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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/184,127	12/21/2021	11206670	IPW2-USCN213451	2425

3624 7590 12/01/2021

VOLPE KOENIG
30 SOUTH 17TH STREET, 18TH FLOOR
PHILADELPHIA, PA 19103

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

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

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

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

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

Intellectual Ventures Holding 81 LLC, Carson City, NV;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

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

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

3624 7590 09/22/2021

VOLPE KOENIG
30 SOUTH 17TH STREET, 18TH FLOOR
PHILADELPHIA, PA 19103

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

Certificate of Mailing or Transmission

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

John D. Wilt	(Typed or printed name)
/John D. Wilt/	(Signature)
November 11, 2021	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/184,127	02/24/2021	Philip Young	IPW2-USCN213451	2425

TITLE OF INVENTION: COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	12/22/2021

EXAMINER	ART UNIT	CLASS-SUBCLASS
NOORISTANY, SULAIMAN	2415	370-330000

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 03-09 or more recent) attached. **Use of a Customer Number is required.**

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

1 Volpe Koenig
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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Intellectual Ventures Holding 81 LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Carson City, NV

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

4a. Fees submitted: ☒ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☒ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 220493

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 /John D. Wilt/ Date November 11, 2021

Typed or printed name John D. Wilt Registration No. 76,110

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal

Application Number:	17184127
Filing Date:	24-Feb-2021
Title of Invention:	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS
First Named Inventor/Applicant Name:	Philip Young
Filer:	John D. Wilt/Caren Burgoon
Attorney Docket Number:	IPW2-USCN213451

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1200	1200

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**1200**

Electronic Acknowledgement Receipt	
EFS ID:	44258892
Application Number:	17184127
International Application Number:	
Confirmation Number:	2425
Title of Invention:	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS
First Named Inventor/Applicant Name:	Philip Young
Customer Number:	3624
Filer:	John D. Wilt/Caren Burgoon
Filer Authorized By:	John D. Wilt
Attorney Docket Number:	IPW2-USCN213451
Receipt Date:	11-NOV-2021
Filing Date:	24-FEB-2021
Time Stamp:	15:31:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$1200
RAM confirmation Number	E2021AAF31551026
Deposit Account	220493
Authorized User	Caren Burgoon
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.21 (Miscellaneous fees and charges) 37 CFR 1.20 (Post Issuance fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.16 (National application filing, search, and examination 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)	IPW2_USCN213451_IssueFeeTransmittalPayment_20211111.pdf	119573 48fee4d0a3a150aac2be3bf00d2e0249da2bb12f	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	38018 4bbe1464e8e9c49f8e4b1b32280bb7c345207581	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	157591		

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.

Notice of Allowability	Application No. 17/184,127	Applicant(s) Young, Philip	
	Examiner SULAIMAN NOORISTANY	Art Unit 2415	AIA (FITF) Status No

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

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

1. ☑ This communication is responsive to 8/20/21 & 8/16/21.
   ☐ 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 See Continuation Sheet . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

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

   Certified copies:

   a) ☑ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☑ Certified copies of the priority documents have been received in Application No. 14372363 .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

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

/SULAIMAN NOORISTANY/
Primary Examiner, Art Unit 2415

Continuation of 3. The allowed claim(s) is/are: 1-5,7-12,14-19 and 21

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UNITED STATES DEPARTMENT OF COMMERCE
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www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

3624 7590 09/22/2021

VOLPE KOENIG
30 SOUTH 17TH STREET, 18TH FLOOR
PHILADELPHIA, PA 19103

EXAMINER
NOORISTANY, SULAIMAN

ART UNIT	PAPER NUMBER
2415	

DATE MAILED: 09/22/2021

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/184,127	02/24/2021	Philip Young	IPW2-USCN213451	2425

TITLE OF INVENTION: COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	12/22/2021

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: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

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

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

3624 7590 09/22/2021

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30 SOUTH 17TH STREET, 18TH FLOOR
PHILADELPHIA, PA 19103

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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 transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/184,127	02/24/2021	Philip Young	IPW2-USCN213451	2425

TITLE OF INVENTION: COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	12/22/2021

EXAMINER	ART UNIT	CLASS-SUBCLASS
NOORISTANY, SULAIMAN	2415	370-330000

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 03-09 or more recent) attached. **Use of a Customer Number is required.**

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

1 _____
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 must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

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

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

4a. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

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

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/184,127	02/24/2021	Philip Young	IPW2-USCN213451	2425

3624 7590 09/22/2021

VOLPE KOENIG
30 SOUTH 17TH STREET, 18TH FLOOR
PHILADELPHIA, PA 19103

EXAMINER	
NOORISTANY, SULAIMAN	
ART UNIT	PAPER NUMBER
2415	

DATE MAILED: 09/22/2021

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 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 17/184,127	Applicant(s) Young, Philip	
	Examiner SULAIMAN NOORISTANY	Art Unit 2415	AIA (FITF) Status No

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

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

1. ☑ This communication is responsive to 8/16/21 & 8/20/21.
   ☐ 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 See Continuation Sheet . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

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

   Certified copies:

   a) ☐ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☑ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 5/28/21.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☑ Interview Summary (PTO-413), Paper No./Mail Date. 8/20/21.
5. ☑ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/SULAIMAN NOORISTANY/
Primary Examiner, Art Unit 2415

Continuation of 3. The allowed claim(s) is/are: 1-5,7-12,14-19 and 21

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Examiner Amendment

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Applicant agreed that the examiner's amendment, authorized by John D. Wilt on 08/20/21

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A user equipment (UE) comprising:

a transceiver; and

a processor, operatively coupled to the transceiver; wherein

the transceiver and the processor are configured to receive a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth, wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and

the transceiver and the processor are configured to acquire the additional system information using the indication of the frequency resources and the time resources, wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.

2. (Original) The UE of claim 1 wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth.

3. (Original) The UE of claim 1 wherein the transceiver and the processor are configured to receive control information and physical downlink shared channel (PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth.

4. (Original) The UE of claim 2 wherein the transceiver and the processor are configured to receive control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion.

5. (Original) The UE of claim 4 wherein the transceiver and the processor are configured to switch between the plurality of bandwidth portions at different times.

6. (Canceled)

7. (Original) The UE of claim 1 wherein the indicated frequency resources and the time resources include a second MIB.

8. (Currently Amended) A method performed by a user equipment (UE), the method comprising:

receiving a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth, wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and

acquiring the additional system information using the indication of the frequency resources and the time resources, wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.

9. (Original) The method of claim 8 wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth.

10. (Original) The method of claim 8, further comprising:

receiving control information and physical downlink shared channel (PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth.

11. (Original) The method of claim 9, further comprising:

receiving control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion.

12. (Original) The method of claim 11, further comprising:

switching between the plurality of bandwidth portions at different times.

13. (Canceled)

14. (Original) The method of claim 8 wherein the indicated frequency resources and the time resources include a second MIB.

15. (Currently Amended) At least one non-transient computer readable medium containing program instructions to perform a method of:

receiving a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth, wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and

acquiring the additional system information using the indication of the frequency resources and the time resources, wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.

16. (Original) The at least one non-transient computer readable medium of claim 15 wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth.

17. (Original) The at least one non-transient computer readable medium of claim 15, further comprising:

receiving control information and physical downlink shared channel (PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth.

18. (Original) The at least one non-transient computer readable medium of claim 16, further comprising:

receiving control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion.

19. (Original) The at least one non-transient computer readable medium of claim 18, further comprising:

switching between the plurality of bandwidth portions at different times.

20. (Canceled)

21. (Original) The at least one non-transient computer readable medium of claim 15 wherein the indicated frequency resources and the time resources include a second MIB.

Claims 1-5, 7-12, 14-19, 21 are allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sulaiman Nooristany whose telephone number is (571) 270-1929. The examiner can normally be reached on M-F from 9 to 5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Rutkowski, can be reached on (571) 270-1215. 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. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/SULAIMAN NOORISTANY/

Primary Examiner, Art Unit 2415

Examiner-Initiated Interview Summary	**Application No.** 17/184,127	**Applicant(s)** Young, Philip		
	Examiner SULAIMAN NOORISTANY	**Art Unit** 2415	**AIA (First Inventor to File) Status** No	**Page** 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	**Title**	**Type**
SULAIMAN NOORISTANY	Primary Examiner	Telephonic
John D. Wilt	Attorney	

Date of Interview: 20 August 2021

Issues Discussed:

Proposed Amendment(s)

Applicant agreed that the examiner's amendment, authorized by John D. Wilt on 08/20/21

/SULAIMAN NOORISTANY/ Primary Examiner, Art Unit 2415	

Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04
Please further see:
MPEP 713.04
Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b)
37 CFR § 1.2 Business to be transacted in writing

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

Notice of References Cited	Application/Control No. 17/184,127	Applicant(s)/Patent Under Reexamination Young, Philip	
	Examiner SULAIMAN NOORISTANY	Art Unit 2415	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20130083749-A1	04-2013	XU; Hao	H04W74/004	370/329
*	B	US-20120327894-A1	12-2012	Axmon; Joakim	H04W48/16	370/330
*	C	US-20100022250-A1	01-2010	Petrovic; Dragan	H04J11/0093	455/450
	D					
	E					
	F					
	G					
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	K					
	L					
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FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	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.

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/184,127	Young, Philip
	Examiner	**Art Unit**
	SULAIMAN NOORISTANY	2415

CPC							
Symbol						**Type**	**Version**
H04W	/	72	/	048		F	2013-01-01
H04W	/	4	/	70		I	2018-02-01
H04L	/	5	/	0037		I	2013-01-01
H04L	/	5	/	0092		I	2013-01-01
H04W	/	72	/	1263		I	2013-01-01
H04L	/	5	/	0005		I	2013-01-01

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

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	18	
/SULAIMAN NOORISTANY/ Primary Examiner, Art Unit 2415	20 August 2021	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	7

U.S. Patent and Trademark Office — Part of Paper No.: 20210820

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/184,127	Young, Philip
	Examiner	**Art Unit**
	SULAIMAN NOORISTANY	2415

INTERNATIONAL CLASSIFICATION					
CLAIMED					
H04W	/	72	/	04	

NON-CLAIMED					
	/		/		

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 18	
/SULAIMAN NOORISTANY/ Primary Examiner, Art Unit 2415 (Primary Examiner)	20 August 2021 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 7

U.S. Patent and Trademark Office — Part of Paper No.: 20210820

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/184,127	Young, Philip
	Examiner	**Art Unit**
	SULAIMAN NOORISTANY	2415

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

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	9	10	17	19										
2	2	10	11		20										
3	3	11	12	18	21										
4	4		13												
5	5	12	14												
	6	13	15												
6	7	14	16												
7	8	15	17												
8	9	16	18												

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	18	
/SULAIMAN NOORISTANY/ Primary Examiner, Art Unit 2415	20 August 2021	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	7

U.S. Patent and Trademark Office Part of Paper No.: 20210820

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/184,127	Young, Philip
	Examiner	**Art Unit**
	SULAIMAN NOORISTANY	2415

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

CLAIMS

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

CLAIM		DATE								
Final	Original	05/12/2021	08/20/2021							
1	1	✓	=							
2	2	✓	=							
3	3	✓	=							
4	4	✓	=							
5	5	✓	=							
	6	✓	-							
6	7	✓	=							
7	8	✓	=							
8	9	✓	=							
9	10	✓	=							
10	11	✓	=							
11	12	✓	=							
	13	✓	-							
12	14	✓	=							
13	15	✓	=							
14	16	✓	=							
15	17	✓	=							
16	18	✓	=							
17	19	✓	=							
	20	✓	-							
18	21	✓	=							

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/184,127	Young, Philip
	Examiner	Art Unit
	SULAIMAN NOORISTANY	2415

CPC - Searched*		
Symbol	Date	Examiner
h04w72/04	05/12/2021	SN

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Tech Search in EAST, Google, Inventor Search, US PGPUB, USPAT , FPRS, JPO, DERWENT	05/12/2021	SN
Tech Search in EAST, Google, Inventor Search, US PGPUB, USPAT , FPRS, JPO, DERWENT	08/20/2021	SN

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
PGPUB	see search history	08/20/2021	SN

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	17184127
Filing Date	2021-02-24
First Named Inventor	Young
Art Unit	2415
Examiner Name	Sulaiman Nooristany
Attorney Docket Number	IPW2-USCN213451

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7499438	B2	03-03-2009	Hinman et al.	
	2	8249635	B2	08-21-2012	Fukui et al.	
	3	8923274	B2	12-30-2014	Wang et al.	
	4	9094991	B2	07-28-2015	Gheorghiu et al.	
	5	9131503	B2	09-08-2015	Ishii et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20070258417	A1	11-08-2007	Harvey et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.N/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Attorney Docket Number	IPW2-USCN213451

	2	20080069060	A1	03-20-2008	Das et al.	
	3	20080130486	A1	06-05-2008	Lim et al.	
	4	20080232240	A1	09-25-2008	Baum et al.	
	5	20090180430	A1	07-16-2009	Fadell	
	6	20090247171	A1	10-01-2009	Suga	
	7	20100015969	A1	01-21-2010	Lee et al.	
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	9	20100130218	A1	05-27-2010	Zhang et al.	
	10	20100135242	A1	06-03-2010	Nam et al.	
	11	20100220607	A1	09-02-2010	Fujishima et al.	
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	Attorney Docket Number	IPW2-USCN213451

	13	20100323633	A1	12-23-2010	Pani et al.	
	14	20100323709	A1	12-23-2010	Nam et al.	
	15	20110085457	A1	04-14-2011	Chen et al.	
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	23	20120157090	A1	06-21-2012	Kim et al.	

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	Attorney Docket Number	IPW2-USCN213451

	24	20120213143	A1	08-23-2012	Zhang et al.	
	25	20120250564	A1	10-04-2012	Marque-Pucheu et al.	
	26	20120263093	A1	10-18-2012	Roessel et al.	
	27	20120289286	A1	11-15-2012	Miki	
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	Attorney Docket Number	IPW2-USCN213451

	35	20110319030	A1	2011-12-29	Kondo et al.	
	36	20130083749	A1	2013-04-04	Xu et al.	
	37	20140036851	A1	2014-02-06	Seo et al.	
	38	20140307697	A1	2014-10-16	Beale	
	39	20100022250	A1	2010-01-28	Petrovic et al.	

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	WO2012023895	WO	A1	2012-02-23	Telefonaktiebolaget LM Ericsson		
	2	WO2011146766	WO	A1	2011-11-24	Qualcomm Incorporated		

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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	Art Unit	2415
	Examiner Name	Sulaiman Nooristany
	Attorney Docket Number	IPW2-USCN213451

	1	DAHLMAN ET AL., "Access Procedures (Chapter 14)," 4G LTE/LTE-Advanced for Mobile Broadband, Academic Press n Elsevier, p. 301-321 (March 2011).
	2	HUAWEI ET AL., "Considerations on the bandwidth reduction for low cost MTC UE," 3GPP TSG RAN WG1#67, R1-113659, San Francisco, USA (November 14 -18, 2011).
	3	NTT DOCOMO, "Issues Regarding LTE Network for Low Cost MTC," 3GPP TSG RAN WG1 Meeting #67, R1-114082, San Francisco, USA (November 14 -18, 2011).
	4	U.S. Patent Application No. 14/372,363, Non-Final Rejection, mailed March 11, 2016.
	5	U.S. Patent Application No. 14/372,363, Non-Final Rejection, mailed August 18, 2017.
	6	U.S. Patent Application No. 14/372,363, Final Rejection, mailed December 16, 2016.
	7	U.S. Patent Application No. 14/372,363, Final Rejection, mailed June 14, 2018.
	8	U.S. Patent Application No. 16/190,420, Non-Final Rejection, mailed August 20, 2019.
	9	U.S. Patent Application No. 16/190,420, Final Rejection, mailed February 3, 2020.
	10	U.S. Patent Application No. 16/190,420, Non-Final Rejection, mailed June 17, 2020.
	11	U.S. Patent Application No. 16/190,420, Notice of Allowance, mailed October 26, 2020.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.N/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17184127
	Filing Date	2021-02-24
	First Named Inventor	Young
	Art Unit	2415
	Examiner Name	Sulaiman Nooristany
	Attorney Docket Number	IPW2-USCN213451

	12	U.S. Patent Application No. 17/184,234, Non-Final Rejection, mailed May 17, 2021.
	13	U.S. Patent Application No. 17/185,442, Non-Final Rejection, mailed May 3, 2021.
	14	U.S. Patent Application No. 17/185,533, Non-Final Rejection, mailed May 3, 2021.

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

EXAMINER SIGNATURE

Examiner Signature	/SULAIMAN NOORISTANY/	Date Considered	08/20/2021

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

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.N/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17184127
	Filing Date	2021-02-24
	First Named Inventor	Young
	Art Unit	2415
	Examiner Name	Sulaiman Nooristany
	Attorney Docket Number	IPW2-USCN213451

CERTIFICATION STATEMENT

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

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

OR

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

See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/John D. Wilt/	Date (YYYY-MM-DD)	2021-05-28
Name/Print	John D. Wilt	Registration Number	76,110

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.N/

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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 record s.

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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /S.N/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	"16190420"	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:30
S2	134,943	Young.in.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:31
S3	0	Young.in. and (SSS same PSSS same PBCH same MIB).clm.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:31
S4	5	Young.in. and (PBCH same MIB).clm.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:32
S5	0	Young.in. and (PBCH same MIB same restrict$3).clm.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:32
S6	0	Young.in. and (MIB same restrict$3).clm.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:32
S7	0	Young.in. and (MIB same restrict$3 near6 bandwidth).clm.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:32
S8	6	Young.in. and (restrict$3 near6 bandwidth).clm.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:32
S9	5	(MIB near6 restrict$3 near6 bandwidth)	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:45
S10	5	(MIB near10 restrict$3 near6 bandwidth)	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:46
S11	26	(MIB same restrict$3 near6 bandwidth)	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:46
S12	2	"20120327895"	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:55
S13	2	"20100015969"	US-PGPUB; USPAT	OR	OFF	2019/08/13 17:16
S14	34	(MIB same restrict$3 near6 (bandwidth band))	US-PGPUB; USPAT	OR	OFF	2019/08/13 17:35
S15	0	(MIB same restrict$3 near6 (bandwidth band)) same less	US-PGPUB; USPAT	OR	OFF	2019/08/13 17:36
S16	4,537	H04W72/048.cpc.	US-PGPUB; USPAT	OR	OFF	2019/08/15 17:31
S17	7	H04W72/048.cpc. and (MIB same restricted near3 (bandwidth band))	US-PGPUB; USPAT	OR	OFF	2019/08/15 17:33
S18	0	TELECOMMUNICATIONS SYSTEMS AND METHODS FOR MACHINE TYPE COMMUNICATION	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	ADJ	OFF	2019/12/09 20:35

			DERWENT; IBM_TDB			
S19	0	SYSTEMS AND METHODS FOR MACHINE TYPE COMMUNICATION	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:35
S20	229	Beale.in. and MACHINE TYPE COMMUNICATION	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:36
S21	50	Beale.in. and (restricted frequency)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:37
S22	11	Beale.in. and (restricted frequency).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:37
S23	12	"2013093436"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:38
S24	62	"2497742"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:40
S25	12	restricted near (frequency band) near6 System adj Information adj Block	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:46
S26	12	restricted near (frequency band) same System adj Information adj Block	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	ADJ	OFF	2019/12/09 20:46

			DERWENT; IBM_TDB			
S27	12	restricted near6 (frequency band) same System adj Information adj Block	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:46
S28	16	("2014/0307697").URPN.	USPAT	OR	OFF	2019/12/09 20:47
S29	78	restricted near6 (frequency band) and System adj Information adj Block	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:47
S30	13	restricted near6 (frequency band) same System adj Information	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:48
S31	44	restricted near (frequency band) and System adj Information adj Block	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:48
S32	0	restricted near (frequency band) and (SIB System adj Information adj Block)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:50
S33	198	restricted near (frequency band) and (SIB System adj Information adj Block)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/12/09 20:50
S34	18	restricted near (frequency band) same (SIB System adj Information adj Block)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/12/09 20:50
S35	38	restricted near6 (frequency band) same (SIB System adj Information adj Block)	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2019/12/09 20:51

