Americas
NEW YORK, NY 10104-3800

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):

- IP Holdings, Inc., Palo Alto, CA, Assignee (with 37 CFR 1.172 Interest);
Raman K. Rao, Palo Alto, CA, Deceased;
Sunil K. Rao, Palo Alto, CA;
Sanjay K. Rao, Palo Alto, CA
Sunil K. Rao, Palo Alto, CA
Sanjay K. Rao, Palo Alto, CA;
Rekha K. Rao, Palo Alto, CA, Legal Representative;

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](http://SelectUSA.gov).

**PART B - FEE(S) TRANSMITTAL**

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

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

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

5514 7590 03/12/2015  
 FITZPATRICK CELLA HARPER & SCINTO  
 1290 Avenue of the Americas  
 NEW YORK, NY 10104-3800

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** *EPS-Web*  
 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 (371) 273-2885, on the date indicated below.

|                           |                    |
|---------------------------|--------------------|
| <i>MICHAEL K. O'NEILL</i> | (Depositor's name) |
| <i>Michael K. O'Neill</i> | (Signature)        |
| <i>March 25, 2015</i>     | (Date)             |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 14/480,584      | 09/08/2014  | Raman K. Rao         | 04245.000900.1      | 5617             |

TITLE OF INVENTION: WIRELESS AND CELLULAR VOICE AND DATA TRANSMISSION WITH MULTIPLE PATHS OF COMMUNICATION

| APPLN. TYPE    | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE   |
|----------------|---------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | SMALL         | \$480         | \$0                 | \$0                  | \$480            | 06/12/2015 |

| EXAMINER    | ART UNIT | CLASS-SUBCLASS |
|-------------|----------|----------------|
| SAM. PHIRIN | 2476     | 370-338000     |

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: IP HOLDINGS, INC.  
 (B) RESIDENCE: (CITY and STATE OR COUNTRY): PALO ALTO, CALIFORNIA

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 06-1205 (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 1.35. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature: *Michael K. O'Neill* Date: *March 25, 2015*  
 Typed or printed name: MICHAEL K. O'NEILL Registration No. 32,622

## Electronic Patent Application Fee Transmittal

|  |  |                 |               |                             |  |
|--|--|-----------------|---------------|-----------------------------|--|
| <b>Application Number:</b>                         | 14480584   |                 |               |                             |  |
| <b>Filing Date:</b>                                | 08-Sep-2014  |                 |               |                             |  |
| <b>Title of Invention:</b>                         | WIRELESS AND CELLULAR VOICE AND DATA TRANSMISSION WITH MULTIPLE PATHS OF COMMUNICATION |                 |               |                             |  |
| <b>First Named Inventor/Applicant Name:</b>        | Raman K. Rao   |                 |               |                             |  |
| <b>Filer:</b>                                      | Michael K. O'Neill/Margaret Lee  |                 |               |                             |  |
| <b>Attorney Docket Number:</b>                     | 04245.000900.1   |                 |               |                             |  |
| Filed as Small Entity                              |  |                 |               |                             |  |
| <b>Filing Fees for Utility under 35 USC 111(a)</b> |  |                 |               |                             |  |
| <b>Description</b>                                 | <b>Fee Code</b>  | <b>Quantity</b> | <b>Amount</b> | <b>Sub-Total in USD(\$)</b> |  |
| <b>Basic Filing:</b>                               |  |                 |               |                             |  |
| <b>Pages:</b>                                      |  |                 |               |                             |  |
| <b>Claims:</b>                                     |  |                 |               |                             |  |
| <b>Miscellaneous-Filing:</b>                       |  |                 |               |                             |  |
| <b>Petition:</b>                                   |  |                 |               |                             |  |
| <b>Patent-Appeals-and-Interference:</b>            |  |                 |               |                             |  |
| <b>Post-Allowance-and-Post-Issuance:</b>           |  |                 |               |                             |  |
| Utility Appl Issue Fee                             | 2501   | 1               | 480           | 480                         |  |

| Description               | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|---------------------------|----------|----------|--------|----------------------|
| <b>Extension-of-Time:</b> |          |          |        |                      |
| <b>Miscellaneous:</b>     |          |          |        |                      |
| <b>Total in USD (\$)</b>  |          |          |        | <b>480</b>           |

## Electronic Acknowledgement Receipt

|   |  |
|---|--|
| <b>EFS ID:</b>                              | 21879151   |
| <b>Application Number:</b>                  | 14480584   |
| <b>International Application Number:</b>    |  |
| <b>Confirmation Number:</b>                 | 5617   |
| <b>Title of Invention:</b>                  | WIRELESS AND CELLULAR VOICE AND DATA TRANSMISSION WITH MULTIPLE PATHS OF COMMUNICATION |
| <b>First Named Inventor/Applicant Name:</b> | Raman K. Rao   |
| <b>Customer Number:</b>                     | 5514   |
| <b>Filer:</b>                               | Michael K. O'Neill/Margaret Lee  |
| <b>Filer Authorized By:</b>                 | Michael K. O'Neill   |
| <b>Attorney Docket Number:</b>              | 04245.000900.1   |
| <b>Receipt Date:</b>                        | 25-MAR-2015  |
| <b>Filing Date:</b>                         | 08-SEP-2014  |
| <b>Time Stamp:</b>                          | 18:40:00   |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)  |

### Payment information:

|  |                     |
|--|---------------------|
| Submitted with Payment                   | yes                 |
| Payment Type                             | Credit Card         |
| Payment was successfully received in RAM | \$480               |
| RAM confirmation Number                  | 4413                |
| Deposit Account                          | 503939              |
| Authorized User                          | O'NEILL, MICHAEL K. |

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:  
 Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)  
 Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

**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) | 04245_000900_1_Fee_Transmittal.pdf | 113485<br>26883a879341bb3168f02ac02232d97e60b8c209 | no               | 1                |

**Warnings:**

**Information:**

|   |                      |              |   |    |   |
|---|----------------------|--------------|---|----|---|
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 30455<br>b1550b6b7c75a06b80960ba77ce31488161f387e | no | 2 |
|---|----------------------|--------------|---|----|---|

**Warnings:**

**Information:**

|                                     |        |
|-------------------------------------|--------|
| <b>Total Files Size (in bytes):</b> | 143940 |
|-------------------------------------|--------|

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.

**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**

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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NOTICE OF ALLOWANCE AND FEE(S) DUE

5514 7590 03/12/2015
FITZPATRICK CELLA HARPER & SCINTO
1290 Avenue of the Americas
NEW YORK, NY 10104-3800

EXAMINER

SAM, PHIRIN

ART UNIT PAPER NUMBER

2476

DATE MAILED: 03/12/2015

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.

14/480,584 09/08/2014 Raman K. Rao 04245.000900.1 5617

TITLE OF INVENTION: WIRELESS AND CELLULAR VOICE AND DATA TRANSMISSION WITH MULTIPLE PATHS OF COMMUNICATION

Table with 7 columns: APPLN. TYPE, ENTITY STATUS, ISSUE FEE DUE, PUBLICATION FEE DUE, PREV. PAID ISSUE FEE, TOTAL FEE(S) DUE, DATE DUE

nonprovisional SMALL \$480 \$0 \$0 \$480 06/12/2015

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

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

**PART B - FEE(S) TRANSMITTAL**

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

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

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

5514 7590 03/12/2015  
**FITZPATRICK CELLA HARPER & SCINTO**  
 1290 Avenue of the Americas  
 NEW YORK, NY 10104-3800

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.

|                             |
|-----------------------------|
| _____<br>(Depositor's name) |
| _____<br>(Signature)        |
| _____<br>(Date)             |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 14/480,584      | 09/08/2014  | Raman K. Rao         | 04245.000900.1      | 5617             |

TITLE OF INVENTION: WIRELESS AND CELLULAR VOICE AND DATA TRANSMISSION WITH MULTIPLE PATHS OF COMMUNICATION

| APPLN. TYPE    | ENTITY STATUS | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE   |
|----------------|---------------|---------------|---------------------|----------------------|------------------|------------|
| nonprovisional | SMALL         | \$480         | \$0                 | \$0                  | \$480            | 06/12/2015 |

| EXAMINER    | ART UNIT | CLASS-SUBCLASS |
|-------------|----------|----------------|
| SAM, PHIRIN | 2476     | 370-338000     |

|   |   |
|---|---|
| <p>1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).</p> <p><input type="checkbox"/> Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.</p> <p><input type="checkbox"/> "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. <b>Use of a Customer Number is required.</b></p> | <p>2. For printing on the patent front page, list</p> <p>(1) The names of up to 3 registered patent attorneys or agents OR, alternatively, _____ 1</p> <p>(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</p> <p>_____ 3</p> |
|---|---|

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

|   |  |
|---|--|
| <p>4a. The following fee(s) are submitted:</p> <p><input type="checkbox"/> Issue Fee</p> <p><input type="checkbox"/> Publication Fee (No small entity discount permitted)</p> <p><input type="checkbox"/> Advance Order - # of Copies _____</p> | <p>4b. Payment of Fee(s): (<b>Please first reapply any previously paid issue fee shown above</b>)</p> <p><input type="checkbox"/> A check is enclosed.</p> <p><input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.</p> <p><input type="checkbox"/> 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).</p> |
|---|--|

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

Applicant certifying micro entity status. See 37 CFR 1.29

Applicant asserting small entity status. See 37 CFR 1.27

Applicant changing to regular undiscounted fee status.

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

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

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

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

|                             |                        |
|-----------------------------|------------------------|
| Authorized Signature _____  | Date _____             |
| Typed or printed name _____ | Registration No. _____ |





UNITED STATES PATENT AND TRADEMARK OFFICE

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1290 Avenue of the Americas
NEW YORK, NY 10104-3800

EXAMINER

SAM, PHIRIN

ART UNIT PAPER NUMBER

2476

DATE MAILED: 03/12/2015

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.

|                               |                                      |                                   |  |
|-------------------------------|--------------------------------------|-----------------------------------|--|
| <b>Notice of Allowability</b> | <b>Application No.</b><br>14/480,584 | <b>Applicant(s)</b><br>RAO ET AL. |  |
|                               | <b>Examiner</b><br>PHIRIN SAM        | <b>Art Unit</b><br>2476           | <b>AIA (First Inventor to File) Status</b><br>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 02/04/2015.  
 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 1-30. 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](http://www.uspto.gov/patents/init_events/pph/index.jsp) or send an inquiry to [FPHfeedback@uspto.gov](mailto:FPHfeedback@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. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Examiner's Amendment/Comment                             |
| 2. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date <u>02/04/15</u> | 6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material                   | 7. <input type="checkbox"/> Other _____.   |
| 4. <input type="checkbox"/> Interview Summary (PTO-413),<br>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. The following is an examiner's statement of reasons for allowance:

**In regard to amended claim 1**, the prior arts of record do not teach or suggest an internet-enabled mobile communication device comprising: a memory; at least two or more antennas; at least one or more processors; and a plurality of wireless transmit and receive units including a first wireless transmit and receive unit and a second wireless transmit and receive unit, wherein each wireless transmit receive component unit is configured to communicate using one or more protocols; wherein the device is configured for multi-band wireless communication; wherein the device is enabled for communication using Internet Protocol (IP); wherein the device is enabled for wireless communication on a wireless local area network; wherein the first wireless transmit and receive unit is configured to communicate using a plurality of antennas; and wherein a transmission first interface for transmission is created and wherein said first interface for transmission uses a plurality of IP interfaces for Internet Protocol communication on the mobile device which utilize the plurality of wireless transmit and receive units on the mobile device to enable a single interface comprised of multiplexed signals from the plurality of wireless transmit and receive units; and wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple communication network paths including at least one connection to a networked server; and wherein at least one

communication path is used for wireless signals representing voice data and at least one communication path is used for wireless signals representing non-voice data.

**In regard to amended claim 14**, the prior arts of record do not teach or suggest an Internet-enabled mobile communication device comprising: a memory; a display; at least two or more antennas; at least one or more processors; and a plurality of wireless transmit and receive units including a first wireless transmit and receive unit and a second wireless transmit and receive unit, wherein each wireless transmit receive component unit is configured to communicate using one or more protocols; wherein the device is enabled for communication using Internet Protocol (IP); wherein the device is enabled for wireless communication on a wireless local area network; wherein the first wireless transmit and receive component unit is enabled to communicate using one or more antennas simultaneously; and wherein the mobile device maintains multiple IP addresses, wherein the first wireless unit is accessible on a first IP address and the second wireless transmit and receive component unit is accessible on a second IP address and wherein the mobile device operates using a plurality of ports; and wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server; and wherein the device is enabled for communication of wireless signals representing voice data and for communication of wireless signals representing non-voice data.

**In regard to amended claim 17**, the prior arts of record do not teach or suggest a portable wireless communication device, comprising: a memory; at least two or more antennas;

at least one or more processors; and a plurality of wireless transmit and receive unit including a first wireless transmit and receive unit and a second wireless transmit and receive unit, wherein each wireless transmit receive unit is configured to communicate using one or more protocols; wherein the device is configured for multi-band wireless communication; wherein the device is enabled for communication using Internet Protocol (IP); wherein the device is enabled for wireless communication on a local area network; wherein the first wireless transmit and receive unit is configured to communicate using a plurality of antennas; and wherein the first wireless transmit and receive component unit is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive unit is configured to communicate with the same or a different remote system using a second network path and wherein the processor on the device is configured to combine the data paths into a single transmission interface to one or more applications on the device; and wherein data transferred by the plurality of transmit and receive units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server; and wherein at least one of the different networks comprises a voice network and wherein at least one of the different networks comprises an Internet protocol data network.

**In regard to amended claim 27**, the prior arts of record do not teach or suggest an IP-enabled communication device comprising: a memory; one or more processors; a plurality of wireless communication units, wherein the device supports a plurality of transmit and receive frequencies and a plurality of wireless protocols; wherein a first wireless communication unit is coupled to a first set of antennas configured to transmit and receive on a first network and

wherein a second wireless communication unit is coupled to a second set of antennas and configured to transmit and receive on a second network; wherein the at least one wireless communication unit is configured for radio frequency communication; wherein the first wireless communication unit is configured to operate at a lower frequency than the second wireless communication unit such that the first and second wireless communication units operate as complementary systems and reduce interference with each other; and wherein the device is configured for voice and/or data connectivity and Internet connectivity; and wherein the first wireless transmit and receive unit operates on the first network path to a remote server and the second wireless transmit and receive unit communicates to the remote server on the second network path in response to a change in the signal strength and/or connectivity of the first wireless communication unit or second wireless communication unit; and wherein video or audio can be accessed simultaneously with performance optimized for each through dedicated or multiplexed paths.

### *Conclusion*

3. 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.”
4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHIRIN SAM whose telephone number is (571)272-3082. The examiner can normally be reached on Flexible Work Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz R. Sheikh can be reached on (571) 272-3795. 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.

Respectfully submitted,

Date: March 9, 2015

By:     /Phirin Sam/      
Primary Examiner  
Art Unit 2476



|                                   |                                       |  |             |
|-----------------------------------|---------------------------------------|--|-------------|
| <b>Notice of References Cited</b> | Application/Control No.<br>14/480,584 | Applicant(s)/Patent Under<br>Reexamination<br>RAO ET AL. |             |
|                                   | Examiner<br>PHIRIN SAM                | Art Unit<br>2476   | Page 1 of 1 |

**U.S. PATENT DOCUMENTS**

| * | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Name                 | Classification |
|---|--|-----------------|----------------------|----------------|
| * | A US-2010/0190453                                | 07-2010         | Rofougaran et al.    | 455/75         |
| * | B US-2005/0220086                                | 10-2005         | Dowling, Eric Morgan | 370/352        |
|   | C US-  |                 |                      |                |
|   | D US-  |                 |                      |                |
|   | E US-  |                 |                      |                |
|   | F US-  |                 |                      |                |
|   | G US-  |                 |                      |                |
|   | H US-  |                 |                      |                |
|   | I US-  |                 |                      |                |
|   | J US-  |                 |                      |                |
|   | K US-  |                 |                      |                |
|   | L US-  |                 |                      |                |
|   | M US-  |                 |                      |                |


**FOREIGN PATENT DOCUMENTS**

| * | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Country | Name | Classification |
|---|--|-----------------|---------|------|----------------|
|   | N  |                 |         |      |                |
|   | O  |                 |         |      |                |
|   | P  |                 |         |      |                |
|   | Q  |                 |         |      |                |
|   | R  |                 |         |      |                |
|   | S  |                 |         |      |                |
|   | T  |                 |         |      |                |

**NON-PATENT DOCUMENTS**

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

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

|  |  |  |
|--|--|--|
| <b>Search Notes</b><br><br> | <b>Application/Control No.</b><br><br>14480584 | <b>Applicant(s)/Patent Under Reexamination</b><br><br>RAO ET AL. |
|  | <b>Examiner</b><br><br>PHIRIN SAM              | <b>Art Unit</b><br><br>2476                                      |

| CPC- SEARCHED          |            |          |
|------------------------|------------|----------|
| Symbol                 | Date       | Examiner |
| H04B7/0404; H04B7/0413 | 11/03/2014 | PS       |

| CPC COMBINATION SETS - SEARCHED |      |          |
|---------------------------------|------|----------|
| Symbol                          | Date | Examiner |
|                                 |      |          |

| US CLASSIFICATION SEARCHED |          |      |          |
|----------------------------|----------|------|----------|
| Class                      | Subclass | Date | Examiner |
|                            |          |      |          |

| SEARCH NOTES   |                           |          |
|--|---------------------------|----------|
| Search Notes   | Date                      | Examiner |
| H04B7/18539; H04b7/18567; H04B7/18578; H03D7/00; H04B7/18508   | 11/03/2014                | PS       |
| 370/315,316,327,328,329,334,338-341,344,351-354,356,389,392,400-402,465,473;455/101,132,272,562.1;375/130,140,144,147,148,316,346,347 (Text search - See search history printout). | 11/03/2014;<br>03/09/2015 | PS       |
| H04W88/02; H04W88/06; H04W16/14; H04W48/16   | 03/09/2015                | PS       |

| INTERFERENCE SEARCH     |   |            |          |
|-------------------------|---|------------|----------|
| US Class/<br>CPC Symbol | US Subclass / CPC Group                   | Date       | Examiner |
|                         | See text search history for interference. | 03/09/2015 | PS       |

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04245.000900.1

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

|                                   |   |                        |
|-----------------------------------|---|------------------------|
| In re Application No.: 14/480,584 | ) |                        |
|                                   | : | Examiner: Phirin Sam   |
| First Named Inventor:             | ) |                        |
|                                   | : | Group Art Unit: 2476   |
| RAMAN K. RAO, ET AL.              | ) |                        |
|                                   | : | Confirmation No.: 5617 |
| Filed: September 8, 2014          | ) |                        |
|                                   | : |                        |
| For: WIRELESS AND CELLULAR VOICE  | ) |                        |
| AND DATA TRANSMISSION WITH        | : |                        |
| MULTIPLE PATHS OF                 | ) |                        |
| COMMUNICATION (As Amended)        | : |                        |
|                                   | ) | February 4, 2015       |

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

INFORMATION DISCLOSURE STATEMENT

Commissioner:

Pursuant to 37 C.F.R. § 1.56, Applicants respectfully direct the Examiner's attention to the documents listed below and on the attached Form PTO-1449. Copies of non-U.S. patent documents are enclosed.

U.S. Patent 4,654,867  
U.S. Patent 4,675,653

CERTIFICATE OF EFS-WEB TRANSMISSION  
I hereby certify that this correspondence is being filed electronically by EFS-Web transmission to the United States Patent Office on  
February 4, 2015  
\_\_\_\_\_  
(Date of Deposit)

\_\_\_\_\_  
Michael K. O'Neill, Reg. No. 32,622  
(Name of Attorney for Applicant)

\_\_\_\_\_  
/Michael K. O'Neill/  
Signature

\_\_\_\_\_  
February 4, 2015  
Date of Signature

U.S. Patent 5,025,486  
U.S. Patent 5,121,391  
U.S. Patent 5,195,130  
U.S. Patent 5,379,341  
U.S. Patent 5,410,738  
U.S. Patent 5,457,714  
U.S. Patent 5,465,401  
U.S. Patent 5,507,035  
U.S. Patent 5,513,242  
U.S. Patent 5,517,553  
U.S. Patent 5,533,029  
U.S. Patent 5,539,391  
U.S. Patent 5,546,429  
U.S. Patent 5,555,258  
U.S. Patent 5,559,794  
U.S. Patent 5,565,929  
U.S. Patent 5,566,205  
U.S. Patent 5,577,118  
U.S. Patent 5,598,407  
U.S. Patent 5,610,617  
U.S. Patent 5,633,742  
U.S. Patent 5,691,974  
U.S. Patent 5,745,884  
U.S. Patent 5,816,918  
U.S. Patent 5,828,658  
U.S. Patent 6,058,422  
U.S. Patent 6,072,994  
U.S. Patent 6,108,314  
U.S. Patent 6,167,099  
U.S. Patent 6,169,789  
U.S. Patent 6,246,688  
U.S. Patent 6,377,570  
U.S. Patent 6,405,049  
U.S. Patent 6,456,610  
U.S. Patent 6,466,558  
U.S. Patent 6,519,478  
U.S. Patent 6,549,534  
U.S. Patent 6,570,871  
U.S. Patent 6,600,734  
U.S. Patent 6,640,086  
U.S. Patent 6,895,253  
U.S. Patent 7,027,773  
U.S. Patent 7,039,370  
U.S. Patent 7,099,695  
U.S. Patent 7,277,679  
U.S. Patent 7,286,502  
U.S. Patent 7,643,848  
U.S. Patent 7,848,300

U.S. Patent Application Publication No. 2002/0126745  
U.S. Patent Application Publication No.2006/0023666  
U.S. Patent Application Publication No. 2010/0260063  
U.S. Patent Application Publication No. 2011/0038637

D374,675

U.S. Application No. 10/940,428  
U.S. Application No. 12/912,607  
U.S. Application No. 13/589,188  
U.S. Application No. 13/621,292  
U.S. Application No. 13/621,294  
U.S. Application No. 14/139,817  
U.S. Application No. 14/480,584  
U.S. Application No. 14/273,323  
U.S. Application No. 14/472,772

U.S. Patent Application Publication No. 2002/0084889  
U.S. Patent Application Publication No. 2001/0006517

U.S. Patent 6,865,169  
U.S. Patent 6,542,736  
U.S. Patent 5,802,469  
U.S. Patent 5,889,816  
U.S. Patent 5,636,211  
U.S. Patent 5,909,183  
U.S. Patent 6,128,489  
U.S. Patent 6,067,290  
U.S. Patent 5,960,039

This application has received an Office Action on the merits but has not yet received either a final action or a notice of allowance. Accordingly, this Information Disclosure Statement is filed under 37 C.F.R. § 1.97(c) and is accompanied by the \$90.00 fee specified at 37 C.F.R. § 1.17(p). Consideration of the art cited herein is accordingly deemed proper, and such action is respectfully requested.

The Examiner is requested to make an independent determination of the relevance and materiality of the cited documents to the claims herein, and to indicate that these documents have been considered by initialing the attached Form PTO-1449.

Applicants' undersigned attorney may be reached in our Costa Mesa, CA office by telephone at (714) 540-8700. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

/Michael K. O'Neill/  
Michael K. O'Neill  
Attorney for Applicants  
Registration No. 32,622

FITZPATRICK, CELLA, HARPER & SCINTO  
1290 Avenue of the Americas  
New York, New York 10104-3800  
Facsimile: (212) 218-2200

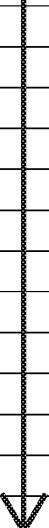
| FORM PTO 1449 (modified)   |                           | ATTY DOCKET NO.<br><b>04245.000900.1</b>  |                    | APPLICATION NO.<br><b>14/480,584</b>    |                            |
|--|---------------------------|---|--------------------|---|----------------------------|
| U.S. DEPARTMENT OF COMMERCE<br>PATENT AND TRADEMARK OFFICE                           |                           | APPLICANT<br><b>SANJAY K. RAO, ET AL.</b> |                    | FILING DATE<br><b>September 8, 2014</b> |                            |
| <b>LIST OF REFERENCES CITED BY APPLICANT(S)</b><br>(Use several sheets if necessary) |                           |   |                    |   |                            |
| U.S. PATENT DOCUMENTS  |                           |   |                    |   |                            |
| *EXAMINER INITIAL  | DOCUMENT NUMBER           | DATE                                      | NAME               | CLASS                                   | FILING DATE IF APPROPRIATE |
| /P.S./   | 4,654,867                 | 03/31/1987                                | Labeledz           |   |                            |
|  | 4,675,653                 | 06/23/1987                                | Priestly           |   |                            |
|  | 5,025,486                 | 06/18/1991                                | Klughart           |   |                            |
|  | 5,121,391                 | 06/09/1992                                | Paneth et al.      |   |                            |
|  | 5,195,130                 | 03/16/1993                                | Weiss et al.       |   |                            |
|  | 5,379,341                 | 01/03/1995                                | Wan                |   |                            |
|  | 5,410,738                 | 04/25/1995                                | Diepstraten et al. |   |                            |
|  | 5,457,714                 | 10/10/1995                                | Engel et al.       |   |                            |
|  | 5,465,401                 | 11/07/1995                                | Thompson           |   |                            |
|  | 5,507,035                 | 04/09/1996                                | Bantz et al.       |   |                            |
|  | 5,513,242                 | 4/30/1996                                 | Mukerjee et al.    |   |                            |
|  | 5,517,553                 | 05/14/1996                                | Sato               |   |                            |
|  | 5,533,029                 | 07/02/1996                                | Gardner            |   |                            |
|  | 5,539,391                 | 07/23/1996                                | Yuen               |   |                            |
|  | 5,546,429                 | 08/13/1996                                | Chiasson et al.    |   |                            |
|  | 5,555,258                 | 09/10/1996                                | Snelling et al.    |   |                            |
|  | 5,559,794                 | 09/24/1996                                | Willis et al.      |   |                            |
|  | 5,565,929                 | 10/15/1996                                | Tanaka             |   |                            |
|  | 5,566,205                 | 10/15/1996                                | Delfine            |   |                            |
|  | 5,577,118                 | 11/19/1996                                | Sasaki et al.      |   |                            |
|  | 5,598,407                 | 01/28/1997                                | Bud et al.         |   |                            |
|  | 5,610,617                 | 03/11/1997                                | Gans et al.        |   |                            |
|  | 5,633,742                 | 05/27/1997                                | Shipley            |   |                            |
|  | 5,691,974                 | 11/25/1997                                | Zehavi et al.      |   |                            |
|  | 5,745,884                 | 04/28/1998                                | Carnegie et al.    |   |                            |
|  | 5,816,918                 | 10/06/1998                                | Kelly et al.       |   |                            |
|  | 5,828,658                 | 10/27/1998                                | Ottersten et al.   |   |                            |
|  | 6,058,422                 | 05/02/2000                                | Ayanoglu et al.    |   |                            |
|  | 6,072,994                 | 06/06/2000                                | Phillips et al.    |   |                            |
| /P.S./   | 6,108,314                 | 08/22/2000                                | Jones et al.       |   |                            |
| EXAMINER   | /Phirin Sam/ (03/09/2015) |   | DATE CONSIDERED    | 03/09/2015                              |                            |

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


| FORM PTO 1449 (modified)   |                           | ATTY DOCKET NO.<br><b>04245.000900.1</b>  |                 | APPLICATION NO.<br><b>14/480,584</b>    |                            |
|--|---------------------------|---|-----------------|---|----------------------------|
| U.S. DEPARTMENT OF COMMERCE<br>PATENT AND TRADEMARK OFFICE                           |                           | APPLICANT<br><b>SANJAY K. RAO, ET AL.</b> |                 | FILING DATE<br><b>September 8, 2014</b> |                            |
| <b>LIST OF REFERENCES CITED BY APPLICANT(S)</b><br>(Use several sheets if necessary) |                           |   |                 |   |                            |
| U.S. PATENT DOCUMENTS  |                           |   |                 |   |                            |
| *EXAMINER INITIAL  | DOCUMENT NUMBER           | DATE                                      | NAME            | CLASS                                   | FILING DATE IF APPROPRIATE |
| /P.S./   | 6,167,099                 | 12/26/2000                                | Rader et al.    |   |                            |
|  | 6,169,789                 | 01/02/2001                                | Rao et al.      |   |                            |
|  | 6,246,688                 | 06/12/2001                                | Angwin et al.   |   |                            |
|  | 6,377,570                 | 04/23/2002                                | Vaziri et al.   |   |                            |
|  | 6,405,049                 | 06/11/2002                                | Herrod et al.   |   |                            |
|  | 6,456,610                 | 09/24/2002                                | Briley          |   |                            |
|  | 6,466,558                 | 10/15/2002                                | Ling            |   |                            |
|  | 6,519,478                 | 02/11/2003                                | Scherzer et al. |   |                            |
|  | 6,549,534                 | 04/15/2003                                | Shaffer et al.  |   |                            |
|  | 6,570,871                 | 05/27/2003                                | Schneider       |   |                            |
|  | 6,600,734                 | 07/29/2003                                | Gernert et al.  |   |                            |
|  | 6,640,086                 | 10/28/2003                                | Wall            |   |                            |
|  | 6,895,253                 | 05/17/2005                                | Carloni et al.  |   |                            |
|  | 7,027,773                 | 04/11/2006                                | McMillin        |   |                            |
|  | 7,039,370                 | 05/02/2006                                | Laroia et al.   |   |                            |
|  | 7,099,695                 | 08/29/2006                                | Ngan            |   |                            |
|  | 7,277,679                 | 10/02/2007                                | Barratt et al.  |   |                            |
|  | 7,286,502                 | 10/23/2007                                | Rao et al.      |   |                            |
|  | 7,643,848                 | 01/05/2010                                | Robinett        |   |                            |
|  | 7,848,300                 | 12/07/2010                                | Rao et al.      |   |                            |
|  | 2002/0126745              | 09/12/2002                                | Prysby et al.   |   |                            |
|  | 2006/0023666              | 01/05/2006                                | Jalali et al.   |   |                            |
|  | 2010/0260063              | 10/14/2010                                | Kubler et al.   |   |                            |
|  | 2011/0038637              | 02/17/2011                                | Rao et al.      |   |                            |
|  | D374,675                  | 10/15/1996                                | Sakai et al.    |   |                            |
|  | 10/940,428                | 09/13/2004                                | Rao et al.      |   |                            |
| /P.S./   | 12/912,607                | 10/26/2010                                | Rao et al.      |   |                            |
| EXAMINER   | /Phirin Sam/ (03/09/2015) |   | DATE CONSIDERED | 03/09/2015                              |                            |