			EPO; JPO; DERWENT; IBM_TDB			
S36	38	(prohibted restricted) near6 (frequency band) same (SIB System adj Information adj Block)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/12/09 20:55
S37	2	"20120327894"	US-PGPUB; USPAT	OR	OFF	2020/01/29 09:47
S38	114	(MIB same (limited restrict$3) near6 (bandwidth band))	US-PGPUB; USPAT	OR	OFF	2020/01/29 10:05
S39	2	(SS near block SSB) and (MIB same (limited restrict$3) near6 (bandwidth band))	US-PGPUB; USPAT	OR	OFF	2020/01/29 10:07
S40	34	(MIB same (restrict$3) near6 (bandwidth band))	US-PGPUB; USPAT	OR	OFF	2020/01/29 10:08
S41	1	(MIB same (restrict$3) near6 (bandwidth band)) and PSS same SSS same PBCH same outside near6 (restricted muted prohibited) near6 (bandwidth band)	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:14
S42	1	PSS same SSS same PBCH same outside near6 (restricted muted prohibited) near6 (bandwidth band)	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:21
S43	1	PSS same SSS same PBCH same outside same (restricted muted prohibited) near6 (bandwidth band)	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:22
S44	0	PSS same SSS same PBCH same out same (restricted muted prohibited) near6 (bandwidth band)	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:22
S45	0	PSS same SSS same PBCH same (restricted muted prohibited) near6 (bandwidth band) same MIB	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:22
S46	5	PSS same SSS same PBCH same (restricted muted prohibited) near6 (bandwidth band)	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:22
S47	15	PSS same SSS same PBCH and MIB same (restricted muted prohibited) near6 (bandwidth band)	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:28
S48	0	scMIB near6 dynamically near3 (allocated scheduled)	US-PGPUB; USPAT	OR	OFF	2020/06/11 13:42
S49	3	scMIB same dynamically near3 (allocated scheduled)	US-PGPUB; USPAT	OR	OFF	2020/06/11 13:42

S50	106	MIB same dynamically near3 (allocated scheduled)	US-PGPUB; USPAT	OR	OFF	2020/06/11 13:45
S51	19	MIB near6 dynamically near3 (allocated scheduled)	US-PGPUB; USPAT	OR	OFF	2020/06/11 13:45
S52	2	"20120327895"	US-PGPUB; USPAT	OR	OFF	2020/06/11 13:47
S53	2	"20100015969"	US-PGPUB; USPAT	OR	OFF	2020/06/11 13:48
S54	1	"16190420"	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:20
S55	1	"16336223"	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:21
S56	357,242	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in.	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:21
S57	2	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in. and (Narrowband near Position$3 same Reference near signal).clm.	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:22
S58	2	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in. and (Narrowband near Position$3 same Reference near signal same sequence).clm.	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:23
S59	1	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in. and (Narrowband near Position$3 same NPRS).clm.	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:24
S60	1	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in. and (NPRS).clm.	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:25
S61	47	(NPRS).clm.	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:25
S62	9	((Narrowband near Position$3 same Reference near signal same sequence same NPRS))	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:25
S63	387	((sequence same NPRS))	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:28
S64	20	h04l5/00 and ((sequence same NPRS))	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:28
S65	12	h04l5/0048 and ((sequence same NPRS))	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:28
S66	17	h04w72/04 and ((sequence same NPRS))	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:28

S67	16	S64 AND S66	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:29
S68	1	wideband near reference near signal near sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:46
S69	2	wideband near (RS reference near signal) near sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:47
S70	1	narrowband near (rs reference near signal) same sequence same subsequence same wideband near (RS reference near signal) near sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:48
S71	2	narrowband near (rs reference near signal) same sequence and wideband near (RS reference near signal) near sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:48
S72	2	narrowband near (rs reference near signal) and wideband near (RS reference near signal) near sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:49
S73	387	NPRS same sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:49
S74	20	NPRS near6 sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:50
S75	6	NPRS near6 sequence near6 resource	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:50
S76	3,135	NPRS	US-PGPUB; USPAT	OR	OFF	2020/08/19 19:08
S77	2,890	S76 and sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 19:08
S78	35	S76 and (RS reference near signal) near sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 19:09
S83	7	Young.in. and (restrict$3 near6 bandwidth).clm.	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:13
S84	0	Young.in. and (restrict$3 near6 bandwidth same SSB).clm.	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:13
S85	40	(MIB same (restrict$3) near6 (bandwidth band))	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:16
S86	0	(MIB same (restrict$3) near6 (bandwidth band) same SSB)	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:16
S87	25	(MIB same (restrict$3) near6 (bandwidth band) same PBCH)	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:17
S88	0	(MIB same (restrict$3) near6 (bandwidth band) same PBCH same PSC same SSC)	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:17

S93	1	"20120327894"	USPAT	OR	OFF	2021/04/27 17:45
S94	0	"17185442"	US-PGPUB; USPAT	OR	OFF	2021/04/27 19:10
S95	27,049	h04w72/04	USPAT	OR	OFF	2021/04/27 21:03
S96	0	S95 and ((restrict$3) near6 (bandwidth band) same PBCH same PSC same SSC)	US-PGPUB; USPAT	OR	OFF	2021/04/27 21:03
S97	0	S95 and ((restrict$3 reserved) near10 (bandwidth band) same PBCH same PSC same SSC)	US-PGPUB; USPAT	OR	OFF	2021/04/27 21:04
S98	0	((restrict$3 reserved) near10 (bandwidth band) same PBCH same PSC same SSC)	US-PGPUB; USPAT	OR	OFF	2021/04/27 21:04
S99	139	((restrict$3 reserved) near10 (bandwidth band) same SIB)	US-PGPUB; USPAT	OR	OFF	2021/04/27 21:04
S100	39	S95 and ((restrict$3 reserved) near10 (bandwidth band) same SIB)	US-PGPUB; USPAT	OR	OFF	2021/04/27 21:04
S101	51	((reserved) near10 (bandwidth band) same SIB)	US-PGPUB; USPAT	OR	OFF	2021/04/27 21:13
S102	4	subordinate NEAR carrier NEAR MIB (scMIB)	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:29
S103	146	FIRST NEAR MIB SAME SECOND NEAR MIB	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:30
S104	112	FIRST NEAR MIB NEAR6 SECOND NEAR MIB	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:32
S105	51	FIRST NEAR MIB NEAR6 SECOND NEAR MIB AND BANDWIDTH	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:33
S106	38	master near information near block AND FIRST NEAR MIB NEAR6 SECOND NEAR MIB AND BANDWIDTH and SIB	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:35
S107	1	"20140274011"	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:46
S108	1	"20100022250"	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:47
S109	1	"16532507"	US-PGPUB; USPAT	OR	OFF	2021/05/12 18:43

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp

S79	159,104	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in.	USPAT	OR	OFF	2020/08/19 18:50
S80	4	Young.in. and (PBCH same MIB).clm.	USPAT	OR	OFF	2020/08/19 18:50
S81	0	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in. and (Narrowband near Position$3 same NPRS).clm.	USPAT	OR	OFF	2020/08/19 18:51
S82	0	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in. and (NPRS).clm.	USPAT	OR	OFF	2020/08/19 18:51
S89	2	Young.in. and (restrict$3 near6 bandwidth).clm.	USPAT	OR	OFF	2020/10/20 09:14
S90	0	Young.in. and (restrict$3 near6 bandwidth same SSB).clm.	USPAT	OR	OFF	2020/10/20 09:14
S91	0	"14372363"	USPAT	OR	OFF	2020/10/20 09:14
S92	2	"14372363"	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:14

8/20/2021 12:29:13 PM
C:\Users\snooristany\Documents\EAST\Workspaces\16190420.wsp

Doc Code: DIST.E.FILE **Document Description: Electronic Terminal Disclaimer - Filed**	PTO/SB/25 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION**
Application Number	17184127
Filing Date	24-Feb-2021
First Named Inventor	Philip Young
Attorney Docket Number	IPW2-USCN213451
Title of Invention	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
Intellectual Ventures Holding 81 LLC	100%

The owner(s) of 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 any patent granted on pending reference Application Number(s)

16190420 filed on 11/14/2018

as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application. 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 any patent granted on the reference application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said reference application, "as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application," in the event that any such patent granted on the pending reference application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

◉ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

○ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.	
Applicant claims the following fee status: ○ Small Entity ○ Micro Entity ◉ Regular Undiscounted I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am: ◉ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application Registration Number 76110 ○ 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	/John D. Wilt/
Name	John D. Wilt

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

Electronic Patent Application Fee Transmittal

Application Number:	17184127
Filing Date:	24-Feb-2021
Title of Invention:	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS
First Named Inventor/Applicant Name:	Philip Young
Filer:	John D. Wilt/Caren Burgoon
Attorney Docket Number:	IPW2-USCN213451

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
STATUTORY OR TERMINAL DISCLAIMER	1814	1	170	170
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**170**

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

Application No.: 17184127

Filing Date: 24-Feb-2021

Applicant/Patent under Reexamination: Young

Electronic Terminal Disclaimer filed on August 20, 2021

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

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

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt	
EFS ID:	43561490
Application Number:	17184127
International Application Number:	
Confirmation Number:	2425
Title of Invention:	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS
First Named Inventor/Applicant Name:	Philip Young
Customer Number:	3624
Filer:	John D. Wilt/Caren Burgoon
Filer Authorized By:	John D. Wilt
Attorney Docket Number:	IPW2-USCN213451
Receipt Date:	20-AUG-2021
Filing Date:	24-FEB-2021
Time Stamp:	13:30:35
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$170
RAM confirmation Number	E20218JD30313942
Deposit Account	220493
Authorized User	Caren Burgoon
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	43808 b9bd872f2dc3ed4823f7b6ad31f8f94911793434	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	38003 da065da979f4772d30ec04deecef9f77c0c9bb2f	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	81811		

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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.

Doc Code: ECOMM.AUTH/ECOMM.WTDW
Doc Description: Internet Communications Authorized/Internet Communications Authorization Withdrawn

PTO/SB/439 (11-15)

AUTHORIZATION FOR INTERNET COMMUNICATIONS IN A PATENT APPLICATION OR REQUEST TO WITHDRAW AUTHORIZATION FOR INTERNET COMMUNICATIONS		
	Application No.	17/184,127
	Filing Date	February 24, 2021
	First Named Inventor	Philip Young
	Art Unit	2415
	Examiner Name	Sulaiman Nooristany
	Practitioner Docket No.	IPW2-USCN213451

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

I. To authorize permission for Internet Communications.

☑ Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned and practitioners in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via video conferencing, instant messaging, or electronic mail. I understand that a copy of these communications will be made of record in the application file. (MPEP 502.03)

II. To withdraw authorization for Internet Communications.

☐ The authorization given on _____, to the USPTO to communicate with the undersigned and any practitioner in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via Internet communications such as video conferencing, instant messaging, or electronic mail is hereby withdrawn. I understand that the withdrawal is effective when approved rather than when received.

I am the

☐ applicant.

☑ attorney or agent of record. Registration number 76,110.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/John D. Wilt/ — Signature

August 20, 2021 — Date

John D. Wilt — Typed or printed name

215-568-6400 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Juristic entities must be represented by a patent practitioner (see 37 CFR 1.31, which is applicable to any paper filed on or after September 16, 2012, that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below*.

☐ * Total of _____ 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).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	43559390
Application Number:	17184127
International Application Number:	
Confirmation Number:	2425
Title of Invention:	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS
First Named Inventor/Applicant Name:	Philip Young
Customer Number:	3624
Filer:	John D. Wilt/Caren Burgoon
Filer Authorized By:	John D. Wilt
Attorney Docket Number:	IPW2-USCN213451
Receipt Date:	20-AUG-2021
Filing Date:	24-FEB-2021
Time Stamp:	10:20:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Internet Communications Authorized	IPW2-USCN213451_Int_Communication_Auth_08202021.pdf	121466 56e43fb715a631eb38111c5118a9d5598335f48b	no	2

Warnings:

Information:	
Total Files Size (in bytes):	121466

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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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:	
Intellectual Ventures Holding 81 LLC	Our File: IPW2-USCN213451
Application No.: 17/184,127	
Confirmation No.: 2425	Date: August 16, 2021
Filed: February 24, 2021	
For: COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS	
Group: 2415	
Examiner: Sulaiman Nooristany	

RESPONSE PURSUANT TO 37 C.F.R. §1.111

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

This Response is being timely filed in response to the Non-Final Office Action dated May 17, 2021.

Please amend the application without prejudice or disclaimer as follows:

Amendments to the Claims:

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

What is claimed is:

1. (Original) A user equipment (UE) comprising:

a transceiver; and

a processor, operatively coupled to the transceiver; wherein

the transceiver and the processor are configured to receive a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth, wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and

the transceiver and the processor are configured to acquire the additional system information using the indication of the frequency resources and the time resources.

2. (Original) The UE of claim 1 wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth.

3. (Original) The UE of claim 1 wherein the transceiver and the processor are configured to receive control information and physical downlink shared channel (PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth.

4. (Original) The UE of claim 2 wherein the transceiver and the processor are configured to receive control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion.

5. (Original) The UE of claim 4 wherein the transceiver and the processor are configured to switch between the plurality of bandwidth portions at different times.

6. (Original) The UE of claim 1 wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.

7. (Original) The UE of claim 1 wherein the indicated frequency resources and the time resources include a second MIB.

8. (Original) A method performed by a user equipment (UE), the method comprising:

receiving a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth, wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and

acquiring the additional system information using the indication of the frequency resources and the time resources.

9. (Original) The method of claim 8 wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth.

10. (Original) The method of claim 8, further comprising:

receiving control information and physical downlink shared channel (PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth.

11. (Original) The method of claim 9, further comprising:

receiving control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion.

12. (Original) The method of claim 11, further comprising:

switching between the plurality of bandwidth portions at different times.

13. (Original) The method of claim 8 wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.

14. (Original) The method of claim 8 wherein the indicated frequency resources and the time resources include a second MIB.

15. (Original) At least one non-transient computer readable medium containing program instructions to perform a method of:

receiving a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell

bandwidth, wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and

acquiring the additional system information using the indication of the frequency resources and the time resources.

16. (Original) The at least one non-transient computer readable medium of claim 15 wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth.

17. (Original) The at least one non-transient computer readable medium of claim 15, further comprising:

receiving control information and physical downlink shared channel (PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth.

18. (Original) The at least one non-transient computer readable medium of claim 16, further comprising:

receiving control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion.

19. (Original) The at least one non-transient computer readable medium of claim 18, further comprising:

switching between the plurality of bandwidth portions at different times.

20. (Original) The at least one non-transient computer readable medium of claim 15 wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.

21. (Original) The at least one non-transient computer readable medium of claim 15 wherein the indicated frequency resources and the time resources include a second MIB.

REMARKS/ARGUMENTS

After the foregoing Amendment, claims 1-21 are currently pending in this application.

Double Patenting Rejection

Claims 1-21 are provisionally rejected under the judicially created doctrine of obviousness-type nonstatutory double patenting as being unpatentable over claims 1-15 of U.S. Patent Application No. 16/190,420. Applicant asks that the rejection be held in abeyance until an agreement is reached on allowable claims.

Claim Rejections - 35 U.S.C. §112

Claims 7, 14 and 21 are rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point and distinctly claim the subject matter which applicant regards as the invention.

The second MIB is the Subordinate Carrier Master Information Block (scMIB). Support for, "the indicated frequency resources and the time resources include a second MIB" may be found throughout US Publ. No. 2021/0185659 A1, in particular, paragraphs [0069] and [0071] as show below.

> [0069] (3) The downlink bandwidth (and possibly other characteristics) of the MTC subordinate carrier could be signalled in a Subordinate Carrier Master Information Block (scMIB). The scMIB would be signalled in fixed time/frequency resources, known in advance to the mobile terminal and preferably defined in the 3GPP specifications. The possibilities for signalling the scMIB are described in the following section. Signalling the Subordinate Carrier Master Information Block (scMIB).
>
> [0071] A Master Information Block may be regarded as collection of parameters giving values to configurable characteristics of the carrier and other information to achieve/maintain radio frame synchronisation. A Master Information Block is required to be supplied in fixed time/frequency resources and must be received and decoded before a more flexible scheme of downlink message exchange may be employed. According to the above description, at the point at which the UE tries to decode the scMIB, the UE will know:

Based on the arguments presented above, withdrawal of the §112 rejection of claims 7, 14 and 21 is respectfully requested.

Claim Rejections - 35 U.S.C. §103

Claims 1-21 are rejected under pre-AIA 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication No. 2013/0083749 to Xu (hereinafter "Xu") in view of U.S. Patent Publication No. 2012/0327894 to Axmon (hereinafter "Axmon")

The Applicant believes that the reference "Xu" does not qualify as prior art under 35 U.S.C §102(e). The Examiner bears the burden of establishing that the cited prior art references qualify as prior art. Under pre-AIA 35 U.S.C. §102(e)—which applies in this case as a result U.S. Patent Publication No. 2013/0083749 (U.S. Patent No. 9,232,540) effective filing date of September 27, 2012 predating the AIA date of

March 16, 2013—a U.S. patent or published patent application may qualify as prior art as of the date of the application to which it claims priority. However, for a patent to serve as prior art, the Examiner is required to make two showings: (1) that the claims of the patent are supported by the provisional application, and (2) that the portions relied upon to anticipate or render obvious the patent-at-issue were included in the priority application. *Dynamic Drinkware v. Nat'l Graphics,* 800 F.3d 1375, 1378–79, 1382 (Fed. Cir. 2015).

The priority date of the current application is January 20, 2012, GB 2498571 (Publ. No.)/ GB 1201000.5 (Appl. No.). However, since "Xu" has a priority date of September 27, 2012, the cited reference of record is the Xu provisional application, 61/542,000 with a priority date of September 30, 2011.

The Xu provisional application states in paragraph [0050], "[f]or narrowband operations, the UE does not monitor PDCCH or PDSCH with large bandwidth, therefore, both SIB1 and SIB2 transmissions can be modified to support such operation. In particular, SIB signaling may be modified by using R-PDCCH to signal the SIB transmission. The R-PDCCH can be carried within the center six resource blocks, so the UE can acquire PSS/SSS/PBCH and SIB1 scheduling information all from the same center six resource blocks." However, this does not teach or describe, "the transceiver and the processor are configured to receive a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a

physical broadcast channel (PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth, wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information." Since the function of a relay is simply to receive and pass on information, the Xu provisional application via the R-PDCCH does not teach the features in claim 1.

The Applicant believes that the reference "Axmon" does not qualify as prior art under 35 U.S.C §102(e). The Examiner bears the burden of establishing that the cited prior art references qualify as prior art. Under pre-AIA 35 U.S.C. §102(e)—which applies in this case as a result U.S. Patent Publication No. 2012/0327894 (U.S. Patent No. 8,848,638) effective filing date of February 16, 2012 predating the AIA date of March 16, 2013—a U.S. patent or published patent application may qualify as prior art as of the date of the application to which it claims priority. However, for a patent to serve as prior art, the Examiner is required to make two showings: (1) that the claims of the patent are supported by the provisional, and (2) that the portions relied upon to anticipate or render obvious the patent-at-issue were included in the priority application. *Dynamic Drinkware v. Nat'l Graphics,* 800 F.3d 1375, 1378–79, 1382 (Fed. Cir. 2015).

The priority date of the current application is January 20, 2012, GB 2498571 (Publ. No.)/ GB 1201000.5 (Appl. No.). However, since "Axmon" has a priority date of February 16, 2012, the cited reference of record is the Axmon provisional application, 61/501,310 with a priority date of June 27, 2011.

The Axmon provisional application states, on page 2, the concept of the invention proposes, "the eNB ("host cell") sets up one or more virtual cells. The virtual cells are configured to have a smaller system bandwidth than the host cell, e.g. 6 RBs, and are serving MTC devices." However, the Axmon provisional application provides no information stating the MIB includes information that identifies one or more possible upcoming locations in terms of time/frequency. Therefore, the Axmon provisional application does not teach or describe, "wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information." It is respectfully submitted that the above features, whether taken alone or in combination, fail to disclose or suggest the above feature of claim 1.

Although not identical, independent claims 8 and 15 recite elements substantially similar to claim 1. Therefore, the Applicant submits that claims 8 and 15 are patentable for at least the same reasons as discussed above.

The Xu provisional application states in paragraph [0050], "[f]or narrowband operations, the UE does not monitor PDCCH or PDSCH with large bandwidth, therefore, both SIB1 and SIB2 transmissions can be modified to support such

operation. In particular, SIB signaling may be modified by using R-PDCCH to signal the SIB transmission. The R-PDCCH can be carried within the center six resource blocks, so the UE can acquire PSS/SSS/PBCH and SIB1 scheduling information all from the same center six resource blocks." However, the features listed in dependent claims 2-7 are not supported in the Xu provisional application. It is respectfully submitted that dependent claims 2-7 are not disclosed or suggested by the Xu provisional application.

Although not identical, dependent claims 9-14 and 16-21 recite elements substantially similar to claims 2-7. Therefore, the Applicant submits that claims 9-14 and 16-21 are patentable for at least the same reasons as discussed above.

Based on the arguments presented above, withdrawal of the §103 rejection of claims 1-21 is respectfully requested.

Claims 1-21 are rejected under pre-AIA 35 U.S.C. §103(a) as being unpatentable over Xu in view of U.S. Patent Publication No. 2010/0022250 to Petrovic (hereinafter "Petrovic").

The Applicant believes that the reference "Xu" does not qualify as prior art under 35 U.S.C §102(e). The Examiner bears the burden of establishing that the cited prior art references qualify as prior art. Under pre-AIA 35 U.S.C. §102(e)—which applies in this case as a result U.S. Patent Publication No. 2013/0083749 (U.S. Patent No. 9,232,540) effective filing date of September 27, 2012 predating the AIA date of

March 16, 2013—a U.S. patent or published patent application may qualify as prior art as of the date of the application to which it claims priority. However, for a patent to serve as prior art, the Examiner is required to make two showings: (1) that the claims of the patent are supported by the provisional, and (2) that the portions relied upon to anticipate or render obvious the patent-at-issue were included in the priority application. *Dynamic Drinkware v. Nat'l Graphics,* 800 F.3d 1375, 1378–79, 1382 (Fed. Cir. 2015).

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The Xu provisional application states in paragraph [0050], "[f]or narrowband operations, the UE does not monitor PDCCH or PDSCH with large bandwidth, therefore, both SIB1 and SIB2 transmissions can be modified to support such operation. In particular, SIB signaling may be modified by using R-PDCCH to signal the SIB transmission. The R-PDCCH can be carried within the center six resource blocks, so the UE can acquire PSS/SSS/PBCH and SIB1 scheduling information all from the same center six resource blocks." However, this does not teach or describe, "the transceiver and the processor are configured to receive a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a

physical broadcast channel (PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth, wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information." Since the function of a relay function is simply to receive and pass on information, the Xu provisional application via the R-PDCCH does not teach the features in claim 1.

Petrovic describes a method for informing a mobile terminal on a target cell-specific system information to facilitate a mobility procedure such as handover or cell reselection in a mobile communication network. Further, Petrovic describes that the MIB and SIB are transmitted relative to common timing reference to ensure detectability. Petrovic further states a pointer in the control message may point to target cell-specific system information that is required for system access to the target cell and/or for performing a mobility procedure. In particular, a value of a common timing reference (e.g. the system frame number) is used to ensure a handover or cell reselection in a mobile communication network is successful. However, using a pointer in the control message to ensure a timing reference for handover or cell reselection does not teach or describe, "wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information." It is respectfully submitted that the above features, whether taken alone or in combination, fail to disclose or suggest the above feature of claim 1.

Although not identical, independent claims 8 and 15 recite elements substantially similar to claim 1. Therefore, the Applicant submits that claims 8 and 15 are patentable for at least the same reasons as discussed above.

The Xu provisional application states in paragraph [0050], "[f]or narrowband operations, the UE does not monitor PDCCH or PDSCH with large bandwidth, therefore, both SIB1 and SIB2 transmissions can be modified to support such operation. In particular, SIB signaling may be modified by using R-PDCCH to signal the SIB transmission. The R-PDCCH can be carried within the center six resource blocks, so the UE can acquire PSS/SSS/PBCH and SIB1 scheduling information all from the same center six resource blocks." However, the features listed in dependent claims 2-7 are not supported in the Xu provisional application and claim 7 is not supported by the Petrovic reference. It is respectfully submitted that dependent claims 2-7 are not disclosed or suggested by the Xu provisional application and claim 7 by the Petrovic reference.

Although not identical, dependent claims 9-14 and 16-21 recite elements substantially similar to claims 2-7. Therefore, the Applicant submits that claims 9-14 and 16-21 are patentable for at least the same reasons as discussed above.

Based on the arguments presented above, withdrawal of the §103 rejection of claims 1-21 is respectfully requested.

Conclusion

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

In view of the foregoing, Applicant respectfully submits that the present application, including claims 1-21, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

Intellectual Ventures Holding 81 LLC

By /John D. Wilt/
John D. Wilt
Registration No. 76,110

Volpe Koenig
30 South 17th Street
Philadelphia, PA 19103-4009
Telephone: (215) 568-6400
Facsimile: (215) 568-6499

JDW/cb

Electronic Acknowledgement Receipt	
EFS ID:	43519486
Application Number:	17184127
International Application Number:	
Confirmation Number:	2425
Title of Invention:	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS
First Named Inventor/Applicant Name:	Philip Young
Customer Number:	3624
Filer:	John D. Wilt/Caren Burgoon
Filer Authorized By:	John D. Wilt
Attorney Docket Number:	IPW2-USCN213451
Receipt Date:	16-AUG-2021
Filing Date:	24-FEB-2021
Time Stamp:	16:21:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IPW2_USCN213451_NFOAReply_20210816.pdf	174179 ca5fe52ff93de2bc9085e2a3d97b97505d9554f1	yes	17

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	17
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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.
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/184,127	02/24/2021	Philip Young	IPW2-USCN213451

CONFIRMATION NO. 2425

3624
VOLPE KOENIG
30 SOUTH 17TH STREET, 18TH FLOOR
PHILADELPHIA, PA 19103

PUBLICATION NOTICE

OC000000126387511

Title:COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS

Publication No.US-2021-0185659-A1
Publication Date:06/17/2021

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The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	17184127
Filing Date	2021-02-24
First Named Inventor	Young
Art Unit	2415
Examiner Name	Sulaiman Nooristany
Attorney Docket Number	IPW2-USCN213451

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7499438	B2	03-03-2009	Hinman et al.	
	2	8249635	B2	08-21-2012	Fukui et al.	
	3	8923274	B2	12-30-2014	Wang et al.	
	4	9094991	B2	07-28-2015	Gheorghiu et al.	
	5	9131503	B2	09-08-2015	Ishii et al.	

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	1	20070258417	A1	11-08-2007	Harvey et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	Young
	Art Unit	2415
	Examiner Name	Sulaiman Nooristany
	Attorney Docket Number	IPW2-USCN213451

	2	20080069060	A1	03-20-2008	Das et al.	
	3	20080130486	A1	06-05-2008	Lim et al.	
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	7	20100015969	A1	01-21-2010	Lee et al.	
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	9	20100130218	A1	05-27-2010	Zhang et al.	
	10	20100135242	A1	06-03-2010	Nam et al.	
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	Art Unit	2415
	Examiner Name	Sulaiman Nooristany
	Attorney Docket Number	IPW2-USCN213451

	13	20100323633	A1	12-23-2010	Pani et al.	
	14	20100323709	A1	12-23-2010	Nam et al.	
	15	20110085457	A1	04-14-2011	Chen et al.	
	16	20110105119	A1	05-05-2011	Bienas et al.	
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	Art Unit	2415
	Examiner Name	Sulaiman Nooristany
	Attorney Docket Number	IPW2-USCN213451

	24	20120213143	A1	08-23-2012	Zhang et al.	
	25	20120250564	A1	10-04-2012	Marque-Pucheu et al.	
	26	20120263093	A1	10-18-2012	Roessel et al.	
	27	20120289286	A1	11-15-2012	Miki	
	28	20120327894	A1	12-27-2012	Axmon et al.	
	29	20120327895	A1	12-27-2012	Wallén et al.	
	30	20130064119	A1	03-14-2013	Montojo et al.	
	31	20130088986	A1	04-11-2013	Xiao et al.	
	32	20130114555	A1	05-09-2013	Sato	
	33	20130242821	A1	09-19-2013	Wei et al.	
	34	20140094183	A1	04-03-2014	Gao et al.	

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	Art Unit	2415
	Examiner Name	Sulaiman Nooristany
	Attorney Docket Number	IPW2-USCN213451

	35	20110319030	A1	2011-12-29	Kondo et al.	
	36	20130083749	A1	2013-04-04	Xu et al.	
	37	20140036851	A1	2014-02-06	Seo et al.	
	38	20140307697	A1	2014-10-16	Beale	
	39	20100022250	A1	2010-01-28	Petrovic et al.	

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	1	WO2012023895	WO	A1	2012-02-23	Telefonaktiebolaget LM Ericsson		
	2	WO2011146766	WO	A1	2011-11-24	Qualcomm Incorporated		

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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	Filing Date	2021-02-24
	First Named Inventor	Young
	Art Unit	2415
	Examiner Name	Sulaiman Nooristany
	Attorney Docket Number	IPW2-USCN213451

	1	DAHLMAN ET AL., "Access Procedures (Chapter 14)," 4G LTE/LTE-Advanced for Mobile Broadband, Academic Press in Elsevier, p. 301-321 (March 2011).	
	2	HUAWEI ET AL., "Considerations on the bandwidth reduction for low cost MTC UE," 3GPP TSG RAN WG1#67, R1-113659, San Francisco, USA (November 14 -18, 2011).	
	3	NTT DOCOMO, "Issues Regarding LTE Network for Low Cost MTC," 3GPP TSG RAN WG1 Meeting #67, R1-114082, San Francisco, USA (November 14 -18, 2011).	
	4	U.S. Patent Application No. 14/372,363, Non-Final Rejection, mailed March 11, 2016.	
	5	U.S. Patent Application No. 14/372,363, Non-Final Rejection, mailed August 18, 2017.	
	6	U.S. Patent Application No. 14/372,363, Final Rejection, mailed December 16, 2016.	
	7	U.S. Patent Application No. 14/372,363, Final Rejection, mailed June 14, 2018.	
	8	U.S. Patent Application No. 16/190,420, Non-Final Rejection, mailed August 20, 2019.	
	9	U.S. Patent Application No. 16/190,420, Final Rejection, mailed February 3, 2020.	
	10	U.S. Patent Application No. 16/190,420, Non-Final Rejection, mailed June 17, 2020.	
	11	U.S. Patent Application No. 16/190,420, Notice of Allowance, mailed October 26, 2020.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17184127
	Filing Date	2021-02-24
	First Named Inventor	Young
	Art Unit	2415
	Examiner Name	Sulaiman Nooristany
	Attorney Docket Number	IPW2-USCN213451

	12	U.S. Patent Application No. 17/184,234, Non-Final Rejection, mailed May 17, 2021.
	13	U.S. Patent Application No. 17/185,442, Non-Final Rejection, mailed May 3, 2021.
	14	U.S. Patent Application No. 17/185,533, Non-Final Rejection, mailed May 3, 2021.

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	Application Number	17184127
	Filing Date	2021-02-24
	First Named Inventor	Young
	Art Unit	2415
	Examiner Name	Sulaiman Nooristany
	Attorney Docket Number	IPW2-USCN213451

CERTIFICATION STATEMENT

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

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

OR

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

See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/John D. Wilt/	Date (YYYY-MM-DD)	2021-05-28
Name/Print	John D. Wilt	Registration Number	76,110

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Application Number:	17184127
Filing Date:	24-Feb-2021
Title of Invention:	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS
First Named Inventor/Applicant Name:	Philip Young
Filer:	John D. Wilt/Caren Burgoon
Attorney Docket Number:	IPW2-USCN213451

Filed as Large Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
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Pages:				
Claims:				
Miscellaneous-Filing:				
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Patent-Appeals-and-Interference:				
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		Total in USD ($)		**260**

Electronic Acknowledgement Receipt	
EFS ID:	42847441
Application Number:	17184127
International Application Number:	
Confirmation Number:	2425
Title of Invention:	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS
First Named Inventor/Applicant Name:	Philip Young
Customer Number:	3624
Filer:	John D. Wilt/Caren Burgoon
Filer Authorized By:	John D. Wilt
Attorney Docket Number:	IPW2-USCN213451
Receipt Date:	28-MAY-2021
Filing Date:	24-FEB-2021
Time Stamp:	16:41:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$260
RAM confirmation Number	E20215RG42261391
Deposit Account	220493
Authorized User	Caren Burgoon
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1	Other Reference-Patent/App/Search documents	17185533_NFR_20210503.pdf	327318 52e6b56146e80e836e0c72b6e4512afe599c7398	no	9
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2	Other Reference-Patent/App/Search documents	16190420_NFR_20200617.pdf	348193 3fcf8ba518cf6db7f5bef6dbb05683368135a2df	no	10
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6	Other Reference-Patent/App/Search documents	16190420_FR_20200203.pdf	321685 ae7fa675f606605d25e4b3e33c2e7bcde34d9475	no	10
Warnings:					
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7	Other Reference-Patent/App/Search documents	16190420_NFR_20190820.pdf	290693 cbb9e73a2d11a7290feed266e1dcd9635c9a635a	no	9
Warnings:					
Information:					
8	Transmittal Letter	IPW2_USCN213451_IDStransmittal_20210528.pdf	89039 2e355d6b30e9ef6f6e235c9021bca33601812b07	no	2
Warnings:					
Information:					
9	Information Disclosure Statement (IDS) Form (SB08)	IPW2_USCN213451_SB08_20210528.pdf	1151653 2046c020fb0a8a427a1cb1e2dd46960ec0e887b0	no	9
Warnings:					
Information:					
10	Fee Worksheet (SB06)	fee-info.pdf	30722 61dc11504b4a474c19a2938e08961c210074b8f8	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3752005		

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:	
Young	
Application No.: 17/184,127	
Confirmation No.: 2425	
Filed: February 24, 2021	
For: COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS	
Group: 2415	
Examiner: Sulaiman Nooristany	

Our File: IPW2-USCN213451

Date: May 28, 2021

INFORMATION DISCLOSURE STATEMENT

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

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

This Application is a continuation of U.S. Patent Application No. 16/190,420, filed November 14, 2018, which issued March 2, 2021 as U.S. Patent No. 10,939,446, which is a continuation of U.S. Patent Application No. 14/372,363, filed July 15, 2014, which is the National Stage Entry of International Application No. PCT/GB2013/050126, filed January 21, 2013.

The following Applications are also continuations of U.S. Patent Application No. 16/190,420: U.S. Patent Application No. 17/184,234, filed February 24, 2021; U.S. Patent Application No. 17/185,533, filed February 25, 2021; and U.S. Patent Application No. 17/185,442, filed February 25, 2021.

Pursuant to 37 C.F.R. §1.98(d) copies of documents cited in the parent application are not enclosed, but copies will be provided upon request. Copies of the Office Actions issued in the parent application and co-pending applications are enclosed.

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

Respectfully submitted,

Intellectual Ventures Holding 81 LLC

By /John D. Wilt/_____
John D. Wilt
Registration No. 76,110
(215) 568-6400

Volpe Koenig
United Plaza
30 South 17th Street
Philadelphia, PA 19103

JDW/PCK
Enclosures

6837381.1

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VOLPE KOENIG
30 SOUTH 17TH STREET, 18TH FLOOR
PHILADELPHIA, PA 19103

Courtesy Reminder for
Application Serial No: 17/184,127

Attorney Docket No: IPW2-USCN213451
Customer Number: 3624
Date of Electronic Notification: 05/17/2021

This is a courtesy reminder that new correspondence is available for this application. If you have not done so already, please review the correspondence. The official date of notification of the outgoing correspondence will be indicated on the form PTOL-90 accompanying the correspondence.

An email notification regarding the correspondence was sent to the following email address(es) associated with your customer number:
eoffice@volpe-koenig.com

To view your correspondence online or update your email addresses, please visit us anytime at **https://ppair-my.uspto.gov/pair/PrivatePair.**
If you have any questions, please email the Electronic Business Center (EBC) at EBC@uspto.gov or call 1-866-217-9197.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/184,127	02/24/2021	Philip Young	IPW2-USCN213451	2425

3624 7590 05/17/2021

VOLPE KOENIG
30 SOUTH 17TH STREET, 18TH FLOOR
PHILADELPHIA, PA 19103

EXAMINER	
NOORISTANY, SULAIMAN	

ART UNIT	PAPER NUMBER
2415	

NOTIFICATION DATE	DELIVERY MODE
05/17/2021	ELECTRONIC

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

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

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

eoffice@volpe-koenig.com

Office Action Summary	**Application No.** 17/184,127	**Applicant(s)** Young, Philip	
	Examiner SULAIMAN NOORISTANY	**Art Unit** 2415	**AIA (FITF) Status** No

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

Period for Reply

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

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

Status

1)☐ Responsive to communication(s) filed on 2/24/21.

☐ 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) 1-21 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) 1-21 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 or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

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

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

Notice of Pre-AIA or AIA Status

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

Double Patenting

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

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

The USPTO internet Web site contains terminal disclaimer forms which may be used. Please visit http://www.uspto.gov/forms/. The filing date of the application will determine what

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

Claims 1-21 are provisionally rejected on the ground of nonstatutory double patenting as being unpatentable over claims **1-15** of parent Application No. 16190420. Although the claims at issue are identical, they are not patentably distinct from each other because they are same variants of each other.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 7 is/ are rejected under 112, second paragraph as being indefinite for failing to particularly point and distinctly claim the subject matter which applicant regards as the invention

In claim 7, the terms "the indicated frequency resources and the time resources include a **second MIB**" is/are not clear what these are in reference to. Also, the description of the present application fails to provide a clear and complete description on the invention as well as the above terms. Therefore, the corresponding technical means in the present invention is unclear, and consequently, have no well-defined meaning for the skilled person and do not comprise any inherent features which can be derived from the wording of these terms as such. However, the

claims will be given a broad reasonable interpretation for the purposes of examination as best understood.

Claims 14 & 21 are rejected for similar reasons as stated for claim 7.

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

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

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

Claim 1-21 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Xu US 20130083749 in view of Axmon US 20120327894

1. A user equipment (UE) comprising:

a transceiver (**Xu: fig. 6**); and

a processor, operatively coupled to the transceiver (**Xu: fig. 6**); wherein

the transceiver and the processor are configured to receive a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel

(PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth (**XU: fig. 7, [0064-0069] - The narrow bandwidth UE(s) monitor a narrow bandwidth control channel assignment for message 2, while the regular UE(s) are able to monitor the PDCCH which spans the whole bandwidth ….The ePDCCH can be carried within the center six resource blocks, so the UE can acquire PSS/SSS/PBCH and SIB1 scheduling information all from the same center six resource blocks**); and

the transceiver and the processor are configured to acquire the additional system information using the indication of the frequency resources and the time resources (**Xu: fig. 7 [0068-0069] - SIB1 is transmitted with a fixed schedule having a periodicity of 80 milliseconds (ms) and repetitions within 80 ms. The first transmission is scheduled in subframe #5 with SFNmod8=0. Repetition is scheduled in subframe #5 for all radio frames where SFNmod2=0. SIB2 is mapped to the system information (SI) message and corresponds to the first entry in the list of system information messages in "schedulingInfoList" in SIB1**).

Xu merely discloses *wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information* [0068]

Axmon further teaches wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information (**Axmon: [0106] - the MIB includes information that identifies one or more possible upcoming locations (i.e., in terms of time/frequency) in which the M-SI might be located if it is being transmitted**) in order to make the UE to determine the exact time/frequency location of an upcoming M-SI can be determined either directly or indirectly [0107]

Thus, it would have been obvious to one ordinary skill in the art before the effective filing date of the claim invention to include the above recited claim limitation into Xu's invention in order to make the UE to determine the exact time/frequency location of an upcoming M-SI can be determined either directly or indirectly [0107], as taught by Axmon.

2. The UE of claim 1 wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth (**Xu: fig. 7 [0064-0069]**).

3. The UE of claim 1 wherein the transceiver and the processor are configured to receive control information and physical downlink shared channel (PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth (**Xu: fig. 7 [0064-0069]**).

4. The UE of claim 2 wherein the transceiver and the processor are configured to receive control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion (**Xu: fig. 7 [0064-0069]**).

5. The UE of claim 4 wherein the transceiver and the processor are configured to switch between the plurality of bandwidth portions at different times (**Xu: fig. 7 [0064-0069]**).

6. The UE of claim 1 wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1 (**Xu: fig. 7 [0064-0069]**).

7. The UE of claim 1 wherein the indicated frequency resources and the time resources include a second MIB (**Xu: fig. 7 [0068]**).

Regarding claims 8-21, the independent claim and each dependent claim are related to the same limitation set for hereinabove in claims 1-7, where the difference used is a "method" and a "non-transitory computer-readable storage medium" and the wordings of the claims were interchanged within the claim itself or some of the claims were presented as a combination of two or more previously presented limitations. This change does not affect the limitation of the above treated claims. Adding these phrases to the claims and interchanging the wording did not introduce new limitations to these claims. Therefore these claims were rejected for similar reasons as stated above.

Claim Rejections - 35 USC § 103

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

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

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

Claim 1-21 is/are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Xu US 20130083749 in view of Petrovic US 20100022250

1. A user equipment (UE) comprising:

a transceiver (Xu: fig. 6); and

a processor, operatively coupled to the transceiver (Xu: fig. 6); wherein

the transceiver and the processor are configured to receive a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth (**XU: fig. 7, [0064-0069] - The narrow bandwidth UE(s) monitor a narrow bandwidth control channel assignment for message 2, while the regular UE(s) are able to monitor the PDCCH which spans the whole bandwidth ….The ePDCCH can be carried within the center six resource blocks, so the UE can acquire PSS/SSS/PBCH and SIB1 scheduling information all from the same center six resource blocks**), *wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information* (**Xu: [0068]**); and

the transceiver and the processor are configured to acquire the additional system information using the indication of the frequency resources and the time resources (**Xu: fig. 7 [0068-0069] - SIB1 is transmitted with a fixed schedule having a periodicity of 80 milliseconds (ms) and repetitions within 80 ms. The first transmission is scheduled in subframe #5 with SFNmod8=0. Repetition is scheduled in subframe #5 for all radio frames where SFNmod2=0. SIB2 is mapped to the system information (SI) message and**

corresponds to the first entry in the list of system information messages in "schedulingInfoList" in SIB1).