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



| FORM PTO 1449 (modified)   |                 | ATTY DOCKET NO.<br><b>04245.000900.1</b>  |                            | APPLICATION NO.<br><b>14/480,584</b>    |                            |  |
|--|-----------------|---|----------------------------|---|----------------------------|--|
| U.S. DEPARTMENT OF COMMERCE<br>PATENT AND TRADEMARK OFFICE                                   |                 | APPLICANT<br><b>SANJAY K. RAO, ET AL.</b> |                            | FILING DATE<br><b>September 8, 2014</b> |                            |  |
| LIST OF REFERENCES CITED BY APPLICANT(S)<br>(Use several sheets if necessary)                |                 |   |                            |   |                            |  |
| U.S. PATENT DOCUMENTS  |                 |   |                            |   |                            |  |
| *EXAMINER INITIAL  | DOCUMENT NUMBER | DATE                                      | NAME                       | CLASS                                   | FILING DATE IF APPROPRIATE |  |
| /P.S./<br> | 13/589,188      | 08/02/2012                                | Rao et al.                 |   |                            |  |
|  | 13/621,292      | 09/17/2012                                | Rao et al.                 |   |                            |  |
|  | 13/621,294      | 09/17/2012                                | Rao et al.                 |   |                            |  |
|  | 14/139,817      | 12/23/2013                                | Rao et al.                 |   |                            |  |
|  | 2002/0084889    | 07/04/2002                                | Bolavage et al.            |   |                            |  |
|  | 2001/0006517    | 07/05/2001                                | Lin et al.                 |   |                            |  |
|  | 6,865,169       | 03/08/2005                                | Quayle et al.              |   |                            |  |
|  | 6,542,736       | 04/01/2003                                | Parkvall et al.            |   |                            |  |
|  | 5,802,469       | 09/01/1998                                | Nounin et al.              |   |                            |  |
|  | 5,889,816       | 03/30/1999                                | Agarwal et al.             |   |                            |  |
|  | 5,636,211       | 06/03/1997                                | Newlin et al.              |   |                            |  |
|  | 5,909,183       | 06/01/1999                                | Borgstahl et al.           |   |                            |  |
|  | 6,128,489       | 10/03/2000                                | Seazholtz et al.           |   |                            |  |
|  | /P.S./          | 6,067,290                                 | 05/23/2000                 | Paulraj et al.                          |                            |  |
|  | /P.S./          | 5,960,039                                 | 09/28/1999                 | Martin et al.                           |                            |  |
| EXAMINER /Phirin Sam/ (03/09/2015)   |                 |   | DATE CONSIDERED 03/09/2015 |   |                            |  |

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

|   |  |  |
|---|--|--|
| <b>Index of Claims</b><br> | <b>Application/Control No.</b><br>14480584 | <b>Applicant(s)/Patent Under Reexamination</b><br>RAO ET AL. |
|   | <b>Examiner</b><br>PHIRIN SAM              | <b>Art Unit</b><br>2476                                      |

|   |                 |   |                   |   |                     |   |                 |
|---|-----------------|---|-------------------|---|---------------------|---|-----------------|
| ✓ | <b>Rejected</b> | - | <b>Cancelled</b>  | N | <b>Non-Elected</b>  | A | <b>Appeal</b>   |
| = | <b>Allowed</b>  | ÷ | <b>Restricted</b> | I | <b>Interference</b> | O | <b>Objected</b> |

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

| CLAIM |          | DATE       |            |  |  |  |  |  |  |
|-------|----------|------------|------------|--|--|--|--|--|--|
| Final | Original | 11/03/2014 | 03/09/2015 |  |  |  |  |  |  |
|       | 1        | ✓          | =          |  |  |  |  |  |  |
|       | 2        | ✓          | =          |  |  |  |  |  |  |
|       | 3        | ✓          | =          |  |  |  |  |  |  |
|       | 4        | ✓          | =          |  |  |  |  |  |  |
|       | 5        | ✓          | =          |  |  |  |  |  |  |
|       | 6        | ✓          | =          |  |  |  |  |  |  |
|       | 7        | ✓          | =          |  |  |  |  |  |  |
|       | 8        | ✓          | =          |  |  |  |  |  |  |
|       | 9        | ✓          | =          |  |  |  |  |  |  |
|       | 10       | ✓          | =          |  |  |  |  |  |  |
|       | 11       | ✓          | =          |  |  |  |  |  |  |
|       | 12       | ✓          | =          |  |  |  |  |  |  |
|       | 13       | ✓          | =          |  |  |  |  |  |  |
|       | 14       | ✓          | =          |  |  |  |  |  |  |
|       | 15       | ✓          | =          |  |  |  |  |  |  |
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|       | 18       | ✓          | =          |  |  |  |  |  |  |
|       | 19       | ✓          | =          |  |  |  |  |  |  |
|       | 20       | ✓          | =          |  |  |  |  |  |  |
|       | 21       | ✓          | =          |  |  |  |  |  |  |
|       | 22       | ✓          | =          |  |  |  |  |  |  |
|       | 23       | ✓          | =          |  |  |  |  |  |  |
|       | 24       | ✓          | =          |  |  |  |  |  |  |
|       | 25       | ✓          | =          |  |  |  |  |  |  |
|       | 26       | ✓          | =          |  |  |  |  |  |  |
|       | 27       | ✓          | =          |  |  |  |  |  |  |
|       | 28       | ✓          | =          |  |  |  |  |  |  |
|       | 29       | ✓          | =          |  |  |  |  |  |  |
|       | 30       | ✓          | =          |  |  |  |  |  |  |

## EAST Search History

## EAST Search History (Prior Art)

| Ref # | Hits    | Search Query   | DBs   | Default Operator | Plurals | Time Stamp          |
|-------|---------|--|---|------------------|---------|---------------------|
| L1    | 1       | "8842653".pn.  | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2015/03/09<br>12:00 |
| L2    | 1771339 | ((wireless or mobile\$1) near3 (terminal\$1 or unit\$1 or device\$1 or station\$1)) or smart\$1phone\$1 or PDA or (hand\$1held adj2 (unit\$1 or device\$1)) or UE                          | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2015/03/09<br>12:12 |
| L3    | 278206  | antennas   | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2015/03/09<br>12:13 |
| L4    | 307732  | transceivers or (transceiv\$3 adj2 (devices or units or apparatuses)) or receivers or transmitters   | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2015/03/09<br>12:14 |
| L5    | 1524679 | protocol\$1  | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2015/03/09<br>12:15 |
| L6    | 25099   | ((multi\$1band\$1 or (multiple adj3 bands) or bands) same wireless same communicat\$3  | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2015/03/09<br>12:16 |
| L7    | 323317  | ((((wireless or mobile\$1) near3 (terminal\$1 or unit\$1 or device\$1 or station\$1)) or smart\$1phone\$1 or PDA or (hand\$1held adj2 (unit\$1 or device\$1)) or UE) same (IP or Internet) | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2015/03/09<br>12:20 |

|     |        |   |   |    |     |                     |
|-----|--------|---|---|----|-----|---------------------|
| L8  | 82966  | ((wireless or mobile\$1) near3 (terminal\$1 or unit\$1 or device\$1 or station\$1)) or smart\$1phone\$1 or PDA or (hand\$1held adj2 (unit\$1 or device\$1)) or UE) same (WLAN or (wireless adj2 LAN) or (wireless adj2 local adj2 area adj2 network)) | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:21 |
| L9  | 123171 | (IP or Internet) near3 (interface\$1 or port\$1)  | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:27 |
| L10 | 132455 | I2 and I3   | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:27 |
| L11 | 48016  | I10 and I4  | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:27 |
| L12 | 31260  | I11 and I5  | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:27 |
| L13 | 3967   | I12 and I6  | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:27 |
| L14 | 2325   | I13 and I7  | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:28 |
| L15 | 1201   | I14 and I8  | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:28 |
| L16 | 158    | I15 and I9  | US-PGPUB;<br>USPAT;   | OR | OFF | 2015/03/09<br>12:28 |

|     |        |   |   |    |     |                     |
|-----|--------|---|---|----|-----|---------------------|
|     |        |   | USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB                            |    |     |                     |
| L17 | 0      | 115 and @ad<"20000717"  | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:30 |
| L18 | 2325   | 113 and I7  | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:32 |
| L19 | 123    | 16 AND ( (H04W24/00 OR H04W88/06 OR H04W16/14 OR H04W28/10 OR H04W88/04 OR H04W4/18 OR H04W12/00 OR H04W12/08 OR H04W12/12 OR H04W28/0236 OR H04W28/048 OR H04W72/1215 OR H04W88/085 OR H04W4/00 OR H04W4/02 OR H04W76/02 OR H04W84/12 OR H04W88/02 OR H04W84/18 OR H04W16/26 OR H04W16/32 OR H04W24/10 OR H04W76/025 OR H04W84/14 OR H04W88/14 OR H04W28/06 OR H04W28/24 OR H04W28/0231 OR H04W28/0252 OR H04W72/085 OR H04W72/1242 OR H04W80/00 OR H04W40/06 OR H04W40/08 OR H04W72/04 OR H04W72/0453 OR H04W74/00 OR H04W76/023 OR H04W84/04 OR H04W88/16 OR H04W92/02 OR H04W12/06 OR H04W24/06 OR H04W24/08 OR H04W4/021 OR H04W4/023 OR H04W4/025 OR H04W4/027 OR H04W4/12 OR H04W4/14 OR H04W4/185 OR H04W4/206 OR H04W4/24 OR H04W4/26 OR H04W52/0219 OR H04W52/0222 OR H04W52/0264 OR H04W52/028 OR H04W64/006 OR H04W72/0413 OR H04W72/082 OR H04W76/043 OR H04W80/04 OR H04W8/22 OR H04W12/04 OR H04W12/10 OR H04W24/02 OR H04W28/0263 OR H04W28/0268 OR H04W28/18 OR H04W36/06 OR H04W36/14 OR H04W40/00 OR H04W4/06 OR H04W52/02 OR H04W52/0209 OR H04W68/00 OR H04W72/0406 OR H04W72/042 OR H04W72/1278 OR H04W76/022 OR H04W76/06 OR H04W84/005 OR H04W88/08 OR H04W88/10 OR H04W8/005 OR H04W8/26 OR H04W92/20 OR H04B7/15542 OR H04B1/719 OR H04B1/28 OR H04B1/40 OR H04B1/006 OR H04B1/10 OR H04B1/1638 OR H04B1/406 OR H04B1/109 OR H04B1/18 OR H04B1/525 OR H04B1/581 OR H04B2001/0491 OR H04B1/005 OR H04B1/38 OR H04B1/52 OR H04B7/15521 OR H04B7/15557).CPC. ) | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:46 |
| L21 | 1      | (first same (interface or port) same (transmission or transmit or send\$3) same ((Internet adj3 Protocol) or IP) same (((wireless or mobile\$1) near3 (terminal\$1 or unit\$1 or device\$1 or station\$1)) or smart\$1phone\$1 or PDA or (hand\$1held adj2 (unit\$1 or device\$1)) or UE) same multiplex\$4 same server).clm.   | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:52 |
| L23 | 107464 | 370/315,316,327,328,329,334,338-341,344,351-354,356,389,392,400-402,465,473.ccls.   | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:57 |
| L24 | 26741  | 455/101,132,272,562.1;375/130,140,144,147,148,316,346,347.ccls.   | US-<br>PGPUB;<br>USPAT;   | OR | OFF | 2015/03/09<br>12:58 |

EAST Search History


|     |        |             |   |    |     |                     |
|-----|--------|-------------|---|----|-----|---------------------|
|     |        |             | USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB                            |    |     |                     |
| L25 | 132489 | I23 or I24  | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:58 |
| L26 | 631    | I25 and I18 | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:58 |
| L27 | 46     | I25 and I16 | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2015/03/09<br>12:58 |

EAST Search History (Interference)

| Ref # | Hits | Search Query  | DBs                             | Default Operator | Plurals | Time Stamp          |
|-------|------|---|---------------------------------|------------------|---------|---------------------|
| L22   | 1    | (first same (interface or port) same (transmission or tranmsit or send\$3) same ((Internet adj3 Protocol) or IP) same (((wireless or mobile\$1) near3 (terminal\$1 or unit\$1 or device\$1 or station\$1)) or smart\$1phone\$1 or PDA or (hand\$1held adj2 (unit\$1 or device\$1)) or UE) same multiplex\$4 same server).clm. | US-<br>PGPUB;<br>USPAT;<br>UPAD | OR               | OFF     | 2015/03/09<br>12:53 |

3/ 9/ 2015 1:07:57 PM


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| <b>Issue Classification</b><br> | <b>Application/Control No.</b><br>14480584 | <b>Applicant(s)/Patent Under Reexamination</b><br>RAO ET AL. |
|  | <b>Examiner</b><br>PHIRIN SAM              | <b>Art Unit</b><br>2476                                      |

| CPC    |    |  |    |      |            |
|--------|----|--|----|------|------------|
| Symbol |    |  |    | Type | Version    |
| H04W   | 80 |  | 04 | F    | 2013-01-01 |
| H04W   | 88 |  | 06 | I    | 2013-01-01 |
| H04W   | 84 |  | 12 | A    | 2013-01-01 |
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| CPC Combination Sets |      |     |         |         |
|----------------------|------|-----|---------|---------|
| Symbol               | Type | Set | Ranking | Version |
|                      |      |     |         |         |
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|  |            |                              |                   |
|--|------------|------------------------------|-------------------|
| NONE   |            | <b>Total Claims Allowed:</b> |                   |
| (Assistant Examiner)                           | (Date)     | 30                           |                   |
| /PHIRIN SAM/<br>Primary Examiner.Art Unit 2476 | 03/09/2015 | O.G. Print Claim(s)          | O.G. Print Figure |
| (Primary Examiner)                             | (Date)     | 1                            | 5A                |

|  |  |  |
|--|--|--|
| <b>Issue Classification</b><br> | <b>Application/Control No.</b><br>14480584 | <b>Applicant(s)/Patent Under Reexamination</b><br>RAO ET AL. |
|  | <b>Examiner</b><br>PHIRIN SAM              | <b>Art Unit</b><br>2476                                      |

| US ORIGINAL CLASSIFICATION |                                   |          |  |  | INTERNATIONAL CLASSIFICATION |   |   |   |                     |             |  |  |  |  |  |  |  |  |  |
|----------------------------|-----------------------------------|----------|--|--|------------------------------|---|---|---|---------------------|-------------|--|--|--|--|--|--|--|--|--|
| CLASS                      |                                   | SUBCLASS |  |  | CLAIMED                      |   |   |   |                     | NON-CLAIMED |  |  |  |  |  |  |  |  |  |
| 370                        |                                   | 338      |  |  | H                            | 0 | 4 | W | 4 / 00 (2009.01.01) |             |  |  |  |  |  |  |  |  |  |
| <b>CROSS REFERENCE(S)</b>  |                                   |          |  |  |                              |   |   |   |                     |             |  |  |  |  |  |  |  |  |  |
| CLASS                      | SUBCLASS (ONE SUBCLASS PER BLOCK) |          |  |  |                              |   |   |   |                     |             |  |  |  |  |  |  |  |  |  |
| 370                        | 352                               |          |  |  |                              |   |   |   |                     |             |  |  |  |  |  |  |  |  |  |
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|   |            |                              |                   |
|---|------------|------------------------------|-------------------|
| NONE  |            | <b>Total Claims Allowed:</b> |                   |
| (Assistant Examiner)                            | (Date)     | 30                           |                   |
| /PHIRIN SAM/<br>Primary Examiner. Art Unit 2476 | 03/09/2015 | O.G. Print Claim(s)          | O.G. Print Figure |
| (Primary Examiner)                              | (Date)     | 1                            | 5A                |



|  |  |  |
|--|--|--|
| <b>Issue Classification</b><br> | <b>Application/Control No.</b><br>14480584 | <b>Applicant(s)/Patent Under Reexamination</b><br>RAO ET AL. |
|  | <b>Examiner</b><br>PHIRIN SAM              | <b>Art Unit</b><br>2476                                      |

| <input checked="" type="checkbox"/> <b>Claims renumbered in the same order as presented by applicant</b> <input type="checkbox"/> <b>CPA</b> <input checked="" type="checkbox"/> <b>T.D.</b> <input type="checkbox"/> <b>R.1.47</b> |          |       |          |       |          |       |          |       |          |       |          |       |          |       |          |
|---|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|-------|----------|
| Final   | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original |
|   | 1        |       | 17       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 2        |       | 18       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 3        |       | 19       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 4        |       | 20       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 5        |       | 21       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 6        |       | 22       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 7        |       | 23       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 8        |       | 24       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 9        |       | 25       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 10       |       | 26       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 11       |       | 27       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 12       |       | 28       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 13       |       | 29       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 14       |       | 30       |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 15       |       |          |       |          |       |          |       |          |       |          |       |          |       |          |
|   | 16       |       |          |       |          |       |          |       |          |       |          |       |          |       |          |

|   |            |                              |                   |
|---|------------|------------------------------|-------------------|
| NONE  |            | <b>Total Claims Allowed:</b> |                   |
|   |            | 30                           |                   |
| (Assistant Examiner)                            | (Date)     |                              |                   |
| /PHIRIN SAM/<br>Primary Examiner. Art Unit 2476 | 03/09/2015 | O.G. Print Claim(s)          | O.G. Print Figure |
| (Primary Examiner)                              | (Date)     | 1                            | 5A                |

|  |  |   |
|--|--|---|
| <b>Doc Code: DIST.E.FILE</b><br><b>Document Description: Electronic Terminal Disclaimer - Filed</b>  |  | PTO/SB/26<br>U.S. Patent and Trademark Office<br>Department of Commerce |
| Electronic Petition Request  | <b>TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT</b> |   |
| Application Number   | 14480584   |   |
| Filing Date  | 08-Sep-2014  |   |
| First Named Inventor   | Raman Rao  |   |
| Attorney Docket Number   | HMTRM1   |   |
| Title of Invention   | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION           |   |
| <input checked="" type="checkbox"/> Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action<br><br><input checked="" type="checkbox"/> This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.   |  |   |
| Owner  | Percent Interest   |   |
| IP Holdings, Inc.  | 100%   |   |
| <p>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)</p> <p>8842653</p> <p>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.</p> <p>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:</p> <ul style="list-style-type: none"> <li>- expires for failure to pay a maintenance fee;</li> <li>- is held unenforceable;</li> <li>- is found invalid by a court of competent jurisdiction;</li> <li>- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;</li> <li>- has all claims canceled by a reexamination certificate;</li> <li>- is reissued; or</li> <li>- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.</li> </ul> <p><input checked="" type="radio"/> Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.</p> |  |   |

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 32622
- 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 | /Michael K. O'Neill/ |
| Name      | Michael K. O'Neill   |

\*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

|  |  |                 |               |                             |
|--|--|-----------------|---------------|-----------------------------|
| <b>Application Number:</b>                         | 14480584   |                 |               |                             |
| <b>Filing Date:</b>                                | 08-Sep-2014  |                 |               |                             |
| <b>Title of Invention:</b>                         | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |                 |               |                             |
| <b>First Named Inventor/Applicant Name:</b>        | Raman K. Rao   |                 |               |                             |
| <b>Filer:</b>                                      | Michael K. O'Neill   |                 |               |                             |
| <b>Attorney Docket Number:</b>                     | HMTRM1   |                 |               |                             |
| Filed as Small Entity                              |  |                 |               |                             |
| <b>Filing Fees for Utility under 35 USC 111(a)</b> |  |                 |               |                             |
| <b>Description</b>                                 | <b>Fee Code</b>  | <b>Quantity</b> | <b>Amount</b> | <b>Sub-Total in USD(\$)</b> |
| <b>Basic Filing:</b>                               |  |                 |               |                             |
| Statutory or Terminal Disclaimer                   | 1814   | 1               | 160           | 160                         |
| <b>Pages:</b>                                      |  |                 |               |                             |
| <b>Claims:</b>                                     |  |                 |               |                             |
| <b>Miscellaneous-Filing:</b>                       |  |                 |               |                             |
| <b>Petition:</b>                                   |  |                 |               |                             |
| <b>Patent-Appeals-and-Interference:</b>            |  |                 |               |                             |
| <b>Post-Allowance-and-Post-Issuance:</b>           |  |                 |               |                             |

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

Doc Code: DISQ.E.FILE

Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 14480584

Filing Date: 08-Sep-2014

Applicant/Patent under Reexamination: Rao et al.

Electronic Terminal Disclaimer filed on February 4, 2015

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

|   |  |
|---|--|
| <b>EFS ID:</b>                              | 21404701   |
| <b>Application Number:</b>                  | 14480584   |
| <b>International Application Number:</b>    |  |
| <b>Confirmation Number:</b>                 | 5617   |
| <b>Title of Invention:</b>                  | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |
| <b>First Named Inventor/Applicant Name:</b> | Raman K. Rao   |
| <b>Customer Number:</b>                     | 5514   |
| <b>Filer:</b>                               | Michael K. O'Neill   |
| <b>Filer Authorized By:</b>                 |  |
| <b>Attorney Docket Number:</b>              | HMTRM1   |
| <b>Receipt Date:</b>                        | 04-FEB-2015  |
| <b>Filing Date:</b>                         | 08-SEP-2014  |
| <b>Time Stamp:</b>                          | 21:42:18   |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)  |

### Payment information:

|  |                     |
|--|---------------------|
| Submitted with Payment                   | yes                 |
| Payment Type                             | Credit Card         |
| Payment was successfully received in RAM | \$160               |
| RAM confirmation Number                  | 29197               |
| Deposit Account                          | 503939              |
| Authorized User                          | O'NEILL, MICHAEL K. |

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

- Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)
- Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

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**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 | 33615<br>0223558955466ba07c06cdf9e7755bff84b01bb | no               | 2                |

**Warnings:**

**Information:**

|   |                      |              |  |    |   |
|---|----------------------|--------------|--|----|---|
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 30186<br>85a8f1a550555c62779c951ec5d42bdd42813b9 | no | 2 |
|---|----------------------|--------------|--|----|---|

**Warnings:**

**Information:**

|                                     |       |
|-------------------------------------|-------|
| <b>Total Files Size (in bytes):</b> | 63801 |
|-------------------------------------|-------|

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.

**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**

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.



04245.000900.1

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

|                                   |   |                        |
|-----------------------------------|---|------------------------|
| In re Application No.: 14/480,584 | ) |                        |
|                                   | : | Examiner: Phirin Sam   |
| First Named Inventor:             | ) |                        |
|                                   | : | Group Art Unit: 2476   |
| RAMAN K. RAO, ET AL.              | ) |                        |
|                                   | : | Confirmation No.: 5617 |
| Filed: September 8, 2014          | ) |                        |
|                                   | : |                        |
| For: WIRELESS AND CELLULAR VOICE  | ) |                        |
| AND DATA TRANSMISSION WITH        | : |                        |
| MULTIPLE PATHS OF                 | ) |                        |
| COMMUNICATION (As Currently       | : |                        |
| Amended)                          | ) | February 4, 2015       |

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

AMENDMENT

Commissioner:

In response to the Office Action dated November 5, 2014, please amend the above-identified application, as follows:

CERTIFICATE OF EFS-WEB TRANSMISSION  
I hereby certify that this correspondence is being filed electronically by  
EFS-Web transmission to the United States Patent Office on  
February 4, 2015  
\_\_\_\_\_  
(Date of Deposit)

Michael K. O'Neill, Reg. No. 32,622  
\_\_\_\_\_  
(Name of Attorney for Applicants)

|  |  |
|--|--|
| _____<br>/Michael K. O'Neill/<br>Signature | _____<br>February 4, 2015<br>Date of Signature |
|--|--|

IN THE TITLE:

Please replace the title as shown below:

-- ~~WIRELESS DEVICES WITH TRANSMISSION CONTROL AND  
MULTIPLE PATHS OF COMMUNICATON~~ --

-- WIRELESS AND CELLULAR VOICE AND DATA TRANSMISSION  
WITH MULTIPLE PATHS OF COMMUNICATION --

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) An Internet-enabled mobile communication device comprising:

a memory;

at least two or more antennas;

at least one or more processors; and

a plurality of wireless transmit and receive ~~components~~ units including a first wireless transmit and receive ~~component~~ unit and a second wireless transmit and receive ~~component~~ unit, wherein each wireless transmit receive ~~component~~ unit is configured to communicate using one or more protocols;

wherein the device is configured for multi-band wireless communication;

wherein the device is enabled for communication using Internet Protocol (IP);

wherein the device is enabled for wireless communication on a wireless local area network;

wherein the first wireless transmit and receive ~~component~~ unit is configured to communicate using a plurality of antennas; and

wherein a ~~transmission~~ first interface for transmission is created and wherein said ~~transmission~~ first interface for transmission uses a plurality of IP-enabled interfaces for Internet Protocol communication on the mobile device which utilize the plurality of wireless transmit and receive ~~components~~ units on the mobile device to enable

a single interface comprised of multiplexed signals from the plurality of wireless transmit and receive ~~components~~ units; and

and wherein data transferred by the plurality of transmit and receive ~~components~~ units is improved by the simultaneous use of multiple communication network paths including at least one connection to a networked server; and wherein at least one communication path is used for wireless signals representing voice data and at least one communication path is used for wireless signals representing non-voice data.

2. (Previously Presented) The device of Claim 1, wherein a single transmission connection is further comprised of at least two or more wireless transmit and receive connections simultaneously transmitting and receiving using the plurality of antennas, and wherein the processor multiplexes the receiving signals into the single transmission connection.

3. (Previously Presented) The device of Claim 1, wherein a single transmission connection is further comprised of at least two or more wireless transmit and receive connections sequentially transmitting and receiving using the plurality of antennas, and wherein the processor multiplexes the receiving signals into the single transmission connection.

4. (Previously Presented) The device of Claim 1, wherein the device is configured to communicate with at least one server, wherein the rate at which data is

transferred between the device and the server is improved by parallel paths and wherein data transmitted and received is multiplexed at each end.

5. (Previously Presented) The device of Claim 2 wherein the mobile device transmits and receives multiple IP data packets and uses protocols including ethernet protocol, USB protocol, internet protocol, transmission control protocol, wifi, VPN, transport layer communication protocols, or application interfaces.

6. (Currently Amended) The device of Claim 1, wherein the first wireless transmit and receive ~~component~~ unit is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive ~~component~~ unit is configured to communicate with the same or different remote system using a second network path and wherein the processor on the mobile device is configured to combine the data paths into a single transmission interface to one or more applications on the mobile device.

7. (Previously Presented) The device of Claim 6, wherein the device is comprised of a cellular telephone.

8. (Previously Presented) The device of Claim 7, wherein the device is configured to use a Virtual Private Network (VPN).

9. (Previously Presented) The device of Claim 8, wherein the use of two or more wireless transmit and receive units create connections to a plurality of remote systems simultaneously and transmit and receive data in a parallel path to increase the rate at which data is transferred.

10. (Currently Amended) The device of Claim 9, wherein multiple wireless transmit and receive ~~components~~ units are presented to the application as a single connection interface such that the multiple transmission interfaces are virtualized into a single transmission interface.

11. (Previously Presented) The device of Claim 1, wherein an application executed by the processor on the mobile device is configured to use a single transport connect interface comprised of two or more wireless connections.

12. (Currently Amended) The device of Claim 1, further in communication with a network box, which is configured with a plurality of antennas and a wireless transmit and receive ~~component~~ unit, wherein the network switch box wireless transmit and receive ~~component~~ unit is configured to communicate a signal stream using the network switch box plurality of antennas simultaneously.

13. (Previously Presented) The device of Claim 1, further comprising of a processor for voice communication and a second processor for data communication.

14. (Currently Amended) An Internet-enabled mobile communication device comprising:

- a memory;
- a display;
- at least two or more antennas;
- at least one or more processors; and
- a plurality of wireless transmit and receive ~~components~~ units including a first wireless transmit and receive ~~component~~ unit and a second wireless transmit and receive ~~component~~ unit, wherein each wireless transmit receive ~~component~~ unit is configured to communicate using one or more protocols;

wherein the device is enabled for communication using Internet Protocol (IP);

wherein the device is enabled for wireless communication on a wireless local area network;

wherein the first wireless transmit and receive ~~component~~ unit is enabled to communicate using one or more antennas simultaneously; and

wherein the mobile device maintains multiple IP addresses, wherein the first wireless ~~component~~ unit is accessible on a first IP address and the second wireless transmit and receive ~~component~~ unit is accessible on a second IP address and wherein the mobile device operates using a plurality of ports;

and wherein data transferred by the plurality of transmit and receive ~~components~~ units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server;

and wherein the device is enabled for communication of wireless signals representing voice data and for communication of wireless signals representing non-voice data data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server.

15. (Previously Presented) The device of Claim 14, further in communication with a server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server such that the communication rate between the server and device is increased.

16. (Currently Amended) The device of Claim 14, wherein the device is configured for multiplexing between a plurality of protocols including transmission control, CDMA, TDMA, internet protocol (IP) and/or combinations thereof.

17. (Currently Amended) A ~~mobile~~ portable wireless communication device, comprising:

- a memory;
- at least two or more antennas;
- at least one or more processors; and



a plurality of wireless transmit and receive unit including a first wireless transmit and receive unit and a second wireless transmit and receive unit, wherein each wireless transmit receive unit is configured to communicate using one or more protocols;

wherein the device is configured for multi-band wireless communication;

wherein the device is enabled for communication using Internet Protocol (IP);

wherein the device is enabled for wireless communication on a local area network;

wherein the first wireless transmit and receive unit is configured to communicate using a plurality of antennas; and

wherein the first wireless transmit and receive ~~component~~ unit is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive ~~component~~ unit is configured to communicate with the same or a different remote system using a second network path and wherein the processor on the ~~mobile~~ device is configured to combine the data paths into a single transmission interface to one or more applications on the ~~mobile~~ device;

and wherein data transferred by the plurality of transmit and receive ~~components~~ units is improved by the simultaneous use of multiple network paths including at least one connection to a networked server;

and wherein at least one of the different networks comprises a voice network and wherein at least one of the different networks comprises an Internet protocol data network.

18. (Currently Amended) The communication device of Claim 17, wherein each of the plurality of communication paths employs a different network including at least one wireless network.

19. (Currently Amended) The communication device of Claim 18, wherein ~~at least one of the different networks comprises a voice network and wherein at least one of~~ the device is enabled for audio or video communication on a different networks comprises an Internet protocol data network.

20. (Currently Amended) The communication device of Claim ~~[[17]]~~ 19, wherein each of the plurality of communication paths employs a different communication protocol and wherein each of the plurality of communication paths involves wireless signals transmitted at a different frequency.

21. (Currently Amended) The communication device of Claim ~~[[17]]~~ 20, wherein one of the plurality of communication paths is used for wireless signals representing voice data, and another of the plurality of communication paths is used for wireless signals representing non-voice data.