Xu merely discloses *wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information* [0068]

Petrovic further teaches wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information (**Petrovic: [0101, 0136] - MIB contains control information on each System Information Block. The control information associated to a respective SIB may have the following structure. Respective control information associated to a SIB may indicate the position of the SIB on a transport channel (e.g. position in the time-frequency plane for OFDM radio access i.e. particular Resource Blocks being assigned for transmission of a respective SIB) on which it is transmitted relative to common timing reference**) in order to forms the root of the tree structure, whereas the so-called system information blocks (SIBs) represent its branches [0118]

Thus, it would have been obvious to one ordinary skill in the art before the effective filing date of the claim invention to include the above recited claim limitation into Xu's invention in order to forms the root of the tree structure, whereas the so-called system information blocks (SIBs) represent its branches [0118], as taught by Petrovic.

2. The UE of claim 1 wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth (**Xu: fig. 7 [0064-0069]**).

3. The UE of claim 1 wherein the transceiver and the processor are configured to receive control information and physical downlink shared channel (PDSCH) transmissions with the first

portion of the cell bandwidth and not in other portions of the cell bandwidth (**Xu: fig. 7 [0064-0069]**).

4. The UE of claim 2 wherein the transceiver and the processor are configured to receive control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion (**Xu: fig. 7 [0064-0069]**).

5. The UE of claim 4 wherein the transceiver and the processor are configured to switch between the plurality of bandwidth portions at different times (**Xu: fig. 7 [0064-0069]**).

6. The UE of claim 1 wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1 (**Xu: fig. 7 [0064-0069]**).

7. The UE of claim 1 wherein the indicated frequency resources and the time resources include a second MIB (**Xu: fig. 7 [0068]; Petrovic fig. 10-17**).

Regarding claims 8-21, the independent claim and each dependent claim are related to the same limitation set for hereinabove in claims 1-7, where the difference used is a "method" and a "non-transitory computer-readable storage medium" and the wordings of the claims were interchanged within the claim itself or some of the claims were presented as a combination of two or more previously presented limitations. This change does not affect the limitation of the above treated claims. Adding these phrases to the claims and interchanging the wording did not introduce new

limitations to these claims. Therefore these claims were rejected for similar reasons as stated above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sulaiman Nooristany whose telephone number is 571-270-1929. The examiner can normally be reached on Monday thru Friday: 8:30am to 5:00pm (EST). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Rutkowski can be reached on 571-270-1215. 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. 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.

/SULAIMAN NOORISTANY/

Primary Examiner, Art Unit 2415

Notice of References Cited	Application/Control No. 17/184,127	Applicant(s)/Patent Under Reexamination Young, Philip	
	Examiner SULAIMAN NOORISTANY	Art Unit 2415	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20130083749-A1	04-2013	XU; Hao	H04W74/004	370/329
*	B	US-20120327894-A1	12-2012	Axmon; Joakim	H04W48/16	370/330
*	C	US-20100022250-A1	01-2010	Petrovic; Dragan	H04J11/0093	455/450
	D					
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FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/184,127	Young, Philip
	Examiner	Art Unit
	SULAIMAN NOORISTANY	2415

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

CLAIMS

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

CLAIM		DATE								
Final	Original	05/12/2021								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
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	18	✓								
	19	✓								
	20	✓								
	21	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/184,127	Young, Philip
	Examiner	Art Unit
	SULAIMAN NOORISTANY	2415

CPC - Searched*		
Symbol	Date	Examiner
h04w72/04	05/12/2021	SN

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Tech Search in EAST, Google, Inventor Search, US PGPUB, USPAT , FPRS, JPO, DERWENT	05/12/2021	SN

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

Bibliographic Data

Application No: 17/184,127

Foreign Priority claimed: ◉ Yes ○ No

35 USC 119 (a-d) conditions met: ☐ Yes ☑ No ☐ Met After Allowance

Verified and Acknowledged: /SULAIMAN NOORISTANY/ Examiner's Signature | Initials

Title: COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
02/24/2021	370	2415	IPW2-USCN213451
RULE			

APPLICANTS

Intellectual Ventures Holding 81 LLC, Carson City, NV,

INVENTORS

Philip Young, Alton, UNITED KINGDOM

CONTINUING DATA

This application is a CON of 16190420 11/14/2018 PAT 10939446

16190420 is a CON of 14372363 07/15/2014ABN

14372363 is a 371 of PCT/GB2013/050126 01/21/2013

FOREIGN APPLICATIONS

UNITED KINGDOM GB1201000.5 01/20/2012

IF REQUIRED, FOREIGN LICENSE GRANTED**

03/08/2021

STATE OR COUNTRY

UNITED KINGDOM

ADDRESS

VOLPE KOENIG

30 SOUTH 17TH STREET, 18TH FLOOR

PHILADELPHIA, PA 19103

UNITED STATES

FILING FEE RECEIVED

$6,260

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L8	4	subordinate NEAR carrier NEAR MIB (scMIB)	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:29
L9	146	FIRST NEAR MIB SAME SECOND NEAR MIB	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:30
L10	112	FIRST NEAR MIB NEAR6 SECOND NEAR MIB	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:32
L11	51	FIRST NEAR MIB NEAR6 SECOND NEAR MIB AND BANDWIDTH	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:33
L12	38	master near information near block AND FIRST NEAR MIB NEAR6 SECOND NEAR MIB AND BANDWIDTH and SIB	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:35
L13	1	"20140274011"	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:46
L14	1	"20100022250"	US-PGPUB; USPAT	OR	OFF	2021/05/12 15:47
S1	1	"16190420"	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:30
S2	134,943	Young.in.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:31
S3	0	Young.in. and (SSS same PSSS same PBCH same MIB).clm.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:31
S4	5	Young.in. and (PBCH same MIB).clm.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:32
S5	0	Young.in. and (PBCH same MIB same restrict$3).clm.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:32
S6	0	Young.in. and (MIB same restrict$3).clm.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:32
S7	0	Young.in. and (MIB same restrict$3 near6 bandwidth).clm.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:32
S8	6	Young.in. and (restrict$3 near6 bandwidth).clm.	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:32
S9	5	(MIB near6 restrict$3 near6 bandwidth)	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:45
S10	5	(MIB near10 restrict$3 near6 bandwidth)	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:46
S11	26	(MIB same restrict$3 near6 bandwidth)	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:46

S12	2	"20120327895"	US-PGPUB; USPAT	OR	OFF	2019/08/13 16:55
S13	2	"20100015969"	US-PGPUB; USPAT	OR	OFF	2019/08/13 17:16
S14	34	(MIB same restrict$3 near6 (bandwidth band))	US-PGPUB; USPAT	OR	OFF	2019/08/13 17:35
S15	0	(MIB same restrict$3 near6 (bandwidth band)) same less	US-PGPUB; USPAT	OR	OFF	2019/08/13 17:36
S16	4,537	H04W72/048.cpc.	US-PGPUB; USPAT	OR	OFF	2019/08/15 17:31
S17	7	H04W72/048.cpc. and (MIB same restricted near3 (bandwidth band))	US-PGPUB; USPAT	OR	OFF	2019/08/15 17:33
S18	0	TELECOMMUNICATIONS SYSTEMS AND METHODS FOR MACHINE TYPE COMMUNICATION	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:35
S19	0	SYSTEMS AND METHODS FOR MACHINE TYPE COMMUNICATION	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:35
S20	229	Beale.in. and MACHINE TYPE COMMUNICATION	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:36
S21	50	Beale.in. and (restricted frequency)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:37
S22	11	Beale.in. and (restricted frequency).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:37
S23	12	"2013093436"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:38

S24	62	"2497742"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:40
S25	12	restricted near (frequency band) near6 System adj Information adj Block	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:46
S26	12	restricted near (frequency band) same System adj Information adj Block	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:46
S27	12	restricted near6 (frequency band) same System adj Information adj Block	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:46
S28	16	("2014/0307697").URPN.	USPAT	OR	OFF	2019/12/09 20:47
S29	78	restricted near6 (frequency band) and System adj Information adj Block	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:47
S30	13	restricted near6 (frequency band) same System adj Information	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:48
S31	44	restricted near (frequency band) and System adj Information adj Block	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	ADJ	OFF	2019/12/09 20:48
S32	0	restricted near (frequency band) and (SIB System adj Information adj Block)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	ADJ	OFF	2019/12/09 20:50

			DERWENT; IBM_TDB			
S33	198	restricted near (frequency band) and (SIB System adj Information adj Block)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/12/09 20:50
S34	18	restricted near (frequency band) same (SIB System adj Information adj Block)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/12/09 20:50
S35	38	restricted near6 (frequency band) same (SIB System adj Information adj Block)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/12/09 20:51
S36	38	(prohibted restricted) near6 (frequency band) same (SIB System adj Information adj Block)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2019/12/09 20:55
S37	2	"20120327894"	US-PGPUB; USPAT	OR	OFF	2020/01/29 09:47
S38	114	(MIB same (limited restrict$3) near6 (bandwidth band))	US-PGPUB; USPAT	OR	OFF	2020/01/29 10:05
S39	2	(SS near block SSB) and (MIB same (limited restrict$3) near6 (bandwidth band))	US-PGPUB; USPAT	OR	OFF	2020/01/29 10:07
S40	34	(MIB same (restrict$3) near6 (bandwidth band))	US-PGPUB; USPAT	OR	OFF	2020/01/29 10:08
S41	1	(MIB same (restrict$3) near6 (bandwidth band)) and PSS same SSS same PBCH same outside near6 (restricted muted prohibited) near6 (bandwidth band)	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:14
S42	1	PSS same SSS same PBCH same outside near6 (restricted muted prohibited) near6 (bandwidth band)	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:21
S43	1	PSS same SSS same PBCH same outside same (restricted muted prohibited) near6 (bandwidth band)	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:22

S44	0	PSS same SSS same PBCH same out same (restricted muted prohibited) near6 (bandwidth band)	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:22
S45	0	PSS same SSS same PBCH same (restricted muted prohibited) near6 (bandwidth band) same MIB	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:22
S46	5	PSS same SSS same PBCH same (restricted muted prohibited) near6 (bandwidth band)	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:22
S47	15	PSS same SSS same PBCH and MIB same (restricted muted prohibited) near6 (bandwidth band)	US-PGPUB; USPAT	OR	OFF	2020/01/29 11:28
S48	0	scMIB near6 dynamically near3 (allocated scheduled)	US-PGPUB; USPAT	OR	OFF	2020/06/11 13:42
S49	3	scMIB same dynamically near3 (allocated scheduled)	US-PGPUB; USPAT	OR	OFF	2020/06/11 13:42
S50	106	MIB same dynamically near3 (allocated scheduled)	US-PGPUB; USPAT	OR	OFF	2020/06/11 13:45
S51	19	MIB near6 dynamically near3 (allocated scheduled)	US-PGPUB; USPAT	OR	OFF	2020/06/11 13:45
S52	2	"20120327895"	US-PGPUB; USPAT	OR	OFF	2020/06/11 13:47
S53	2	"20100015969"	US-PGPUB; USPAT	OR	OFF	2020/06/11 13:48
S54	1	"16190420"	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:20
S55	1	"16336223"	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:21
S56	357,242	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in.	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:21
S57	2	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in. and (Narrowband near Position$3 same Reference near signal).clm.	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:22
S58	2	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in. and (Narrowband near Position$3 same Reference near signal same sequence).clm.	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:23
S59	1	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in. and (Narrowband near Position$3 same NPRS).clm.	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:24

S60	1	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in. and (NPRS).clm.	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:25
S61	47	(NPRS).clm.	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:25
S62	9	((Narrowband near Position$3 same Reference near signal same sequence same NPRS))	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:25
S63	387	((sequence same NPRS))	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:28
S64	20	h04l5/00 and ((sequence same NPRS))	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:28
S65	12	h04l5/0048 and ((sequence same NPRS))	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:28
S66	17	h04w72/04 and ((sequence same NPRS))	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:28
S67	16	S64 AND S66	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:29
S68	1	wideband near reference near signal near sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:46
S69	2	wideband near (RS reference near signal) near sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:47
S70	1	narrowband near (rs reference near signal) same sequence same subsequence same wideband near (RS reference near signal) near sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:48
S71	2	narrowband near (rs reference near signal) same sequence and wideband near (RS reference near signal) near sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:48
S72	2	narrowband near (rs reference near signal) and wideband near (RS reference near signal) near sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:49
S73	387	NPRS same sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:49
S74	20	NPRS near6 sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:50
S75	6	NPRS near6 sequence near6 resource	US-PGPUB; USPAT	OR	OFF	2020/08/19 18:50
S76	3,135	NPRS	US-PGPUB; USPAT	OR	OFF	2020/08/19 19:08
S77	2,890	S76 and sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 19:08

S78	35	S76 and (RS reference near signal) near sequence	US-PGPUB; USPAT	OR	OFF	2020/08/19 19:09
S83	7	Young.in. and (restrict$3 near6 bandwidth).clm.	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:13
S84	0	Young.in. and (restrict$3 near6 bandwidth same SSB).clm.	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:13
S85	40	(MIB same (restrict$3) near6 (bandwidth band))	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:16
S86	0	(MIB same (restrict$3) near6 (bandwidth band) same SSB)	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:16
S87	25	(MIB same (restrict$3) near6 (bandwidth band) same PBCH)	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:17
S88	0	(MIB same (restrict$3) near6 (bandwidth band) same PBCH same PSC same SSC)	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:17
S93	1	"20120327894"	USPAT	OR	OFF	2021/04/27 17:45
S94	0	"17185442"	US-PGPUB; USPAT	OR	OFF	2021/04/27 19:10
S95	27,049	h04w72/04	USPAT	OR	OFF	2021/04/27 21:03
S96	0	S95 and ((restrict$3) near6 (bandwidth band) same PBCH same PSC same SSC)	US-PGPUB; USPAT	OR	OFF	2021/04/27 21:03
S97	0	S95 and ((restrict$3 reserved) near10 (bandwidth band) same PBCH same PSC same SSC)	US-PGPUB; USPAT	OR	OFF	2021/04/27 21:04
S98	0	((restrict$3 reserved) near10 (bandwidth band) same PBCH same PSC same SSC)	US-PGPUB; USPAT	OR	OFF	2021/04/27 21:04
S99	139	((restrict$3 reserved) near10 (bandwidth band) same SIB)	US-PGPUB; USPAT	OR	OFF	2021/04/27 21:04
S100	39	S95 and ((restrict$3 reserved) near10 (bandwidth band) same SIB)	US-PGPUB; USPAT	OR	OFF	2021/04/27 21:04
S101	51	((reserved) near10 (bandwidth band) same SIB)	US-PGPUB; USPAT	OR	OFF	2021/04/27 21:13

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S79	159,104	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in.	USPAT	OR	OFF	2020/08/19 18:50

S80	4	Young.in. and (PBCH same MIB).clm.	USPAT	OR	OFF	2020/08/19 18:50
S81	0	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in. and (Narrowband near Position$3 same NPRS).clm.	USPAT	OR	OFF	2020/08/19 18:51
S82	0	(Lin Bergman Gunnarsson Liberg Modarres Razavi Ryden Sui Wang).in. and (NPRS).clm.	USPAT	OR	OFF	2020/08/19 18:51
S89	2	Young.in. and (restrict$3 near6 bandwidth).clm.	USPAT	OR	OFF	2020/10/20 09:14
S90	0	Young.in. and (restrict$3 near6 bandwidth same SSB).clm.	USPAT	OR	OFF	2020/10/20 09:14
S91	0	"14372363"	USPAT	OR	OFF	2020/10/20 09:14
S92	2	"14372363"	US-PGPUB; USPAT	OR	OFF	2020/10/20 09:14

5/12/2021 4:53:44 PM
C:\Users\snooristany\Documents\EAST\Workspaces\16190420.wsp

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/184,127	02/24/2021	Philip Young	IPW2-USCN213451	2425

3624 7590 04/08/2021

Volpe Koenig
30 SOUTH 17TH STREET, 18TH FLOOR
PHILADELPHIA, PA 19103

EXAMINER	
ART UNIT	PAPER NUMBER
2415	

NOTIFICATION DATE	DELIVERY MODE
04/08/2021	ELECTRONIC

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

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

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

eoffice@volpe-koenig.com

Decision Granting Request for Prioritized Examination (Track I)	**Application No.** 17/184,127	**Applicant(s)** Young, Philip	
	Examiner CHERYL P GIBSON BAYLOR	**Art Unit** OPET	**AIA (FITF) Status** No

1. THE REQUEST FILED 24 February 2021 IS **GRANTED** .

The above-identified application has met the requirements for prioritized examination

A. ☑ for an original nonprovisional application (Track I).
B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination**. The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

A. filing a **petition for extension of time** to extend the time period for filing a reply;

B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims** , or a multiple dependent claim;

C. filing a **request for continued examination** ;

D. filing a notice of appeal;

E. filing a request for suspension of action;

F. mailing of a notice of allowance;

G. mailing of a final Office action;

H. completion of examination as defined in 37 CFR 41.102; or

I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to CHERYL GIBSON BAYLOR at (571)272-3213. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.

/CHERYL GIBSON BAYLOR/ Paralegal Specialist, OPET	

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
17/184,127	02/24/2021		1920	IPW2-USCN213451	21	3

CONFIRMATION NO. 2425

FILING RECEIPT

3624
Volpe Koenig
30 SOUTH 17TH STREET, 18TH FLOOR
PHILADELPHIA, PA 19103

OC000000123898587

Date Mailed: 03/09/2021

Receipt is acknowledged of this non-provisional utility 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 FIRST INVENTOR, 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 corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction 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 provided that the request is grantable.

Inventor(s)

Philip Young, Alton, UNITED KINGDOM;

Applicant(s)

Intellectual Ventures Holding 81 LLC, Carson City, NV;

Assignment For Published Patent Application

Intellectual Ventures Holding 81 LLC, Carson City, NV

Power of Attorney: The patent practitioners associated with Customer Number 03624

Domestic Priority data as claimed by applicant

This application is a CON of 16/190,420 11/14/2018 PAT 10939446
which is a CON of 14/372,363 07/15/2014 ABN
which is a 371 of PCT/GB2013/050126 01/21/2013

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.)
UNITED KINGDOM 1201000.5 01/20/2012 No Access Code Provided

Permission to Access Application via Priority Document Exchange: Yes

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If Required, Foreign Filing License Granted: 03/08/2021
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/184,127**
Projected Publication Date: 06/17/2021
Non-Publication Request: No
Early Publication Request: No
Title

COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS

Preliminary Class

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 17/184,127

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	320
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	700
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	800
TOTAL CLAIMS (37 CFR 1.16(i))	21 minus 20 =	* 1			OR	x 100 =	100
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x 480 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1920

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

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

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

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

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

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (07-13)
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TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	Not Yet Known
Filing Date	February 24, 2021
First Named Inventor	Philip Young
Title	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS
Art Unit	Not Yet Known
Examiner Name	Not Yet Known
Attorney Docket Number	IPW2-USCN213451

SIGNATURE of Applicant or Patent Practitioner

Signature	/John D. Wilt/	Date (Optional)	2021/02/24
Name	John D. WIlt	Registration Number	76110
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)	Intellectual Ventures Holding 81 LLC		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ *Total of _____ 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.

Doc Code: PA..
Document Description: Power of Attorney

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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.

Application Number	Filing Date

(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: 03624

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:

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):

Intellectual Ventures Holding 81 LLC

☐ 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	/Rocky Adornato/	Date (Optional)	18 FEB 2014
Name	Rocky Adornato		
Title	Authorized Person for Intellectual Ventures Holding 81, LLC		

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 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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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.

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

I, Rocky Adornato (whose title is supplied below), hereby declare that I am authorized to sign documents on behalf of Intellectual Ventures Holding 81 LLC

Rocky Adornato

Rocky Adornato
Authorized Person for Intellectual Ventures Holding 81 LLC

Dec 3, 2020

Date

Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (04-14)

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

First Named Inventor:	Philip Young	Nonprovisional Application Number (if known):	Not Known
Title of Invention:	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS		

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)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.

2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.

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 inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, **or** the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) 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 /John D. Wilt/	Date 2021-02-24
Name (Print/Typed) John D. Wilt	Practitioner Registration Number 76,110

Note: *This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.**

☐ *Total of _____ 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.

Doc code: Oath
Document Description: Oath or declaration filed

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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)

Title of Invention	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS

This statement is directed to:

☐ The attached application,

OR

☒ United States application or PCT international application number 16/190,420 filed on November 14, 2018.

LEGAL NAME of inventor to whom this substitute statement applies:

(*E.g.*, Given Name (first and middle (if any)) and Family Name or Surname)

Philip Young

Residence (except for a deceased or legally incapacitated inventor):

City	State	Country
Alton		GB

Mailing Address (except for a deceased or legally incapacitated inventor):

Sweet Briar, Hussell Lane
Medstead

City	State	Zip	Country
Alton, Hampshire		GU34 5PF	GB

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:

☐ Legal Representative (for deceased or legally incapacitated inventor only),

☒ Assignee,

☐ Person to whom the inventor is under an obligation to assign,

☐ Person who otherwise shows a sufficient proprietary interest in the matter (petition under 37 CFR 1.46 is required), or

☐ Joint 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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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: Rocky Adornato

Date (Optional): Dec 3, 2020

Signature: Rocky Adornato
Rocky Adornato (Dec 3, 2020 10:10 PST)

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:

Applicant Name: Intellectual Ventures Holding 81 LLC

Title of Person Executing This Substitute Statement: Authorized Person

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: Bellevue | State: WA | Country: U.S.

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

112 North Curry Street,

City: Carson City | State: NV | Zip: 89703 | Country: U.S.

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

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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.

FIG. 1

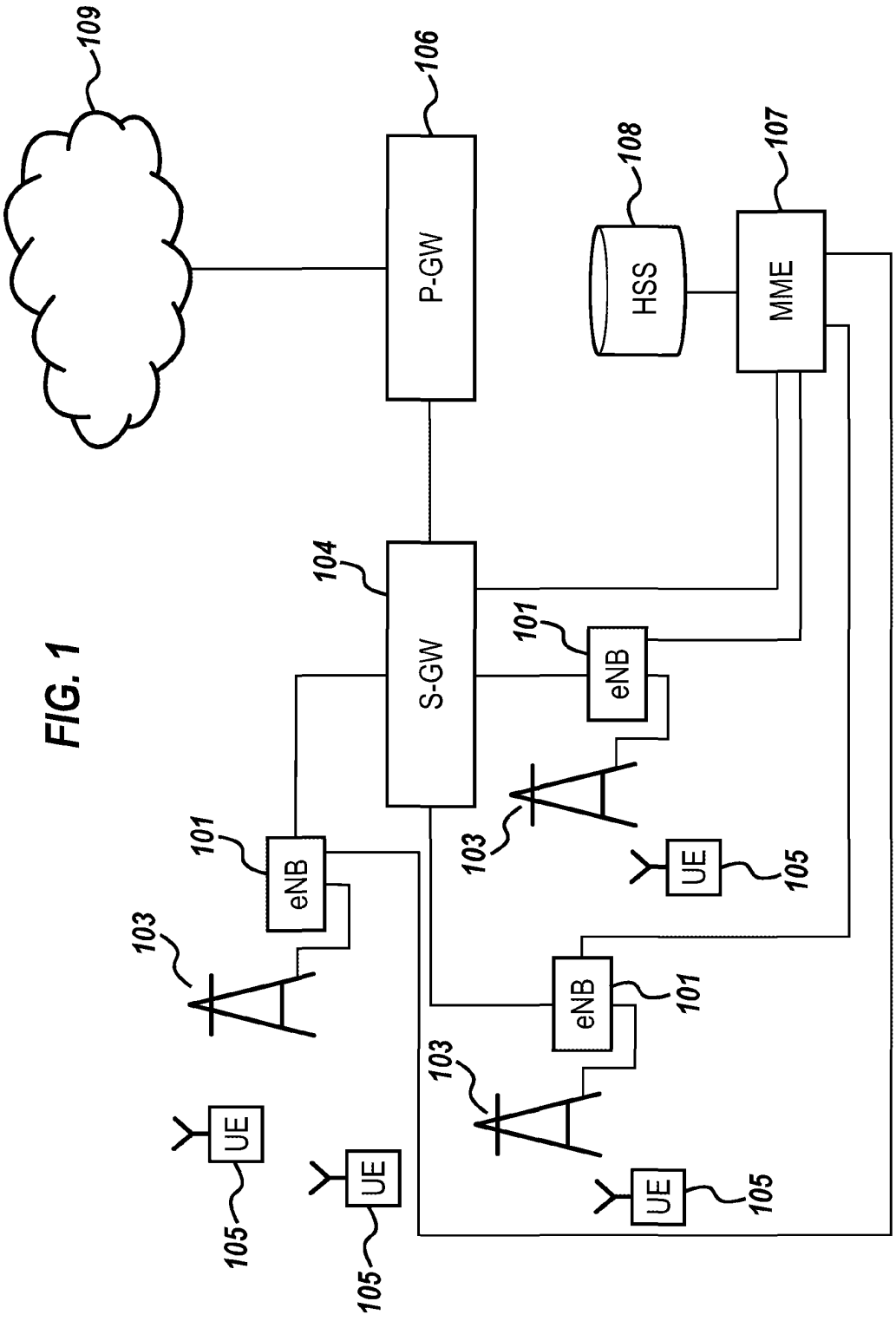


FIG. 2

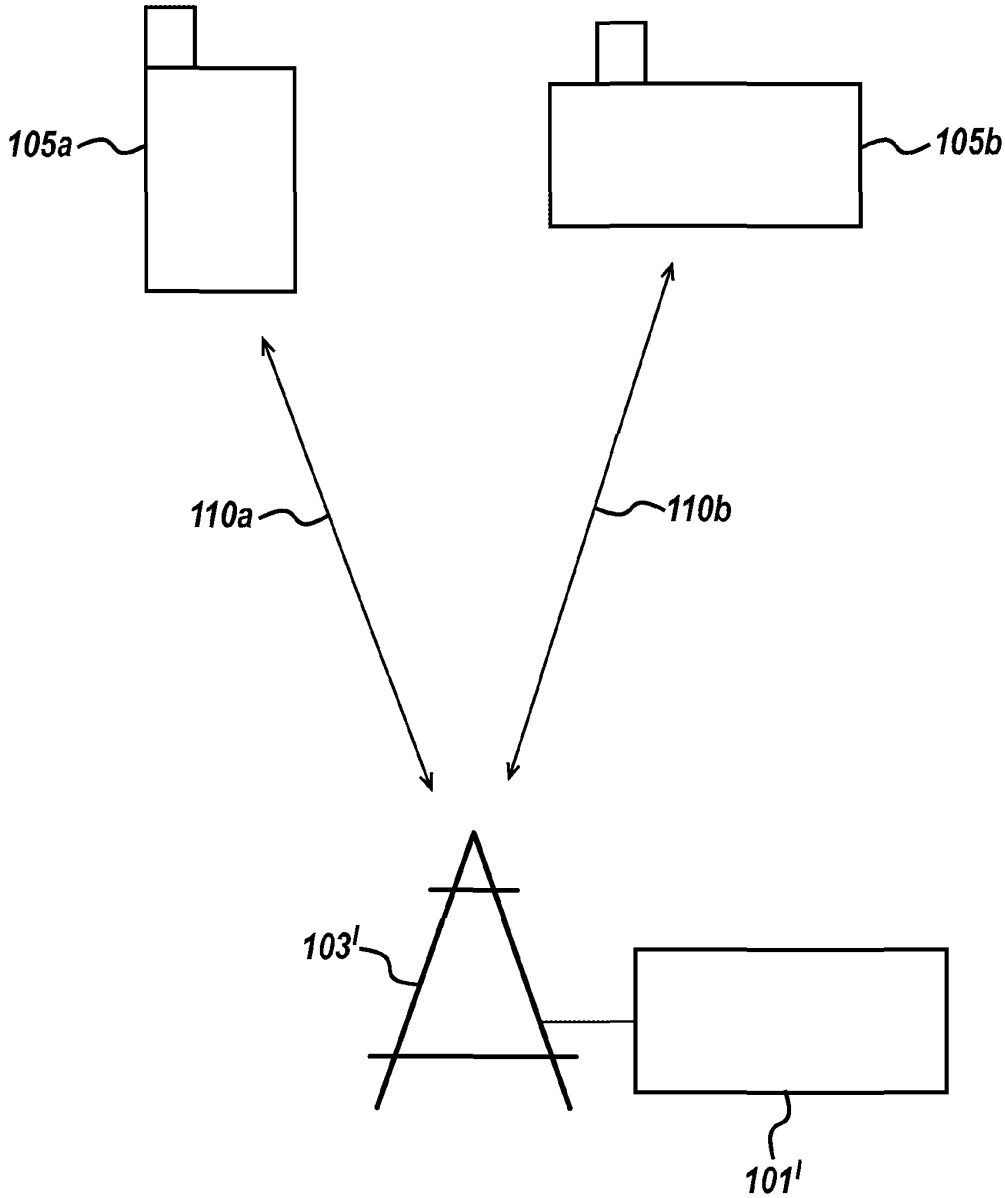


FIG. 3

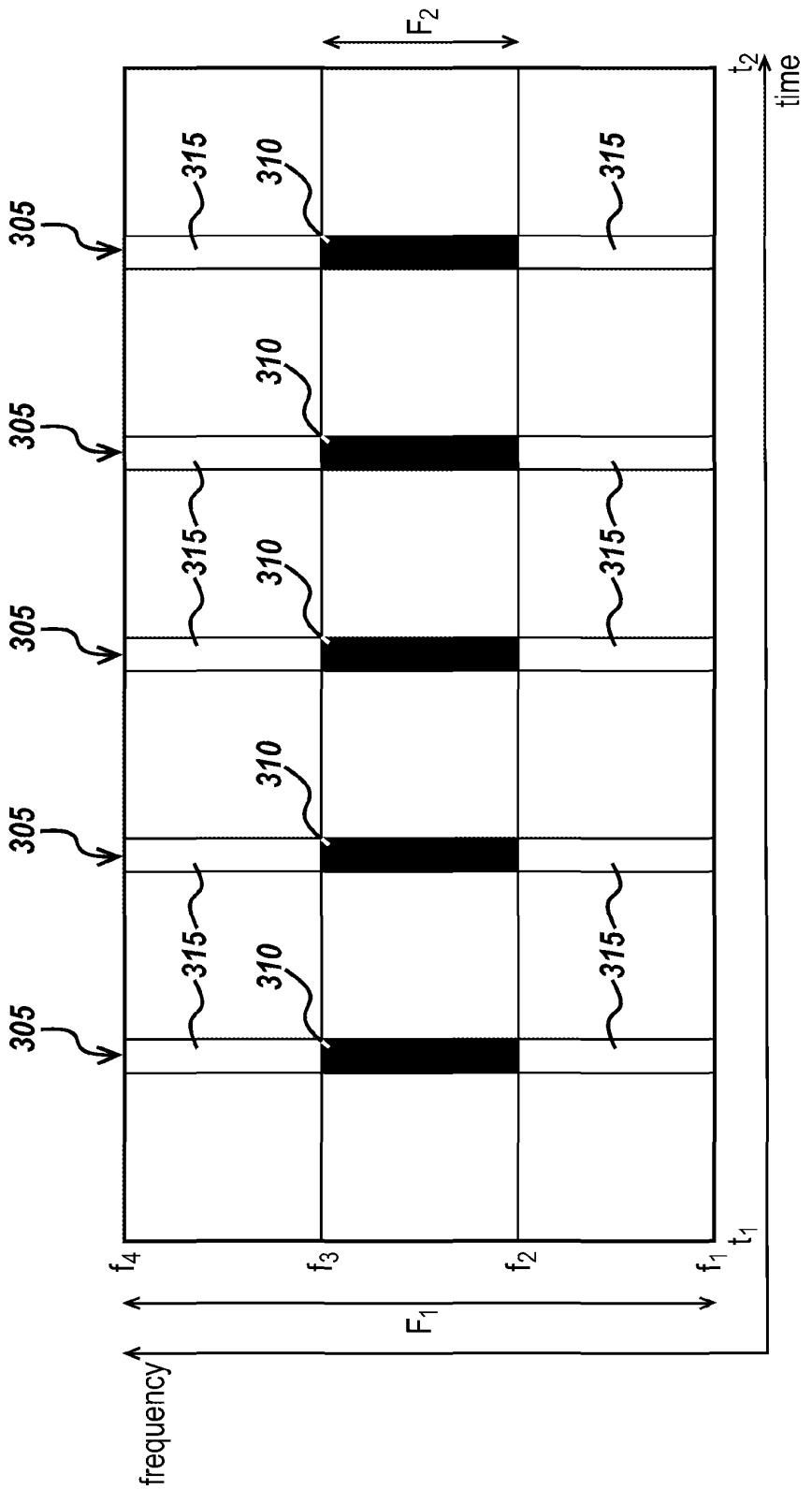


FIG. 4

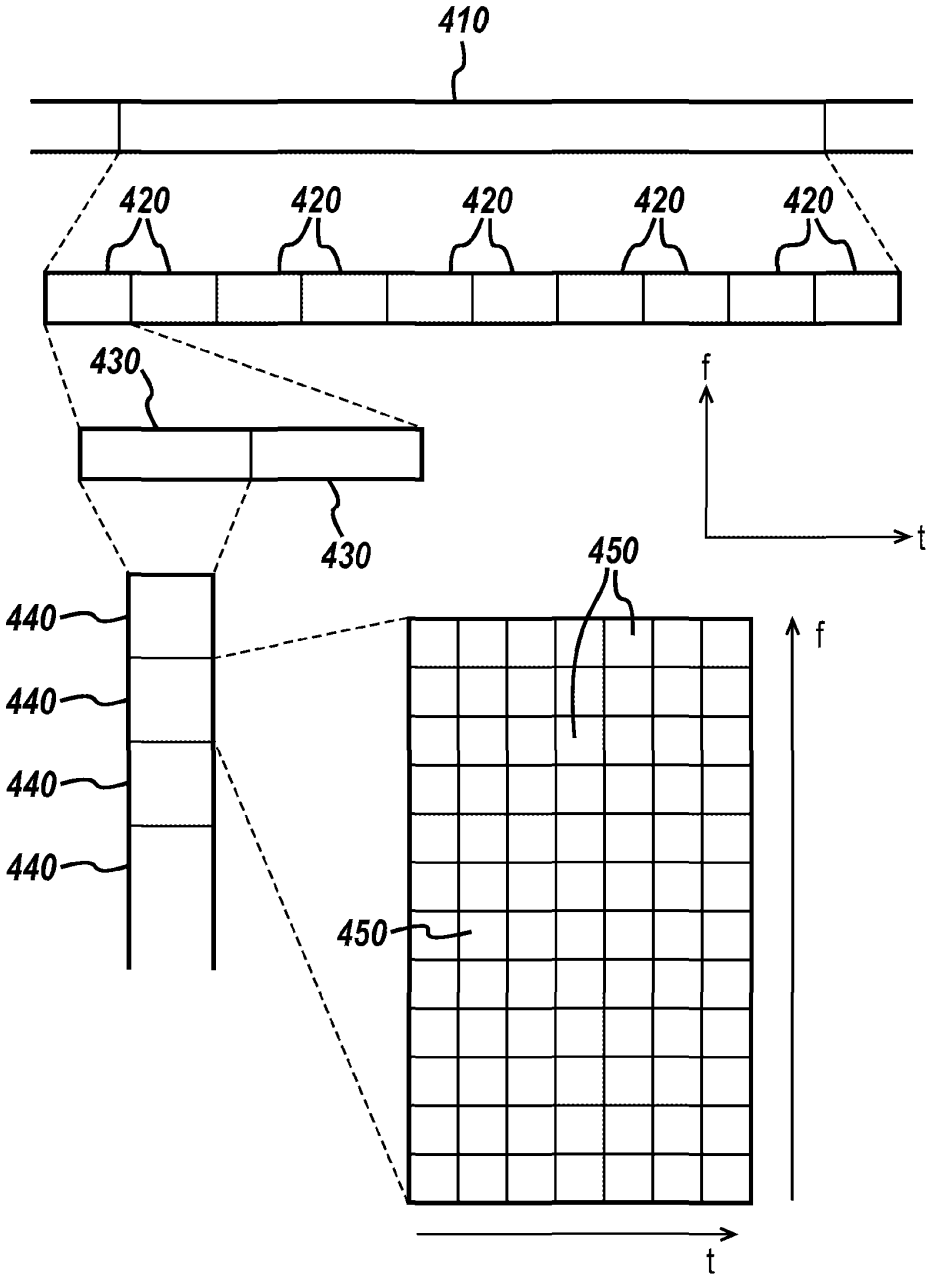


FIG. 5A

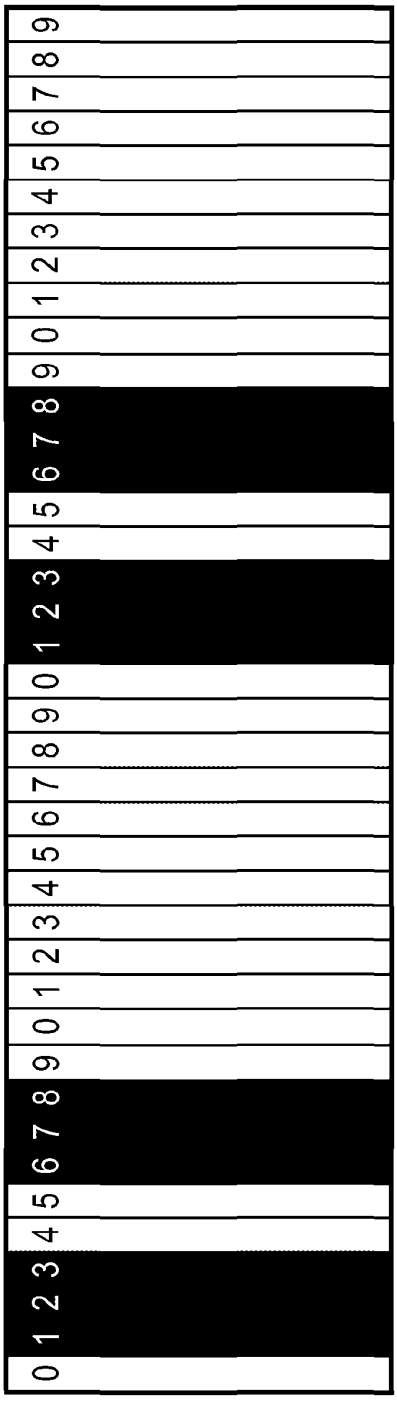

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9

FIG. 5B

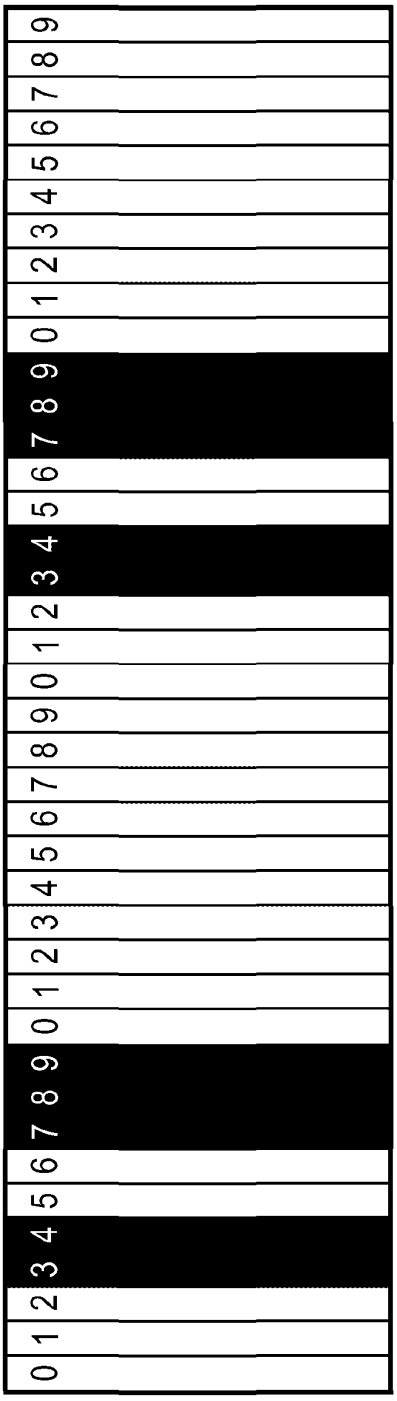

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9

FIG. 5C

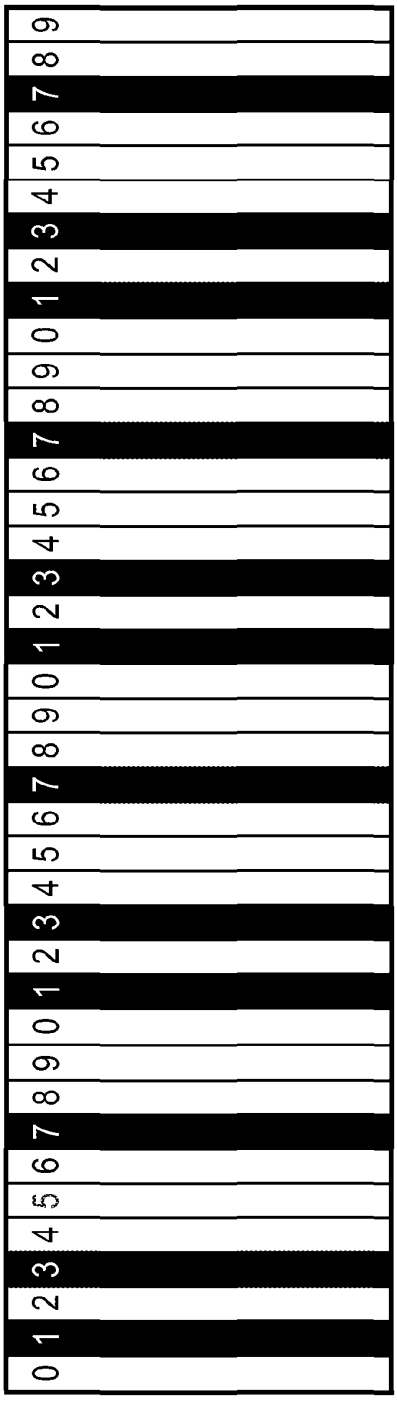

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9

FIG. 5D

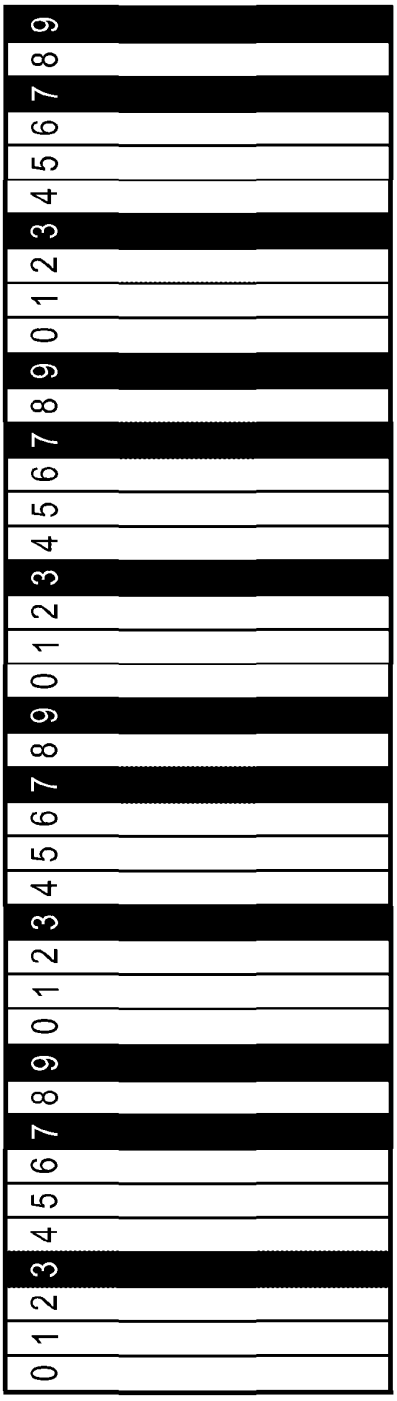

0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9

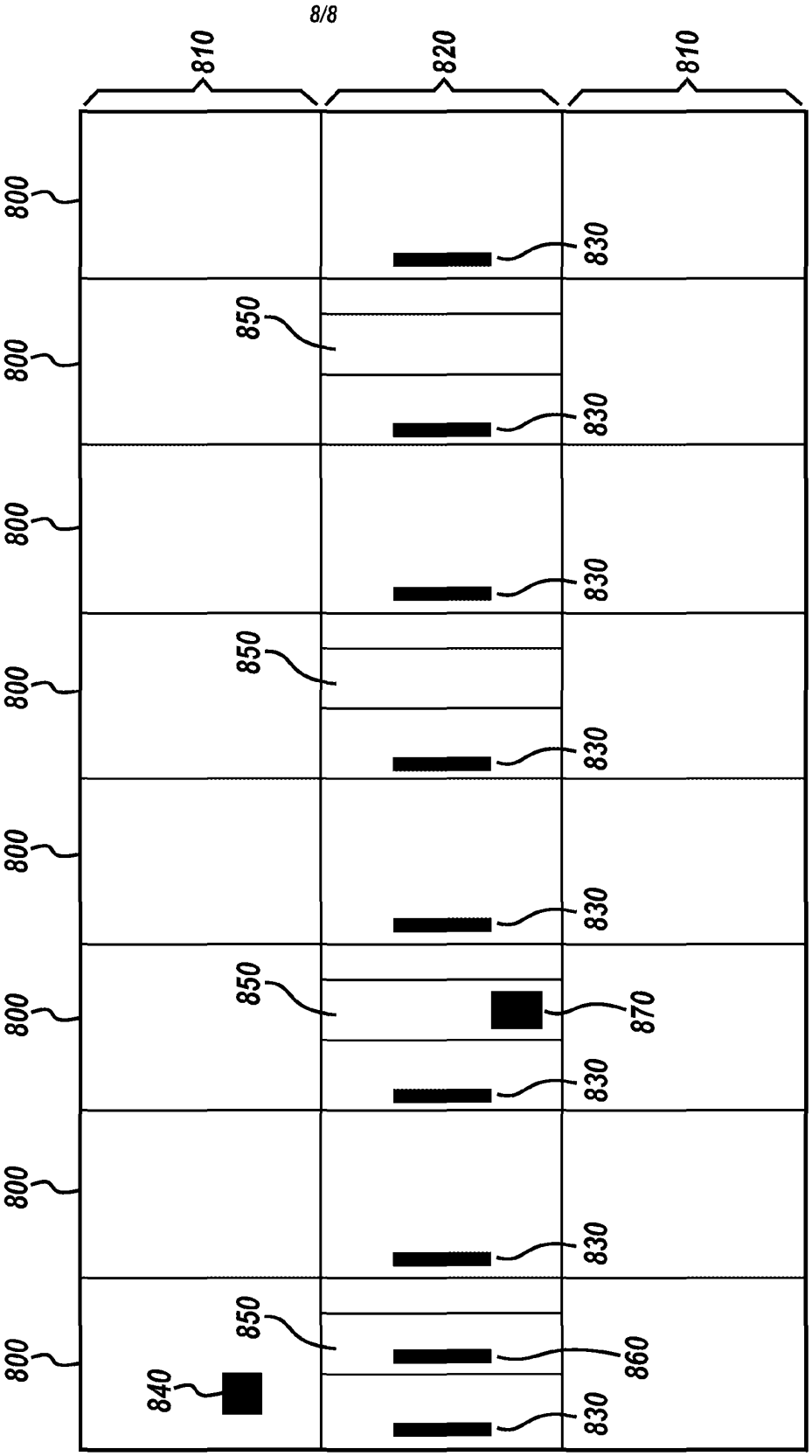
FIG. 6

Synchronise, read PBCH
A1
Subord. carrier indicator present?
A2
N
Y
Teminate camp-on with this carrier
A4
Subordinate carrier present-continue camp-on
A3
A

FIG. 7

A
Determine location of scMIB
B1
Receive and decode scMIB
B2
Determine bandwidth and centre frequency of subordinate carrier
B3
Determine allocation of subordinate carrier sub-frames
B4
Obtain System Information (SIBs) from within subordinate carrier sub-frames
B5
Subordinate carrier acquisition completed
B6

FIG. 8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ABSTRACT

User equipment (UE) may receive a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB). Further, the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth. The MIB includes an indication of frequency resources and time resources for use in acquiring additional system information. The UE may further acquire the additional system information using the indication of the frequency resources and the time resources.

CLAIMS

What is claimed is:

1. A user equipment (UE) comprising:

a transceiver; and

a processor, operatively coupled to the transceiver; wherein

the transceiver and the processor are configured to receive a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth, wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and

the transceiver and the processor are configured to acquire the additional system information using the indication of the frequency resources and the time resources.

2. The UE of claim 1 wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth.

3. The UE of claim 1 wherein the transceiver and the processor are configured to receive control information and physical downlink shared channel

(PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth.

4. The UE of claim 2 wherein the transceiver and the processor are configured to receive control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion.

5. The UE of claim 4 wherein the transceiver and the processor are configured to switch between the plurality of bandwidth portions at different times.

6. The UE of claim 1 wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.

7. The UE of claim 1 wherein the indicated frequency resources and the time resources include a second MIB.

8. A method performed by a user equipment (UE), the method comprising:

receiving a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master

information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth, wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and

acquiring the additional system information using the indication of the frequency resources and the time resources.

9. The method of claim 8 wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth.

10. The method of claim 8, further comprising:

receiving control information and physical downlink shared channel (PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth.

11. The method of claim 9, further comprising:

receiving control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion.

12. The method of claim 11, further comprising:

switching between the plurality of bandwidth portions at different times.

13. The method of claim 8 wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.

14. The method of claim 8 wherein the indicated frequency resources and the time resources include a second MIB.

15. At least one non-transient computer readable medium containing program instructions to perform a method of:

receiving a primary synchronization signal (PSS), a secondary synchronization signal (SSS), and a physical broadcast channel (PBCH) including a master information block (MIB), the PSS, SSS and PBCH are in a first bandwidth of a cell having a cell bandwidth, wherein the first bandwidth is a first portion of the cell bandwidth, wherein the MIB includes an indication of frequency resources and time resources for use in acquiring additional system information; and

acquiring the additional system information using the indication of the frequency resources and the time resources.

16. The at least one non-transient computer readable medium of claim 15 wherein the indication of the frequency resources and the time resources is within a first portion of the cell bandwidth.

17. The at least one non-transient computer readable medium of claim 15, further comprising:

receiving control information and physical downlink shared channel (PDSCH) transmissions with the first portion of the cell bandwidth and not in other portions of the cell bandwidth.

18. The at least one non-transient computer readable medium of claim 16, further comprising:

receiving control information indicating a plurality of bandwidth portions of the cell bandwidth, wherein the plurality of bandwidth portions includes the first portion.

19. The at least one non-transient computer readable medium of claim 18, further comprising:

switching between the plurality of bandwidth portions at different times.

20. The at least one non-transient computer readable medium of claim 15 wherein the indicated frequency resources and the time resources include control information for use by the UE to acquire a system information block 1.

21. The at least one non-transient computer readable medium of claim 15 wherein the indicated frequency resources and the time resources include a second MIB.

COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application is a continuation of U.S. Patent Application Serial No. 16/190,420, filed November 14, 2018, which is a continuation of U.S. Patent Application Serial No. 14/372,363, filed July 15, 2014, now abandoned, which is a §371 application of International Application No. PCT/GB2013/050126, filed January 21, 2013, which are incorporated by reference as if fully set forth.

FIELD OF INVENTION

[0002] The present invention relates to wireless communications systems and methods, and in particular to a system, method, base station and terminal device for communicating using a subordinate carrier of a host carrier.

BACKGROUND OF THE INVENTION

[0003] Mobile communication systems have evolved over the past ten years or so from the GSM System (Global System for Mobile communications) to the 3G system and now include packet data communications as well as circuit switched communications. The third generation partnership project (3GPP) is developing a fourth generation mobile communication system referred to as Long Term Evolution (LTE) in which a core network part has been evolved to form a more simplified architecture based on a merging of components of earlier mobile radio network architectures and a radio access interface which is based on Orthogonal Frequency Division Multiplexing (OFDM) on the downlink and Single Carrier Frequency Division Multiple Access (SC-FDMA) on the uplink.

[0004] Third and fourth generation mobile telecommunication systems, such as those based on the 3GPP defined UMTS and Long Term Evolution (LTE) architectures, are able to support a more sophisticated range of services than simple

voice and messaging services offered by previous generations of mobile telecommunication systems.

[0005] For example, with the improved radio interface and enhanced data rates provided by LTE systems, a user is able to enjoy high data rate applications such as mobile video streaming and mobile video conferencing that would previously only have been available via a fixed line data connection. The demand to deploy third and fourth generation networks is therefore strong and the coverage area of these networks, i.e. geographic locations where access to the networks is possible, is expected to increase rapidly.

[0006] The anticipated widespread deployment of third and fourth generation networks has led to the parallel development of a class of devices and applications which, rather than taking advantage of the high data rates available, instead take advantage of the robust radio interface and increasing ubiquity of the coverage area. Examples include so-called machine type communication (MTC) applications, also known as machine-to-machine (M2M) communications, some of which are in some respects typified by semi-autonomous or autonomous wireless communication devices (i.e. MTC devices) communicating small amounts of data on a relatively infrequent basis. Examples include so-called smart meters which, for example, are located in a customer's home and periodically transmit data back to a central MTC server relating to the customer's consumption of a utility such as gas, water, electricity and so on.

[0007] Whilst it can be convenient for a terminal such as an MTC-type terminal to take advantage of the wide coverage area provided by a third or fourth generation mobile telecommunication network there are at present disadvantages. Unlike a conventional third or fourth generation mobile terminal such as a smartphone, a primary driver for MTC-type terminals will be a desire for such terminals to be relatively simple and inexpensive. The type of functions typically performed by a MTC-type terminal (e.g. simple collection and reporting of relatively small amounts of data) do not require particularly complex processing to perform, for example, compared to a smartphone supporting video streaming. However, third and fourth

generation mobile telecommunication networks typically employ advanced data modulation techniques and support wide bandwidth usage on the radio interface which can require more complex and expensive radio transceivers to implement. It is usually justified to include such complex transceivers in a smartphone as a smartphone will typically require a powerful processor to perform typical smartphone type functions. However, as indicated above, there is now a desire to use relatively inexpensive and less complex devices to communicate using LTE type networks.

SUMMARY OF THE INVENTION

[0008] According to a first aspect of the invention there is provided a wireless communications system, comprising a base station, one or more terminal devices of a first type and one or more terminal devices of a second type. The base station is operable to communicate with the terminal devices of the first type using a host carrier comprising radio resource segments distributed in time, each radio resource segment providing radio resources across a first frequency band. The base station is operable to communicate with the terminal devices of the second type using a subordinate carrier comprising radio resources within a second frequency band of a subset of the radio resource segments of the host carrier, the second frequency band being narrower than and contained within the first frequency band.