22. (Previously Presented) The communication device of Claim 17, wherein the one or more communication modules comprises a plurality of communication modules, each of the plurality of communication modules being configured for communication via a different communication path and wherein the one or more

communication modules comprises a plurality of communication modules each comprising a separate antenna.

23. (Currently Amended) The communication device of Claim ~~[[17]]~~ 22, wherein the one or more processors are programmed to differentiate between wireless signals received via one of the plurality of communication paths and another of the plurality of communication paths.

24. (Previously Presented) The communication device of Claim 23, wherein one or more processors are programmed to process data represented by wireless signals received via the one communication path separately from data represented by wireless signals received via the other communication path.

25. (Previously Presented) The communication device of Claim 24, wherein the one or more processors comprise a plurality of processors, a first processor of the plurality of processors being programmed to process data represented by wireless signals received via the one communication path, and a second processor of the plurality of processors being programmed to process data represented by wireless signals received via the other communication path.

26. (Previously Presented) The communication device of Claim 17, wherein the one or more processors are programmed to process voice data represented by wireless signals received via one of the plurality of communication paths, and to process

non-voice data represented by wireless signals received via another of the plurality of communication paths.

27. (Currently Amended) An IP-enabled communication device comprising:

a memory;

one or more processors;

a plurality of wireless communication ~~components~~ units, wherein the device supports a plurality of transmit and receive frequencies and a plurality of wireless protocols;

wherein a first wireless communication ~~component~~ unit is coupled to a first set of antennas configured to transmit and receive on a first network and wherein a second wireless communication ~~component~~ unit is coupled to a second set of antennas and configured to transmit and receive on a second network;

wherein the at least one wireless communication ~~component~~ unit is configured for radio frequency communication;

wherein the first wireless communication ~~component~~ unit is configured to operate at a lower frequency than the second wireless communication ~~component~~ unit such that the first and second wireless communication ~~components~~ units operate as complementary systems and reduce interference with each other; and

wherein the device is configured for voice and/or data connectivity and Internet connectivity; and

wherein the first wireless transmit and receive unit operates on the first network path to a remote server and the second wireless transmit and receive unit communicates to the remote server on the second network path in response to a change in the signal strength and/or connectivity of the first wireless communication unit or second wireless communication unit; and wherein video or audio can be accessed simultaneously with performance optimized for each through dedicated or multiplexed paths.

28. (Previously Presented) The device of Claim 27, further in communication with the remote server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server.

29. (Previously Presented) The device of Claim 27, further in communication with the remote server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server.

30. (Previously Presented) The device of Claim 29, wherein the IP enabled communication device is a mobile device, and wherein the mobile device is configured as a server and wherein the mobile device is configured to transmit and receive a signal stream with a second mobile device.

### REMARKS

This application has been carefully reviewed in light of the Office Action dated November 5, 2014. Claims 1 to 30 are in the application, of which Claims 1, 14, 17 and 27 are independent. Reconsideration and further examination are respectfully requested.

Claims 1 to 30 were rejected for alleged obviousness-type double patenting over issued Claims 1 to 30 of parent U.S. Patent No. 8,842,653 (hereinafter “the ‘653 parent patent”). The rejection is respectfully traversed, since it is believed that the pending claims, including amendments made herein, differ non-obviously from issued Claims 1 to 30 of the ‘653 parent patent. Nevertheless, in the interest of advancing prosecution, a Terminal Disclaimer is filed herewith, relative to the ‘653 parent patent.

The Terminal Disclaimer is being filed electronically, via the eTerminal Disclaimer program, together with the statutory fee of \$160.00 (small entity) required by 37 C.F.R. § 1.20(d).

Submission of this Terminal Disclaimer is not necessarily a concession of the correctness of any obviousness-type double patenting concerns. See MPEP § 804.02 and *Quad Environmental Technologies Corp. v. Union Sanitary District*, 946 F.2d 1870, 20 USPQ2d 1392 (Fed. Cir. 1991).

In addition, Claims 1 and 14 were provisionally rejected for alleged obviousness-type double patenting over Claims 1 and 6 of copending Application No. 14/493,343 (hereinafter “the ‘343 application”). In an Amendment dated November 20, 2014, in the ‘343 application, Claims 1 and 6 were cancelled. Accordingly, it is believed

that the obviousness-type double patenting rejection over Claims 1 and 6 of the '343 application is mooted.

No other matters being raised, it is believed the entire application is fully in condition for allowance, and such action is courteously solicited.

Any fees due in connection with this paper are being charged concurrently to a credit card, and no additional fees are believed due. However, should it be determined that processing of this paper requires additional fees under 37 C.F.R. 1.16 or 1.17, the Director is hereby authorized to charge such fees to Deposit Account 06-1205.

Applicants' undersigned attorney may be reached in our Costa Mesa, California office by telephone at (714) 540-8700. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

/Michael K. O'Neill/  
Michael K. O'Neill  
Attorney for Applicants  
Registration No. 32,622

FITZPATRICK, CELLA, HARPER & SCINTO  
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04245.000900.1

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

|                                   |   |                        |
|-----------------------------------|---|------------------------|
| In re Application No.: 14/480,584 | ) |                        |
|                                   | : | Examiner: Phirin Sam   |
| First Named Inventor:             | ) |                        |
|                                   | : | Group Art Unit: 2476   |
| RAMAN K. RAO, ET AL.              | ) |                        |
|                                   | : | Confirmation No.: 5617 |
| Filed: September 8, 2014          | ) |                        |
|                                   | : |                        |
| For: WIRELESS AND CELLULAR VOICE  | ) |                        |
| AND DATA TRANSMISSION WITH        | : |                        |
| MULTIPLE PATHS OF                 | ) |                        |
| COMMUNICATION (As Amended)        | : |                        |
|                                   | ) | February 4, 2015       |

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

INFORMATION DISCLOSURE STATEMENT

Commissioner:

Pursuant to 37 C.F.R. § 1.56, Applicants respectfully direct the Examiner's attention to the documents listed below and on the attached Form PTO-1449. Copies of non-U.S. patent documents are enclosed.

U.S. Patent 4,654,867  
U.S. Patent 4,675,653

CERTIFICATE OF EFS-WEB TRANSMISSION  
I hereby certify that this correspondence is being filed electronically by  
EFS-Web transmission to the United States Patent Office on  
February 4, 2015  
\_\_\_\_\_  
(Date of Deposit)

\_\_\_\_\_  
Michael K. O'Neill, Reg. No. 32,622  
(Name of Attorney for Applicant)

|  |  |
|--|--|
| _____<br>/Michael K. O'Neill/<br>Signature | _____<br>February 4, 2015<br>Date of Signature |
|--|--|



U.S. Patent 5,025,486  
U.S. Patent 5,121,391  
U.S. Patent 5,195,130  
U.S. Patent 5,379,341  
U.S. Patent 5,410,738  
U.S. Patent 5,457,714  
U.S. Patent 5,465,401  
U.S. Patent 5,507,035  
U.S. Patent 5,513,242  
U.S. Patent 5,517,553  
U.S. Patent 5,533,029  
U.S. Patent 5,539,391  
U.S. Patent 5,546,429  
U.S. Patent 5,555,258  
U.S. Patent 5,559,794  
U.S. Patent 5,565,929  
U.S. Patent 5,566,205  
U.S. Patent 5,577,118  
U.S. Patent 5,598,407  
U.S. Patent 5,610,617  
U.S. Patent 5,633,742  
U.S. Patent 5,691,974  
U.S. Patent 5,745,884  
U.S. Patent 5,816,918  
U.S. Patent 5,828,658  
U.S. Patent 6,058,422  
U.S. Patent 6,072,994  
U.S. Patent 6,108,314  
U.S. Patent 6,167,099  
U.S. Patent 6,169,789  
U.S. Patent 6,246,688  
U.S. Patent 6,377,570  
U.S. Patent 6,405,049  
U.S. Patent 6,456,610  
U.S. Patent 6,466,558  
U.S. Patent 6,519,478  
U.S. Patent 6,549,534  
U.S. Patent 6,570,871  
U.S. Patent 6,600,734  
U.S. Patent 6,640,086  
U.S. Patent 6,895,253  
U.S. Patent 7,027,773  
U.S. Patent 7,039,370  
U.S. Patent 7,099,695  
U.S. Patent 7,277,679  
U.S. Patent 7,286,502  
U.S. Patent 7,643,848  
U.S. Patent 7,848,300

U.S. Patent Application Publication No. 2002/0126745  
U.S. Patent Application Publication No.2006/0023666  
U.S. Patent Application Publication No. 2010/0260063  
U.S. Patent Application Publication No. 2011/0038637

D374,675

U.S. Application No. 10/940,428  
U.S. Application No. 12/912,607  
U.S. Application No. 13/589,188  
U.S. Application No. 13/621,292  
U.S. Application No. 13/621,294  
U.S. Application No. 14/139,817  
U.S. Application No. 14/480,584  
U.S. Application No. 14/273,323  
U.S. Application No. 14/472,772

U.S. Patent Application Publication No. 2002/0084889  
U.S. Patent Application Publication No. 2001/0006517

U.S. Patent 6,865,169  
U.S. Patent 6,542,736  
U.S. Patent 5,802,469  
U.S. Patent 5,889,816  
U.S. Patent 5,636,211  
U.S. Patent 5,909,183  
U.S. Patent 6,128,489  
U.S. Patent 6,067,290  
U.S. Patent 5,960,039

This application has received an Office Action on the merits but has not yet received either a final action or a notice of allowance. Accordingly, this Information Disclosure Statement is filed under 37 C.F.R. § 1.97(c) and is accompanied by the \$90.00 fee specified at 37 C.F.R. § 1.17(p). Consideration of the art cited herein is accordingly deemed proper, and such action is respectfully requested.

The Examiner is requested to make an independent determination of the relevance and materiality of the cited documents to the claims herein, and to indicate that these documents have been considered by initialing the attached Form PTO-1449.

Applicants' undersigned attorney may be reached in our Costa Mesa, CA office by telephone at (714) 540-8700. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

/Michael K. O'Neill/  
Michael K. O'Neill  
Attorney for Applicants  
Registration No. 32,622

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New York, New York 10104-3800  
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| FORM PTO 1449 (modified)   |                    | ATTY DOCKET NO.<br><b>04245.000900.1</b>  |                    | APPLICATION NO.<br><b>14/480,584</b>    |                               |
|--|--------------------|---|--------------------|---|-------------------------------|
| U.S. DEPARTMENT OF COMMERCE<br>PATENT AND TRADEMARK OFFICE                           |                    | APPLICANT<br><b>SANJAY K. RAO, ET AL.</b> |                    | FILING DATE<br><b>September 8, 2014</b> |                               |
| <b>LIST OF REFERENCES CITED BY APPLICANT(S)</b><br>(Use several sheets if necessary) |                    |   |                    |   |                               |
| U.S. PATENT DOCUMENTS  |                    |   |                    |   |                               |
| *EXAMINER<br>INITIAL   | DOCUMENT<br>NUMBER | DATE                                      | NAME               | CLASS                                   | FILING DATE<br>IF APPROPRIATE |
|  | 4,654,867          | 03/31/1987                                | Labeledz           |   |                               |
|  | 4,675,653          | 06/23/1987                                | Priestly           |   |                               |
|  | 5,025,486          | 06/18/1991                                | Klughart           |   |                               |
|  | 5,121,391          | 06/09/1992                                | Paneth et al.      |   |                               |
|  | 5,195,130          | 03/16/1993                                | Weiss et al.       |   |                               |
|  | 5,379,341          | 01/03/1995                                | Wan                |   |                               |
|  | 5,410,738          | 04/25/1995                                | Diepstraten et al. |   |                               |
|  | 5,457,714          | 10/10/1995                                | Engel et al.       |   |                               |
|  | 5,465,401          | 11/07/1995                                | Thompson           |   |                               |
|  | 5,507,035          | 04/09/1996                                | Bantz et al.       |   |                               |
|  | 5,513,242          | 4/30/1996                                 | Mukerjee et al.    |   |                               |
|  | 5,517,553          | 05/14/1996                                | Sato               |   |                               |
|  | 5,533,029          | 07/02/1996                                | Gardner            |   |                               |
|  | 5,539,391          | 07/23/1996                                | Yuen               |   |                               |
|  | 5,546,429          | 08/13/1996                                | Chiasson et al.    |   |                               |
|  | 5,555,258          | 09/10/1996                                | Snelling et al.    |   |                               |
|  | 5,559,794          | 09/24/1996                                | Willis et al.      |   |                               |
|  | 5,565,929          | 10/15/1996                                | Tanaka             |   |                               |
|  | 5,566,205          | 10/15/1996                                | Delfine            |   |                               |
|  | 5,577,118          | 11/19/1996                                | Sasaki et al.      |   |                               |
|  | 5,598,407          | 01/28/1997                                | Bud et al.         |   |                               |
|  | 5,610,617          | 03/11/1997                                | Gans et al.        |   |                               |
|  | 5,633,742          | 05/27/1997                                | Shipley            |   |                               |
|  | 5,691,974          | 11/25/1997                                | Zehavi et al.      |   |                               |
|  | 5,745,884          | 04/28/1998                                | Carnegie et al.    |   |                               |
|  | 5,816,918          | 10/06/1998                                | Kelly et al.       |   |                               |
|  | 5,828,658          | 10/27/1998                                | Ottersten et al.   |   |                               |
|  | 6,058,422          | 05/02/2000                                | Ayanoglu et al.    |   |                               |
|  | 6,072,994          | 06/06/2000                                | Phillips et al.    |   |                               |
|  | 6,108,314          | 08/22/2000                                | Jones et al.       |   |                               |
| EXAMINER   |                    |   | DATE CONSIDERED    |   |                               |

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

| FORM PTO 1449 (modified)   |                    | ATTY DOCKET NO.<br><b>04245.000900.1</b>  |                 | APPLICATION NO.<br><b>14/480,584</b>    |                               |
|--|--------------------|---|-----------------|---|-------------------------------|
| U.S. DEPARTMENT OF COMMERCE<br>PATENT AND TRADEMARK OFFICE                           |                    | APPLICANT<br><b>SANJAY K. RAO, ET AL.</b> |                 | FILING DATE<br><b>September 8, 2014</b> |                               |
| <b>LIST OF REFERENCES CITED BY APPLICANT(S)</b><br>(Use several sheets if necessary) |                    |   |                 |   |                               |
| U.S. PATENT DOCUMENTS  |                    |   |                 |   |                               |
| *EXAMINER<br>INITIAL   | DOCUMENT<br>NUMBER | DATE                                      | NAME            | CLASS                                   | FILING DATE<br>IF APPROPRIATE |
|  | 6,167,099          | 12/26/2000                                | Rader et al.    |   |                               |
|  | 6,169,789          | 01/02/2001                                | Rao et al.      |   |                               |
|  | 6,246,688          | 06/12/2001                                | Angwin et al.   |   |                               |
|  | 6,377,570          | 04/23/2002                                | Vaziri et al.   |   |                               |
|  | 6,405,049          | 06/11/2002                                | Herrod et al.   |   |                               |
|  | 6,456,610          | 09/24/2002                                | Briley          |   |                               |
|  | 6,466,558          | 10/15/2002                                | Ling            |   |                               |
|  | 6,519,478          | 02/11/2003                                | Scherzer et al. |   |                               |
|  | 6,549,534          | 04/15/2003                                | Shaffer et al.  |   |                               |
|  | 6,570,871          | 05/27/2003                                | Schneider       |   |                               |
|  | 6,600,734          | 07/29/2003                                | Gernert et al.  |   |                               |
|  | 6,640,086          | 10/28/2003                                | Wall            |   |                               |
|  | 6,895,253          | 05/17/2005                                | Carloni et al.  |   |                               |
|  | 7,027,773          | 04/11/2006                                | McMillin        |   |                               |
|  | 7,039,370          | 05/02/2006                                | Laroia et al.   |   |                               |
|  | 7,099,695          | 08/29/2006                                | Ngan            |   |                               |
|  | 7,277,679          | 10/02/2007                                | Barratt et al.  |   |                               |
|  | 7,286,502          | 10/23/2007                                | Rao et al.      |   |                               |
|  | 7,643,848          | 01/05/2010                                | Robinett        |   |                               |
|  | 7,848,300          | 12/07/2010                                | Rao et al.      |   |                               |
|  | 2002/0126745       | 09/12/2002                                | Prysby et al.   |   |                               |
|  | 2006/0023666       | 01/05/2006                                | Jalali et al.   |   |                               |
|  | 2010/0260063       | 10/14/2010                                | Kubler et al.   |   |                               |
|  | 2011/0038637       | 02/17/2011                                | Rao et al.      |   |                               |
|  | D374,675           | 10/15/1996                                | Sakai et al.    |   |                               |
|  | 10/940,428         | 09/13/2004                                | Rao et al.      |   |                               |
|  | 12/912,607         | 10/26/2010                                | Rao et al.      |   |                               |
| EXAMINER   |                    |   | DATE CONSIDERED |   |                               |

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



## Electronic Patent Application Fee Transmittal

|  |  |                 |               |                             |
|--|--|-----------------|---------------|-----------------------------|
| <b>Application Number:</b>                         | 14480584   |                 |               |                             |
| <b>Filing Date:</b>                                | 08-Sep-2014  |                 |               |                             |
| <b>Title of Invention:</b>                         | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |                 |               |                             |
| <b>First Named Inventor/Applicant Name:</b>        | Raman K. Rao   |                 |               |                             |
| <b>Filer:</b>                                      | Michael K. O'Neill   |                 |               |                             |
| <b>Attorney Docket Number:</b>                     | HMTRM1   |                 |               |                             |
| Filed as Small Entity                              |  |                 |               |                             |
| <b>Filing Fees for Utility under 35 USC 111(a)</b> |  |                 |               |                             |
| <b>Description</b>                                 | <b>Fee Code</b>  | <b>Quantity</b> | <b>Amount</b> | <b>Sub-Total in USD(\$)</b> |
| <b>Basic Filing:</b>                               |  |                 |               |                             |
| <b>Pages:</b>                                      |  |                 |               |                             |
| <b>Claims:</b>                                     |  |                 |               |                             |
| <b>Miscellaneous-Filing:</b>                       |  |                 |               |                             |
| <b>Petition:</b>                                   |  |                 |               |                             |
| <b>Patent-Appeals-and-Interference:</b>            |  |                 |               |                             |
| <b>Post-Allowance-and-Post-Issuance:</b>           |  |                 |               |                             |
| <b>Extension-of-Time:</b>                          |  |                 |               |                             |

| Description                             | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|---|----------|----------|--------|----------------------|
| <b>Miscellaneous:</b>                   |          |          |        |                      |
| Submission- Information Disclosure Stmt | 2806     | 1        | 90     | 90                   |
| <b>Total in USD (\$)</b>                |          |          |        | <b>90</b>            |



## Electronic Acknowledgement Receipt

|   |  |
|---|--|
| <b>EFS ID:</b>                              | 21404714   |
| <b>Application Number:</b>                  | 14480584   |
| <b>International Application Number:</b>    |  |
| <b>Confirmation Number:</b>                 | 5617   |
| <b>Title of Invention:</b>                  | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |
| <b>First Named Inventor/Applicant Name:</b> | Raman K. Rao   |
| <b>Customer Number:</b>                     | 5514   |
| <b>Filer:</b>                               | Michael K. O'Neill   |
| <b>Filer Authorized By:</b>                 |  |
| <b>Attorney Docket Number:</b>              | HMTRM1   |
| <b>Receipt Date:</b>                        | 04-FEB-2015  |
| <b>Filing Date:</b>                         | 08-SEP-2014  |
| <b>Time Stamp:</b>                          | 21:46:37   |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)  |

### Payment information:

|  |                     |
|--|---------------------|
| Submitted with Payment                   | yes                 |
| Payment Type                             | Credit Card         |
| Payment was successfully received in RAM | \$90                |
| RAM confirmation Number                  | 29215               |
| Deposit Account                          | 503939              |
| Authorized User                          | O'NEILL, MICHAEL K. |

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

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

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**File Listing:**

| Document Number | Document Description                                  | File Name                         | File Size(Bytes)/ Message Digest                  | Multi Part /.zip | Pages (if appl.) |
|-----------------|---|-----------------------------------|---|------------------|------------------|
| 1               | Amendment/Req. Reconsideration-After Non-Final Reject | 04245_000900_1_Amend_02042015.pdf | 105702<br>9ca51c7a5ec606bceb33444ace2b0ba8fc9d8fd | no               | 15               |

**Warnings:**

**Information:**

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| 2 | Information Disclosure Statement (IDS) Form (SB08) | 04245_000900_1_IDS_02042015.pdf | 164067<br>1c2de64f9343a66f70e63ecc25d46c524bc69fb | no | 7 |
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| 3 | Fee Worksheet (SB06) | fee-info.pdf | 30487<br>f37d5a7b2b277f905cba2fba40b624aa5bf0fcc | no | 2 |
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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**

**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.**

## Electronic Acknowledgement Receipt

|   |  |
|---|--|
| <b>EFS ID:</b>                              | 21404714   |
| <b>Application Number:</b>                  | 14480584   |
| <b>International Application Number:</b>    |  |
| <b>Confirmation Number:</b>                 | 5617   |
| <b>Title of Invention:</b>                  | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |
| <b>First Named Inventor/Applicant Name:</b> | Raman K. Rao   |
| <b>Customer Number:</b>                     | 5514   |
| <b>Filer:</b>                               | Michael K. O'Neill   |
| <b>Filer Authorized By:</b>                 |  |
| <b>Attorney Docket Number:</b>              | HMTRM1   |
| <b>Receipt Date:</b>                        | 04-FEB-2015  |
| <b>Filing Date:</b>                         | 08-SEP-2014  |
| <b>Time Stamp:</b>                          | 21:46:37   |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)  |

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| Submitted with Payment                   | yes                 |
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| RAM confirmation Number                  | 29215               |
| Deposit Account                          | 503939              |
| Authorized User                          | O'NEILL, MICHAEL K. |

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- Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

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**File Listing:**

| Document Number | Document Description                                  | File Name                         | File Size(Bytes)/ Message Digest                  | Multi Part /.zip | Pages (if appl.) |
|-----------------|---|-----------------------------------|---|------------------|------------------|
| 1               | Amendment/Req. Reconsideration-After Non-Final Reject | 04245_000900_1_Amend_02042015.pdf | 105702<br>9ca51c7a5ec606bceb33444ace2b0ba8fc9f8fd | no               | 15               |

**Warnings:**

**Information:**

|   |  |                                 |   |    |   |
|---|--|---------------------------------|---|----|---|
| 2 | Information Disclosure Statement (IDS) Form (SB08) | 04245_000900_1_IDS_02042015.pdf | 164067<br>1c2de64f9343a66f70e63ecc25d46c524bc69fb | no | 7 |
|---|--|---------------------------------|---|----|---|

**Warnings:**

**Information:**

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|   |                      |              |  |    |   |
|---|----------------------|--------------|--|----|---|
| 3 | Fee Worksheet (SB06) | fee-info.pdf | 30487<br>f37d5a7b2b277f905cba2fba40b624aa5bf0fcc | no | 2 |
|---|----------------------|--------------|--|----|---|

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**Information:**

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| <b>Total Files Size (in bytes):</b> | 300256 |
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**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.**

**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.**

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

|   |   |              |   |                                  |                                       |
|---|---|--------------|---|----------------------------------|---------------------------------------|
| <b>PATENT APPLICATION FEE DETERMINATION RECORD</b><br>Substitute for Form PTO-875                               |   |              | Application or Docket Number<br><b>14/480,584</b> | Filing Date<br><b>09/08/2014</b> | <input type="checkbox"/> To be Mailed |
| ENTITY: <input type="checkbox"/> LARGE <input checked="" type="checkbox"/> SMALL <input type="checkbox"/> MICRO |   |              |   |                                  |                                       |
| <b>APPLICATION AS FILED – PART I</b>  |   |              |   |                                  |                                       |
| (Column 1)  |   | (Column 2)   |   |                                  |                                       |
| FOR   | NUMBER FILED  | NUMBER EXTRA | RATE (\$)   | FEE (\$)                         |                                       |
| <input type="checkbox"/> BASIC FEE<br><small>(37 CFR 1.16(a), (b), or (c))</small>                              | N/A   | N/A          | N/A   |                                  |                                       |
| <input type="checkbox"/> SEARCH FEE<br><small>(37 CFR 1.16(k), (l), or (m))</small>                             | N/A   | N/A          | N/A   |                                  |                                       |
| <input type="checkbox"/> EXAMINATION FEE<br><small>(37 CFR 1.16(o), (p), or (q))</small>                        | N/A   | N/A          | N/A   |                                  |                                       |
| TOTAL CLAIMS<br><small>(37 CFR 1.16(i))</small>   | minus 20 =  | *            | X \$  | =                                |                                       |
| INDEPENDENT CLAIMS<br><small>(37 CFR 1.16(h))</small>   | minus 3 =   | *            | X \$  | =                                |                                       |
| <input type="checkbox"/> APPLICATION SIZE FEE<br><small>(37 CFR 1.16(s))</small>                                | 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). |              |   |                                  |                                       |
| <input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT<br><small>(37 CFR 1.16(j))</small>                    |   |              |   |                                  |                                       |
| * If the difference in column 1 is less than zero, enter "0" in column 2.                                       |   |              | TOTAL   |                                  |                                       |

|   |  |                                  |       |                                    |               |           |                     |  |
|---|--|----------------------------------|-------|------------------------------------|---------------|-----------|---------------------|--|
| <b>APPLICATION AS AMENDED – PART II</b> |  |                                  |       |                                    |               |           |                     |  |
| (Column 1)                              |  | (Column 2)                       |       | (Column 3)                         |               |           |                     |  |
| AMENDMENT                               | <b>02/04/2015</b>  | CLAIMS REMAINING AFTER AMENDMENT |       | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$) | ADDITIONAL FEE (\$) |  |
|   | Total (37 CFR 1.16(i))   | * 30                             | Minus | ** 30                              | = 0           | X \$40 =  | 0                   |  |
|   | Independent (37 CFR 1.16(h))   | * 4                              | Minus | ***4                               | = 0           | X \$210 = | 0                   |  |
|   | <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))                           |                                  |       |                                    |               |           |                     |  |
|   | <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) |                                  |       |                                    |               |           |                     |  |
| TOTAL ADD'L FEE                         |  |                                  |       |                                    |               | <b>0</b>  |                     |  |

|   |  |                                  |       |                                    |               |                    |                     |  |
|---|--|----------------------------------|-------|------------------------------------|---------------|--------------------|---------------------|--|
| (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 \$               | =                   |  |
|   | <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))                           |                                  |       |                                    |               |                    |                     |  |
|   | <input type="checkbox"/> 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.   |  |                                  |       |                                    |               | LIE<br>/POLIN ANG/ |                     |  |
| ** 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.*



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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

|            |            |              |        |      |
|------------|------------|--------------|--------|------|
| 14/480,584 | 09/08/2014 | Raman K. Rao | HMTRM1 | 5617 |
|------------|------------|--------------|--------|------|

5514 7590 11/05/2014  
 FITZPATRICK CELLA HARPER & SCINTO  
 1290 Avenue of the Americas  
 NEW YORK, NY 10104-3800

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| EXAMINER |
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SAM, PHIRIN

|          |              |
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| ART UNIT | PAPER NUMBER |
|----------|--------------|

2476

|           |               |
|-----------|---------------|
| MAIL DATE | DELIVERY MODE |
|-----------|---------------|

11/05/2014

PAPER

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

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

|                              |                                      |                                   |  |
|------------------------------|--------------------------------------|-----------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>14/480,584 | <b>Applicant(s)</b><br>RAO ET AL. |  |
|                              | <b>Examiner</b><br>PHIRIN SAM        | <b>Art Unit</b><br>2476           | <b>AIA (First Inventor to File) Status</b><br>No |

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

**Period for Reply**

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

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

**Status**

- 1)  Responsive to communication(s) filed on 09/08/2014.  
 A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on \_\_\_\_\_.
- 2a)  This action is **FINAL**.                      2b)  This action is non-final.
- 3)  An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims\***

- 5)  Claim(s) 1-30 is/are pending in the application.  
5a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 6)  Claim(s) \_\_\_\_\_ is/are allowed.
- 7)  Claim(s) 1-30 is/are rejected.
- 8)  Claim(s) \_\_\_\_\_ is/are objected to.
- 9)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

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

**Application Papers**

- 10)  The specification is objected to by the Examiner.
- 11)  The drawing(s) filed on 09/08/2014 is/are: a)  accepted or b)  objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

**Priority under 35 U.S.C. § 119**

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

**Certified copies:**

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

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

**Attachment(s)**

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

### DETAILED ACTION

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

#### *Double Patenting*

2. 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>.

3. Claims 1-30 rejected on the ground of nonstatutory double patenting over claims 1-30 of U.S. Patent No. 8,842,653 since the claims, if allowed, would improperly extend the “right to exclude” already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as seen in the bold and italic in the tables below.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

**Application Claim 1:**

**U.S. Patent Claim 1:**

|   |   |
|---|---|
| An Internet-enabled mobile communication device comprising: | An Internet-enabled mobile communication device comprising:       |
| a memory;   | a memory;   |
| at least two or more antennas;                              | <b><i>display electronics;</i></b> at least two or more antennas; |

|   |   |
|---|---|
| at least one or more processors; and  | at least one or more processors; and  |
| a plurality of wireless transmit and receive components including a first wireless transmit and receive component and a second wireless transmit and receive component, wherein each wireless transmit receive component is configured to communicate using one or more protocols;  | a plurality of wireless transmit and receive components including a first wireless transmit and receive component and a second wireless transmit and receive component, wherein each wireless transmit receive component is configured to communicate using one or more protocols;  |
| wherein the device is configured for multi-band wireless communication;   | wherein the device is configured for multi-band wireless communication;   |
| wherein the device is enabled for communication using Internet Protocol (IP);   | wherein the device is enabled for communication using Internet Protocol (IP);   |
| wherein the device is enabled for wireless communication on a wireless local area network;  | wherein the device is enabled for wireless communication on a wireless local area network;  |
| wherein the first wireless transmit and receive component is configured to communicate using a plurality of antennas; and   | wherein the first wireless transmit and receive component is configured to communicate using a plurality of antennas; and   |
| wherein a transmission interface is created and wherein said transmission interface uses a plurality of IP enabled interfaces on the mobile device which utilize the plurality of wireless transmit and receive components on the mobile device to enable a single interface comprised of multiplexed signals from the plurality of wireless transmit and receive components; and | wherein a transmission interface is created and wherein said transmission interface uses a plurality of IP enabled interfaces on the mobile device which utilize the plurality of wireless transmit and receive components on the mobile device to enable a single interface comprised of multiplexed signals from the plurality of wireless transmit and receive components. |
| <i>wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server.</i>  |   |

**Application Claim 2:**

**U.S. Patent Claim 2:**

|  |  |
|--|--|
| The device of Claim 1, wherein a single transmission connection is further comprised | The device of claim 1, wherein a single transmission connection is further comprised |
|--|--|

of at least two or more wireless transmit and receive connections simultaneously transmitting and receiving using the plurality of antennas, and wherein the processor multiplexes the receiving signals into the single transmission connection.

of at least two or more wireless transmit and receive connections simultaneously transmitting and receiving using the plurality of antennas, and wherein the processor multiplexes the receiving signals into the single transmission connection.