[0009] In this way, an efficient and flexible mechanism for specifying and controlling an amount and location of radio resources to be dedicated to a subordinate earner for use by a particular (e.g. reduced capability) type of device can be provided.

[0010] One way of achieving this differentiated access between the terminal devices of the first type and second type is to allocate a part of the carrier resource that is dedicated to the second type of device (e.g. MTC traffic) using normal eNB (base station) scheduling. The eNB differentiates between MTC and non-MTC (example of the first type of device) UEs and only schedules MTC UEs within the reserved part of the earner resource and only schedules non-MTC UEs outside of the reserved part of the carrier resource. While this solution is viable, the simple

scheduling approach places some restrictions on the MTC subordinate carrier that can be realised. For instance, it would be necessary to use the same carrier characteristics and/or reference signals. If it were advantageous to use different carrier characteristics or to use additional or modified reference signals then this may not be possible in an MTC subordinate carrier implemented purely by eNB scheduling.

[0011] The radio resource segments may be sub-frames of radio frames, each radio frame comprising a plurality of sub-frames. In this case, the sub-frames may be allocated to the subordinate carrier using a subordinate carrier sub-frame allocation set, the subordinate carrier sub-frame allocation set determining which sub frames within a repeating group of one or more radio frames are allocated to the subordinate carrier. The subordinate carrier sub-frame allocation set may be defined by one or more reserved sub-frame allocation patterns. The one or more reserved sub-frame allocation patterns may comprise all or a sub-set of all reserved sub-frame allocation patterns defined for the host carrier.

[0012] In one example, the subframes selected for the subordinate carrier are so-called MBSFN (Multimedia Broadcast/multicast service over a Single Frequency Network) subframes. This embodiment relies on the fact that such subframes do not have to be used exclusively for MBSFN. The LTE Rel. 8/9/10 specifications define a means (in the standard LTE SystemInformationBlockType2 - SIB2) by which certain subframes can be excluded from normal allocation to the Physical Downlink Shared Channel (PDSCH). Furthermore, the specifications define signalling within the standard system information which allows some or all of these excluded subframes to be used for other defined purposes, such as MBMS (in SystemInformationBlockType13 - SIB 13), relay and positioning reference signal transmission. However, reading of this system information may require reception across the whole carrier bandwidth.

[0013] Acquisition information required for a terminal device of the second type to receive the subordinate carrier may be allocated for inclusion in sub-frames of the

subordinate carrier using at least a portion of the subframes in one or more of the reserved sub-frame allocation patterns defining the subordinate carrier.

[0014] The base station may be operable to transmit an indication of the radio resources of all reserved sub-frames to terminal devices of the first type. In this way, the first type of device is informed of subframes which are reserved for the subordinate carrier, another subordinate carrier, and for other purposes such as relay backhaul. A particular device of the first type is not required to know why a particular sub-frame is reserved, merely that it is not available to that device. This indication may be presented to the terminal devices of the first type as a reserved subframe allocation within a system information block transmitted using frequency resources not necessarily limited to the second frequency band of the subordinate carrier. In this way, it is possible to exclude non-MTC devices from a resource reserved for the subordinate carrier.

[0015] The base station may be operable to transmit, using radio resources within the second frequency band, subordinate carrier information indicating that a subordinate carrier is available within the host carrier. A terminal device of the second type may be responsive to subordinate carrier information indicating that a subordinate carrier is not available within the host carrier to terminate a camp-on procedure for camping on to the network.

[0016] The subordinate carrier information may be provided within first acquisition information transmitted on radio resources within the second frequency band, the first acquisition information being required for a terminal device of the first type to receive the system information of the host carrier. The first acquisition information may be a master information block transmitted on a physical broadcast channel within radio resources of the host earner. In this way it is possible to signal via the first acquisition information, to terminal devices of the second type, the presence of an MTC subordinate carrier existing within the reserved resource and using only a restricted bandwidth. If the subordinate carrier information is not

present then the camp-on process by a terminal device may be terminated early, thereby reducing time and power wastage at the terminal device.

[0017] The first type of terminal device may be capable of receiving the full bandwidth of the first frequency band, and the second type of terminal device may not be capable of receiving the full bandwidth of the first frequency band but be capable of receiving the full bandwidth of the second frequency band. The bandwidth of the subordinate carrier may be predetermined and be known in advance to terminal devices of the second type. Alternatively, the base station may be operable to transmit, using radio resources within the second frequency band, an indication of the bandwidth of the subordinate carrier. In this case the bandwidth need not necessarily be predetermined. The indication of the bandwidth of the subordinate carrier may be provided within first acquisition information transmitted on radio resources within the second frequency band, the acquisition information being provided to permit a terminal device of the first type to receive the host carrier downlink and camp on to the host carrier. Alternatively, the base station may be operable to transmit, using radio resources of the subordinate carrier, an indication of the bandwidth of the subordinate carrier.

[0018] The base station may be operable to transmit, using radio resources of the subordinate carrier, second acquisition information required for a terminal device of the second type to receive the subordinate carrier downlink and camp on to the subordinate carrier. The second acquisition information may be transmitted on predetermined radio resources which are known in advance to terminal devices of the second type. The second acquisition information may comprise an indication of the bandwidth of the subordinate carrier. In this way, it is possible to signal system information defining the characteristics of the MTC subordinate carrier using only resources within the MTC subordinate carrier.

[0019] The radio resource segments may be sub-frames of radio frames in the time direction, each radio frame comprising a plurality of sub-frames. The second acquisition information may be transmitted in at least some of the sub-frames

allocated to the subordinate carrier. A terminal device of the second type may be operable to determine whether a sub-frame contains second acquisition information from a current radio frame number and a first sub-frame allocation set for allocating the second acquisition information to sub-frames within the subordinate carrier, said first sub-frame allocation set identifying which sub-frames within a repeating group of one or more radio frames contain the second acquisition information.

[0020] The current radio frame number may be determined from first acquisition information transmitted on radio resources within the second frequency band, the first acquisition information being required for a terminal device of the first type to receive the host carrier downlink and camp on to the network. The first sub-frame allocation set may be predetermined and known in advance to terminal devices of the second type. The second acquisition information may comprise an indication of the current radio frame number. Accordingly, once the second acquisition information is available to a mobile terminal, it may from that point on obtain the current radio frame number from the second acquisition information rather than having to refer back to the first acquisition information.

[0021] A terminal device of the second type may be operable to determine whether a sub-frame is allocated to the subordinate carrier from a current radio frame number and a second sub-frame allocation set for the subordinate carrier, said second sub-frame allocation set identifying which sub-frames within a repeating group of one or more radio frames are allocated to the subordinate carrier. The current radio frame number may be determined from the second acquisition information. Alternatively, the current radio frame number may be determined from the first acquisition information and updated by counting radio frames.

[0022] The second sub-frame allocation set may be predetermined and known in advance to terminal devices of the second type. Alternatively, the second sub-frame allocation set may be specified in the second acquisition information. It will be appreciated that the second sub-frame allocation set may be different to the first sub-

frame allocation set, but will include all of the sub-frames of the first sub-frame allocation set (and probably additional sub-frames as well).

[0023] The first type of terminal device may be an LTE device and the second type of device may be a low data rate device. The first type of terminal device may be an LTE device and the second type of device may be a low data rate device for providing machine-to-machine (M2M) communication.

[0024] It will be appreciated that different radio resource segments of the same or a different frequency band may be used to support a further subordinate carrier.

[0025] At least a portion of the radio resources outside of the second frequency band of the subset of the radio resource segments of the host earner allocated to the subordinate carrier may be allocated to another subordinate carrier. In other words, a different frequency band of the same resource segments (in time) may support another carrier.

[0026] At least a portion of the radio resources outside of the second frequency band of the subset of the radio resource segments of the host carrier allocated to the subordinate carrier may be used for communicating with terminal devices of the first type. In other words, a different frequency band of the same resource segments (in time) may support the host carrier.

[0027] Viewed from another aspect, there is provided a base station for communicating with terminal devices. The base station is operable to communicate with terminal devices of a first type using a host carrier comprising radio resource segments distributed in time, each radio resource segment providing radio resources across a first frequency band. The base station is operable to communicate with terminal devices of a second type using a subordinate carrier comprising radio resources within a second frequency band of a subset of the radio resource segments of the host carrier, the second frequency band being narrower than and contained within the first frequency band.

[0028] Viewed from another aspect, there is provided a terminal device for communicating with a base station which supports a host carrier comprising radio

resource segments distributed in time, each radio resource segment providing radio resources across a first frequency band. The terminal device is operable to communicate with the base station using a subordinate carrier comprising radio resources within a second frequency band of a subset of the radio resource segments of the host carrier, the second frequency band being narrower than and contained within the first frequency band.

[0029] Viewed from another aspect, there is provided a method of communicating between a base station and terminal devices of a first type and a second type. The method comprises communicating between the base station and terminal devices of a first type using a host carrier comprising radio resource segments distributed in time, each radio resource segment providing radio resources across a first frequency band, and communicating between the base station and terminal devices of a second type using a subordinate carrier comprising radio resources within a second frequency band of a subset of the radio resource segments of the host carrier, the second frequency band being narrower than and contained within the first frequency band.

[0030] Viewed from another aspect, there is provided a method of communicating with a base station from a terminal device, comprising communicating with the base station using a subordinate carrier of a host carrier comprising radio resource segments distributed in time, each radio resource segment of the host carrier providing radio resources across a first frequency band, the subordinate carrier comprising radio resources within a second frequency band of a subset of the radio resource segments of the host carrier, the second frequency band being narrower than and contained within the first frequency band.

[0031] It will be appreciated that features of the above-described aspects and embodiments of the invention may be combined with features of other aspects and embodiments of the invention as appropriate and in combinations other than those explicitly set out. For example, optional features of the first aspect of the invention

may equally optionally be incorporated in embodiments according to other aspects of the invention, for example where the different aspects have corresponding features.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] Example embodiments of the present invention will now be described with reference to the accompanying drawings in which like parts have the same designated references and in which:

[0033] Figure 1 is a schematic block diagram of a radio network and a plurality of user equipments forming a wireless communication system which operates in accordance with the 3GPP Long Term Evolution (LTE) standard;

[0034] Figure 2 schematically represents elements of a mobile telecommunications system for implementing embodiments of the invention;

[0035] Figure 3 schematically represents a time and frequency resource allocation between a host carrier and a subordinate carrier;

[0036] Figure 4 schematically illustrates a radio frame and resource grid structure of time and frequency resources;

[0037] Figures 5A to 5D schematically illustrate example allocations of resources to the subordinate carrier;

[0038] Figure 6 is a schematic flow diagram of a first part of a camp-on procedure for connecting to the subordinate carrier;

[0039] Figure 7 is a schematic flow diagram of a second part of the camp-on procedure for connecting to the subordinate carrier; and

[0040] Figure 8 schematically illustrates a signalling configuration according to an embodiment of the invention.

DETAILED DESCRIPTION OF THE EXAMPLE EMBODIMENTS

Network Structure

[0041] Embodiments of the present invention are described herein with particular reference to an example implementation in a wireless communication system having carriers based around the 3GPP Long Term Evolution (LTE) standard.

[0042] Figure 1 schematically shows an example architecture of an LTE system. The LTE system is provided by a telecommunications network operator to allow parties to communicate. As shown in Figure 1, mobile communications devices designated as user equipment (UE) 105 are arranged to communicate data to and from base stations (transceiver stations) 101 which are frequently referred to in LTE as E-UTRAN NodeBs (e-nodeB). Each of the base stations 101 comprises a transceiver unit 103 enabling communication of data to and from a plurality of mobile communication devices via a radio interface. The e-nodeBs 101 are connected to a serving gateway S-GW 104 and to a mobility management entity (MME) 107. The S-GW 104 is arranged to perform routing and management of mobile communications services to the communications devices 105 in the mobile radio network. In order to maintain mobility management and connectivity, the mobility management entity (MME) 107 manages evolved packet system (EPS) connections with the communications devices 105 using subscriber information stored in a home subscriber server (HSS) 108. Other core network components include a packet data network gateway (P-GW) 106 which connects to an internet network 109 and finally to an external server (not shown). In the context of MTC communications a UE supporting MTC communications may, for example, be conveniently referred to as an MTC terminal or MTC UE, and a server with which the MTC terminal(s) communicate data may, for example, be conveniently referred to as an MTC server. More generally, devices in the system capable of supporting MTC communications may be referred to as MTC entities. The various elements of Figure 1 and their respective modes of operation are well-known and defined in the relevant standards administered by the 3GPP (RTM) body and also described in many books on the subject, for example, Holma H. and Toskala A [1]. These conventional aspects of LTE networks are not described further in the interest of brevity.

[0043] Two classes of device are considered herein. A first class of device is configured to communicate via a host carrier, and a second class of device is configured to communicate via a subordinate carrier. In some of the particular examples considered here, the first class of device and the host carrier are compliant with particular standards, for example, LTE Rel. 8/9/10 standards, and the second class of device and the subordinate carrier are compliant with modified versions of these particular standards, for example, based on versions of the standards modified to support lower-capability devices. Accordingly, and purely for the sake of reference and to aid explanation, the first class of device and the host carrier may be referred to here in some examples as legacy devices and legacy carrier, while the second class of device and the subordinate carrier may be referred to in some examples as MTC devices and MTC carrier (or in alternative DMN (Dedicated Messaging Network) devices and DMN carrier). However, it will be appreciated that these terms are simply used as labels for ease of explanation of particular implementations of embodiments of the invention for distinguishing the two classes of device and carrier. Thus, the term "legacy" should not be considered as indicating any form of obsolescence, and indeed the devices and carrier(s) referred to here as legacy devices and carrier(s) may equally correspond with devices and carrier(s) that comply with future releases of the LTE standards, for examples Rel. 11 and beyond. Equally, and as already noted above, DMN should not be taken to refer to a network which exclusively supports only basic messaging services. Furthermore, the second class of device and subordinate carrier that are described here as not being fully compliant with the operating standards of the first class of device and first carrier (for example because of reduced capability) may nonetheless be compliant with their own standards. Furthermore, the functionality described herein as regards both the first and second classes of device and carriers might comply with different aspects of a future standard, for example a future release of the LTE standards.

[0044] Referring now to Figure 2, a base station 101' is shown communicatively connected to an LTE device 105a via a transceiver unit 103' and a first (host) earner

110a, and communicatively connected to an MTC device 105b via the transceiver unit 103' and a second (subordinate) carrier 110b. The base station 101' is responsible for a coverage area in which both the LTE device 105a and the MTC device 105b are located. The single base station 101' is able to communicate on both the first carrier 110a and the second carrier 110b. The first carrier 110a is a host carrier having a broad bandwidth, while the second carrier 110b is a subordinate carrier having a narrower bandwidth located within the frequency band of the host earner. As will be explained in more detail below, the time and frequency resources of the first (host) carrier and the second (subordinate) carrier are logically separate for the purposes of data transmission and most control signalling, but some time and frequency resources are accessible to and used by devices connected to both the first and second carriers.

Host Carrier and Subordinate Carrier Overview

[0045] Referring to Figure 3, the time and frequency resources constituting the host carrier and the subordinate carrier are schematically illustrated. The horizontal axis of Figure 3 is time, with a time period from t_1 to t_2 being shown in Figure 3. The vertical axis of Figure 3 is frequency, the frequency increasing from a frequency f_1 to a frequency f_4. The host carrier has a frequency band F_1, extending from the frequency f_1 to the frequency f_4. The subordinate earner has a frequency band F_2, extending from a frequency f_2 to a frequency f_3. The subordinate carrier is intended primarily for use by terminal devices which do not have the capability to receive or transmit between the frequencies f_1 and f_2, and between the frequencies f_3 and f_4. The subordinate carrier does not occupy all of the time and frequency resources within the frequency band F_2. Instead, certain time periods 305 of the frequency band F_2 are allocated to the subordinate carrier (and potentially to other subordinate carriers), with the unallocated time periods within the frequency band F_2 forming part of the host carrier resources. The shaded portions 310 of Figure 3 indicates those time and frequency resources allocated to the subordinate carrier. When a time period 305 is allocated to the subordinate carrier, the time and frequency resources

315 falling outside of the frequency band F_2 (but within the frequency band F_1) are not allocated to the subordinate carrier. In some implementations these time and frequency resources may be available to the host carrier (or to another subordinate earner having a different (and non-overlapping) frequency band). In other implementations these time and frequency resources may be "lost" and unusable by either the first type of device or the second type of device. It is envisaged that the central frequency and bandwidth of the frequency bands F_1 and F_2 would be fixed for a given host carrier/subordinate carrier, although implementations in which they are not fixed may be possible. The particular time periods allocated to the subordinate carrier may be fixed, or may be dynamically variable, for example to increase or decrease the amount of radio resources allocated to the subordinate carrier to adapt to traffic conditions of the subordinate carrier (and/or possibly of the host carrier).

Radio Frame and Resource Grid Structure

[0046] Referring now to Figure 4, a radio frame and resource grid structure for an LTE type network is schematically illustrated. At the top of Figure 4, a radio frame 410 is shown. This occupies the full width of the frequency band of the host carrier, and has a duration of 10ms. The radio frame 410 is one of a sequence of radio frames which are used to communicate data between a base station and a terminal device. The radio frame 410 comprises 10 sub-frames 420, which again occupy the fully width of the frequency band of the host carrier. Each of these sub-frames 420 has a duration of 1ms. Each of the sub-frames 420 comprises two slots 430, each slot occupying the full width of the frequency band of the host carrier and having a duration of 0.5ms. Each slot comprises a plurality of resource blocks 440 in the frequency direction, and only a single resource block 440 in the time direction. In other words each resource block 440 has a duration of 0.5ms (the same as the duration of the slot 430), but occupies only a portion of the bandwidth of the host carrier. Each resource block 440 comprises a two-dimensional array of resource elements 450 distributed in both the time direction and the frequency direction. Each resource element 450 has a length (duration) of one modulation symbol, and a frequency range

of one subcarrier (e.g. 15kHz). In the present case the resource block 440 has a dimension of 12 resource elements 450 in the frequency dimension and 7 resource elements 450 in the time dimension, resulting in an overall bandwidth of 12 subcarriers and a duration of 7 symbols.

[0047] In operation, data transmissions between a base station and a terminal device may be scheduled to use particular resource blocks. This scheduling is usually carried out by the base station or a related network entity. Certain resource blocks may be permanently allocated to carry predetermined signalling information.

[0048] 3GPP LTE Releases 8, 9 and 10 (Rel. 8/9/10) define 6 downlink transmission bandwidth configurations from 1.4 MHz to 20 MHz representing the use of 6, 15, 25, 50, 75 or 100 resource blocks. As noted above, all Rel. 8/9/10 terminal devices are required to support the maximum single carrier bandwidth of 20 MHz for compliance with the Rel. 8/9/10 standards. Nevertheless, for all bandwidth configurations Rel. 8/9/10 has specified that basic physical layer synchronisation signals (Primary Synchronisation Signals - PSS, and Secondary Synchronisation Signals - SSS), and the most fundamental system information (Master Information Block - MIB) is transmitted using only the central 6 resource blocks which are receivable with a 1.4 MHz transceiver. However, in order to receive the remainder of the carrier system information the terminal device is required to be able to receive the full bandwidth of the carrier.

[0049] However, and as also noted above, for some applications, for example in situations relating to machine type communications (MTC) and/or dedicated messaging networks (DMN), there is a drive to build low cost and hence low capability devices. Ideally, device simplification should permit a reduction in required bandwidth of operation as well as reduction of features and throughput. Terminal devices with a lower bandwidth capability than that specified for Rel. 8/9/10 may mean that such devices are unable to operate properly on Rel. 8/9/10 compliant networks which specify higher bandwidth capabilities. For example, terminal devices

with a lower bandwidth capability may not even be able to receive any more system information than that contained in the MIB of a Rel. 8/9/10 compliant network.

[0050] Low capability devices will ideally be able to find and camp-on the carrier associated with their target dedicated messaging network(s) even in the presence of Rel. 8/9/10 higher bandwidth carriers. Furthermore, there is a desire that DMN carriers are not swamped by Rel. 8/9/10 capable devices camping-on the DMN, even though the Rel. 8/9/10 capable devices are in the coverage area of a higher bandwidth Rel. 8/9/10 carrier which they could otherwise use.

Subordinate Carrier Definition

[0051] As described in relation to Figure 3, the subordinate carrier resources (for use by MTC devices) may be defined by a certain bandwidth in the frequency domain (frequency band F_2 in Figure 3 for example) and a certain pattern of time periods in the time domain. The certain pattern of time periods may be a sequence of subframes as described above with reference to Figure 4. The sequence of subframes may be a sequence of MBSFN subframes as defined by signalling within SystemInformationBlockType2 (SIB2) of the legacy LTE host carrier. However, it will be recognised that the subordinate carrier may be delineated by other means, for example by scheduling by a base station. The pattern of subframes may be a subset (or all) of those subframes reserved by the information element mbsfh-SubframeConfigList in the host carrier SIB2.

[0052] Conveniently, non-MTC UEs will read SIB2 of the legacy LTE host carrier and determine that a configured pattern of subframes are reserved for other purposes (such as MBMS, relay or as in the present case MTC subordinate carrier operation). The non-MTC UEs will therefore ignore the subframes allocated to the subordinate carrier. The configured pattern of reserved subframes is defined in a flexible manner by the information element mbsfn-SubframeConfigList.

[0053] In particular, mbsfn-SubframeConfigList comprises a set of 1 or more subframe allocations each of which is defined by the following fragment of ASN.1 from TS 36.331:

```
MBSFN-SubframeConfig ::=     SEQUENCE {
        radioframeAllocationPeriod      ENUMERATED {n1 , n2, n4, n8, n16, n32},
        radioframeAllocationOffset      INTEGER (0..7),
        subframeAllocation                      CHOICE {
                oneFrame                                BIT STRING (SIZE(6)),
                fourFrames                              BIT STRING (SIZE(24))
        }
}
```

[0054] For a given allocation, the "radioframeAllocationPeriod" indicates the periodicity, in radio frames, with which MBSFN subframes are included in the allocation, "n1" indicates that MBSFN subframes are present in every radio frame, while "n2" indicates that MBSFN subframes are present in every other radio frame. A radioframeAllocationPeriod of "n32" indicates that one in every 32 radio frames includes one or more MBSFN subframes. Radio-frames that contain MBSFN subframes occur when equation SystemFrameNumber mod radioFrameAllocationPeriod = radioFrameAllocationOffset is satisfied. In other words, the radioframeAllocationOffset parameter sets an offset for a start position of the repeating pattern of radio frames. The subframeAllocation parameter defines the subframes that are allocated for MBSFN within the radio frame allocation period defined by the radioFrameAllocationPeriod and the radioFrameAllocationOffset parameters. The subframe allocation can either be specified for a single radio frame within the radio frame allocation period (oneFrame) or for four consecutive radio frames within the radio frame allocation period (four Frames). The subFrameAllocation parameter is a 6 bit (oneFrame) or 24 bit (fourFrame) mask, indicating whether each of 6 (oneFrame) or 24 (fourFrame) predetermined subframes are to be reserved. The LTE specification places restrictions on which subframes may be reserved for other purposes by this method, in order that there is no conflict with the requirement to receive system information and paging. In an FDD LTE system one or more of subframes 1, 2, 3, 6, 7 and 8 may be reserved for other purposes. In a

TDD LTE system the subframes that may be reserved are 3, 4, 7, 8 and 9. The system frame number can be derived from the MIB of the host carrier.

[0055] Figures 5A to 5D are example subframe patterns. Each of Figures 5 A to 5D shows a portion of a repeating pattern which could be specified by mbsfn-SubframeConfigList or by a similar pattern specifying function. Four radio frames having ten subframes each are shown in Figures 5A to 5D. The subframes are labelled from 0 (zero) to 9 (nine). The shaded subframes are those allocated to the subordinate carrier, with the unshaded subframes being retained for use on the host carrier. Figure 5A schematically illustrates an FDD pattern in which radioFrameAllocationPeriod is set to n2 (MBSFN subframes present in every other radio frame), the radioFrameAllocationOffset is 0 (zero) and the subframeAllocation mask is 111111 (thereby selecting each of subframes 1, 2, 3, 6, 7 and 8). It will be appreciated that this subframe allocation is a "oneFrame" allocation. A longer bit string would be used for the subframeAllocation if subframes were to be provided over four consecutive radio frames.

[0056] Figure 5B schematically illustrates a TDD pattern based on the same parameters as Figure 5A. Specifically, radioFrameAllocationPeriod is set to n2 (MBSFN subframes present in every other radio frame), the radioFrameAllocationOffset is 0 (zero) and the subframeAllocation mask is 11111x (thereby selecting each of subframes 3, 4, 7, 8 and 9). It should be noted that the last bit of the mask is not used for TDD. The difference between Figures 5A and 5B results from the different subframes mapped to the bit mask in the FDD and TDD schemes.

[0057] Figure 5C schematically illustrates an FDD pattern in which radioFrameAllocationPeriod is set to n1 (MBSFN subframes present in every radio frame), the radioFrameAllocationOffset is 0 (zero) and the subframeAllocation mask is 101010 (thereby selecting each of subframes 1, 3 and 7). It will be appreciated that this subframe 615 allocation is a "oneFrame" allocation. A longer bit string would be

used for the subframeAllocation if subframes were to be provided over four consecutive radio frames.

[0058] Figure 5D schematically illustrates a TDD pattern based on the same parameters as Figure 5A. Specifically, radioFrameAllocationPeriod is set to nl (MBSFN subframes present in every radio frame), the radioFrameAllocationOffset is 0 (zero) and the subframeAllocation mask is 10101x (thereby selecting each of subframes 3, 7 and 9). It should be noted that the last bit of the mask is not used for TDD. Again, the difference between Figures 5C and 5D results from the different subframes mapped to the bit mask in the FDD and TDD schemes. All of the patterns shown in Figures 5A to 5D will repeat until the mbsfn-SubframeConfigList is altered. The set of allocation patterns specified in mbsfn-SubframeConfigList, which is signalled in SIB2, defines the "reserved set". A sub-set of the allocation patterns could be used to define the subordinate earner. Also, two mutually exclusive sub-sets could be used to define two separate subordinate carriers delimited in the time domain.

[0059] It will be appreciated that this mechanism provides a great deal of flexibility in how much carrier resource is to be allocated to the subordinate carrier, and also how that resource is distributed with respect to time. The minimum (non-zero) amount of resources (in the time domain) which can be allocated is 1 in 320 subframes (when radioframeAllocationPeriod is set to n32 and only one bit is set in the subframeAllocation bit mask). The maximum amount of resources (in the time domain) which can be allocated is 192 in 320 subframes (when radioframeAllocationPeriod is set to n1 and all six bits are set in the subframeAllocation bit mask). In some implementations the allocation might be static to provide a fixed resource subordinate carrier. The fixed resources could in this case be known to a terminal device in advance. In other implementations the allocation might be dynamic, resulting in a subordinate carrier having a resource allocation which can be increased or decreased to for example meet traffic loading conditions on the subordinate carrier and/or on the host carrier. These increases or

decreases could be based on requests from terminal devices for additional resource, or based on decisions made at the base station or a related entity. An increase in the amount of resources allocated to the subordinate carrier could be achieved either by altering the parameters of an existing subframe allocation as defined above, or by adding a new subframe allocation according to the principles set out above. A decrease in the amount of resources allocated to the subordinate carrier could be achieved either by altering the parameters of an existing subframe allocation as defined above, or by removing an existing subframe allocation.

[0060] In other words, it is possible to use multiple subframe allocations to achieve allocation patterns which would not be possible with a single subframe allocation, and to provide a simple way of increasing (or decreasing, if one of multiple subframe allocations is removed) the amount of resources allocated to the subordinate carrier. In one implementation, a first subframe allocation with a relatively low allocation period and subframe allocation could be used to maintain a low resource subordinate carrier which can be camped onto by a low capability terminal device, and then further subframe allocations could be added to service the communication needs of the low capability terminal device when it has successfully camped on. In this way, the resources available to the host carrier are retained at a high level to serve LTE traffic when the subordinate carrier is not in use.

Signalling the presence of the Subordinate Carrier

[0061] Certain resource blocks may be used to carry control signalling including synchronisation signals and system information. As explained above, a problem can therefore arise if essential control signalling from the base station is transmitted outside of the frequency range which can be received by a low-capability device. Fortunately, as described above, the synchronisation signals and the Master Information Block (MIB) of the system information are present within a frequency range which is likely to be receivable by a low-capability device. However, further system information, carried in System Information Blocks (SIBs), and the associated control signalling may be transmitted at a frequency which cannot be received by the

low-capability device. This would cause problems, potentially preventing the low-capability device from being able to camp on to the network. It will be appreciated that not all host carriers will necessary support a subordinate carrier. If a low-capability device attempts to camp-on to a network which does not support a subordinate carrier then the camp-on procedure will ultimately fail. This is a waste of time and power for the low-capability device.