**Application Claim 3:**

**U.S. Patent Claim 3:**

The device of Claim 1, wherein a single transmission connection is further comprised of at least two or more wireless transmit and receive connections sequentially transmitting and receiving using the plurality of antennas, and wherein the processor multiplexes the receiving signals into the single transmission connection.

The device of claim 1, wherein a single transmission connection is further comprised of at least two or more wireless transmit and receive connections sequentially transmitting and receiving using the plurality of antennas, and wherein the processor multiplexes the receiving signals into the single transmission connection.

**Application Claim 4:**

**U.S. Patent Claim 4:**

The device of Claim 1, wherein the device is configured to communicate with at least one server, wherein the rate at which data is transferred between the device and the server is improved by parallel paths and wherein data transmitted and received is multiplexed at each end.

The device of claim 1, wherein the device is configured to communicate with at least one server, wherein the rate at which data is transferred between the device and the server is improved by parallel paths and wherein data transmitted and received is multiplexed at each end.

**Application Claim 5:**

**U.S. Patent Claim 5:**

The device of Claim 2 wherein the mobile device transmits and receives multiple IP data packets and uses protocols including Ethernet protocol, USB protocol, internet protocol, transmission control protocol, *Wi-Fi*, *VPN*, transport layer communication protocols, or application interfaces.

The device of claim 2 wherein the mobile device transmits and receives multiple IP data packets and uses protocols including Ethernet protocol, USB protocol, internet protocol, transmission control protocol, transport layer communication protocols, or application interfaces.

**Application Claim 6:**

**U.S. Patent Claim 6:**

|   |   |
|---|---|
| <p>The device of Claim 1, wherein the first wireless transmit and receive component is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive component is configured to communicate with the same or different remote system using a second network path and wherein the processor on the mobile device is configured to combine the data paths into a single transmission interface to one or more applications on the mobile device.</p> | <p>The device of claim 1, wherein the first wireless transmit and receive component is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive component is configured to communicate with the same or different remote system using a second network path and wherein the processor on the mobile device is configured to combine the data paths into a single transmission interface to one or more applications on the mobile device.</p> |
|---|---|

**Application Claim 7:**

**U.S. Patent Claim 7:**

|  |  |
|--|--|
| <p>The device of Claim 6, wherein the device is comprised of a cellular telephone.</p> | <p>The device of claim 1, wherein the device is comprised of a cellular telephone.</p> |
|--|--|

**Application Claim 8:**

**U.S. Patent Claim 8:**

|  |  |
|--|--|
| <p>The device of Claim 7, wherein the device is configured to use a Virtual Private Network (VPN).</p> | <p>The device of claim 1, wherein the device is configured to use a Virtual Private Network (VPN).</p> |
|--|--|

**Application Claim 9:**

**U.S. Patent Claim 9:**

|   |   |
|---|---|
| <p>The device of Claim 8, wherein the use of two or more wireless transmit and receive units create connections to a plurality of remote systems simultaneously and transmit and receive data in a parallel path to increase the rate at which data is transferred.</p> | <p>The device of claim 1, wherein the use of two or more wireless transmit and receive units create connections to a plurality of remote systems simultaneously and transmit and receive data in a parallel path to increase the rate at which data is transferred.</p> |
|---|---|

**Application Claim 10:**

**U.S. Patent Claim 10:**

|   |   |
|---|---|
| The device of Claim 9, wherein multiple wireless transmit and receive components are presented to the application as a single connection interface such that the multiple transmission interfaces are virtualized into a single transmission interface. | The device of claim 1, wherein multiple wireless transmit and receive components are presented to the application as a single connection interface such that the multiple transmission interfaces are virtualized into a single transmission interface. |
|---|---|

**Application Claim 11:**

**U.S. Patent Claim 11:**

|   |   |
|---|---|
| The device of Claim 1, wherein an application executed by the processor on the mobile device is configured to use a single transport connect interface comprised of two or more wireless connections. | The device of claim 1, wherein an application executed by the processor on the mobile device is configured to use a single transport connect interface comprised of two or more wireless connections. |
|---|---|

**Application Claim 12:**

**U.S. Patent Claim 12:**

|  |  |
|--|--|
| The device of Claim 1, further in communication with a network box, which is configured with a plurality of antennas and a wireless transmit and receive component, wherein the network switch box wireless transmit and receive component is configured to communicate a signal stream using the network switch box plurality of antennas simultaneously. | The device of claim 1, further in communication with a network box, which is configured with a plurality of antennas and a wireless transmit and receive component, wherein the network switch box wireless transmit and receive component is configured to communicate a signal stream using the network switch box plurality of antennas simultaneously. |
|--|--|

**Application Claim 13:**

**U.S. Patent Claim 13:**

|   |   |
|---|---|
| The device of Claim 1, further comprising of a processor for voice communication and a second processor for data communication. | The device of claim 1, further comprising of a processor for voice communication and a second processor for data communication. |
|---|---|

**Application Claim 14:**

**U.S. Patent Claim 14:**

|  |  |
|--|--|
| An Internet-enabled mobile communication | An Internet-enabled mobile communication |
|--|--|

|  |  |
|--|--|
| device comprising:   | device comprising:   |
| a memory;  | a memory;  |
| a display;   | a display;   |
| at least two or more antennas;   | at least two or more antennas;   |
| at least one or more processors; and   | at least one or more processors; and   |
| a plurality of wireless transmit and receive components including a first wireless transmit and receive component and a second wireless transmit and receive component, wherein each wireless transmit receive component is configured to communicate using one or more protocols;                 | a plurality of wireless transmit and receive components including a first wireless transmit and receive component and a second wireless transmit and receive component, wherein each wireless transmit receive component is configured to communicate using one or more protocols;                 |
| wherein the device is enabled for communication using Internet Protocol (IP);  | wherein the device is enabled for communication using Internet Protocol (IP);  |
| wherein the device is enabled for wireless communication on a wireless local area network;   | wherein the device is enabled for wireless communication on a wireless local area network;   |
| wherein the first wireless transmit and receive component is enabled to communicate using one or more antennas simultaneously; and   | wherein the first wireless transmit and receive component is enabled to communicate using one or more antennas simultaneously; and   |
| wherein the mobile device maintains multiple IP addresses, wherein the first wireless component is accessible on a first IP address and the second wireless transmit and receive component is accessible on a second IP address and wherein the mobile device operates using a plurality of ports; | wherein the mobile device maintains multiple IP addresses, wherein the first wireless component is accessible on a first IP address and the second wireless transmit and receive component is accessible on a second IP address and wherein the mobile device operates using a plurality of ports. |
| <b><i>and wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server; and</i></b>  |  |
| <b><i>wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server.</i></b>  |  |

**Application Claim 15:**

**U.S. Patent Claim 15:**

|  |  |
|--|--|
| <p>The device of Claim 14, further in communication with a server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server such that the communication rate between the server and device is increased.</p> | <p>The device of claim 14, further in communication with a server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server such that the communication rate between the server and device is increased.</p> |
|--|--|

**Application Claim 16:**

**U.S. Patent Claim 16:**

|  |  |
|--|--|
| <p>The device of Claim 14, wherein the device is configured for a plurality of protocols including transmission control, CDMA, TDMA, internet protocol (IP) and/or combinations thereof.</p> | <p>The device of claim 14, wherein the device is configured for a plurality of protocols including transmission control, CDMA, TDMA, internet protocol (IP) and/or combinations thereof.</p> |
|--|--|

**Application Claim 17:**

**U.S. Patent Claim 17:**

|  |  |
|--|--|
| <p>A mobile communication device, comprising:</p>  | <p>A mobile communication device, comprising:</p>  |
| <p>a memory;</p>   | <p>a memory; a display electronics;</p>  |
| <p>at least two or more antennas;</p>  | <p>at least two or more antennas;</p>  |
| <p>at least one or more processors; and</p>  | <p>at least one or more processors; and</p>  |
| <p>a plurality of wireless transmit and receive unit including a first wireless transmit and receive unit and a second wireless transmit and receive unit, wherein each wireless transmit receive unit is configured to communicate using one or more protocols;</p> | <p>a plurality of wireless transmit and receive unit including a first wireless transmit and receive unit and a second wireless transmit and receive unit, wherein each wireless transmit receive unit is configured to communicate using one or more protocols;</p> |
| <p>wherein the device is configured for multi band wireless communication;</p>   | <p>wherein the device is configured for multi-band wireless communication;</p>   |

|   |   |
|---|---|
| wherein the device is enabled for communication using Internet Protocol (IP);   | wherein the device is enabled for communication using Internet Protocol (IP);   |
| wherein the device is enabled for wireless communication on a local area network;   | wherein the device is enabled for wireless communication on a local area network;   |
| wherein the first wireless transmit and receive component unit is configured to communicate using a plurality of antennas; and  | wherein the first wireless transmit and receive component is configured to communicate using a plurality of antennas; and   |
| wherein the first wireless transmit and receive component is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive component is configured to communicate with the same or a different remote system using a second network path and wherein the processor on the mobile device is configured to combine the data paths into a single transmission interface to one or more applications on the mobile device; and | wherein the first wireless transmit and receive component is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive component is configured to communicate with the same or a different remote system using a second network path and wherein the processor on the mobile device is configured to combine the data paths into a single transmission interface to one or more applications on the mobile device. |
| <i>wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server.</i>  |   |

**Application Claim 18:**

**U.S. Patent Claim 18:**

|   |   |
|---|---|
| The communication device of Claim 17, wherein each of the plurality of communication paths employs a different network. | The communication device of claim 17, wherein each of the plurality of communication paths employs a different network. |
|---|---|

**Application Claim 19:**

**U.S. Patent Claim 19:**

|  |  |
|--|--|
| The communication device of Claim 18, wherein at least one of the different networks | The communication device of claim 18, wherein at least one of the different networks |
|--|--|



|   |   |
|---|---|
| comprises a voice network and wherein at least one of the different networks comprises an Internet protocol data network. | comprises a voice network and wherein at least one of the different networks comprises an Internet protocol data network. |
|---|---|

**Application Claim 20:**

**U.S. Patent Claim 20:**

|  |  |
|--|--|
| The communication device of Claim 17, wherein each of the plurality of communication paths employs a different communication protocol and wherein each of the plurality of communication paths involves wireless signals transmitted at a different frequency. | The communication device of claim 17, wherein each of the plurality of communication paths employs a different communication protocol and wherein each of the plurality of communication paths involves wireless signals transmitted at a different frequency. |
|--|--|

**Application Claim 21:**

**U.S. Patent Claim 21:**

|   |   |
|---|---|
| The communication device of Claim 17, wherein one of the plurality of communication paths is used for wireless signals representing voice data, and another of the plurality of communication paths is used for wireless signals representing non-voice data. | The communication device of claim 17, wherein one of the plurality of communication paths is used for wireless signals representing voice data, and another of the plurality of communication paths is used for wireless signals representing non-voice data. |
|---|---|

**Application Claim 22:**

**U.S. Patent Claim 22:**

|   |   |
|---|---|
| The communication device of Claim 17, wherein the one or more communication modules comprises a plurality of communication modules, each of the plurality of communication modules being configured for communication via a different communication path and wherein the one or more communication modules comprises a plurality of communication modules each comprising a separate antenna. | The communication device of claim 17, wherein the one or more communication modules comprises a plurality of communication modules, each of the plurality of communication modules being configured for communication via a different communication path and wherein the one or more communication modules comprises a plurality of communication modules each comprising a separate antenna. |
|---|---|

**Application Claim 23:**

**U.S. Patent Claim 23:**

|   |   |
|---|---|
| The communication device of Claim 17, wherein the one or more processors are programmed to differentiate between wireless signals received via one of the plurality of communication paths and another of the plurality of communication paths. | The communication device of claim 17, wherein the one or more processors are programmed to differentiate between wireless signals received via one of the plurality of communication paths and another of the plurality of communication paths. |
|---|---|

**Application Claim 24:**

**U.S. Patent Claim 24:**

|   |   |
|---|---|
| The communication device of Claim 23, wherein one or more processors are programmed to process data represented by wireless signals received via the one communication path separately from data represented by wireless signals received via the other communication path. | The communication device of claim 23, wherein one or more processors are programmed to process data represented by wireless signals received via the one communication path separately from data represented by wireless signals received via the other communication path. |
|---|---|

**Application Claim 25:**

**U.S. Patent Claim 25:**

|   |   |
|---|---|
| The communication device of Claim 24, wherein the one or more processors comprise a plurality of processors, a first processor of the plurality of processors being programmed to process data represented by wireless signals received via the one communication path, and a second processor of the plurality of processors being programmed to process data represented by wireless signals received via the other communication path. | The communication device of claim 24, wherein the one or more processors comprise a plurality of processors, a first processor of the plurality of processors being programmed to process data represented by wireless signals received via the one communication path, and a second processor of the plurality of processors being programmed to process data represented by wireless signals received via the other communication path. |
|---|---|

**Application Claim 26:**

**U.S. Patent Claim 26:**

|   |   |
|---|---|
| The communication device of Claim 17, wherein the one or more processors are programmed to process voice data represented by wireless signals received via one of the | The communication device of claim 17, wherein the one or more processors are programmed to process voice data represented by wireless signals received via one of the |
|---|---|

|   |   |
|---|---|
| plurality of communication paths, and to process non-voice data represented by wireless signals received via another of the plurality of communication paths. | plurality of communication paths, and to process non-voice data represented by wireless signals received via another of the plurality of communication paths. |
|---|---|

**Application Claim 27:**

**U.S. Patent Claim 27:**

|  |   |
|--|---|
| An IP-enabled communication device comprising:   | An IP-enabled communication device comprising:  |
| a memory;  | a memory;   |
| one or more processors;  | one or more processors; display electronics;  |
| a plurality of wireless communication components, wherein the device supports a plurality of transmit and receive frequencies and a plurality of wireless protocols;   | a plurality of wireless communication units, wherein the wireless device supports a plurality of transmit and receive frequencies and a plurality of wireless protocols;  |
| wherein a first wireless communication component is coupled to a first set of antennas configured to transmit and receive on a first network and wherein a second wireless communication component is coupled to a second set of antennas and configured to transmit and receive on a second network;    | wherein a first wireless communication unit is coupled to a first set of antennas configured to transmit and receive on a first network and wherein a second wireless communication unit is coupled to a second set of antennas and configured to transmit and receive on a second network; |
| wherein the at least one wireless communication component is configured for radio frequency communication;   | wherein the at least one wireless communication unit is configured for radio frequency communication;   |
| wherein the first wireless communication component is configured to operate at a lower frequency than the second wireless communication component such that the first and second wireless communication components operate as complementary systems and <i>reduce interference with each other</i> ; and | wherein the first wireless communication unit is configured to operate at a lower frequency than the second wireless communication unit such that the first wireless communication unit and second wireless communication unit operate as complementary systems;                            |
| wherein the device is configured for voice and/or data connectivity and Internet connectivity; and   | wherein the device is capable of voice, data, and Internet connectivity; and  |
| wherein the first wireless transmit and receive  | wherein the first wireless transmit and receive   |

|   |  |
|---|--|
| <p>unit operates on the first network path to a remote server and the second wireless transmit and receive unit communicates to the remote server on the second network path in response to a change in the signal strength and/or connectivity of the first wireless communication unit or second wireless communication unit.</p> | <p>unit operates on a first network path to a remote server and the second wireless transmit and receive unit communicates to the remote server on a second network path at the same time and wherein a plurality of signal are multiplexed to increase throughput and enable simultaneous multi path communication.</p> |
|---|--|

**Application Claim 28:**

**U.S. Patent Claim 28:**

|   |   |
|---|---|
| <p>The device of Claim 27, further in communication with the remote server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server.</p> | <p>The device of claim 27, further in communication with the remote server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server.</p> |
|---|---|

**Application Claim 29:**

**U.S. Patent Claim 29:**

|   |   |
|---|---|
| <p>The device of Claim 27, further in communication with the remote server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server.</p> | <p>The device of claim 27, wherein the first wireless transmit and receive unit operates on the first network path to a remote server and the second wireless transmit and receive unit communicates to the remote server on the second network path in response to a change in the signal strength and/or connectivity of the first wireless communication unit or second wireless communication unit.</p> |
|---|---|

**Application Claim 30:**

**U.S. Patent Claim 30:**

|  |   |
|--|---|
| <p>The device of Claim 29, wherein the IP enabled communication device is a mobile device, and wherein the mobile device</p> | <p>The device of claim 29, wherein the IP enabled communication device is a mobile device, and wherein the mobile device is configured as a</p> |
|--|---|

|  |   |
|--|---|
| is configured as a server and wherein the mobile device is configured to transmit and receive a signal stream with a second mobile device. | server and wherein the mobile device is configured to transmit and receive a signal stream with a second mobile device. |
|--|---|

4. Claims 1 and 14 provisionally rejected on the ground of nonstatutory double patenting over claims 1 and 6 of copending Application No. 14/493,343. This is a provisional double patenting rejection because the patentably indistinct claims have not in fact been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows:

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

**Application Claim 1:**

**Co-pending Claim 1:**

|   |  |
|---|--|
| An Internet-enabled mobile communication device comprising: | An Internet-enabled mobile device configured for voice and data communication, said device comprising: |
| a memory;   | a memory;  |
| at least two or more antennas;                              | at least two or more antennas;   |
| at least one or more processors; and                        | at least one or more processors;   |
|   | <b><i>at least one port;</i></b>   |

|  |  |
|--|--|
| <p>a plurality of wireless transmit and receive components including a first wireless transmit and receive component and a second wireless transmit and receive component, wherein each wireless transmit receive component is configured to communicate using one or more protocols;</p>  | <p>a plurality of wireless transmit and receive components including a first wireless transmit and receive component and a second wireless transmit and receive component, wherein each wireless transmit receive component is configured to communicate using one or more protocols;</p>  |
| <p>wherein the device is configured for multi-band wireless communication;</p>   | <p>wherein the device is configured for multi-band wireless communication;</p>   |
| <p>wherein the device is enabled for communication using Internet Protocol (IP);</p>   | <p>wherein the device is enabled for communication using Internet Protocol (IP);</p>   |
| <p>wherein the device is enabled for wireless communication on a wireless local area network;</p>  | <p>wherein the device is enabled for wireless communication on a wireless local area network;</p>  |
| <p>wherein the first wireless transmit and receive component is configured to communicate using a plurality of antennas; and</p>   | <p>wherein the first wireless transmit and receive component is configured to communicate using a plurality of antennas; and</p>   |
| <p>wherein a transmission interface is created and wherein said transmission interface uses a plurality of IP enabled interfaces on the mobile device which utilize the plurality of wireless transmit and receive components on the mobile device to enable a single interface comprised of multiplexed signals from the plurality of wireless transmit and receive components; and</p> | <p>wherein a transmission interface is created and wherein said transmission interface uses a plurality of IP enabled interfaces on the mobile device which utilize the plurality of wireless transmit and receive components on the mobile device to enable a single interface comprised of multiplexed signals from the plurality of wireless transmit and receive components; and</p>   |
| <p>wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server.</p>   | <p>wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server; <b><i>and wherein the use of two or more wireless transmit and receive units create connections to a plurality of remote systems simultaneously and transmit and receive data in a parallel path to increase the rate at which data is transferred.</i></b></p> |

**Application Claim 14:**

**Co-pending Claim 6:**

|  |  |
|--|--|
| An Internet-enabled mobile communication device comprising:  | An Internet-enabled mobile communication device comprising:  |
| a memory;  | a memory;  |
| a display;   | a display;   |
| at least two or more antennas;   | at least two or more antennas;   |
| at least one or more processors; and   | at least one or more processors; and   |
| a plurality of wireless transmit and receive components including a first wireless transmit and receive component and a second wireless transmit and receive component, wherein each wireless transmit receive component is configured to communicate using one or more protocols;                 | a plurality of wireless transmit and receive components including a first wireless transmit and receive component and a second wireless transmit and receive component, wherein each wireless transmit receive component is configured to communicate using one or more protocols;                 |
| wherein the device is enabled for communication using Internet Protocol (IP);  | wherein the device is enabled for communication using Internet Protocol (IP);  |
| wherein the device is enabled for wireless communication on a wireless local area network;   | wherein the device is enabled for wireless communication on a wireless local area network;   |
| wherein the first wireless transmit and receive component is enabled to communicate using one or more antennas simultaneously; and   | wherein the first wireless transmit and receive component is enabled to communicate using one or more antennas simultaneously; and   |
| wherein the mobile device maintains multiple IP addresses, wherein the first wireless component is accessible on a first IP address and the second wireless transmit and receive component is accessible on a second IP address and wherein the mobile device operates using a plurality of ports; | wherein the mobile device maintains multiple IP addresses, wherein the first wireless component is accessible on a first IP address and the second wireless transmit and receive component is accessible on a second IP address and wherein the mobile device operates using a plurality of ports; |
| and wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server; and  | and wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server; and  |
| wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server.  | wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server.  |

*Conclusion*

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHIRIN SAM whose telephone number is (571)272-3082. The examiner can normally be reached on Flexible Work Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ayaz R. Sheikh can be reached on (571) 272-3795. 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.

Respectfully submitted,

Date: November 3, 2014

By:           /Phirin Sam/            
Primary Examiner  
Art Unit 2476



|                                   |                                       |  |             |
|-----------------------------------|---------------------------------------|--|-------------|
| <b>Notice of References Cited</b> | Application/Control No.<br>14/480,584 | Applicant(s)/Patent Under<br>Reexamination<br>RAO ET AL. |             |
|                                   | Examiner<br>PHIRIN SAM                | Art Unit<br>2476   | Page 1 of 1 |

**U.S. PATENT DOCUMENTS**

| * | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Name                | Classification |
|---|--|-----------------|---------------------|----------------|
| * | A US-8,842,653                                   | 09-2014         | Rao et al.          | 370/338        |
| * | B US-8,295,406                                   | 10-2012         | Sorrells et al.     | 375/340        |
| * | C US-6,659,947                                   | 12-2003         | Carter et al.       | 600/300        |
| * | D US-6,154,658                                   | 11-2000         | Caci, Joseph Claude | 455/466        |
|   | E US-  |                 |                     |                |
|   | F US-  |                 |                     |                |
|   | G US-  |                 |                     |                |
|   | H US-  |                 |                     |                |
|   | I US-  |                 |                     |                |
|   | J US-  |                 |                     |                |
|   | K US-  |                 |                     |                |
|   | L US-  |                 |                     |                |
|   | M US-  |                 |                     |                |

**FOREIGN PATENT DOCUMENTS**

| * | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Country | Name | Classification |
|---|--|-----------------|---------|------|----------------|
|   | N  |                 |         |      |                |
|   | O  |                 |         |      |                |
|   | P  |                 |         |      |                |
|   | Q  |                 |         |      |                |
|   | R  |                 |         |      |                |
|   | S  |                 |         |      |                |
|   | T  |                 |         |      |                |

**NON-PATENT DOCUMENTS**

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

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

## EAST Search History

## EAST Search History (Prior Art)

| Ref # | Hits   | Search Query  | DBs   | Default Operator | Plurals | Time Stamp          |
|-------|--------|---|---|------------------|---------|---------------------|
| L1    | 555887 | (IP or Internet) same (wireless or mobile)            | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2014/11/03<br>10:21 |
| L2    | 112974 | memory and antennas                                   | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2014/11/03<br>10:22 |
| L3    | 893574 | (transmitter\$1 and receiver\$1) or<br>transceiver\$1 | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2014/11/03<br>10:22 |
| L4    | 28626  | multi\$1band\$1                                       | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2014/11/03<br>10:23 |
| L5    | 595698 | LAN   | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2014/11/03<br>10:23 |
| L6    | 45430  | l1 and l2   | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR               | OFF     | 2014/11/03<br>10:24 |
| L7    | 36684  | l6 and l3   | US-<br>PGPUB;<br>USPAT;   | OR               | OFF     | 2014/11/03<br>10:24 |

|     |        |   |   |    |     |                     |
|-----|--------|---|---|----|-----|---------------------|
|     |        |   | USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB                            |    |     |                     |
| L8  | 1376   | l7 and l4   | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2014/11/03<br>10:24 |
| L9  | 505    | l8 and l5   | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2014/11/03<br>10:24 |
| L10 | 10     | l9 and @ad<"20000717"   | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2014/11/03<br>10:25 |
| L11 | 102728 | 370/315,316,327,328,329,334,338-<br>341,344,351-354,356,389,392,400-<br>402,465,473.ccls. | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2014/11/03<br>10:33 |
| L12 | 6750   | 455/101,132,272,562.1.ccls.   | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2014/11/03<br>10:33 |
| L13 | 20246  | 375/130,140,144,147,148,316,346,347.ccls.   | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2014/11/03<br>10:34 |
| L14 | 127187 | l11 or l12 or l13   | US-<br>PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2014/11/03<br>10:34 |

EAST Search History


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| L15 | 103  | I14 and I9  | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2014/11/03<br>10:34 |
| L16 | 6    | 10 AND ( (H04B7/18539 OR H04B7/18567 OR H04B7/18578 OR H04B7/18508 OR H04B7/18506 OR H04B7/1853).CPC. ) | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2014/11/03<br>10:43 |
| L17 | 6396 | H04B7/0404.cpc. or H04B7/0413.cpc.  | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2014/11/03<br>10:43 |
| L18 | 546  | I17 and I1  | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2014/11/03<br>10:43 |
| L19 | 100  | I18 and ((IP or Internet) near3 (phone\$1 or telephone\$2))   | US-PGPUB;<br>USPAT;<br>USOCR;<br>FPRS;<br>EPO;<br>JPO;<br>IBM_TDB | OR | OFF | 2014/11/03<br>10:44 |

**EAST Search History (Interference)**

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**C:\ Users\ psam\ Documents\ EAST\ Workspaces\ 13-627663.wsp**

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| <b><i>Index of Claims</i></b><br> | <b>Application/Control No.</b><br>14480584 | <b>Applicant(s)/Patent Under Reexamination</b><br>RAO ET AL. |
|  | <b>Examiner</b><br>PHIRIN SAM              | <b>Art Unit</b><br>2476                                      |

|   |                 |   |                   |   |                     |   |                 |
|---|-----------------|---|-------------------|---|---------------------|---|-----------------|
| ✓ | <b>Rejected</b> | - | <b>Cancelled</b>  | N | <b>Non-Elected</b>  | A | <b>Appeal</b>   |
| = | <b>Allowed</b>  | ÷ | <b>Restricted</b> | I | <b>Interference</b> | O | <b>Objected</b> |

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

| CLAIM |          | DATE       |  |  |  |  |  |  |  |  |  |
|-------|----------|------------|--|--|--|--|--|--|--|--|--|
| Final | Original | 11/03/2014 |  |  |  |  |  |  |  |  |  |
|       | 1        | ✓          |  |  |  |  |  |  |  |  |  |
|       | 2        | ✓          |  |  |  |  |  |  |  |  |  |
|       | 3        | ✓          |  |  |  |  |  |  |  |  |  |
|       | 4        | ✓          |  |  |  |  |  |  |  |  |  |
|       | 5        | ✓          |  |  |  |  |  |  |  |  |  |
|       | 6        | ✓          |  |  |  |  |  |  |  |  |  |
|       | 7        | ✓          |  |  |  |  |  |  |  |  |  |
|       | 8        | ✓          |  |  |  |  |  |  |  |  |  |
|       | 9        | ✓          |  |  |  |  |  |  |  |  |  |
|       | 10       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 11       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 12       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 13       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 14       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 15       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 16       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 17       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 18       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 19       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 20       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 21       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 22       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 23       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 24       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 25       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 26       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 27       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 28       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 29       | ✓          |  |  |  |  |  |  |  |  |  |
|       | 30       | ✓          |  |  |  |  |  |  |  |  |  |

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| <b>Search Notes</b><br><br> | <b>Application/Control No.</b><br><br>14480584 | <b>Applicant(s)/Patent Under Reexamination</b><br><br>RAO ET AL. |
|  | <b>Examiner</b><br><br>PHIRIN SAM              | <b>Art Unit</b><br><br>2476                                      |

| CPC- SEARCHED          |            |          |
|------------------------|------------|----------|
| Symbol                 | Date       | Examiner |
| H04B7/0404; H04B7/0413 | 11/03/2014 | PS       |

| CPC COMBINATION SETS - SEARCHED |      |          |
|---------------------------------|------|----------|
| Symbol                          | Date | Examiner |
|                                 |      |          |

| US CLASSIFICATION SEARCHED |          |      |          |
|----------------------------|----------|------|----------|
| Class                      | Subclass | Date | Examiner |
|                            |          |      |          |

| SEARCH NOTES   |            |          |
|--|------------|----------|
| Search Notes   | Date       | Examiner |
| H04B7/18539; H04b7/18567; H04B7/18578; H03D7/00; H04B7/18508   | 11/03/2014 | PS       |
| 370/315,316,327,328,329,334,338-341,344,351-354,356,389,392,400-402,465,473;455/101,132,272,562.1;375/130,140,144,147,148,316,346,347 (Text search - See search history printout). | 11/03/2014 | PS       |

| INTERFERENCE SEARCH     |                         |      |          |
|-------------------------|-------------------------|------|----------|
| US Class/<br>CPC Symbol | US Subclass / CPC Group | Date | Examiner |
|                         |                         |      |          |