[0062] It would therefore be desirable to signal to an MTC UE which has restricted reception bandwidth the presence of an MTC subordinate carrier within a larger bandwidth LTE carrier accessible to legacy UEs (LTE Rel. 8/9/10 UEs). It was discussed above that for all LTE bandwidths (Rel. 8/9/10) the basic physical layer synchronisation signals and the most important system information (Master Information Block) is transmitted using only the central 6 resource blocks (72 subcarriers). The Master Information Block (MIB) is transmitted in the Physical Broadcast Channel (PBCH) which is allocated to the central 72 subcarriers and to just the first 4 OFDMA symbols of the second slot of every 10ms radio frame. Thus, assuming that the low bandwidth MT UE is able to receive at least 6 resource blocks in the frequency domain, then the PBCH (for example the MIB) may be used to signal the presence of an MTC subordinate carrier.

[0063] In Figure 6, a schematic flow diagram of a first part of a camp-on procedure is shown. At a step A1, an MTC device seeking to camp-on to a subordinate carrier, for example following power-up, seeks to identify and decode PSS (Primary Synchronisation Signals) and SSS (Secondary Synchronisation Signals) signalling being broadcast in its location. Once the MTC device synchronises to a carrier using the PSS and SSS, the MTC device determines the frame timing and proceeds to decode the PBCH to determine the MIB for the carrier. At a step A2, the MTC device determines whether or not a subordinate carrier indicator flag is present in the MIB. The MTC subordinate carrier indicator flag may be signalled in one (or more) of the MIB bits that are spare in LTE Release 8 / 9 / 10 (10 bits are currently spare). If the MTC device determines that the MIB contains a subordinate carrier indicator flag

then the camp-on process continues at a step A3. If on the other hand the MTC subordinate carrier indicator flag was found not to be present, then the camp-on procedure to this carrier would be terminated. This would allow the device to decide upon proceeding with camp-on (or not) simply based upon decoding of the legacy LTE MIB, and to discontinue with camp-on immediately after the decoding of the legacy LTE MIB should the subordinate carrier indicator flag not be present. As an alternative to using the MIB to signal the presence of a subordinate carrier, a subordinate carrier indicator signal could be provided at a known time / frequency somewhere other than in the MIB. The particular time / frequency may be defined referentially with respect to the MIB (for example). The subordinate carrier indicator signal may be relative to the host carrier PBCH and/or the System Frame Number conveyed in the host carrier PBCH / MIB. In this case the MTC device would, following synchronisation (at the step A1), search for the subordinate carrier indicator signal at the expected time / frequency (at the step A2). If it is found, then the MTC device knows that one (or more) subordinate carriers are present and continues its discovery of the MTC subordinate carrier and the subsequent camp-on process.

[0064] In either implementation, it will be appreciated that the presence of the subordinate carrier indicator is derivable by the MTC device without being required to decode any system information block (SIB) of the host carrier since the MTC device may be unable to receive the host carrier SIBs which are signalled across the full host carrier frequency band F1.

[0065] If the MTC device does not find a subordinate carrier associated with the host carrier, then it may search for and seek to camp-on to another carrier by returning to the step A1 to seek to synchronise with and decode PBCH for a different carrier.

Signalling the bandwidth of the subordinate carrier(s)

[0066] Having detected the presence of an MTC subordinate carrier the UE needs to determine the bandwidth of the subordinate carrier in order to be able to

read the further system information which will contain the other characteristics of the subordinate carrier. There are a number of alternative ways in which the subordinate carrier bandwidth may be signalled to the MTC UE:

(1) The simplest method is to fix the bandwidth of the subordinate carrier in the 3GPP specifications. Having detected the presence of a subordinate carrier in the manner described above, the MTC UE would know by definition the MTC subordinate carrier bandwidth (e.g. 1,4MHz, 3MHz or 5 MHZ).

(2) The downlink bandwidth of the MTC subordinate carrier may be signalled in the legacy LTE MIB. For example if the subordinate carrier indicator flag were signalled in the PBCH by using a 2 bit field, 4 states could be signalled (absence of a subordinate earner and three different subordinate carrier bandwidths, e.g. 1.4MHz, 3MHz and 5 MHZ).

(3) The downlink bandwidth (and possibly other characteristics) of the MTC subordinate carrier could be signalled in a Subordinate Carrier Master Information Block (scMIB). The scMIB would be signalled in fixed time / frequency resources, known in advance to the mobile terminal and preferably defined in the 3GPP specifications. The possibilities for signalling the scMIB are described in the following section.

Signalling the Subordinate Carrier Master Information Block (scMIB)

[0067] In the above section three methods of determining the downlink bandwidth of an MTC subordinate carrier by an MTC UE have been described. The first two of these methods involve a priori knowledge of when decoding of the subordinate carrier begins. The last of the described methods involves signalling the downlink bandwidth in a Master Information Block of the subordinate carrier itself.

[0068] A Master Information Block may be regarded as collection of parameters giving values to configurable characteristics of the carrier and other information to achieve/maintain radio frame synchronisation. A Master Information Block is required to be supplied in fixed time/frequency resources and must be received and

decoded before a more flexible scheme of downlink message exchange may be employed. According to the above description, at the point at which the UE tries to decode the scMIB, the UE will know:

- That an MTC subordinate carrier is present (from the indicator flag / signal).
- The subordinate carrier centre frequency (it may generally be assumed that this will be the same as the centre frequency of the host legacy LTE carrier).

[0069] In addition the UE may know the MTC subordinate carrier bandwidth, if this has been fixed in the specifications, conveyed in the host carrier MIB or conveyed by some other a priori means. In order to receive and decode the scMIB the UE must be able to determine in which resource elements it is carried. The number of resource elements used for the scMIB could be related to the subordinate carrier bandwidth or it could be fixed (as is the case for the legacy LTE MIB). If the number of resource elements were defined to be dependent upon the subordinate carrier bandwidth, this would require the value of the subordinate carrier bandwidth to be known a priori. There are a limited number of spare bits available in the legacy host carrier LTE MIB, and so it may be considered that there are not sufficient available to use 1 or more of these to carry subordinate carrier bandwidth information. In this case, the UE will not have a priori knowledge of the subordinate carrier bandwidth so the UE will be unable to derive the scMIB resource elements from the bandwidth. Accordingly, for the purposes of the following description it is assumed that the scMIB is always signalled in a fixed set of resource elements defined within the 3GPP specifications. Nonetheless, it should be understood that the present invention is not limited to this, and that in certain implementations the set of resource elements used to convey the scMIB may not be fixed.

[0070] The fixed set of resource elements is contained within a subset (or all) of those subframes reserved by one (or more) of the subframe allocations configured in the information element mbsfn-SubframeConfigList broadcast in the host carrier SIB2. The fixed subframe allocation to convey the scMIB should:

- Be frequent enough to occasion an acceptable latency for acquisition of the scMIB by MTC UEs.
- Not be too frequent that excessive resources are consumed from the host carrier and subordinate carrier.

[0071] It should be noted that it is common for MTC devices to exhibit low mobility and be able to tolerate comparatively high latencies in message transmission. However, this may not be the case with all possible MTC traffic and it is therefore preferable that the frequency of MIB transmission be fixed within the 3GPP specification and thus cannot be configured dependent upon the expected MTC traffic characteristics.

[0072] Various fixed characteristics of the scMIB transmission scheme, including the following, should preferably be defined within the 3GPP specifications:

- The number, periodicity and relationship to host carrier System Frame Number of the subframes used for scMIB.
- The level of repetition encoding employed.
- Within the subframes used, the number and location of resource elements used to convey the scMIB (that is, exactly which slot(s), subcarriers and symbols are to be used).

[0073] The number of resource elements used for the scMIB will be a function of the number of bits of information that must be conveyed by this method, which will be influenced by the further details of the subordinate carrier design, but the number will also be constrained by the overhead that this imposes. The System Frame Number, necessary for the UE to maintain radio frame synchronisation, upon which many LTE higher layer processes are dependent, may be read from the host carrier MIB. However, for efficiency reasons it is likely that once the UE synchronises to the subordinate carrier, it would be undesirable for the UE to have to keep re-reading the host carrier MIB to maintain this information. Thus, System Frame Number is likely to be carried by the scMIB, although the UE might depend upon the host carrier MIB for this information.

[0074] Any combination of parameters conforming to and fully resolving the definition of MBSFN-SubframeConfig may be chosen to define which subframes convey the scMIB. However, use of a single subframe allocation pattern will provide a solution involving least complexity. For example a single pattern comprising a single subframe allocation once per radio frame allocation period of 32 frames and with an offset value of zero may be considered adequate to convey the scMIB dependent upon other details of the subordinate carrier design. Alternatively, if more MIB bits are required then a shorter allocation period of, for example, 16 or 8 radio frames could be used and/or more subframes per allocation period. Note that while the subframes used to convey the scMIB may be defined by such a subframe allocation pattern or patterns, not all slots or resource elements in the subframes defined by the pattern(s) are necessarily used to convey the scMIB. Use of a shorter allocation period but sparse use of the resource elements for the scMIB may offer the best compromise in relation to scMIB acquisition time and resource overhead.

[0075] The subframe allocation pattern or patterns chosen to define the subframes used for the scMIB will be included in the mbsfn-SubframeConfigList of SIB2 of the host carrier in order to reserve these subframes for special use within the context of the host carrier. However, low bandwidth MTC UEs searching for a suitable subordinate carrier will not be required to read SIB2 of the host carrier to gain this information, since the subframe allocation pattern(s) for the scMIB will be fixed and defined in the 3GPP specifications.

Camp-on procedure

[0076] Referring to Figure 7, the camp-on procedure following the initial steps shown in Figure 6 is schematically illustrated. At a step B1 the location of the scMIB is determined. As discussed above, the location of the scMIB is likely to be fixed in the 3GPP standards, and so the MTC UE will be able to frame synchronise with the scMIB broadcast by comparing the location of the scMIB (radio frame and sub-frame known from the 3GPP specifications) with the current System Frame Number (which the MTC UE can derive from the host carrier MIB). At a step B2 the scMIB is

received and decoded, whereby the system information specified therein can be acquired and used. At a step B3 the bandwidth and central frequency of the subordinate carrier is determined. The bandwidth of the subordinate carrier may be determined by one of the methods described above in the section "Signalling the Bandwidth of the Subordinate Carrier(s)". The central frequency may be assumed to be the same as that of the host carrier, but in some implementations may have a different central frequency which would need to be signalled to the MTC UE. The central frequency and bandwidth together identify the frequency band forming the subordinate carrier. Note that if the bandwidth is not determined from the scMIB then the step B3 can be performed before (or in parallel with) the steps B1 and B2.

[0077] At a step B4, the allocation of subordinate carrier subframes is determined. An indication of those subframes allocated to the subordinate carrier may be specified in the scMIB. As described above, sub-frames are allocated to the subordinate carrier using a subordinate carrier sub-frame allocation set which determines which sub frames within a repeating group of radio frames are allocated to the subordinate carrier. At a step B5, further system information (System Information Blocks) relating to the subordinate carrier is obtained from subframes allocated to the subordinate carrier. This further system information can be used to complete the camp on procedure of the MTC UE to the subordinate carrier at a step B6. The further system information may be at a fixed location within the radio resources of the subordinate carrier, or at a location within the radio resources of the subordinate carrier which has been scheduled by the base station, or a combination of both.

[0078] In Figure 8, example signalling on the host carrier and the subordinate carrier is schematically illustrated. In Figure 8, eight radio frames 800 are shown, each having a central frequency portion 820 usable by both the host carrier and the subordinate carrier, and outer frequency portions 810 usable only by the host carrier. In each radio frame, a MIB 830 is provided in the central frequency portion 820. The MIB 830 is readable by devices using both the host carrier and the subordinate

carrier. Devices seeking to use a subordinate carrier may be able to determine from the MIB 830 whether a subordinate carrier exists based on a flag present in the MIB 830. In an outer frequency portion 810, system information 840 is provided for use by devices served by the host carrier. The system information 840 is shown to be outside of the central frequency portion 820 and is thus not available to the kind of low-capability devices intending to use the subordinate carrier. It will be appreciated that some system information may happen to be transmitted within the central frequency portion 820, but this cannot be guaranteed. The system information 840 is provided in the form of System Information Blocks (SIBs). Unlike the Master Information Block which is broadcast on the Physical Broadcast Channel (PBCH), the SIBs are mapped onto the Physical Downlink Shared Channel (PDSCH). Generally, the Master Information Block 830 provides sufficient information to gain access to the first of the System Information Blocks (SIB1), which in turn provides sufficient information to gain access to SIB2 et seq. SIB2 includes parameters relating to the reservation of MBSFN subframes (as described above). Legacy LTE devices using the host carrier will therefore be informed of the subframes reserved for use by the subordinate carrier (or for other purposes, for example MBMS or relay backhaul) when they decode SIB2. They will therefore know that these subframes cannot be used and to ignore them. Within the central portion 810 of some or all of the radio frames (every other radio frame in this example) is a portion 850 allocated to the subordinate carrier. For the sake of clarity the portion 850 shown in Figure 8 is contiguous, but it will be appreciated from Figures 5A to 5D for example that this may not be the case. The portions 850 are used to transmit data and signalling to low capability devices using the subordinate carrier. Within the allocated portion 850 of the first radio frame is a subordinate carrier MIB (scMIB) 860 carrying various information required for a low capability device to acquire the remainder of the subordinate carrier system information.

[0079] Within the allocated, portion 850 of the second radio frame is system information 870 relating to the subordinate carrier. This system information 870

provides information required for a terminal device to camp on to the subordinate carrier. It will be appreciated that the locations of the scMIB 860 and the system information 870 is purely exemplary. The important point is that the scMIB 860 and the system information 870 are conveyed in the allocated portions 850. As described in detail above, the location and periodicity of the scMIB would probably be fixed (predetermined). The system information 870, which could be conveyed in the form of System Information Blocks in a similar manner to with the host carrier, may be predetermined, or dynamically allocated (scheduled), depending on implementation.

[0080] In the host carrier, the MIB and any associated SIBs together provide the parameters necessary for system access using the host carrier. Similarly, in the subordinate carrier, the scMIB and any associated SIBs carried in subframes allocated to the subordinate carrier provide the parameters necessary for system access using the subordinate carrier. In both cases, the UE (legacy or MTC) requires the MIB to decode the shared channel (and thus access SIBs). The MIB contains downlink system bandwidth of the host carrier and the system frame number.

[0081] The above embodiment describes a method of conveying a subordinate carrier for low bandwidth devices within a portion of a larger host carrier using for example MBSFN subframe allocation pattern(s) to reserve subframes for the subordinate carrier. This permits a flexible and efficient definition of a subordinate carrier within a host carrier. An indication of the presence of the MTC subordinate carrier is provided using a flag in the host carrier MIB. This may require the 3GPP standard to be updated, but will not require any change to legacy LTE devices because the flag is set in current spare bits which can and will be ignored by a legacy device. Various methods of signalling subordinate carrier downlink bandwidth have been described, including fixing the MTC subordinate carrier bandwidth in 3GPP specifications, signalling the subordinate carrier downlink bandwidth via a field in host carrier MIB, or signalling using a bit field within the subordinate carrier MIB (scMIB). A method of defining the subframes used for the subordinate carrier Master Information Block by using fixed (defined in 3GPP specifications) subframe allocation

pattern(s) in relation to the System Frame Number of the host carrier has also been described above. A subordinate carrier has been described (in one example) to be specified using a repeating pattern of sub-frames. A mechanism to specify this already exists in LTE, originally for the purpose of specifying sub-frames for use in MBSFN.

[0082] It will be appreciated that various modifications can be made to the embodiments described above without departing from the scope of the present invention as defined in the appended claims. In particular although embodiments of the invention have been described with reference to an LTE mobile radio network, it will be appreciated that the present invention can be applied to other forms of network such as GSM, 3G / UMTS, CDMA2000, etc. The term MTC terminal as used herein can be replaced with user equipment (UE), mobile communications device, mobile terminal etc. Furthermore, although the term base station has been used interchangeably with e-nodeB it should be understood that there is no difference in functionality between these network entities.

[0083] Further particular and preferred aspects of the present invention are set out in the accompanying independent and dependent claims. It will be appreciated that features of the dependent claims may be combined with features of the independent claims in combinations other than those explicitly set out in the claims.

REFERENCES

[1] Holma H. and Toskala A. "*LTE for UMTS OFDMA and SC-FDMA based radio access*", John Wiley and Sons, 2009.

* * *

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPW2-USCN213451
	Application Number	
Title of Invention	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

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

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Philip		Young	

Residence Information (Select One) US Residency ● Non US Residency Active US Military Service

City	Alton	Country of Residence i	GB

Mailing Address of Inventor:

Address 1	Sweet Briar, Hussell Lane		
Address 2	Medstead		
City	Alton, Hampshire	**State/Province**	
Postal Code	GU34 5PF	**Country** i	GB

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	03624		
Email Address	eoffice@vklaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS		
Attorney Docket Number	IPW2-USCN213451	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	8	**Suggested Figure for Publication (if any)**	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPW2-USCN213451
	Application Number	
Title of Invention	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS	

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

Publication Information:

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

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

Representative Information:

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

Please Select One:	● Customer Number	US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	03624		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim 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" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	16/190420	2018-11-14

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPW2-USCN213451
	Application Number	
Title of Invention	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS	

Prior Application Status	Abandoned		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16/190420	Continuation of	14/372363	2014-07-15
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
14/372363	a 371 of international	PCT/GB2013/050126	2013-01-21
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.			Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(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).

			Remove
Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)
1201000.5	GB	2012-01-20	
Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.			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.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPW2-USCN213451
	Application Number	
Title of Invention	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is 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 State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPW2-USCN213451
	Application Number	
Title of Invention	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS	

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.

Applicant 1 — 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.

Clear

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

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

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	Intellectual Ventures Holding 81 LLC		
Mailing Address Information For Applicant:			
Address 1	112 North Curry Street		
Address 2			
City	Carson City	**State/Province**	NV
Country	US	Postal Code	89703
Phone Number		Fax Number	
Email Address			

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

Assignee Information including Non-Applicant Assignee Information:

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPW2-USCN213451
	Application Number	
Title of Invention	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS	

Assignee 1

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.

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If the Assignee or Non-Applicant Assignee is an Organization check here. ☒

Organization Name	Intellectual Ventures Holding 81 LLC

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	112 North Curry Street		
Address 2			
City	Carson City	**State/Province**	NV
Country i	US	Postal Code	89703
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

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NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

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

Signature	/John D. Wilt/			Date (YYYY-MM-DD)	2021-02-24
First Name	John D.	Last Name	Wilt	Registration Number	76110

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	IPW2-USCN213451
	Application Number	
Title of Invention	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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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).

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 CooperationTreaty.

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.

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS
First Named Inventor/Applicant Name:	Philip Young
Filer:	John D. Wilt/Caren Burgoon
Attorney Docket Number:	IPW2-USCN213451

Filed as Large Entity

Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	320	320
UTILITY SEARCH FEE	1111	1	700	700
UTILITY EXAMINATION FEE	1311	1	800	800
REQUEST FOR PRIORITIZED EXAMINATION	1817	1	4200	4200
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	1202	1	100	100
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
PROCESSING FEE, EXCEPT PROV. APPLS.	1830	1	140	140
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**6260**

Electronic Acknowledgement Receipt	
EFS ID:	42012055
Application Number:	17184127
International Application Number:	
Confirmation Number:	2425
Title of Invention:	COMMUNICATION IN A WIRELESS NETWORK USING RESTRICTED BANDWIDTHS
First Named Inventor/Applicant Name:	Philip Young
Customer Number:	3624
Filer:	John D. Wilt/Caren Burgoon
Filer Authorized By:	John D. Wilt
Attorney Docket Number:	IPW2-USCN213451
Receipt Date:	24-FEB-2021
Filing Date:	
Time Stamp:	16:41:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$6260
RAM confirmation Number	E20212NG42133204
Deposit Account	220493
Authorized User	Caren Burgoon
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	IPW2_USCN213451_POA_20210224.pdf	534099 3a513baebef4aa23c1f94674f284ba8b452bd10e	no	3
Warnings:					
Information:					
2	Miscellaneous Incoming Letter	IPW2_USCN213451_DRATS_20210224.pdf	76409 eae0964b0e87b0e5244884cf3cd5b474740ab60e	no	1
Warnings:					
Information:					
3	TrackOne Request	IPW2_USCN213451_Track1Request_20210224.pdf	132710 e1db0e838eeccec690130191d2a5917b87815a90	no	2
Warnings:					
Information:					
4	Oath or Declaration filed	IPW2_USCN213451_Substitute Statement_20210224.pdf	2194673 eee8a994b94e2b6b619a7253f290d630766056ac	no	3
Warnings:					
Information:					
5	Drawings-only black and white line drawings	IPW2_USCN213451_Drawings_20210224.pdf	89636 ec6330241f40a10864830116ae2136f0212484cc	no	8
Warnings:					
Information:					
6		IPW2_USCN213451_Track1ContinuationApplication_20210224.pdf	229076 3a399e5c5c82e0de9ae9d95515ea4035bd9a996a	yes	37
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	

	Abstract		37	37	
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	Specification		1	30	
Warnings:					
Information:					
7	Application Data Sheet	IPW2_USCN213451_ADS_20210224.pdf	1338914 3d0820de9dea2daf196c4a212ec6434c6787b7fa	no	8
Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	41638 4e9aa4e68454c4d3aada5a551cd1c1aa530bfbf6	no	2
Warnings:					
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		Total Files Size (in bytes):	4637155		

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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.