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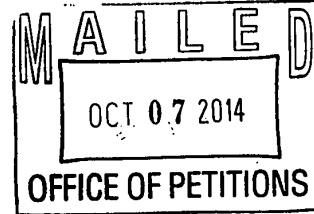
|   |   |                               |                               |   |                                |
|---|---|-------------------------------|-------------------------------|---|--------------------------------|
| <b>SERIAL NUMBER</b><br>14/480,584  | <b>FILING or 371(c) DATE</b><br>09/08/2014<br><b>RULE</b>   | <b>CLASS</b><br>370           | <b>GROUP ART UNIT</b><br>2476 | <b>ATTORNEY DOCKET NO.</b><br>HMTRM1  |                                |
| <b>APPLICANTS</b><br>IP Holdings, Inc., Palo Alto, CA, Assignee (with 37 CFR 1.172 Interest);<br>Sanjay K. Rao, Palo Alto, CA<br>Sunil K. Rao, Palo Alto, CA<br>Rekha K. Rao, Palo Alto, CA, Legal Representative;  |   |                               |                               |   |                                |
| <b>INVENTORS</b><br>Raman K. Rao, Palo Alto, CA, Deceased;<br>Sunil K. Rao, Palo Alto, CA;<br>Sanjay K. Rao, Palo Alto, CA;   |   |                               |                               |   |                                |
| <b>** CONTINUING DATA *****</b><br>This application is a CON of 14/139,817 12/23/2013 PAT 8842653<br>which is a CON of 12/912,607 10/26/2010 PAT 8824434<br>which is a CON of 10/940,428 09/13/2004 PAT 7848300<br>which is a CON of 09/617,608 07/17/2000 PAT 7286502<br>which is a CIP of 09/281,739 06/04/1999 PAT 6169789 |   |                               |                               |   |                                |
| <b>** FOREIGN APPLICATIONS *****</b><br><b>** IF REQUIRED, FOREIGN FILING LICENSE GRANTED *** SMALL ENTITY **</b><br>09/15/2014   |   |                               |                               |   |                                |
| Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Verified and Acknowledged <u>/PHIRIN SAM/</u><br>Examiner's Signature   | <input type="checkbox"/> Met after Allowance<br>Initials _____  | <b>STATE OR COUNTRY</b><br>CA | <b>SHEETS DRAWINGS</b><br>5   | <b>TOTAL CLAIMS</b><br>30   | <b>INDEPENDENT CLAIMS</b><br>4 |
| <b>ADDRESS</b><br>FITZPATRICK CELLA HARPER & SCINTO<br>1290 Avenue of the Americas<br>NEW YORK, NY 10104-3800<br>UNITED STATES  |   |                               |                               |   |                                |
| <b>TITLE</b><br>WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION  |   |                               |                               |   |                                |
| <b>FILING FEE RECEIVED</b><br>1340  | FEES: Authority has been given in Paper<br>No. _____ to charge/credit DEPOSIT ACCOUNT<br>No. _____ for following: |                               |                               | <input type="checkbox"/> All Fees<br><input type="checkbox"/> 1.16 Fees (Filing)<br><input type="checkbox"/> 1.17 Fees (Processing Ext. of time)<br><input type="checkbox"/> 1.18 Fees (Issue)<br><input type="checkbox"/> Other _____<br><input type="checkbox"/> Credit |                                |



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1290 Avenue of the Americas  
NEW YORK NY 10104-3800



|   |                            |
|---|----------------------------|
| <b>Decision Granting Request for Prioritized Examination (Track I or After RCE)</b>   | Application No.:14/480,584 |
| <p>1. THE REQUEST FILED <u>September 8, 2014</u> IS <b>GRANTED</b>.</p> <p>The above-identified application has met the requirements for prioritized examination</p> <p>A. <input checked="" type="checkbox"/> for an original nonprovisional application (Track I).<br/> B. <input type="checkbox"/> for an application undergoing continued examination (RCE).</p> <p>2. <b>The above-identified application will undergo prioritized examination.</b> The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:</p> <p>A. filing a <b>petition for extension of time</b> to extend the time period for filing a reply;<br/> B. filing an <b>amendment to amend the application to contain more than four independent claims, more than thirty total claims</b>, or a multiple dependent claim;<br/> C. filing a <b>request for continued examination</b>;<br/> D. filing a notice of appeal;<br/> E. filing a request for suspension of action;<br/> F. mailing of a notice of allowance;<br/> G. mailing of a final Office action;<br/> H. completion of examination as defined in 37 CFR 41.102; or<br/> I. abandonment of the application.</p> <p>Telephone inquiries with regard to this decision should be directed to Kimberly Inabinet at 571-272-4618.</p> <p>/ Kimberly Inabinet/ <span style="float: right;">Paralegal Specialist, Office of Petitions</span></p> |                            |



|   |  |
|---|--|
| <b>PATENT APPLICATION FEE DETERMINATION RECORD</b><br>Substitute for Form PTO-875 | Application or Docket Number<br>14/480,584 |
|---|--|

| APPLICATION AS FILED - PART I   |   |                 | SMALL ENTITY |         | OR   | OTHER THAN SMALL ENTITY |         |
|---|---|-----------------|--------------|---------|------|-------------------------|---------|
|   | (Column 1)  | (Column 2)      |              |         |      |                         |         |
| FOR   | NUMBER FILED  | NUMBER EXTRA    | RATE(\$)     | FEE(\$) |      | RATE(\$)                | FEE(\$) |
| BASIC FEE<br><small>(37 CFR 1.16(a), (b), or (c))</small>                 | N/A   | N/A             | N/A          | 70      |      | N/A                     |         |
| SEARCH FEE<br><small>(37 CFR 1.16(k), (j), or (m))</small>                | N/A   | N/A             | N/A          | 300     |      | N/A                     |         |
| EXAMINATION FEE<br><small>(37 CFR 1.16(o), (p), or (q))</small>           | N/A   | N/A             | N/A          | 360     |      | N/A                     |         |
| TOTAL CLAIMS<br><small>(37 CFR 1.16(i))</small>                           | 30  | minus 20 =<br>* | 10           | x 40 =  | 400  | OR                      |         |
| INDEPENDENT CLAIMS<br><small>(37 CFR 1.16(h))</small>                     | 4   | minus 3 =<br>*  | 1            | x 210 = | 210  |                         |         |
| APPLICATION SIZE FEE<br><small>(37 CFR 1.16(s))</small>                   | 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 <small>(37 CFR 1.16(j))</small>          |   |                 |              |         | 0.00 |                         |         |
| * If the difference in column 1 is less than zero, enter "0" in column 2. |   |                 | TOTAL        |         | 1340 | TOTAL                   |         |

| APPLICATION AS AMENDED - PART II  |  |            |                                    |               | SMALL ENTITY    |                    | OR | OTHER THAN SMALL ENTITY |                    |   |
|---|--|------------|------------------------------------|---------------|-----------------|--------------------|----|-------------------------|--------------------|---|
|   | (Column 1)   | (Column 2) | (Column 3)                         | (Column 4)    |                 |                    |    |                         |                    |   |
| AMENDMENT A   | CLAIMS REMAINING AFTER AMENDMENT   | MINUS      | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE(\$)        | ADDITIONAL FEE(\$) |    | RATE(\$)                | ADDITIONAL FEE(\$) |   |
|   | Total<br><small>(37 CFR 1.16(i))</small>                                       | *          | Minus                              | **            | =               | x                  | =  | OR                      | x                  | = |
|   | Independent<br><small>(37 CFR 1.16(h))</small>                                 | *          | Minus                              | ***           | =               | x                  | =  | OR                      | x                  | = |
|   | Application Size Fee <small>(37 CFR 1.16(s))</small>                           |            |                                    |               |                 |                    |    | OR                      |                    |   |
|   | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <small>(37 CFR 1.16(j))</small> |            |                                    |               |                 |                    |    | OR                      |                    |   |
|   |  |            |                                    |               | TOTAL ADD'L FEE |                    | OR | TOTAL ADD'L FEE         |                    |   |
| AMENDMENT B   | CLAIMS REMAINING AFTER AMENDMENT   | MINUS      | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE(\$)        | ADDITIONAL FEE(\$) |    | RATE(\$)                | ADDITIONAL FEE(\$) |   |
|   | Total<br><small>(37 CFR 1.16(i))</small>                                       | *          | Minus                              | **            | =               | x                  | =  | OR                      | x                  | = |
|   | Independent<br><small>(37 CFR 1.16(h))</small>                                 | *          | Minus                              | ***           | =               | x                  | =  | OR                      | x                  | = |
|   | Application Size Fee <small>(37 CFR 1.16(s))</small>                           |            |                                    |               |                 |                    |    | OR                      |                    |   |
|   | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM <small>(37 CFR 1.16(j))</small> |            |                                    |               |                 |                    |    | OR                      |                    |   |
|   |  |            |                                    |               | TOTAL ADD'L FEE |                    | OR | TOTAL ADD'L FEE         |                    |   |
| <p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.</p> |  |            |                                    |               |                 |                    |    |                         |                    |   |



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Table with 7 columns: APPLICATION NUMBER, FILING or 371(c) DATE, GRP ART UNIT, FIL FEE REC'D, ATTY DOCKET NO, TOT CLAIMS, IND CLAIMS. Row 1: 14/480,584, 09/08/2014, 2642, 1340, HMTRM1, 30, 4

CONFIRMATION NO. 5617

FILING RECEIPT

5514
FITZPATRICK CELLA HARPER & SCINTO
1290 Avenue of the Americas
NEW YORK, NY 10104-3800



Date Mailed: 09/16/2014

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

Inventor(s)

Raman K. Rao, Palo Alto, CA, Deceased;
Sunil K. Rao, Palo Alto, CA;
Sanjay K. Rao, Palo Alto, CA;

Applicant(s)

IP Holdings, Inc., Palo Alto, CA
Sanjay K. Rao, Palo Alto, CA
Sunil K. Rao, Palo Alto, CA
Rekha K. Rao, Palo Alto, CA, Legal Representative;

Power of Attorney: The patent practitioners associated with Customer Number 05514

Domestic Priority data as claimed by applicant

This application is a CON of 14/139,817 12/23/2013 PAT 8842653
which is a CON of 12/912,607 10/26/2010 PAT 8824434
which is a CON of 10/940,428 09/13/2004 PAT 7848300
which is a CON of 09/617,608 07/17/2000 PAT 7286502
which is a CIP of 09/281,739 06/04/1999 PAT 6169789

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.

If Required, Foreign Filing License Granted: 09/15/2014

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/480,584**

**Projected Publication Date:** Request for Non-Publication Acknowledged

**Non-Publication Request:** Yes

**Early Publication Request:** No

**\*\* SMALL ENTITY \*\***

**Title**

WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION

**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).

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**Title 37, Code of Federal Regulations, 5.11 & 5.15**

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REGISTERED PRACTITIONERS**

**NOTE:** This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B or equivalent) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5. If the Power of Attorney by Applicant form is not accompanied by this transmittal form or an equivalent, the Power of Attorney will not be recognized in the application.

|                        |  |
|------------------------|--|
| Application Number     | 14/480,584   |
| Filing Date            | September 8, 2014  |
| First Named Inventor   | Raman Rao  |
| Title                  | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |
| Art Unit               |  |
| Examiner Name          |  |
| Attorney Docket Number | 04245.000900.1   |

**SIGNATURE of Applicant or Patent Practitioner**

|                     |                      |           |                    |
|---------------------|----------------------|-----------|--------------------|
| Signature           | /Michael K. O'Neill/ | Date      | September 10, 2014 |
| Name                | Michael K. O'Neill   | Telephone | (714) 540-8700     |
| Registration Number | 32,622               |           |                    |

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

\*Total of 5 Pages forms are submitted.

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 35 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.**

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## POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

|                           |                    |
|---------------------------|--------------------|
| <b>Application Number</b> | <b>Filing Date</b> |
| 14/480,584                | September 8, 2014  |

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

- I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 05514
- OR**
- I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

**Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:**

- The address associated with the above-mentioned Customer Number
- OR**
- The address associated with Customer Number: 05514
- OR**

|                         |       |     |  |
|-------------------------|-------|-----|--|
| Firm or Individual Name |       |     |  |
| Address                 |       |     |  |
| City                    | State | Zip |  |
| Country                 |       |     |  |
| Telephone               | Email |     |  |

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

- Inventor or Joint Inventor (title not required below)
- Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

**SIGNATURE of Applicant for Patent**

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

|           |                                   |                 |  |
|-----------|-----------------------------------|-----------------|--|
| Signature | /Rekha K. Rao/                    | Date (Optional) |  |
| Name      | Rekha K. Rao                      |                 |  |
| Title     | CEO, IP Holdings, inc. (Assignee) |                 |  |

**NOTE:** Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

Total of **1** forms are submitted.

This collection of information is required by 37 CFR 1.131, 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 35 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.*

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## POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

|                           |                    |
|---------------------------|--------------------|
| <b>Application Number</b> | <b>Filing Date</b> |
| 14/480,584                | September 8, 2014  |

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

- I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 05514
- OR**
- I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

**Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:**

- The address associated with the above-mentioned Customer Number
- OR**
- The address associated with Customer Number: 05514
- OR**

|                         |       |     |  |
|-------------------------|-------|-----|--|
| Firm or Individual Name |       |     |  |
| Address                 |       |     |  |
| City                    | State | Zip |  |
| Country                 |       |     |  |
| Telephone               | Email |     |  |

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

- Inventor or Joint Inventor (title not required below)
- Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

**SIGNATURE of Applicant for Patent**

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

|           |   |                 |  |
|-----------|---|-----------------|--|
| Signature | /Rekha K. Rao/                                  | Date (Optional) |  |
| Name      | Rekha K. Rao                                    |                 |  |
| Title     | Legal Representative of Raman K. Rao (inventor) |                 |  |

**NOTE:** Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 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 35 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.

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## POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

|                           |                    |
|---------------------------|--------------------|
| <b>Application Number</b> | <b>Filing Date</b> |
| 14/480584                 | September 8, 2014  |

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

- I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 05514
- OR**
- I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

**Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:**

- The address associated with the above-mentioned Customer Number
- OR**
- The address associated with Customer Number: 05514
- OR**

|                         |       |     |  |
|-------------------------|-------|-----|--|
| Firm or Individual Name |       |     |  |
| Address                 |       |     |  |
| City                    | State | Zip |  |
| Country                 |       |     |  |
| Telephone               | Email |     |  |

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

- Inventor or Joint Inventor (title not required below)
- Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

**SIGNATURE of Applicant for Patent**

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

|           |                 |                 |  |
|-----------|-----------------|-----------------|--|
| Signature | /Sanjay K. Rao/ | Date (Optional) |  |
| Name      | Sanjay K. Rao   |                 |  |
| Title     |                 |                 |  |

**NOTE:** Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

Total of 3 forms are submitted.

This collection of information is required by 37 CFR 1.131, 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 35 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.

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## POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

|                           |                    |
|---------------------------|--------------------|
| <b>Application Number</b> | <b>Filing Date</b> |
| 14/480584                 | September 8, 2014  |

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

- I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 05514
- OR**
- I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

**Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:**

- The address associated with the above-mentioned Customer Number
- OR**
- The address associated with Customer Number: 05514
- OR**

|                         |       |     |  |
|-------------------------|-------|-----|--|
| Firm or Individual Name |       |     |  |
| Address                 |       |     |  |
| City                    | State | Zip |  |
| Country                 |       |     |  |
| Telephone               | Email |     |  |

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

- Inventor or Joint Inventor (title not required below)
- Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
- Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
- Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

**SIGNATURE of Applicant for Patent**

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

|           |                |                 |  |
|-----------|----------------|-----------------|--|
| Signature | /Sunil K. Rao/ | Date (Optional) |  |
| Name      | Sunil K. Rao   |                 |  |
| Title     |                |                 |  |

**NOTE:** Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

Total of 3 forms are submitted.

This collection of information is required by 37 CFR 1.131, 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 35 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.**

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## Electronic Acknowledgement Receipt

|   |  |
|---|--|
| <b>EFS ID:</b>                              | 20104365   |
| <b>Application Number:</b>                  | 14480584   |
| <b>International Application Number:</b>    |  |
| <b>Confirmation Number:</b>                 | 5617   |
| <b>Title of Invention:</b>                  | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |
| <b>First Named Inventor/Applicant Name:</b> | Raman K Rao  |
| <b>Customer Number:</b>                     | 105481   |
| <b>Filer:</b>                               | Michael K. O'Neill/Margaret Lee  |
| <b>Filer Authorized By:</b>                 | Michael K. O'Neill   |
| <b>Attorney Docket Number:</b>              | HMTRM1   |
| <b>Receipt Date:</b>                        | 10-SEP-2014  |
| <b>Filing Date:</b>                         |  |
| <b>Time Stamp:</b>                          | 18:44:40   |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)  |

### Payment information:

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| Submitted with Payment | no |
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### File Listing:

| Document Number | Document Description | File Name                                   | File Size(Bytes)/<br>Message Digest                | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|---|--|------------------|------------------|
| 1               | Power of Attorney    | 04245_000900_1_MKON_POA_Filing_09102014.pdf | 1873542<br>a697ed1238ffb9167f65c78532adb593198dcb6 | no               | 5                |

### Warnings:

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1873542

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.

**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**

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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|   |                               |                                     |
|---|-------------------------------|-------------------------------------|
| <b>UTILITY<br/>PATENT APPLICATION<br/>TRANSMITTAL</b><br><br><i>(Only for new nonprovisional applications under 37 CFR 1.53(b))</i> | <i>Attorney Docket No.</i>    | HMTRM1                              |
|   | <i>First Inventor</i>         | Raman Rao                           |
|   | <i>Title</i>                  | Wireless Device with Transmission.. |
|   | <i>Express Mail Label No.</i> | NA                                  |

|  |  |
|--|--|
| <b>APPLICATION ELEMENTS</b><br><i>See MPEP chapter 600 concerning utility patent application contents.</i> | <b>ADDRESS TO:</b><br><b>Commissioner for Patents</b><br><b>P.O. Box 1450</b><br><b>Alexandria VA 22313-1450</b> |
|--|--|

|   |   |
|---|---|
| 1. <input type="checkbox"/> <b>Fee Transmittal Form</b> (e.g., PTO/SB/17)<br>2. <input checked="" type="checkbox"/> <b>Applicant claims small entity status.</b><br>See 37 CFR 1.27.<br>3. <input checked="" type="checkbox"/> <b>Specification</b> [Total Pages <u>27</u> ]<br>Both the claims and abstract must start on a new page<br><i>(For information on the preferred arrangement, see MPEP 608.01(a))</i><br>4. <input checked="" type="checkbox"/> <b>Drawing(s)</b> (35 U.S.C. 113) [Total Sheets <u>5</u> ]<br>5. <b>Oath or Declaration</b> [Total Sheets _____ ]<br>a. <input type="checkbox"/> Newly executed (original or copy)<br>b. <input checked="" type="checkbox"/> A copy from a prior application (37 CFR 1.63(d))<br><i>(for continuation/divisional with Box 18 completed)</i><br>i. <input type="checkbox"/> <b>DELETION OF INVENTOR(S)</b><br>Signed statement attached deleting inventor(s)<br>name in the prior application, see 37 CFR<br>1.63(d)(2) and 1.33(b).<br>6. <input checked="" type="checkbox"/> <b>Application Data Sheet.</b> See 37 CFR 1.76<br>7. <input type="checkbox"/> <b>CD-ROM or CD-R</b> in duplicate, large table or<br>Computer Program <i>(Appendix)</i><br><input type="checkbox"/> Landscape Table on CD<br>8. <b>Nucleotide and/or Amino Acid Sequence Submission</b><br><i>(if applicable, items a. – c. are required)</i><br>a. <input type="checkbox"/> Computer Readable Form (CRF)<br>b. <input type="checkbox"/> Specification Sequence Listing on:<br>i. <input type="checkbox"/> CD-ROM or CD-R (2 copies); or<br>ii. <input type="checkbox"/> Paper<br>c. <input type="checkbox"/> Statements verifying identity of above copies | <b>ACCOMPANYING APPLICATION PARTS</b><br>9. <input type="checkbox"/> <b>Assignment Papers</b> (cover sheet & document(s))<br>Name of Assignee _____<br>10. <input checked="" type="checkbox"/> <b>37 CFR 3.73(b) Statement</b> <input type="checkbox"/> <b>Power of Attorney</b><br><i>(when there is an assignee)</i><br>11. <input type="checkbox"/> <b>English Translation Document</b> <i>(if applicable)</i><br>12. <input type="checkbox"/> <b>Information Disclosure Statement</b> (PTO/SB/08 or PTO-1449)<br><input type="checkbox"/> Copies of citations attached<br>13. <input type="checkbox"/> <b>Preliminary Amendment</b><br>14. <input type="checkbox"/> <b>Return Receipt Postcard</b> (MPEP 503)<br><i>(Should be specifically itemized)</i><br>15. <input type="checkbox"/> <b>Certified Copy of Priority Document(s)</b><br><i>(if foreign priority is claimed)</i><br>16. <input type="checkbox"/> <b>Nonpublication Request</b> under 35 U.S.C. 122(b)(2)(B)(i).<br>Applicant must attach form PTO/SB/35 or equivalent.<br>17. <input type="checkbox"/> Other: _____ |
|---|---|

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:

Continuation  Divisional  Continuation-in-part (CIP) of prior application No.: 14/139,817.....

Prior application information: Examiner Phirin Sam Art Unit: 2476

### 19. CORRESPONDENCE ADDRESS

The address associated with Customer Number:  OR  Correspondence address below

|         |           |          |  |  |
|---------|-----------|----------|--|--|
| Name    |           |          |  |  |
| Address |           |          |  |  |
| City    | State     | Zip Code |  |  |
| Country | Telephone | Email    |  |  |

|                   |                 |                                   |            |
|-------------------|-----------------|-----------------------------------|------------|
| Signature         | /Sanjay K. Rao/ | Date                              | 09/08/2014 |
| Name (Print/Type) | Sanjay K. Rao   | Registration No. (Attorney/Agent) |            |

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

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

## 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.

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|---|--|------------------------|--------|
| <b>Application Data Sheet 37 CFR 1.76</b>   |  | Attorney Docket Number | HMTRM1 |
|   |  | Application Number     |        |
| Title of Invention  | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |                        |        |
| 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

|                          |  |
|--------------------------|--|
| <input type="checkbox"/> | Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2. (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.) |
|--------------------------|--|

## Inventor Information:

|   |                   |                       |                    |                               |                                       |
|---|-------------------|-----------------------|--------------------|-------------------------------|---------------------------------------|
| <b>Inventor 1</b>   |                   |                       |                    |                               | <input type="button" value="Remove"/> |
| <b>Legal Name</b>   |                   |                       |                    |                               |                                       |
| <b>Prefix</b>   | <b>Given Name</b> | <b>Middle Name</b>    | <b>Family Name</b> | <b>Suffix</b>                 |                                       |
|   | Raman             | K                     | Rao                |                               |                                       |
| <b>Residence Information (Select One)</b> <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service |                   |                       |                    |                               |                                       |
| <b>City</b>   | Palo Alto         | <b>State/Province</b> | CA                 | <b>Country of Residence i</b> | US                                    |
| <b>Mailing Address of Inventor:</b>   |                   |                       |                    |                               |                                       |
| <b>Address 1</b>  | 3087 Alexis Drive |                       |                    |                               |                                       |
| <b>Address 2</b>  |                   |                       |                    |                               |                                       |
| <b>City</b>   | Palo Alto         | <b>State/Province</b> | CA                 |                               |                                       |
| <b>Postal Code</b>  | 94304             | <b>Country i</b>      | US                 |                               |                                       |
| <b>Inventor 2</b>   |                   |                       |                    |                               | <input type="button" value="Remove"/> |
| <b>Legal Name</b>   |                   |                       |                    |                               |                                       |
| <b>Prefix</b>   | <b>Given Name</b> | <b>Middle Name</b>    | <b>Family Name</b> | <b>Suffix</b>                 |                                       |
|   | Sunil             | K                     | Rao                |                               |                                       |
| <b>Residence Information (Select One)</b> <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service |                   |                       |                    |                               |                                       |
| <b>City</b>   | Palo Alto         | <b>State/Province</b> | CA                 | <b>Country of Residence i</b> | US                                    |
| <b>Mailing Address of Inventor:</b>   |                   |                       |                    |                               |                                       |
| <b>Address 1</b>  | 3087 Alexis Drive |                       |                    |                               |                                       |
| <b>Address 2</b>  |                   |                       |                    |                               |                                       |
| <b>City</b>   | Palo Alto         | <b>State/Province</b> | CA                 |                               |                                       |
| <b>Postal Code</b>  | 94304             | <b>Country i</b>      | US                 |                               |                                       |
| <b>Inventor 3</b>   |                   |                       |                    |                               | <input type="button" value="Remove"/> |
| <b>Legal Name</b>   |                   |                       |                    |                               |                                       |
| <b>Prefix</b>   | <b>Given Name</b> | <b>Middle Name</b>    | <b>Family Name</b> | <b>Suffix</b>                 |                                       |
|   | Sanjay            | K                     | Rao                |                               |                                       |
| <b>Residence Information (Select One)</b> <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service |                   |                       |                    |                               |                                       |

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|   |  |                        |        |                                    |    |
|---|--|------------------------|--------|------------------------------------|----|
| <b>Application Data Sheet 37 CFR 1.76</b>   |  | Attorney Docket Number | HMTRM1 |                                    |    |
|   |  | Application Number     |        |                                    |    |
| Title of Invention  | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |                        |        |                                    |    |
| City  | Palo Alto  | State/Province         | CA     | Country of Residence i             | US |
| <b>Mailing Address of Inventor:</b>   |  |                        |        |                                    |    |
| Address 1   | 3087 Alexis Drive  |                        |        |                                    |    |
| Address 2   |  |                        |        |                                    |    |
| City  | Palo Alto  | State/Province         | CA     |                                    |    |
| Postal Code   | 94304  | Country i              | US     |                                    |    |
| All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the <b>Add</b> button. |  |                        |        | <input type="button" value="Add"/> |    |

**Correspondence Information:**

|   |  |
|---|--|
| Enter either Customer Number or complete the Correspondence Information section below.<br>For further information see 37 CFR 1.33(a). |  |
| <input type="checkbox"/> An Address is being provided for the correspondence Information of this application.                         |  |
| Customer Number   | 105481   |
| Email Address   | <input type="button" value="Add Email"/> <input type="button" value="Remove Email"/> |

**Application Information:**

|   |  |   |                                     |
|---|--|---|-------------------------------------|
| Title of the Invention                  | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |   |                                     |
| Attorney Docket Number                  | HMTRM1   | Small Entity Status Claimed               | <input checked="" type="checkbox"/> |
| Application Type                        | Nonprovisional   |   |                                     |
| Subject Matter                          | Utility  |   |                                     |
| Total Number of Drawing Sheets (if any) | 5  | Suggested Figure for Publication (if any) |                                     |

**Filing By Reference :**

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

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

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

**Publication Information:**

|   |
|---|
| <input type="checkbox"/> Request Early Publication (Fee required at time of Request 37 CFR 1.219)   |
| <input checked="" type="checkbox"/> <b>Request Not to Publish.</b> I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application <b>has not and will not</b> be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing. |

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|   |  |                        |        |
|---|--|------------------------|--------|
| <b>Application Data Sheet 37 CFR 1.76</b> |  | Attorney Docket Number | HMTRM1 |
|   |  | Application Number     |        |
| Title of Invention                        | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |                        |        |

### Representative Information:

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

|                    |  |  |   |
|--------------------|--|--|---|
| Please Select One: | <input checked="" type="radio"/> Customer Number | <input type="radio"/> US Patent Practitioner | <input type="radio"/> Limited Recognition (37 CFR 11.9) |
| Customer Number    | 105481   |  |   |

### Domestic Benefit/National Stage Information:

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

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

|   |                         |                          |                          |               |                         |
|---|-------------------------|--------------------------|--------------------------|---------------|-------------------------|
| Prior Application Status  | Pending                 |                          | <a href="#">Remove</a>   |               |                         |
| Application Number  | Continuity Type         | Prior Application Number | Filing Date (YYYY-MM-DD) |               |                         |
| This  | Continuation of         | 14/139817                | 2013-12-23               |               |                         |
| Prior Application Status  | Patented                |                          | <a href="#">Remove</a>   |               |                         |
| Application Number  | Continuity Type         | Prior Application Number | Filing Date (YYYY-MM-DD) | Patent Number | Issue Date (YYYY-MM-DD) |
| 14/139817   | Continuation of         | 12/912607                | 2010-10-26               | 8824434       | 2014-09-02              |
| Prior Application Status  | Patented                |                          | <a href="#">Remove</a>   |               |                         |
| Application Number  | Continuity Type         | Prior Application Number | Filing Date (YYYY-MM-DD) | Patent Number | Issue Date (YYYY-MM-DD) |
| 12/912607   | Continuation of         | 10/940428                | 2004-09-13               | 7848300       | 2010-12-07              |
| Prior Application Status  | Patented                |                          | <a href="#">Remove</a>   |               |                         |
| Application Number  | Continuity Type         | Prior Application Number | Filing Date (YYYY-MM-DD) | Patent Number | Issue Date (YYYY-MM-DD) |
| 10/940428   | Continuation of         | 09/617608                | 2000-07-17               | 7286502       | 2007-10-23              |
| Prior Application Status  | Patented                |                          | <a href="#">Remove</a>   |               |                         |
| Application Number  | Continuity Type         | Prior Application Number | Filing Date (YYYY-MM-DD) | Patent Number | Issue Date (YYYY-MM-DD) |
| 09/617608   | Continuation in part of | 09/281739                | 1999-06-04               | 6169789       | 2001-01-02              |
| Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the <b>Add</b> button. |                         |                          |                          |               | <a href="#">Add</a>     |

### Foreign Priority Information:



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|   |  |                        |        |
|---|--|------------------------|--------|
| <b>Application Data Sheet 37 CFR 1.76</b> |  | Attorney Docket Number | HMTRM1 |
|   |  | Application Number     |        |
| Title of Invention                        | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |                        |        |

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

| <input type="button" value="Remove"/>  |                      |                          |  |
|--|----------------------|--------------------------|--|
| Application Number   | Country <sup>i</sup> | Filing Date (YYYY-MM-DD) | Access Code <sup>i</sup> (if applicable) |
|  |                      |                          |  |
| Additional Foreign Priority Data may be generated within this form by selecting the <b>Add</b> button. |                      |                          | <input type="button" value="Add"/>       |

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

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

## Authorization to Permit Access:

- Authorization to Permit Access to the Instant Application by the Participating Offices

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

|   |  |                        |        |
|---|--|------------------------|--------|
| <b>Application Data Sheet 37 CFR 1.76</b> |  | Attorney Docket Number | HMTRM1 |
|   |  | Application Number     |        |
| Title of Invention                        | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |                        |        |

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

## Applicant Information:

|  |  |  |                                       |
|--|--|--|---------------------------------------|
| Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.  |  |  |                                       |
| <b>Applicant 1</b>   |  |  | <input type="button" value="Remove"/> |
| If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section. |  |  |                                       |
| <input type="button" value="Clear"/>   |  |  |                                       |
| <input checked="" type="radio"/> Assignee  | <input type="radio"/> Legal Representative under 35 U.S.C. 117 | <input type="radio"/> Joint Inventor                                   |                                       |
| <input type="radio"/> Person to whom the inventor is obligated to assign.  |  | <input type="radio"/> Person who shows sufficient proprietary interest |                                       |
| If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:  |  |  |                                       |
|  |  |  |                                       |
| Name of the Deceased or Legally Incapacitated Inventor : <input type="text"/>  |  |  |                                       |
| If the Applicant is an Organization check here. <input checked="" type="checkbox"/>  |  |  |                                       |
| Organization Name  | IP Holdings, Inc.  |  |                                       |
| <b>Mailing Address Information:</b>  |  |  |                                       |
| Address 1  | 3087 Alexis Drive  |  |                                       |
| Address 2  |  |  |                                       |
| City   | Palo Alto  | State/Province   | CA                                    |
| Country <sup>i</sup>   | US   | Postal Code  | 94304                                 |
| Phone Number   |  | Fax Number   |                                       |

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|   |  |   |             |                                       |
|---|--|---|-------------|---------------------------------------|
| <b>Application Data Sheet 37 CFR 1.76</b>   |  | Attorney Docket Number                          | HMTRM1      |                                       |
|   |  | Application Number                              |             |                                       |
| Title of Invention  | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |   |             |                                       |
| Email Address   |  |   |             |                                       |
| Additional Applicant Data may be generated within this form by selecting the Add button.  |  |   |             | <input type="button" value="Add"/>    |
| <b>Applicant 2</b>  |  |   |             | <input type="button" value="Remove"/> |
| <p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p> |  |   |             |                                       |
|   |  |   |             | <input type="button" value="Clear"/>  |
| <input type="radio"/> Assignee  | <input type="radio"/> Legal Representative under 35 U.S.C. 117                 | <input checked="" type="radio"/> Joint Inventor |             |                                       |
| <input type="radio"/> Person to whom the inventor is obligated to assign.   | <input type="radio"/> Person who shows sufficient proprietary interest         |   |             |                                       |
| If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:   |  |   |             |                                       |
|   |  |   |             |                                       |
| Name of the Deceased or Legally Incapacitated Inventor : <input type="text"/>   |  |   |             |                                       |
| If the Applicant is an Organization check here. <input type="checkbox"/>  |  |   |             |                                       |
| Prefix  | Given Name   | Middle Name                                     | Family Name | Suffix                                |
|   | Sanjay   | K   | Rao         |                                       |
| <b>Mailing Address Information:</b>   |  |   |             |                                       |
| Address 1   | 3087 Alexis Drive  |   |             |                                       |
| Address 2   |  |   |             |                                       |
| City  | Palo Alto  | State/Province                                  | CA          |                                       |
| Country <sup>i</sup>  | US   | Postal Code                                     | 94304       |                                       |
| Phone Number  |  | Fax Number                                      |             |                                       |
| Email Address   |  |   |             |                                       |
| Additional Applicant Data may be generated within this form by selecting the Add button.  |  |   |             | <input type="button" value="Add"/>    |

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|   |  |                        |        |
|---|--|------------------------|--------|
| <b>Application Data Sheet 37 CFR 1.76</b> |  | Attorney Docket Number | HMTRM1 |
|   |  | Application Number     |        |
| Title of Invention                        | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |                        |        |

|   |  |  |                                       |
|---|--|--|---------------------------------------|
| <b>Applicant 3</b>  |  |  | <input type="button" value="Remove"/> |
| <p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p> |  |  |                                       |
| <input type="button" value="Clear"/>  |  |  |                                       |
| <input type="radio"/> Assignee  | <input type="radio"/> Legal Representative under 35 U.S.C. 117 | <input checked="" type="radio"/> Joint Inventor                        |                                       |
| <input type="radio"/> Person to whom the inventor is obligated to assign.   |  | <input type="radio"/> Person who shows sufficient proprietary interest |                                       |
| If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:   |  |  |                                       |
|   |  |  |                                       |
| Name of the Deceased or Legally Incapacitated Inventor : <input type="text"/>   |  |  |                                       |
| If the Applicant is an Organization check here. <input type="checkbox"/>  |  |  |                                       |

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|--------|------------|-------------|-------------|--------|
|        | Sunil      | K           | Rao         |        |

|                                     |                   |                |       |
|-------------------------------------|-------------------|----------------|-------|
| <b>Mailing Address Information:</b> |                   |                |       |
| Address 1                           | 3087 Alexis Drive |                |       |
| Address 2                           |                   |                |       |
| City                                | Palo Alto         | State/Province | CA    |
| Country <sup>i</sup>                | US                | Postal Code    | 94304 |
| Phone Number                        |                   | Fax Number     |       |
| Email Address                       |                   |                |       |

|  |                                    |
|--|------------------------------------|
| Additional Applicant Data may be generated within this form by selecting the Add button. | <input type="button" value="Add"/> |
|--|------------------------------------|

|   |   |  |                                       |
|---|---|--|---------------------------------------|
| <b>Applicant 4</b>  |   |  | <input type="button" value="Remove"/> |
| <p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p> |   |  |                                       |
| <input type="button" value="Clear"/>  |   |  |                                       |
| <input type="radio"/> Assignee  | <input checked="" type="radio"/> Legal Representative under 35 U.S.C. 117 | <input type="radio"/> Joint Inventor                                   |                                       |
| <input type="radio"/> Person to whom the inventor is obligated to assign.   |   | <input type="radio"/> Person who shows sufficient proprietary interest |                                       |
| If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:   |   |  |                                       |
|   |   |  |                                       |

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|---|--|------------------------|--------|
| <b>Application Data Sheet 37 CFR 1.76</b> |  | Attorney Docket Number | HMTRM1 |
|   |  | Application Number     |        |
| Title of Invention                        | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |                        |        |

|  |                          |
|--|--------------------------|
| Name of the Deceased or Legally Incapacitated Inventor : | <input type="text"/>     |
| If the Applicant is an Organization check here.          | <input type="checkbox"/> |

| Prefix | Given Name | Middle Name | Family Name | Suffix |
|--------|------------|-------------|-------------|--------|
|        | Rekha      | K           | Rao         |        |

|                                     |                   |                |       |  |
|-------------------------------------|-------------------|----------------|-------|--|
| <b>Mailing Address Information:</b> |                   |                |       |  |
| Address 1                           | 3087 Alexis Drive |                |       |  |
| Address 2                           |                   |                |       |  |
| City                                | Palo Alto         | State/Province | CA    |  |
| Country <sup>i</sup>                | US                | Postal Code    | 94304 |  |
| Phone Number                        |                   | Fax Number     |       |  |
| Email Address                       |                   |                |       |  |

|  |                                    |
|--|------------------------------------|
| Additional Applicant Data may be generated within this form by selecting the Add button. | <input type="button" value="Add"/> |
|--|------------------------------------|

### Assignee Information including Non-Applicant Assignee Information:

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

| <b>Assignee 1</b>  |            |             |             |             |        |  |  |  |  |  |
|--|------------|-------------|-------------|-------------|--------|--|--|--|--|--|
| Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication. |            |             |             |             |        |  |  |  |  |  |
| <input type="button" value="Remove"/>  |            |             |             |             |        |  |  |  |  |  |
| If the Assignee or Non-Applicant Assignee is an Organization check here. <input type="checkbox"/>  |            |             |             |             |        |  |  |  |  |  |
| <table border="1"> <thead> <tr> <th>Prefix</th> <th>Given Name</th> <th>Middle Name</th> <th>Family Name</th> <th>Suffix</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>  | Prefix     | Given Name  | Middle Name | Family Name | Suffix |  |  |  |  |  |
| Prefix   | Given Name | Middle Name | Family Name | Suffix      |        |  |  |  |  |  |
|  |            |             |             |             |        |  |  |  |  |  |

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| <b>Application Data Sheet 37 CFR 1.76</b> |  | Attorney Docket Number | HMTRM1 |
|   |  | Application Number     |        |
| Title of Invention                        | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |                        |        |

|   |  |                |                                    |
|---|--|----------------|------------------------------------|
| <b>Mailing Address Information For Assignee including Non-Applicant Assignee:</b>                                 |  |                |                                    |
| Address 1   |  |                |                                    |
| Address 2   |  |                |                                    |
| City  |  | State/Province |                                    |
| Country i   |  | Postal Code    |                                    |
| Phone Number  |  | Fax Number     |                                    |
| Email Address   |  |                |                                    |
| Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. |  |                | <input type="button" value="Add"/> |

**Signature:**

|   |                |                   |                                    |
|---|----------------|-------------------|------------------------------------|
| NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications |                |                   |                                    |
| Signature   | /Rekha K. Rao/ | Date (YYYY-MM-DD) | 2014-09-08                         |
| First Name  | Rekha          | Last Name         | Rao                                |
| Registration Number   |                |                   |                                    |
| Additional Signature may be generated within this form by selecting the Add button.   |                |                   | <input type="button" value="Add"/> |

**Signature:**

|   |                 |                   |                                    |
|---|-----------------|-------------------|------------------------------------|
| NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications |                 |                   |                                    |
| Signature   | /Sanjay K. Rao/ | Date (YYYY-MM-DD) | 2014-09-08                         |
| First Name  | Sanjay          | Last Name         | Rao                                |
| Registration Number   |                 |                   |                                    |
| Additional Signature may be generated within this form by selecting the Add button.   |                 |                   | <input type="button" value="Add"/> |

**Signature:**

|   |                |                   |                                    |
|---|----------------|-------------------|------------------------------------|
| NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications |                |                   |                                    |
| Signature   | /Sunil K. Rao/ | Date (YYYY-MM-DD) | 2014-09-08                         |
| First Name  | Sunil          | Last Name         | Rao                                |
| Registration Number   |                |                   |                                    |
| Additional Signature may be generated within this form by selecting the Add button.   |                |                   | <input type="button" value="Add"/> |

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.**

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

|   |  |        |
|---|--|--------|
| <b>Application Data Sheet 37 CFR 1.76</b> | Attorney Docket Number   | HMTRM1 |
|   | Application Number   |        |
| Title of Invention                        | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |        |

## 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.



WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF  
COMMUNICATION

By:

5

Raman K. Rao

Sunil K. Rao

Sanjay K. Rao

CROSS REFERENCE TO RELATED APPLICATIONS

10

[0001] The present application is a continuation and claims the priority benefit of co-pending U.S. Patent Application No. 14/139,817, filed December 23, 2013, which is a continuation of U.S. Patent Application No. 12/912,607, filed October, 26, 2010, now Patent No. 8,824, 434, which is a continuation of Patent Application No. 10/940,428, filed September 13, 2004, now Patent No. 7,848,300, which is a continuation of Patent Application No. 09/617,608, filed on July 17, 2000 now Patent No. 7,286,502, which is a continuation-in-part of Patent Application No. 09/281,739, filed June 4, 1999, now Patent No. 6,169,789; the disclosures of all the above referenced matters are herein incorporated by reference in the entirety.

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BACKGROUND OF THE INVENTION

[0002] ABBREVIATIONS: Cellular Telephone as CT. Mobile Device as MD. Non-Wireless Device as NWD. Internet Protocol as IP. The typical cellular telephone/mobile device (CT/MD) today has a single antenna, which is directly connected to a single receiver. While  
5 spread spectrum techniques often used in the CT/MD use a broad band of frequencies, at any specific point in time, only a single frequency connected to one receiver is used. While spread spectrum techniques greatly increase the reliability and stability of the transmission, signal "fade" and communication disconnects are often encountered. Some communications systems may rely on two separate systems; one at a high frequency and preferably using spread spectrum  
10 transmissions for clarity and reliability, and another providing a different set of frequencies, such as lower frequencies. The secondary system is used when signal fade is a problem in the main system. These are two separate, complementary systems, each devoted to solving a separate, distinguishable problem.

SUMMARY OF THE INVENTION

[0003] It is an object of the present invention to provide wireless enhancements to IP based cellular telephones/mobile wireless devices (CT/MD). The same enhancements are applied to IP based and locally based network switch boxes.

5 [0004] The typical CT/MD has one transmitter and one receiver (T/R), with one antenna. An unfulfilled need exists for multiple T/R in a CT/MD, providing enhanced capabilities, and the multiple T/R capabilities will often be best met with multiple antennas. The present invention is possible due to advances in the art which allow the necessary components to be integrated, with the size shrunk to achieve the package, performance, and cost desired. The multiple T/R  
10 capability allows the single CT/MD to perform tasks in different environments – each T/R being specifically designed or configured for that specific purpose.

[0005] Other objects, features and advantages of the present invention will become apparent from the following detailed description when taken in conjunction with the accompanying drawings.

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BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0006] The accompanying drawings, being incorporated in and forming a part of this specification, illustrate embodiments of the invention and, together with the description, serve to explain the principles of the present invention:

5 [0007] FIG. 1A illustrates characteristics of a cellular telephone (CT/MD) of the prior art as opposed to a desired CT /MD of the present invention. FIG 1B shows the CT/MD has three transmit frequencies and three receive frequencies.

[0008] FIG. 2 illustrates an embodiment of the present invention for a communication system with data being transferred from computer to computer.

10 [0009] FIG. 3 illustrates characteristics of the prior art showing a computer to computer data path with one channel.

[0010] FIG. 4 illustrates a dual antenna, dual transmit/receive (T/R) unit in the CT/MD of the present invention in a dual band system.

15 [0011] FIG. 5A illustrates a dual antenna, dual T/R unit in a CT/MD interfacing with a dual processor in the present invention in a dual band system.

[0012] FIG. 5B illustrates a wide band network switch box system that is capable of operating in a number of network environments sequentially or simultaneously.

[0013] FIG. 6 is an embodiment of the present invention showing a wired interface system for wireless or non-wireless devices and including a wireless cradle adapter.

20 [0014] FIG. 7 is an embodiment of the present invention showing a CT/MD with multiple T/R units and multiple antennas in a communication system connecting to a Server C through a wireless connection.

[0015] FIG. 8 is an embodiment of the present invention illustrating the connection of multiple wireless signals to an optical network for connection to a wide area network (WAN) or local area network (LAN) or to the Internet.

5 [0016] FIG. 9 is an embodiment of the present invention showing a multiple processing system.

[0017] FIG. 10 is an embodiment of the present invention showing a data system with three data streams.

[0018] FIG. 11 is an embodiment of the present invention showing a data system with three data streams.

10 [0019] FIG. 12 is an embodiment of the present invention showing a Virtual Private Network (VPN).

[0020] FIG. 13 is an embodiment of the present invention showing how Virtual Private Network or Networks (VPN) system may be provided.

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DETAILED DESCRIPTION OF THE INVENTION

[0021] Reference will now be made in detail to preferred embodiments of the invention, with examples illustrated in the accompanying drawings. The invention is described in conjunction with the preferred embodiments, however, it will be understood that the preferred embodiments are not intended to limit the invention. The invention is intended to cover alternatives, modifications and equivalents included, now or later, within the spirit and scope of the present invention as defined by the appended claims.

[0022] In the present invention, one or more antennas and T/R units in a CT/MD will provide better tuning and greater bandwidth for a given frequency/application. For example, consider an embodiment of a cell phone, CB radio, and wireless phone, all in a single CT/MD for improving the data rates of a wireless device/network:

[0023] It is seen that the data rate of the CT/MD is increased. Currently the CT/MD data rates are very low and pose a severe limitation for high speed wireless data networking. 14.4 KBPS (kilobits per second) is probably the best reliable speed for a wireless network that is commercially available. The speed at which RF waves are transmitted from point A to point B is a physical property based on the frequency of transmission and reception in a given medium such as air. The signal speed is determined by the frequency and the signal strength is determined by the power, line of sight, interference, etc. In a given assigned frequency band, the data speed is fixed but the power may be varied. The rate at which data may be transmitted over a wireless network is also determined by the ability to encode and decode the signal at the T/R ends using the electronics and computing power resident at each end.

[0024] Data transferred to a CT/MD over a wireless network comes in encoded form and must be decoded at the CT/MD after the data is received, such as by a receiver. The ability to encode and decode the data is a function of the number of encoders/decoders available and assigned to the task at the CT/MD or at a network switch box. It will be appreciated that while a CT/MD and a network switch box are very similar in many ways, they are completely different functional units, with the CT/MD providing personal services and the network switch box providing system services. The ability to encode and decode the data is also a function of the speed at which the encoder/decoder electronics operate at the T/R ends. Of course, each encoder/decoder must be associated with appropriate electronics to effect this task when more than one encoder/decoder is used.

[0025] FIG. 1A illustrates characteristics of a cellular telephone/mobile device (CT/MD) of the prior art as opposed to a desired CT /MD of the present invention having multiple transmit/receive (T/R) units and multiple antennas. In FIG. 1A, Cellphone 102, CB Radio 104, and Wireless 106 of the prior art all have a single transmit frequency and a single receive frequency. In contrast, the CT /MD 108 of FIG. 1B of this embodiment of the present invention has three transmit frequencies and three receive frequencies.

[0026] FIG. 2 illustrates an embodiment of the present invention for a communication system 200 with data being transferred from computer 202 to computer 204. In FIG. 2, computer 202 communicates through a system of T/R units 206, located within or in proximity to computer system 202, with computer system 204 through T/R unit 208. T/R 208 may be located within computer system 204 or in close proximity to computer system 204 to route the data to computer 204 or alternatively to a network server 204, as required. The rate at which data from system 202 to system 204 is transferred is gated by the speed of the transmit and receive units is

improved by the parallel paths provided by the present invention. The signal is sampled and may be multiplexed at each end, at a rate that assures accuracy.

[0027] FIG. 3 is an embodiment of the prior art showing a computer to computer data path with a single channel 300. In FIG. 3, using a single antenna and a single T/R unit the signal is processed through the internal electronics module 308 of the CT/MD 302, said module 308, which is shown separate from CT/MD 302 for illustrative purposes only but is normally included within CT/MD 302. Module 308 contains RF/IF 304 and A/D, D/A converter 306, as well as processor 310, memory 312, control electronics 314, and other electronics such as display electronics 316 and special interface circuitry 318, such as for driving the output 320. It should be clear that output 320 can also be an input/output for the CT/MD 302. This is also true for a network switch box such as network switch box 552 with the functionality of CT/MD 302. The module 308 and elements 310 through 318 are included within CT/MD 302 or network switch box 552. All of these components or systems are normally contained within CT/MD 302. Since there is only one path, however, it is clear that this system does not form an efficient, convenient interface. The transmission data rate is limited by antenna 322 of CT/MD 302, which has only one antenna 322.

[0028] The antenna 322 is capable of receiving only a limited frequency band due to its design limitations, which are common to single antennas used for this purpose.

[0029] Adding additional antennas gives the CT/MD (by extension the same is true for the network switch box) enhanced capabilities to differentiate between various signals or to combine multiple paths into a single communication channel. As an example, the design considerations for receiving cellular telephone frequencies may be totally different from those



for streaming video or data signals, and with the present invention both can be combined into the CT/MD.

[0030] FIG. 4 illustrates a dual antenna, dual T/R unit in the CT/MD of the present invention in a dual band system 400. In FIG. 4, this scheme with CT/MD 402 transmitting on the dual T/R unit 404 allows the internal processor 406 to independently process the two incoming signal streams separately and optimally, causing the appropriate output to be delivered on the desired output port. In FIG. 4 the processor 406 is shown as a single processor, however, the processor 406 is not limited to only one processor and may contain multiple processors. Alternately, the single processor may have multiple channels for parallel processing of each data stream to process accurately two distinct signals 408 that were more optimally received by two dedicated antennas and two separate T/R units contained within the CT/MD to improve performance and quality of output. An example is a CT/MD 402 which is optimized for video and voice.

[0031] Having more than one T/R unit gives a performance edge as each signal can be better processed and tuned to the specific frequency band of the signal. Thus better quality of output can be achieved for each type of signal and application. As an example, by having each of the data streams sampled at differing clock frequencies the performance can be better optimized.

[0032] FIG. 5A illustrates a dual antenna, dual T/R unit 504 in a CT/MD 502 interfacing with a dual processor 506 in the present invention in a dual band system 500. In FIG. 5A, in addition to multiple antennas 508 and multiple T/R units 504 the figure also shows multiple processors 506 in a process unit functional block in a CT/MD. The system may communicate through an output or outputs 510. For example, these outputs may be fibre optic channel, ethernet, cable, telephone, or other. By extension the feature of multiple antennas, multiple T/R

units and multiple processors is extendable to the network switch box or network switch boxes that form a local, wide area, Virtual private network or connect to the Internet.

[0033] Server C controls the communication protocols in conjunction with the network switching box or other devices, such as CT/MD 502. The multiple processors 506 allow for parallel and custom processing of each signal or data stream to achieve higher speed and better quality of output. This can also be done with a single processor that has the parallelism and pipeline capability built in for handling one or more data streams simultaneously. Processor 506 is the complete electronics inclusive of DSP, CPU, memory controller, and other elements essential to process various types of signals. These can be defined as, for example, either single chip or multichip solutions. The processor contained within the CT/MD 502 is further capable of delivering the required outputs to a number of different ports such as optical, USB, cable and others such as 1202 to 1210. The CT/MD 502 is also capable of taking different inputs, as well as wireless, for the appropriate processing to be done on these signals within the CT/MD 502 and outputting the desired signal on a designated port or ports. Thus the CT/MD 502 has universal connectivity in addition to having a wide range of functionality made possible through the features of multiple antennas, multiple T/R units 504 and processors 506 in this invention. These features may also exist in a network switch box, such as network switch box 552.

[0034] FIG. 5B illustrates a wide band network switch box system 550 that is capable of operating in a number of network environments sequentially or simultaneously. The network switch box is configured with multiple processors, multiple antennas and multiple T/R units that can be multiplexed to process incoming and outgoing wireless signals. In addition to wireless signals there is a need to process other types of input/output signals such as optical, cable, USB etc. to fully interface with other types of devices and networks. The network switch box is

normally a fixed part of a network, whereas the CT/MD is portable. However, the network switch box may be portable and may be used in the wireless mode only in a wireless network or it may also be connected to one or more networks by wired and wireless means to fully leverage all the input/output ports.

5           **[0035]** In FIG. 5B, network switch box 552 that is limited in quality because of the limitations of wireless may fully leverage the networks, including fibre optic networks, such as by multiple antennas 554 and multiple I/O ports 556. As an example, the ability to view streaming video on a network switch box 552 may be limited by the wireless signal quality due to the need for compression. This is due to transmissions that are inherently impaired in air as  
10           opposed to fibre optic cable. A prior art network switch box while in the mobile mode may receive video of poorer quality. The network switch box 552, when at home or in the office, could be easily connected to the optical network directly or through I/O ports 556, such as by a cradle adapter. In this mode the best data, video or audio quality can be received using the same unit. This provides the network switch box 552 single unit to have universal applications since it  
15           can sequentially or simultaneously communicate optimally with other systems and networks to deliver quality/performance and speed tailored for each application.

**[0036]** The network switch box 552 as disclosed above executes substantially the same function as the CT/MD 502. However, the network switch box 552 operates at a network system level capable of coordinating the operations of a number of mobile and other devices in one or  
20           more networks, while the CT/MD 502 performs at a personal level.

**[0037]** FIG. 6 is an embodiment of the present invention showing a wired interface system 600 for wireless or non-wireless devices. In FIG. 6, a wireless device, CT/MD 602 with I/O ports 610 and CT/MD 612 with the ability to interface through a cradle adapter 604 having

both wireless and wired connections 606 interfacing with multiple input/output (I/O) ports 608 is shown. One, all, or some of the connections may be used simultaneously or sequentially for combining multiple data paths into a single path. Whether to combine all the paths into a single data channel or use separate data channels for simultaneous operations will be based on the needs of the application. Examples of inputs/outputs are, for example, standard telephone, coaxial cable, Ethernet, twisted pair, wireless, optical, and USB. In addition to the multiple I/O ports 610 shown on the CT/MD 602 and the ports 608 shown for connecting the CT/MD 612 to cradle adapter 604, the present invention anticipates a universal port and a universal connector. By having the signal path selection done by user defined menu driven software and multiplexing the signals onto a universal input/output port as opposed to the multiple ports 608, 610 or wired connections 606, the desired signals are delivered to the universal port.

[0038] Note that the cradle adapter 604 connection also allows I/O contacts 608 between a non-wireless device (NWD) 613 and a wireless cradle adapter 604 or similar wireless enabling attachment. The enabling attachment can make any non-wireless device (NWD) unit 613 wireless enabled while being plugged into the cradle adapter 604, as shown for CT/MD 612, to access a number of wired, optical or wireless communication paths through the ports 608. The cradle adapter itself may have multiple antennas, multiple T/R units and multiple processors built-in to deliver full functionality. The cradle adapter 604 may also accommodate multiple wired or wireless devices to be plugged in at the same time. The cradle adapter may also contain power ports for the individual devices in addition to the I/O ports. The cradle adapter 604 may be a passive pass through connection enabling device or may have internal electronic smarts to perform certain server functions to control data traffic. Alternately, a Server C located on a LAN, WAN or the Internet can be the control vehicle.

[0039] FIG. 7 is an embodiment of the present invention showing a CT/MD 702 having multiple T/R units internally and with multiple antennas 710 in a communication system 700 connecting to a Server C 706 through a wireless connection 704. Server C 706 then communicates with a network such as the Internet or other path to data such as a local  
5 WAN/LAN line, etc., through connection 708. The multiple T/R units and antennas 710 allow multiple simultaneous communication paths over connection 704 between the CT/MD and the Server C such that the communication rate is increased.

[0040] FIG. 8 is an embodiment of the present invention illustrating the connection of multiple wireless signals to an optical network for connection to a wide area network (WAN) or  
10 local area network (LAN) or to the Internet. In FIG. 8, a CT/MD 802 communicates through internal electronic interfaces, such as an RF/IF module 804 and an AD/DA unit 806 in a T/R block 808 with a processor 810. Processor 810 then provides an electrical signal generated by the T/R block 808 and processed by processor 810 to an optical converter (OC) 812. OC 812 then delivers the optical signal to fibre optic cable 814 for delivery to, for example, a network  
15 such as a WAN/LAN or the Internet.

[0041] This avoids delay in processing the signal and improves quality/performance. Similar conversions can be done by the processor for other input/output protocols or systems such as universal serial bus (USB) or Ethernet either locally or in conjunction with a server such as Server C 706 to receive/deliver input output signals as needed. By extension, the same  
20 features are possible for the network switch box such as network switch box 552.

[0042] Some unique features of the present invention, which apply to either a CT/MD such as CT/MD 802 or to a network switch box such as network switch box 552, are:

Multiple antennas for greater signal range and bandwidth.

Multiple T/R units so that paths or tasks can be paralleled.

Multiple internal signal processors, or one or more processors that execute in parallel.

Multiple built in input/outputs for universal connectivity to different network environments.

5           Capability to interface wired and wireless devices through a cradle adapter to achieve universal connectivity.

Parallel processing of signals and data streams at a system level using hardware and software on a server such as Server C 706.

10           **[0043]** FIG. 9 is an embodiment of the present invention showing a multiple processing system 900. In FIG. 9, computer 902 and computer 908 need to exchange data streams at very fast rates. Having a single channel for T/R with a single antenna or a single processor would cause a limitation in data transfer rates, so multiple channels 912 are provided. Server C 910 polls the tasks by communicating with computer 902 and computer 908, and through computer 902 and computer 908 control the wireless units 904 and 906, such as CT/MDs or wireless  
15           boxes, by optimally allocating channels and transfers of the data. Having multiple channels 912 enhances the data transfer rate compared to a single channel or communication path. Server C 910 oversees the allocation of data to the different channels and keeps the process under control. In addition the multiple channels 912 help overcome the RF to digital electronic conversion rate problem. The rate at which the sampling and conversion takes place is a function of, for  
20           example, the A/D and D/A 806 conversion rates and limitations in the other electronics components such as processor 810. Consequently having the data partitioned by the Server C 910 and assigned to multiple channels 912 enables parallel processing of the communications,

and having parallel processing of wireless data streams where the data streams coexist, as in the present invention, increases the data transfer rate.

[0044] FIG. 10 is an embodiment of the present invention showing a data system 1000 with three data streams DS1 1002, DS2 1004 and DS3 1006. In FIG. 10, three wireless T/R units 1008, 1010, and 1012 are shown. The three data streams 1002, 1004, and 1006 are processed by the three T/R units 1008, 1010 and 1012, converted by converters 1014, 1016, and 1018, and presented to processors 1020, 1022, and 1024 under the control of controller 1026. The data streams may be interfaced separately with server C 1030 or combined into data stream 1028 and interfaced to Server C 1030. The processor or CPU speed is seldom a limiting factor, so the improvement in speed by providing multiple data paths is fully realized by the present invention. Each subtask being processed can be assigned to a separate channel. The rate at which the data is acquired, processed and converted is dependent on the type of electronic components. Therefore, component limitations can be overcome in a straightforward and convenient way by parallel processing. In such cases, the processor speed is seldom a limitation, and conversion speed of RF to electrical and electrical to RF, becomes the primary bottleneck in data transfers for wireless systems. By providing, for example, a single chip, multichip, or hybrid converter for parallel conversions in accordance with the present invention under the supervision of the Server C 910, this bottleneck is avoided. Each channel may be sampled and clocked individually as necessary to optimally process each data stream and combine the individual data packets.

[0045] FIG. 11 is an embodiment of the present invention showing a data system 1100 with three data streams DS1 1102, DS2 1104 and DS3 1106. In FIG. 11, three fibre optic channel units 1108, 1110, and 1112 are shown. The three data streams 1102, 1104, and 1106 are processed by the three fibre optic channel units 1108, 1110 and 1112, converted by converters

1114, 1116, and 1118, and presented to processors 1120, 1122, and 1124 under the control of controller 1126. The data streams are combined into data stream 1128 and interfaced to Server C 1130. The processor or CPU speed is seldom a limiting factor, and can be overcome by providing multiple processors as shown, including for Server C 1130, so the improvement in speed is fully realized by the present invention. Each subtask being processed can be assigned to a separate optical fibre optic channel. The rate at which the data is acquired, processed and converted is limited by the components used for conversion of optical to electrical and electrical to optical signals. Therefore, component limitations can be overcome in a straightforward and convenient way by parallel processing. This can be especially important with fibre optic transmissions, where fibre optic to electrical and electrical to fibre optic conversions can create significant communications limitations. In such cases, the processor speed is seldom a limitation or can be overcome with parallel processors, and conversion speed becomes the primary bottleneck in data transfers for optical systems. As discussed before, by providing, for example, a single chip, multichip, or hybrid converter for parallel conversions in accordance with the present invention under the supervision of a Server C, such as Server C 1130, the fibre optic channel conversion bottleneck is avoided.

[0046] FIG. 12 is an embodiment of the present invention showing a Virtual Private Network (VPN) communication path 1200. In FIG. 12, multiple communications channels such as USB 1202, telephone 1204, cable 1206, fibre optic channel 1208, and wireless 1210 are all employed to communicate data relating to tasks and subtasks from data path 1212, such as from Server C 1130, to data path 1214. Data path 1214 may be connected to, for example, another Server C 1030 or similarly. The result is that multiple communication environments are enabled by the data paths 1200, the environments having, for example, devices such as multiple CT/MDs,



network switch boxes, and combinations for forming a VPN, such as VPN 1302. This is true even where the individual units belong to another VPN. The VPN, such as VPN 1302, or several VPNs, such as VPNs 1300, can be under the control of a single or multiple Server C, such as Server C 1130, machines. Each device in a VPN such as VPN 1300 may operate wireless or  
5 wired devices such as the devices in VPN 1302 connected to other wired or wireless networks, including fibre optic channel networks. The devices in a VPN, such as VPN 1302 of the present invention can be multiplexed or multitasked by a Server C, such as Server C 1130. This allows many such devices to be under the supervision and control of a Server C 1130 or multiple Server C machines such as Server C 1030, 1130.

10 [0047] FIG. 13 is an embodiment of the present invention showing how Virtual Private Network or Networks (VPN) system 1300 may be provided. In FIG. 13, VPN 1302, 1306, and 1310 are connected through a wide area network (WAN) or local area network (LAN) to wireless network 1304, optical network, such as a fibre optic channel 1308, and cable network 1312. Other networks could be used as well, the embodiment is not intended to restrict the  
15 present invention. All the VPNs such as VPN 1302 and optionally the connections may be under the supervision of a Server C 1314 or many servers. VPN 1302 is shown with a network switch box 1316, server 1318, and a CT/MD 1320, which allows multipath communication through the network switch box 1316 to server 1318. This allows communication from/to the network switch box or from/to an outside source, such as a CT/MD service provider, to CT/MD 1320.  
20 The CT/MD 1320 can communicate simultaneously with the network switch box 1316 and an outside source as well.

[0048] VPN 1306 shows network switch box 1322 communicating with a server 1324 and optionally with CT/MD 1326. As shown, the VPN 1302 and the VPN 1306 operate in

parallel, and may both be under the supervision and control of server 1314, which acts as a sort of executive level supervisor.

[0049] VPN 1310 shows network switch box 1328 and server 1330, with both CT/MD 1332 and CT/MD 1334 in the VPN 1310. Network box 1328 may communicate with either or both CT/MD 1332 and 1334, and CT/MD 1332 and CT/MD 1334 may intercommunicate as well. VPN 1310 may also be under the supervision and control of server 1314. The server 1314 may also control and supervise VPN 1302 and 1306.

[0050] The present invention includes the following features:

[0051] (1) A cellular telephone/mobile device (CT/MD) with two or more antennas as opposed to the current state of the art in a single antenna system. Each antenna may be specifically designed for a specific frequency or application or may be multiplexed for different uses.

[0052] (2) A CT/MD with two or more transmit/receive (T/R) units as opposed to the prior art single T/R unit. Each T/R unit in the CT/MD may be designed for a specific frequency or application or may be multiplexed for different uses.

[0053] (3) A CT/MD with two or more processor units (or a single processor unit with built in parallelism to execute same, different and or custom applications) as opposed to the prior art of a single processor unit. Each processor unit in the CT/MD may be designed for a specific application or may be multiplexed for different uses. As an example one processor may be specifically designed to handle voice, another for data, another for high quality audio and yet another for streaming video.

[0054] (4) A CT/MD that has multiple input/output ports as opposed to a single input/output (I/O) port as in the prior art. The CT/MD may have a universal serial bus (USB)

port, a coaxial cable port, a standard telephone (POTS) port, a twisted pair port, Ethernet port, and most importantly an optical port. The CT/MD thus can fully interface and interact with different environments sequentially or simultaneously. The feature is more than one port being available with variations in the number of ports (I/O) from one to N.

5           **[0055]** (5) A network switch box with two or more antennas as opposed to the prior art of a single antenna system. Each antenna may be specifically designed for an assigned frequency or application or may be multiplexed for different uses.

**[0056]** (6) A network switch box with two or more T/R units within it as opposed to the prior art of a single T/R unit. Each T/R unit may be designed for an assigned frequency or  
10 application or may be multiplexed for different uses.

**[0057]** (7) A network switch box with two or more processor units (or a single processor unit with built in parallelism to execute same, different and or custom applications) as opposed to the prior art of a single processor unit. Each processor unit in the network box may be designed for a specific application or may be multiplexed for different uses. As an example one processor  
15 may be specifically designed to handle voice, another for data, another for high quality audio and yet another for streaming video.

**[0058]** (8) A network switch box has multiple input/output ports as opposed to a single input/output (I/O) port as in the prior art. The network switch box may have a universal serial bus (USB) port, a coaxial cable port, a standard telephone (POTS) port, a twisted pair port,  
20 Ethernet port, and most importantly an optical port. The network switch box thus can fully interface and interact with different environments sequentially or simultaneously. The feature is more than one port being available with variations in the number of ports (I/O) from one to N.

[0059] (9) The ability to use the same CT/MD in different environments and applications and the ability to quickly interface to various inputs and outputs by a quick and easy plug in method into a receptacle or socket or by wired or wireless means such as a docking station.

5 [0060] (10) The ability to use the same network switch box in different environments and applications and the ability to quickly interface to various inputs and outputs by a quick and easy plug in method into a receptacle or socket or by wired or wireless means such as a docking station.

10 [0061] (11) The CT/MD and the network switch box may be used for communication, control, command, compute, entertainment, gaming, or other applications that may be defined in the future for both wireless and wired equipment.

[0062] (12) The unique feature that allows one or more antennas, one or more T/R units, one or more processors and one or more input/outputs to coexist in totality or as subsets of any combination of the above in one single CT/MD or a network switch box.

15 [0063] (13) The feature described in item 10 above and this invention allows parallel processing of the signals and data streams through the antennas, through the T/R units, through the multiple processors and through the I/O. This allows the present invention to achieve faster data rates with flexible connections for making multiple applications sequentially or simultaneously available using the same CT/MD or network switch box. As an example, video, audio and other uses can be accessed simultaneously with performance optimized for each  
20 through dedicated or multiplexed antenna paths, T/R paths, through multiple processors and I/O paths.

[0064] (14) The internal electronics of a CT/MD or a network switch box other than the antenna, T/R and I/O may be shared or separate. For example, the processor, memory, etc. may be common or may be separate as defined by the application, cost, and site, etc.

5 [0065] (15) The ability to have an internal IP based web server function within the CT/MD and the network switch box or an external server C connected by wired or wireless means to keep track of all the communication protocols within the unit and with the outside world and other units.

[0066] (16) The electronics that converts wireless to optical signals directly, to efficiently interface wireless and optical signals and systems without intermediate transport.

10 [0067] (17) The ability to process in parallel signals derived from optical signals such as at a much higher frequency.

[0068] (18) The attachment that makes a non-wireless device fully wireless (see figure 6).

15 [0069] (19) The ability to form many concentric/overlying networks and have the CT/MD exist in one or more wired or wireless networks simultaneously. Thus one single CT/MD can, at the same time, be part of one or more wired or wireless VPN (virtual private networks) or of a public network. Thus a mixed network, a mixed VPN, is dynamically made possible under the supervision of server C. In this mixed VPN one or more network boxes from different networks, different CT/MDs and base stations coexist in a new virtual network. All of these VPNs, mixed VPNs and public networks being accessible by the CT/MD through the  
20 supervision of the central server C located on a LAN, WAN, or the Internet.

[0070] (20) The ability for a CT/MD to communicate with one or more CT/MDs and other wired or wireless devices in one or more VPNs and public networks directly allowing for paging and data transmission and communication between one or more CT/MDs. This is

accomplished with all the VPNs being under the control of Server C located on a LAN, WAN or the Internet.

[0071] (21) The network box may also operate as a wireless base station, with the characteristics enumerated for the network box, such as multiple antennas, multiple T/R units, multiple processors and multiple I/O ports. The base station may receive inputs from one type of network and transmit to another type of network seamlessly. For example, an optical network input may be transmitted as a wireless RF output over the wireless network. In reverse the wireless input to base station may be seamlessly converted into optical output for transmission over an optical network.

[0072] (22) In either the base station configuration or the network box configuration, the units have the ability to take optical data and multiplex the data for wireless transmission over one or more channels, at one or more frequencies and power levels. The base station, the network box or the CT/MD may use one or more transmission protocols as deemed optimal and appropriate by the local server C or the super server C located in a LAN, WAN or the Internet.

Thus the base station unit, the network box and the CT/MD determines the required frequency spectrum, other wireless parameters such as power and signal to noise ratio to optimally transmit the data. In addition the units have the ability to multiplex between one or more transmission protocols such as CDMA, TDMA to ensure that the fast data rates of the optical network or matched closely in a wireless network to minimize the potential data transmission speed degradation of a wireless network. As an example, the data path between two optical networks may involve a wireless hop due to physical constraints. In such a case the wireless hop transmission speed is likely to be a bottleneck. The base station or the network box, configured as described in the present invention at the hardware level offers universal functionality. In

addition the software capability that is resident internally to the unit, at the local server C level or network server C level, is capable of dynamically determining a number of factors for best data transfer. As an example, the unit can determine the best transmission frequencies and protocols, determine the best error correction and channel coding algorithms and multiplexes the  
5 transmission paths and tasks. Thus it is possible that various optical and wireless protocols can co-exist in a network.

[0073] (23) The network box or network boxes may also be used to configure a predominantly optical network that has wireless capability as an adjunct or a predominantly wireless network that has optical capability as an adjunct. Other combinations are possible by  
10 extension with or without multiplexing. The optical to wireless multiplexer, can be part of a wireless ethernet or optical ethernet. Similarly other types of conversion and transmission multiplexers could be defined to be incorporated into the CT/MD, the network box or the base station to optimally and seamlessly transfer data between networks or within a network.

[0074] The foregoing descriptions of specific embodiments of the present invention have  
15 been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and it should be understood that many modifications and variations are possible in light of the above teaching. The embodiments were chosen and described in order to best explain the principles of the present invention and its practical application, to thereby enable others skilled in the art to best utilize the present invention and  
20 various embodiments, with various modifications, as are suited to the particular use contemplated. It is intended that the scope of the invention be defined by the Claims appended hereto and their equivalents.

WHAT IS CLAIMED IS:

1. An Internet-enabled mobile communication device comprising:
- 5 a memory;
- at least two or more antennas;
- at least one or more processors; and
- a plurality of wireless transmit and receive components including a first wireless transmit and receive component and a second wireless transmit and receive component, wherein
- 10 each wireless transmit receive component is configured to communicate using one or more protocols;
- wherein the device is configured for multi-band wireless communication;
- wherein the device is enabled for communication using Internet Protocol (IP);
- wherein the device is enabled for wireless communication on a wireless local area
- 15 network;
- wherein the first wireless transmit and receive component is configured to communicate using a plurality of antennas; and
- wherein a transmission interface is created and wherein said transmission interface uses a plurality of IP enabled interfaces on the mobile device which utilize the plurality
- 20 of wireless transmit and receive components on the mobile device to enable a single interface comprised of multiplexed signals from the plurality of wireless transmit and receive components;



and wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server.

5                   2. The device of Claim 1, wherein a single transmission connection is further comprised of at least two or more wireless transmit and receive connections simultaneously transmitting and receiving using the plurality of antennas, and wherein the processor multiplexes the receiving signals into the single transmission connection.

10                   3. The device of Claim 1, wherein a single transmission connection is further comprised of at least two or more wireless transmit and receive connections sequentially transmitting and receiving using the plurality of antennas, and wherein the processor multiplexes the receiving signals into the single transmission connection.

15                   4. The device of Claim 1, wherein the device is configured to communicate with at least one server, wherein the rate at which data is transferred between the device and the server is improved by parallel paths and wherein data transmitted and received is multiplexed at each end.

20                   5. The device of Claim 2 wherein the mobile device transmits and receives multiple IP data packets and uses protocols including ethernet protocol, USB protocol, internet protocol, transmission control protocol, wifi, VPN, transport layer communication protocols, or application interfaces.

6. The device of Claim 1, wherein the first wireless transmit and receive component is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive component is configured to communicate with the same or different remote system using a second network path and wherein the processor on the mobile device is configured to combine the data paths into a single transmission interface to one or more applications on the mobile device.

7. The device of Claim 6, wherein the device is comprised of a cellular telephone.

8. The device of Claim 7, wherein the device is configured to use a Virtual Private Network (VPN).

9. The device of Claim 8, wherein the use of two or more wireless transmit and receive units create connections to a plurality of remote systems simultaneously and transmit and receive data in a parallel path to increase the rate at which data is transferred.

10. The device of Claim 9, wherein multiple wireless transmit and receive components are presented to the application as a single connection interface such that the multiple transmission interfaces are virtualized into a single transmission interface.

11. The device of Claim 1, wherein an application executed by the processor on the mobile device is configured to use a single transport connect interface comprised of two or more wireless connections.

5                   12. The device of Claim 1, further in communication with a network box, which is configured with a plurality of antennas and a wireless transmit and receive component, wherein the network switch box wireless transmit and receive component is configured to communicate a signal stream using the network switch box plurality of antennas simultaneously.

10                   13. The device of Claim 1, further comprising of a processor for voice communication and a second processor for data communication.

14. An Internet-enabled mobile communication device comprising:  
a memory;  
15                   a display;  
at least two or more antennas;  
at least one or more processors; and  
a plurality of wireless transmit and receive components including a first wireless transmit and receive component and a second wireless transmit and receive component, wherein  
20                   each wireless transmit receive component is configured to communicate using one or more protocols;  
wherein the device is enabled for communication using Internet Protocol (IP);

wherein the device is enabled for wireless communication on a wireless local area network;

wherein the first wireless transmit and receive component is enabled to communicate using one or more antennas simultaneously; and

5 wherein the mobile device maintains multiple IP addresses, wherein the first wireless component is accessible on a first IP address and the second wireless transmit and receive component is accessible on a second IP address and wherein the mobile device operates using a plurality of ports;

10 and wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server;

and wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server.

15

15. The device of Claim 14, further in communication with a server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple  
20 simultaneous communication paths over connections between the device and the server such that the communication rate between the server and device is increased.

16. The device of Claim 14, wherein the device is configured for a plurality of protocols including transmission control, CDMA, TDMA, internet protocol (IP) and/or combinations thereof.

5                   17. A mobile communication device, comprising:  
a memory;  
at least two or more antennas;  
at least one or more processors; and  
a plurality of wireless transmit and receive unit including a first wireless transmit  
10 and receive unit and a second wireless transmit and receive unit, wherein each wireless transmit  
receive unit is configured to communicate using one or more protocols;  
wherein the device is configured for multi-band wireless communication;  
wherein the device is enabled for communication using Internet Protocol (IP);  
wherein the device is enabled for wireless communication on a local area  
15 network;  
wherein the first wireless transmit and receive ~~component~~ unit is configured to  
communicate using a plurality of antennas; and  
wherein the first wireless transmit and receive component is configured to  
communicate over Internet Protocol with a remote system over a first network path and the  
20 second wireless transmit and receive component is configured to communicate with the same or  
a different remote system using a second network path and wherein the processor on the mobile  
device is configured to combine the data paths into a single transmission interface to one or more  
applications on the mobile device;

and wherein data transferred by the plurality of transmit and receive components is improved by the simultaneous use of multiple network paths including at least one connection to a networked server.

5

18. The communication device of Claim 17, wherein each of the plurality of communication paths employs a different network.

10

19. The communication device of Claim 18, wherein at least one of the different networks comprises a voice network and wherein at least one of the different networks comprises an Internet protocol data network.

15

20. The communication device of Claim 17, wherein each of the plurality of communication paths employs a different communication protocol and wherein each of the plurality of communication paths involves wireless signals transmitted at a different frequency.

20

21. The communication device of Claim 17, wherein one of the plurality of communication paths is used for wireless signals representing voice data, and another of the plurality of communication paths is used for wireless signals representing non-voice data.

22. The communication device of Claim 17, wherein the one or more communication modules comprises a plurality of communication modules, each of the plurality of communication modules being configured for communication via a different communication

path and wherein the one or more communication modules comprises a plurality of communication modules each comprising a separate antenna.

23. The communication device of Claim 17, wherein the one or more processors  
5 are programmed to differentiate between wireless signals received via one of the plurality of communication paths and another of the plurality of communication paths.

24. The communication device of Claim 23, wherein one or more processors are  
10 programmed to process data represented by wireless signals received via the one communication path separately from data represented by wireless signals received via the other communication path.

25. The communication device of Claim 24, wherein the one or more processors  
15 comprise a plurality of processors, a first processor of the plurality of processors being programmed to process data represented by wireless signals received via the one communication path, and a second processor of the plurality of processors being programmed to process data represented by wireless signals received via the other communication path.

26. The communication device of Claim 17, wherein the one or more processors  
20 are programmed to process voice data represented by wireless signals received via one of the plurality of communication paths, and to process non-voice data represented by wireless signals received via another of the plurality of communication paths.

27. An IP-enabled communication device comprising:

a memory;

one or more processors;

5 a plurality of wireless communication components, wherein the device supports a plurality of transmit and receive frequencies and a plurality of wireless protocols;

wherein a first wireless communication component is coupled to a first set of antennas configured to transmit and receive on a first network and wherein a second wireless communication component is coupled to a second set of antennas and configured to transmit and receive on a second network;

10 wherein the at least one wireless communication component is configured for radio frequency communication;

wherein the first wireless communication component is configured to operate at a lower frequency than the second wireless communication component such that the first and second wireless communication components operate as complementary systems and reduce interference with each other; and

15 wherein the device is configured for voice and/or data connectivity and Internet connectivity; and

20 wherein the first wireless transmit and receive unit operates on the first network path to a remote server and the second wireless transmit and receive unit communicates to the remote server on the second network path in response to a change in the signal strength and/or connectivity of the first wireless communication unit or second wireless communication unit.



28. The device of Claim 27, further in communication with the remote server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server.

5

29. The device of Claim 27, further in communication with the remote server, wherein the mobile device is configured to receive multiple IP data packets on a plurality of ports at substantially the same time and send multiple data packets to the server, to allow multiple simultaneous communication paths over connections between the device and the server.

10

30. The device of Claim 29, wherein the IP enabled communication device is a mobile device, and wherein the mobile device is configured as a server and wherein the mobile device is configured to transmit and receive a signal stream with a second mobile device.

15

ABSTRACT OF THE INVENTION

A method and apparatus in which multiple Internet Protocol (IP) based wireless data transmissions are simultaneously provided between a wireless device and a server, including providing multiple antennas, multiple T/R units, multiple processors and multiple I/O ports on the wireless device. The method includes receiving multiple IP data packets on the I/O ports at substantially the same time, and sending multiple data packets from the wireless device to the server, whereby the transmission rate between the wireless device and the server is increased.

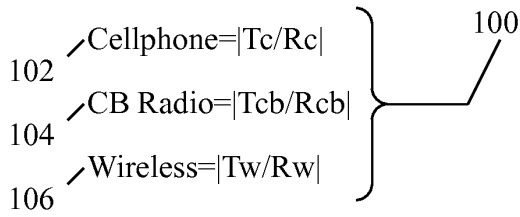


FIG. 1A  
-Prior Art-

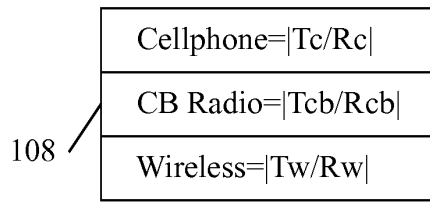


FIG. 1B

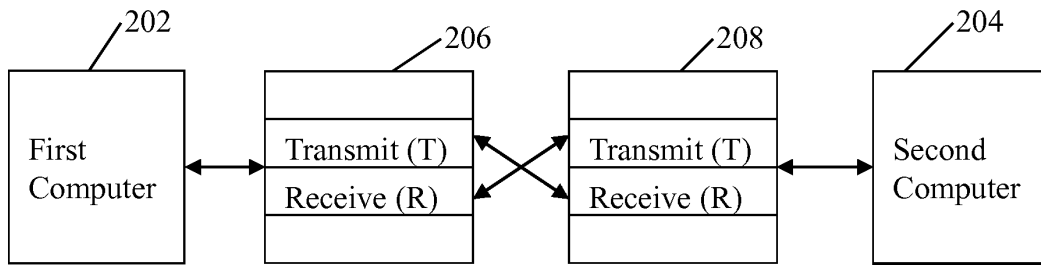


FIG. 2

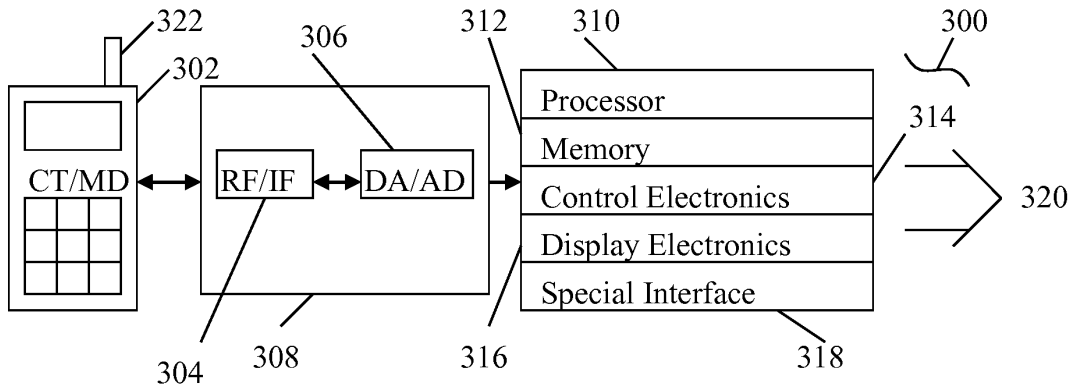


FIG. 3  
-Prior Art-

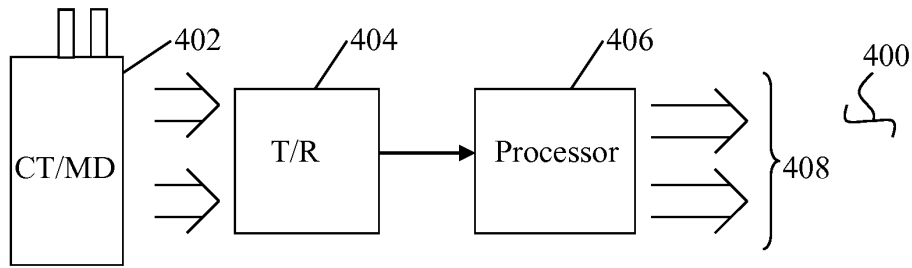


FIG. 4

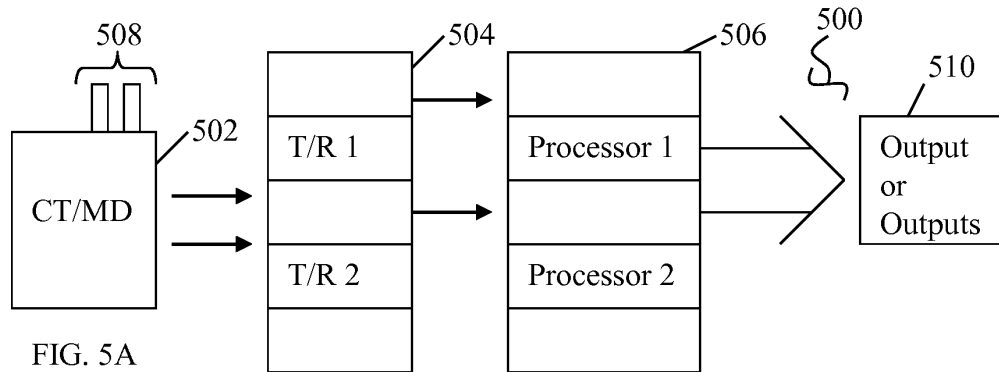


FIG. 5A

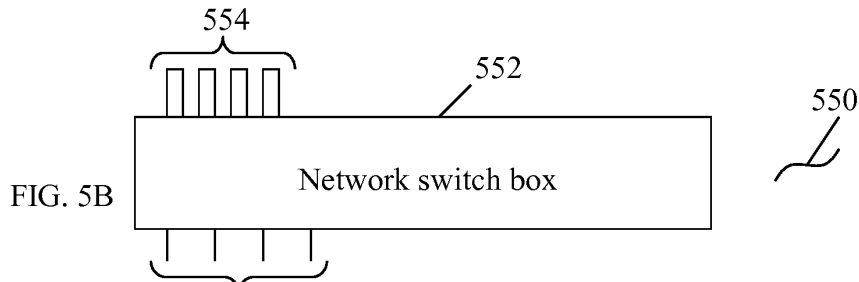


FIG. 5B

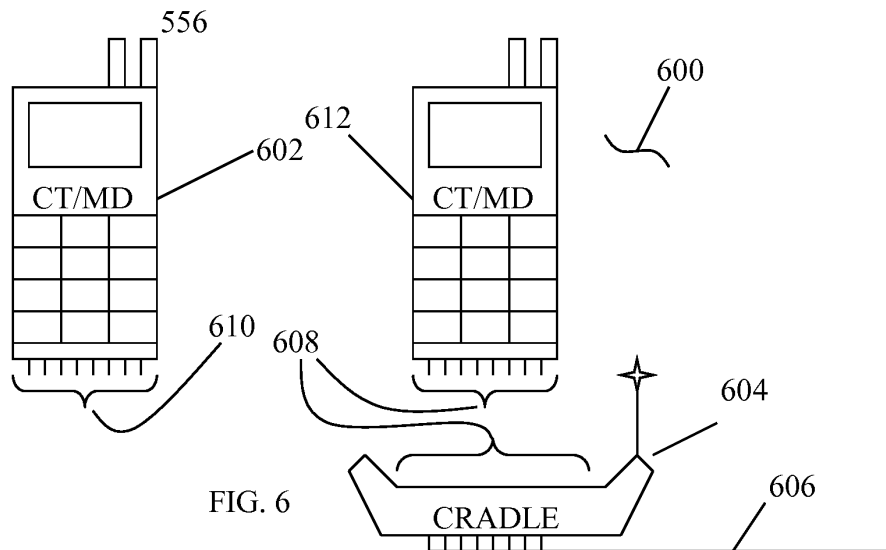
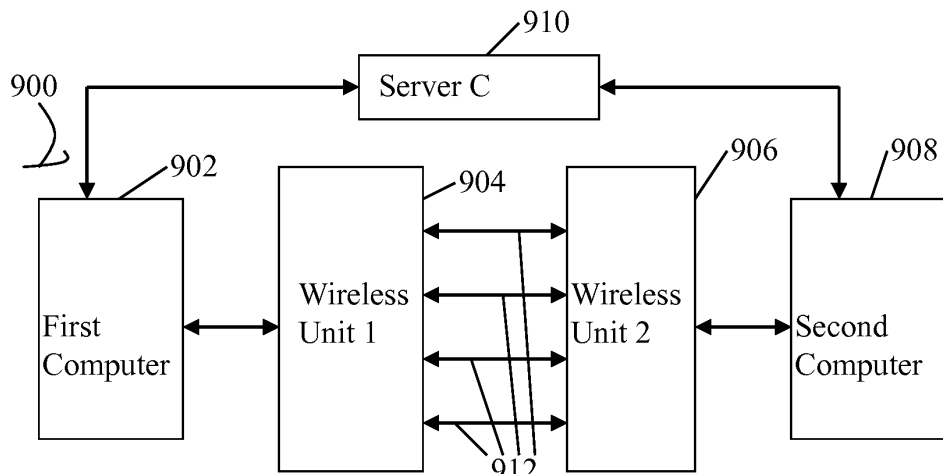
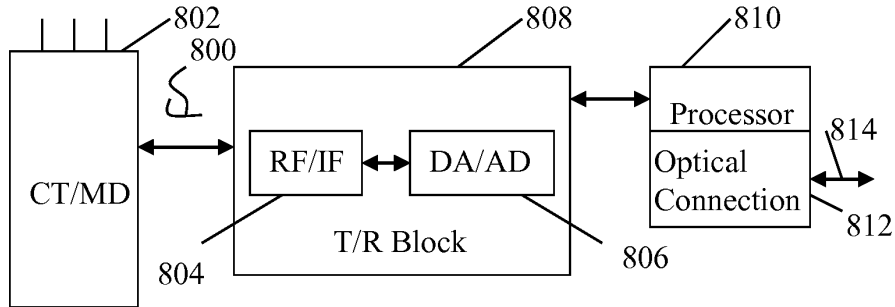
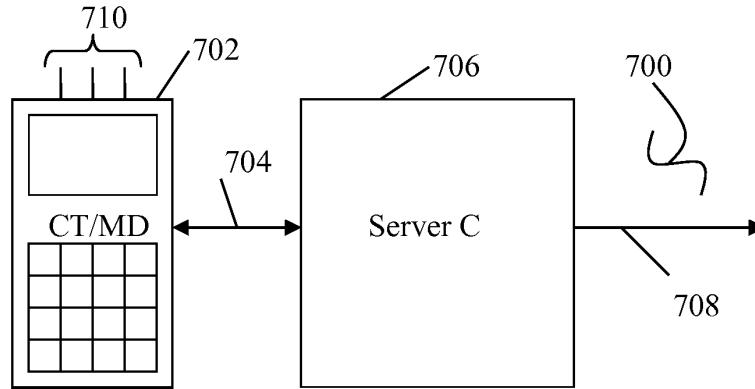


FIG. 6



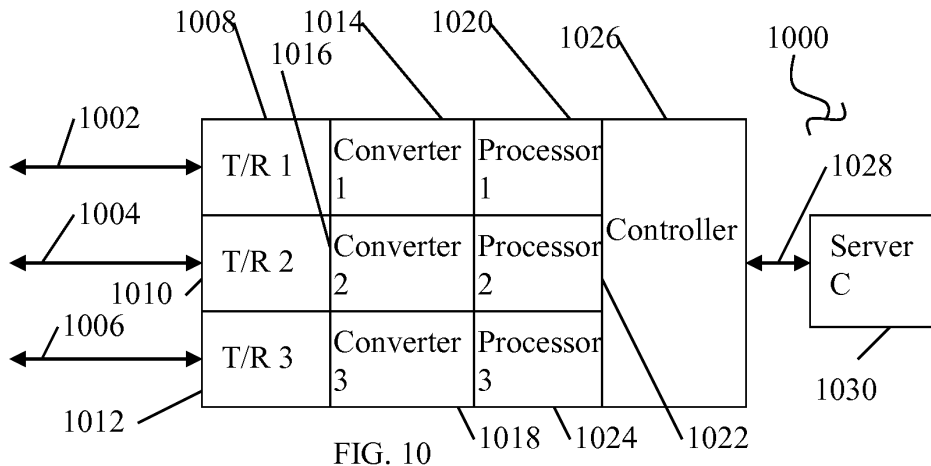


FIG. 10

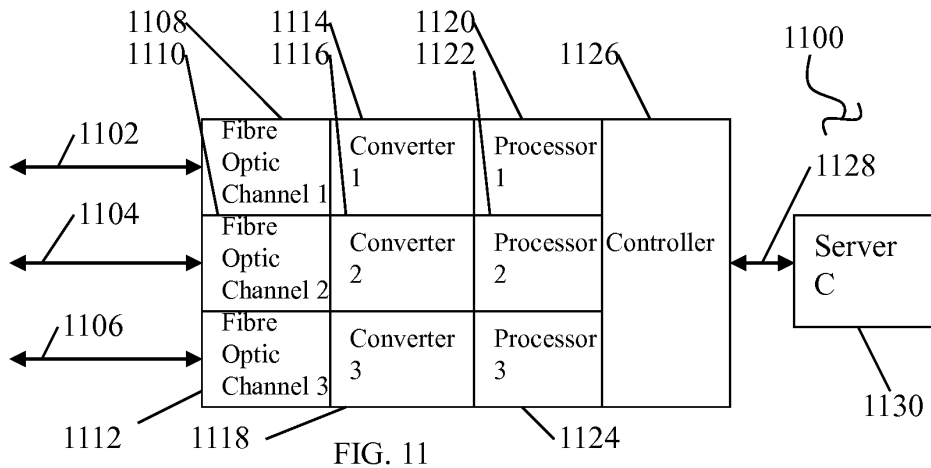


FIG. 11

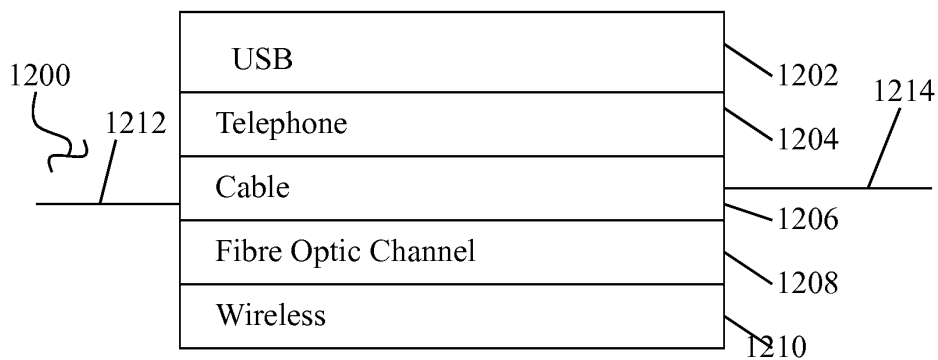


FIG. 12

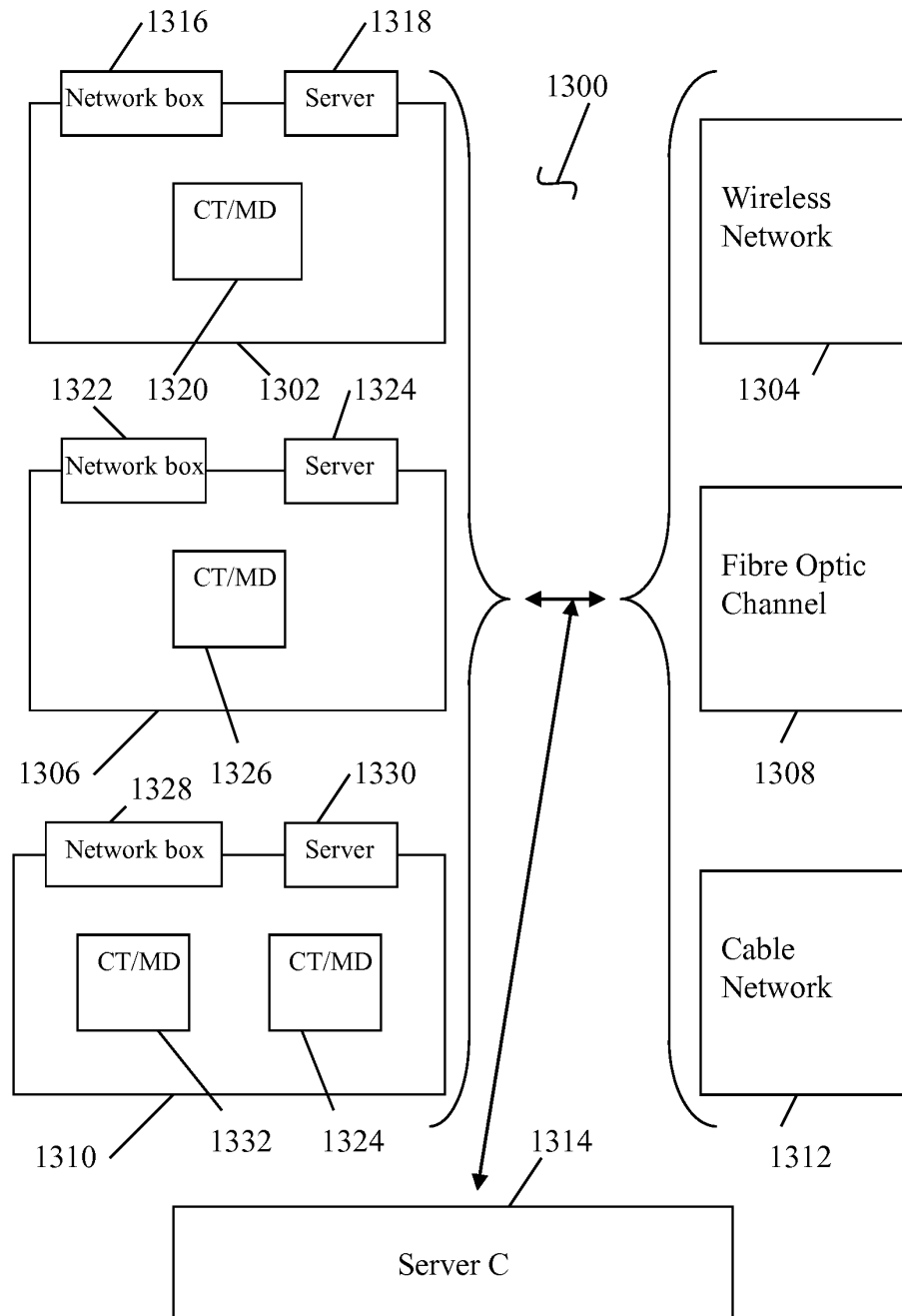


FIG. 13

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application No.: Not Yet Assigned  
Confirmation No.: Not Yet Assigned  
Filing Date: Concurrently Herewith  
Inventor(s): Raman K. RAO et al.  
Title: WIRELESS DEVICES WITH TRANSMISSION CONTROL AND  
MULTIPLE PATHS OF COMMUNICATION  
Examiner: Phirin Sam  
Group Art Unit: 2476

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This application is a continuation under 37 C.F.R. 1.53 (b) of U.S. Patent Application 14/139817.

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

**Transmittal of New Application**

Examiner:

This application is being filed as a small entity, together with a Request for Non Publication, and a Request for a Track 1 Prioritized Examination. The following fees are being paid upon filing:

- Basic Filing Fee: \$70
- Utility Search Fee: \$300
- Examination Fee: \$360



- Track 1 Prioritized Examination Fee: \$2000
- Claims in Excess of 20: \$400
- Independent Claim in excess of 3: \$210
- Processing Fee: \$70
- Publication Fee: \$300 (listed under petition fees)
- Total: \$3710

Because the application will not be published, a refund is requested for the publication fee. Should it be determined that any additional fees should be reclassified for processing of this application for prioritized examination (Track 1), the Director is hereby authorized to charge the full amount of \$3710 as paid in full at the time of filing.

Respectfully submitted,

/Sanjay K. Rao/  
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Sanjay Rao

/Rekha K. Rao/  
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Rekha K. Rao

/Sunil K. Rao/  
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Sunil K. Rao

## Electronic Patent Application Fee Transmittal

|   |  |                 |               |                             |
|---|--|-----------------|---------------|-----------------------------|
| <b>Application Number:</b>  |  |                 |               |                             |
| <b>Filing Date:</b>   |  |                 |               |                             |
| <b>Title of Invention:</b>  | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |                 |               |                             |
| <b>First Named Inventor/Applicant Name:</b>   | Raman K Rao  |                 |               |                             |
| <b>Filer:</b>   | Rekha Kaliputnam Rao/Sanjay Rao  |                 |               |                             |
| <b>Attorney Docket Number:</b>  | HMTRM1   |                 |               |                             |
| Filed as Small Entity   |  |                 |               |                             |
| <b>Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a) Filing Fees</b> |  |                 |               |                             |
| <b>Description</b>  | <b>Fee Code</b>  | <b>Quantity</b> | <b>Amount</b> | <b>Sub-Total in USD(\$)</b> |
| <b>Basic Filing:</b>  |  |                 |               |                             |
| Utility filing Fee (Electronic filing)  | 4011   | 1               | 70            | 70                          |
| Utility Search Fee  | 2111   | 1               | 300           | 300                         |
| Utility Examination Fee   | 2311   | 1               | 360           | 360                         |
| Request for Prioritized Examination   | 2817   | 1               | 2000          | 2000                        |
| <b>Pages:</b>   |  |                 |               |                             |
| <b>Claims:</b>  |  |                 |               |                             |
| Claims in excess of 20  | 2202   | 10              | 40            | 400                         |
| Independent Claims in Excess of 3   | 2201   | 1               | 210           | 210                         |

| Description                              | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|--|----------|----------|--------|----------------------|
| <b>Miscellaneous-Filing:</b>             |          |          |        |                      |
| Publ. Fee- Early, Voluntary, or Normal   | 1504     | 1        | 0      | 0                    |
| PROCESSING FEE, EXCEPT PROV. APPLS.      | 2830     | 1        | 70     | 70                   |
| <b>Petition:</b>                         |          |          |        |                      |
| Petition Fee - 37 CFR 1.17(F)(Group I)   | 2462     | 1        | 200    | 200                  |
| Petition Fee-37CFR 1.17(g)(GroupII)      | 2463     | 1        | 100    | 100                  |
| <b>Patent-Appeals-and-Interference:</b>  |          |          |        |                      |
| <b>Post-Allowance-and-Post-Issuance:</b> |          |          |        |                      |
| <b>Extension-of-Time:</b>                |          |          |        |                      |
| <b>Miscellaneous:</b>                    |          |          |        |                      |
| <b>Total in USD (\$)</b>                 |          |          |        | <b>3710</b>          |

## Electronic Acknowledgement Receipt

|   |  |
|---|--|
| <b>EFS ID:</b>                              | 20080603   |
| <b>Application Number:</b>                  | 14480584   |
| <b>International Application Number:</b>    |  |
| <b>Confirmation Number:</b>                 | 5617   |
| <b>Title of Invention:</b>                  | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |
| <b>First Named Inventor/Applicant Name:</b> | Raman K Rao  |
| <b>Customer Number:</b>                     | 105481   |
| <b>Filer:</b>                               | Rekha Kaliputnam Rao/Sanjay Rao  |
| <b>Filer Authorized By:</b>                 | Rekha Kaliputnam Rao   |
| <b>Attorney Docket Number:</b>              | HMTRM1   |
| <b>Receipt Date:</b>                        | 08-SEP-2014  |
| <b>Filing Date:</b>                         |  |
| <b>Time Stamp:</b>                          | 22:08:59   |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)  |

### Payment information:

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| Submitted with Payment                   | yes         |
| Payment Type                             | Credit Card |
| Payment was successfully received in RAM | \$3710      |
| RAM confirmation Number                  | 8061        |
| Deposit Account                          |             |
| Authorized User                          |             |

### File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/<br>Message Digest | Multi Part /.zip | Pages (if appl.) |
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| <b>Warnings:</b>    |  |                     |  |    |   |
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| 2                   | TrackOne Request                       | sb0424_SR.pdf       | 140501                                   | no | 2 |
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| <b>Warnings:</b>    |  |                     |  |    |   |
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| 4                   | Nonpublication request from applicant. | sb0035_nonpub_1.pdf | 233320                                   | no | 2 |
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| 5                   | Nonpublication request from applicant. | sb0035_nonpub_3.pdf | 233309                                   | no | 2 |
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| 6                   | Nonpublication request from applicant. | sb0035_nonpub_2.pdf | 233334                                   | no | 2 |
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| <b>Warnings:</b>    |  |                     |  |    |   |
| <b>Information:</b> |  |                     |  |    |   |
| 7                   | Oath or Declaration filed              | aia0002.pdf         | 204214                                   | no | 3 |
|                     |  |                     | b803b1e4f01f472739b8769692089225edf8e8b  |    |   |
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| 8                   | Oath or Declaration filed              | aia0001_RR.pdf      | 164915                                   | no | 2 |
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| 10   | Oath or Declaration filed                      | aia0001_SR1.pdf                  | 164979<br>57b62e85aad6c9cb2382ed6fa9da1373c18ed73   | no  | 2  |
| <b>Warnings:</b>   |  |                                  |   |     |    |
| <b>Information:</b>  |  |                                  |   |     |    |
| 11   | Assignee showing of ownership per 37 CFR 3.73. | HMTRM1_Assignment.pdf            | 117966<br>6f61b9673b585e21af18a743bce5a65974220fd   | no  | 3  |
| <b>Warnings:</b>   |  |                                  |   |     |    |
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| 12   | Transmittal of New Application                 | HMTRM1_patentTransmittalForm.pdf | 321537<br>dc301db63cab53d0160917a9d122787e1f0d0074  | no  | 2  |
| <b>Warnings:</b>   |  |                                  |   |     |    |
| <b>Information:</b>  |  |                                  |   |     |    |
| 13   | Application Data Sheet                         | HMTRM1_ADS.pdf                   | 1566295<br>6ac4cf54ba991c0131cc03dfa9094bca530c53d5 | no  | 11 |
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| <b>Information:</b>  |  |                                  |   |     |    |
| 14   |  | HMTRM1_Specification.pdf         | 232796<br>d14c4ac0a9811b9f18d84acce77d4e0430f09799  | yes | 34 |
| <b>Multipart Description/PDF files in .zip description</b> |  |                                  |   |     |    |
| <b>Document Description</b>                                |  | <b>Start</b>                     | <b>End</b>  |     |    |
| Specification  |  | 1                                | 23  |     |    |
| Claims   |  | 24                               | 33  |     |    |
| Abstract   |  | 34                               | 34  |     |    |
| <b>Warnings:</b>   |  |                                  |   |     |    |
| <b>Information:</b>  |  |                                  |   |     |    |
| 15   | Drawings-only black and white line drawings    | HMTRM1_Drawings.pdf              | 146840<br>16d6db759b224453a40976c05f08e9c37bc4b243  | no  | 5  |
| <b>Warnings:</b>   |  |                                  |   |     |    |
| <b>Information:</b>  |  |                                  |   |     |    |
| 16   | Transmittal of New Application                 | TRANSMITTALLETTER.pdf            | 207074<br>0f6a901499dccc440219d3dfa2de2ab98647040c  | no  | 2  |
| <b>Warnings:</b>   |  |                                  |   |     |    |
| <b>Information:</b>  |  |                                  |   |     |    |

|   |                      |              |  |    |   |
|---|----------------------|--------------|--|----|---|
| 17  | Fee Worksheet (SB06) | fee-info.pdf | 46202<br><small>f274118a89d0459026c0d05f4aa62d7fe290e28f</small> | no | 2 |
| <b>Warnings:</b>  |                      |              |  |    |   |
| <b>Information:</b>   |                      |              |  |    |   |
| <b>Total Files Size (in bytes):</b>   |                      |              | 4459246  |    |   |
| <p><b>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.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/> <b>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.</b></p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/> <b>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.</b></p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/> <b>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.</b></p> |                      |              |  |    |   |

**CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION  
 UNDER 37 CFR 1.102(e) (Page 1 of 1)**

|                       |  |   |                  |
|-----------------------|--|---|------------------|
| First Named Inventor: | Raman K. Rao   | Nonprovisional Application Number (if known): | Not Yet Assigned |
| Title of Invention:   | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |   |                  |

**APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.**

1. The processing fee set forth in 37 CFR 1.17(i), the prioritized examination fee set forth in 37 CFR 1.17(c), and if not already paid, the publication fee set forth in 37 CFR 1.18(d) have been filed with the request. The basic filing fee, search fee, examination fee, and any required excess claims and application size fees are filed with the request or have been already been paid.
2. The application contains or is amended to contain no more than four independent claims and no more than thirty total claims, and no multiple dependent claims.
3. The applicable box is checked below:

**I.  Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)**

- i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.  
 ---OR---  
 (b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.
- ii. An executed oath or declaration under 37 CFR 1.63 is filed with the application.

**II.  Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)**

- i. A request for continued examination has been filed with, or prior to, this form.
- ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
- iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
- iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
- v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

|                                  |                                  |
|----------------------------------|----------------------------------|
| Signature /Sanjay K. Rao/        | Date 09/08/2014                  |
| Name (Print/Typed) Sanjay K. Rao | Practitioner Registration Number |

**Note:** Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required in accordance with 37 CFR 1.33 and 11.18. Please see 37 CFR 1.4(d) for the form of the signature. If necessary, submit multiple forms for more than one signature, see below\*.

\*Total of 3 forms are submitted.



## 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).
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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.

**CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION  
 UNDER 37 CFR 1.102(e) (Page 1 of 1)**

|                       |  |   |                  |
|-----------------------|--|---|------------------|
| First Named Inventor: | Raman K. Rao   | Nonprovisional Application Number (if known): | Not Yet Assigned |
| Title of Invention:   | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |   |                  |

**APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.**

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2. The application contains or is amended to contain no more than four independent claims and no more than thirty total claims, and no multiple dependent claims.
3. The applicable box is checked below:
  - I.  **Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)**
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 ---OR---  
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    - ii. An executed oath or declaration under 37 CFR 1.63 is filed with the application.
  - II.  **Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)**
    - i. A request for continued examination has been filed with, or prior to, this form.
    - ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
    - iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
    - iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
    - v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

|  |                                  |
|--|----------------------------------|
| Signature <u>/Rekha K. Rao/</u>  | Date <u>09/08/2014</u>           |
| Name (Print/Typed) <u>Rekha K. Rao</u>   | Practitioner Registration Number |
| <p><b>Note:</b> Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required in accordance with 37 CFR 1.33 and 11.18. Please see 37 CFR 1.4(d) for the form of the signature. If necessary, submit multiple forms for more than one signature, see below*.</p> |                                  |
| <input checked="" type="checkbox"/> *Total of <u>3</u> forms are submitted.  |                                  |

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

|   |                        |                                      |               |
|---|------------------------|--------------------------------------|---------------|
| <b>NONPUBLICATION REQUEST<br/>UNDER<br/>35 U.S.C. 122(b)(2)(B)(i)</b> | First Named Inventor   |                                      | Sanjay K. Rao |
|   | Title                  | WIRELESS DEVICES WITH TRANSMISSION C |               |
|   | Attorney Docket Number |                                      | HMTRM1        |

I hereby certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

I hereby request that the attached application not be published under 35 U.S.C. 122(b).

/Sanjay K. Rao/

09/08/2014

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Sanjay K. Rao

\_\_\_\_\_  
Typed or printed name

\_\_\_\_\_  
Registration Number, if applicable

\_\_\_\_\_  
Telephone Number

This request must be signed in compliance with 37 CFR 1.33(b) and submitted with the application **upon filing**.

Applicant may rescind this nonpublication request at any time. If applicant rescinds a request that an application not be published under 35 U.S.C. 122(b), the application will be scheduled for publication at eighteen months from the earliest claimed filing date for which a benefit is claimed.

If applicant subsequently files an application directed to the invention disclosed in the attached application in another country, or under a multilateral international agreement, that requires publication of applications eighteen months after filing, the applicant **must** notify the United States Patent and Trademark Office of such filing within forty-five (45) days after the date of the filing of such foreign or international application. **Failure to do so will result in abandonment of this application (35 U.S.C. 122(b)(2)(B)(iii)).**

This collection of information is required by 37 CFR 1.213(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: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

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|   |                        |                                      |              |
|---|------------------------|--------------------------------------|--------------|
| <b>NONPUBLICATION REQUEST<br/>UNDER<br/>35 U.S.C. 122(b)(2)(B)(i)</b> | First Named Inventor   |                                      | Sunil K. Rao |
|   | Title                  | WIRELESS DEVICES WITH TRANSMISSION C |              |
|   | Attorney Docket Number |                                      | HMTRM1       |

I hereby certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

I hereby request that the attached application not be published under 35 U.S.C. 122(b).

/Rekha K. Rao/

09/08/2014

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Rekha K. Rao

\_\_\_\_\_  
Typed or printed name

\_\_\_\_\_  
Registration Number, if applicable

\_\_\_\_\_  
Telephone Number

This request must be signed in compliance with 37 CFR 1.33(b) and submitted with the application **upon filing**.

Applicant may rescind this nonpublication request at any time. If applicant rescinds a request that an application not be published under 35 U.S.C. 122(b), the application will be scheduled for publication at eighteen months from the earliest claimed filing date for which a benefit is claimed.

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|   |                        |                                      |
|---|------------------------|--------------------------------------|
| <b>NONPUBLICATION REQUEST<br/>UNDER<br/>35 U.S.C. 122(b)(2)(B)(i)</b> | First Named Inventor   | Raman K. Rao                         |
|   | Title                  | WIRELESS DEVICES WITH TRANSMISSION C |
|   | Attorney Docket Number | HMTRM1                               |

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I hereby request that the attached application not be published under 35 U.S.C. 122(b).

/Sunil K. Rao/

09/08/2014

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

Sunil K. Rao

\_\_\_\_\_  
Typed or printed name

\_\_\_\_\_  
Registration Number, if applicable

\_\_\_\_\_  
Telephone Number

This request must be signed in compliance with 37 CFR 1.33(b) and submitted with the application **upon filing**.

Applicant may rescind this nonpublication request at any time. If applicant rescinds a request that an application not be published under 35 U.S.C. 122(b), the application will be scheduled for publication at eighteen months from the earliest claimed filing date for which a benefit is claimed.

If applicant subsequently files an application directed to the invention disclosed in the attached application in another country, or under a multilateral international agreement, that requires publication of applications eighteen months after filing, the applicant **must** notify the United States Patent and Trademark Office of such filing within forty-five (45) days after the date of the filing of such foreign or international application. **Failure to do so will result in abandonment of this application (35 U.S.C. 122(b)(2)(B)(iii)).**

This collection of information is required by 37 CFR 1.213(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: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.



## 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.

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.

**SUBSTITUTE STATEMENT IN LIEU OF AN OATH OR DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (35 U.S.C. 115(d) AND 37 CFR 1.64)**

|   |  |         |         |
|---|--|---------|---------|
| <b>Title of Invention</b>   | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |         |         |
| This statement is directed to:  |  |         |         |
| <input checked="" type="checkbox"/> The attached application,   |  |         |         |
| OR  |  |         |         |
| <input type="checkbox"/> United States application or PCT international application number _____ filed on _____.  |  |         |         |
| <b>LEGAL NAME of inventor to whom this substitute statement applies:</b>  |  |         |         |
| (E.g., Given Name (first and middle (if any)) and Family Name or Surname)   |  |         |         |
| Raman K Rao   |  |         |         |
| Residence (except for a deceased or legally incapacitated inventor):  |  |         |         |
| City  | State  | Country |         |
|   |  |         |         |
| Mailing Address (except for a deceased or legally incapacitated inventor):  |  |         |         |
| 3087 Alexis Drive   |  |         |         |
| City  | State  | Zip     | Country |
| Palo Alto   | CA   | 94304   | US      |
| I believe the above-named inventor or joint inventor to be the original inventor or an original joint inventor of a claimed invention in the application.                         |  |         |         |
| The above-identified application was made or authorized to be made by me.   |  |         |         |
| I hereby acknowledge that any willful false statement made in this statement is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both. |  |         |         |
| Relationship to the inventor to whom this substitute statement applies:   |  |         |         |
| <input checked="" type="checkbox"/> Legal Representative (for deceased or legally incapacitated inventor only),   |  |         |         |
| <input type="checkbox"/> Assignee,  |  |         |         |
| <input type="checkbox"/> Person to whom the inventor is under an obligation to assign,  |  |         |         |
| <input type="checkbox"/> Person who otherwise shows a sufficient proprietary interest in the matter (petition under 37 CFR 1.46 is required), or                                  |  |         |         |
| <input type="checkbox"/> Joint Inventor.  |  |         |         |

[Page 1 of 2]

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 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.

## SUBSTITUTE STATEMENT

Circumstances permitting execution of this substitute statement:

- Inventor is deceased,  
 Inventor is under legal incapacity,  
 Inventor cannot be found or reached after diligent effort, or  
 Inventor has refused to execute the oath or declaration under 37 CFR 1.63.

If there are joint inventors, please check the appropriate box below:

- An application data sheet under 37 CFR 1.76 (PTO/AIA/14 or equivalent) naming the entire inventive entity has been or is currently submitted.

OR

- An application data sheet under 37 CFR 1.76 (PTO/AIA/14 or equivalent) has not been submitted. Thus, a Substitute Statement Supplemental Sheet (PTO/AIA/11 or equivalent) naming the entire inventive entity and providing inventor information is attached. See 37 CFR 1.64(b).

### 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.

### PERSON EXECUTING THIS SUBSTITUTE STATEMENT:

Name: **Rekha K. Rao** Date (Optional):

Signature: **/Rekha K. Rao/**

### APPLICANT NAME AND TITLE OF PERSON EXECUTING THIS SUBSTITUTE STATEMENT:

If the applicant is a juristic entity, list the applicant name and the title of the signer:

**IP Holdings, Inc. c/o Rekha K. Rao**

Applicant Name:

Title of Person Executing This Substitute Statement: **CEO**

The signer, whose title is supplied above, is authorized to act on behalf of the applicant.

### Residence of the signer (unless provided in an application data sheet, PTO/AIA/14 or equivalent):

City **Palo Alto** State **CA** Country **US**

### Mailing Address of the signer (unless provided in an application data sheet, PTO/AIA/14 or equivalent)

**3087 Alexis Drive**

City **Palo Alto** State **CA** Zip **94304** Country **US**

Note: Use an additional PTO/AIA/02 form for each inventor who is deceased, legally incapacitated, cannot be found or reached after diligent effort, or has refused to execute the oath or declaration under 37 CFR 1.63.

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

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

|                           |   |
|---------------------------|---|
| <b>Title of Invention</b> | <b>WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION</b> |
|---------------------------|---|

As the below named inventor, I hereby declare that:

This declaration is directed to:  The attached application, or  United States application or PCT international application number \_\_\_\_\_ filed on \_\_\_\_\_.

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

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

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

**WARNING:**

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO 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: Raman K Rao Date (Optional) : \_\_\_\_\_

Signature: ---[deceased]

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 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.*

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

|                           |   |
|---------------------------|---|
| <b>Title of Invention</b> | <b>WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION</b> |
|---------------------------|---|

As the below named inventor, I hereby declare that:

This declaration is directed to:  The attached application, or  United States application or PCT international application number \_\_\_\_\_ filed on \_\_\_\_\_.

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

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

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

**WARNING:**

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LEGAL NAME OF INVENTOR

Inventor: Sunil K. Rao Date (Optional): 09/08/2014

Signature: /Sunil K. Rao/

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

|   |   |
|---|---|
| <b>Title of Invention</b>   | <b>WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION</b> |
| As the below named inventor, I hereby declare that:<br><br>This declaration is directed to: <input checked="" type="checkbox"/> The attached application, or<br><input type="checkbox"/> United States application or PCT international application number _____<br>filed on _____<br><br>The above-identified application was made or authorized to be made by me.<br><br>I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.<br><br>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.<br><br><b>WARNING:</b><br><br>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. |   |
| <b>LEGAL NAME OF INVENTOR</b><br><br>Inventor: <u>Sanjay K Rao</u> Date (Optional): <u>09/08/2014</u><br><br>Signature: <u>/Sanjay K Rao/</u>   |   |
| 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 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.*

## 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)**

Applicant/Patent Owner: IP Holdings, Inc.  
Application No./Patent No.: Not Yet Assigned Filed/Issue Date: Concurrently Herewith  
Titled: WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION  
IP Holdings, Inc., a Corporation  
(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 026974, Frame 0545, 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: \_\_\_\_\_ To: \_\_\_\_\_

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

2. From: \_\_\_\_\_ To: \_\_\_\_\_

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

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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**

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**STATEMENT UNDER 37 CFR 3.73(c)**

3. From: \_\_\_\_\_ To: \_\_\_\_\_

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

4. From: \_\_\_\_\_ To: \_\_\_\_\_

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

5. From: \_\_\_\_\_ To: \_\_\_\_\_

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

6. From: \_\_\_\_\_ To: \_\_\_\_\_

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

/Rekha K. Rao/

September 8, 2014

Signature

Date

Rekha K. Rao

CEO, IP Holdings, Inc.

Printed or Typed Name

Title or Registration Number

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**CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION  
 UNDER 37 CFR 1.102(e) (Page 1 of 1)**

|                       |  |   |                  |
|-----------------------|--|---|------------------|
| First Named Inventor: | Raman K. Rao   | Nonprovisional Application Number (if known): | Not Yet Assigned |
| Title of Invention:   | WIRELESS DEVICES WITH TRANSMISSION CONTROL AND MULTIPLE PATHS OF COMMUNICATION |   |                  |

**APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.**

1. The processing fee set forth in 37 CFR 1.17(i), the prioritized examination fee set forth in 37 CFR 1.17(c), and if not already paid, the publication fee set forth in 37 CFR 1.18(d) have been filed with the request. The basic filing fee, search fee, examination fee, and any required excess claims and application size fees are filed with the request or have been already been paid.
2. The application contains or is amended to contain no more than four independent claims and no more than thirty total claims, and no multiple dependent claims.
3. The applicable box is checked below:

**I.  Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)**

- i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.  
 ---OR---  
 (b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.
- ii. An executed oath or declaration under 37 CFR 1.63 is filed with the application.

**II.  Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)**

- i. A request for continued examination has been filed with, or prior to, this form.
- ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
- iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
- iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
- v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

|                                 |                                  |
|---------------------------------|----------------------------------|
| Signature /Sunil K. Rao/        | Date 09/08/2014                  |
| Name (Print/Typed) Sunil K. Rao | Practitioner Registration Number |

**Note:** Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required in accordance with 37 CFR 1.33 and 11.18. Please see 37 CFR 1.4(d) for the form of the signature. If necessary, submit multiple forms for more than one signature, see below\*.

\*Total of 3 forms are submitted.

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