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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/611,309	11/20/2018	10136416	IPW2-USCN212602	7561

3624 7590 10/31/2018

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

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

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

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

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

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

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

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

Martin Warwick Beale, Bristol, UNITED KINGDOM;
Intellectual Ventures Holding 81 LLC, Las Vegas, 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), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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

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

3624 7590 07/17/2018
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET, 18th Floor
PHILADELPHIA, PA 19103

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

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/611,309	06/01/2017	Martin Warwick Beale	IPW2-USCN212602	7561

TITLE OF INVENTION: SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1000	\$0	\$0	\$1000	10/17/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
ZHU, BO HUI ALVIN	2465	370-329000

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

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

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

1 Volpe and Koenig, P.C.

2 _____

3 _____

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

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

(A) NAME OF ASSIGNEE

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

Intellectual Ventures Holding 81 LLC

Las Vegas, 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. The following fee(s) are submitted:

- ☒ Issue Fee
- ☒ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☒ Payment by credit card. Form PTO-2038 is attached.
- ☒ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 22-0493 (enclose an extra copy of this form).

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

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

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

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

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

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

Authorized Signature /Harry Vartanian/

Date October 17, 2018

Typed or printed name Harry Vartanian

Registration No. 56,787

**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	COMMUNICATING ON A SHARED CHANNEL IN A WIRELESS NETWORK		
This statement is directed to:			
☐ The attached application,			
OR			
☒ United States application or PCT international application number <u>15/611,309</u> filed on <u>June 1, 2017</u>			
LEGAL NAME of inventor to whom this substitute statement applies:			
(E.g., Given Name (first and middle (if any)) and Family Name or Surname)			
Martin Warwick Beale			
Residence (except for a deceased or legally incapacitated inventor):			
City	Bristol	State	Country UK
Mailing Address (except for a deceased or legally incapacitated inventor):			
9 Walker Street, Kingsdown			
City	Bristol	State	Zip BS2 8HE Country UK
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.			

[Page 1 of 2]

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

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

SUBSTITUTE STATEMENT

Circumstances permitting execution of this substitute statement:

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

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

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

OR

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

WARNING:

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

PERSON EXECUTING THIS SUBSTITUTE STATEMENT:Name: **Tracy Lemke**9/20/18
Date (Optional):Signature: **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.

INTELLECTUAL VENTURES HOLDING 81 LLC

Applicant Name:

Title of Person Executing

This Substitute Statement: **Authorized Person for INTELLECTUAL VENTURES HOLDING 81 LLC**

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 **Seattle**State **WA**Country **U.S.****Mailing Address of the signer (unless provided in an application data sheet, PTO/AIA/14 or equivalent)****2215-B Renaissance Drive**City **Las Vegas**State **NV**Zip **89119**Country **US**

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

Privacy Act Statement

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

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

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

Electronic Patent Application Fee Transmittal				
Application Number:		15611309		
Filing Date:		01-Jun-2017		
Title of Invention:		COMMUNICATING ON A SHARED CHANNEL IN A WIRELESS NETWORK		
First Named Inventor/Applicant Name:		Martin Warwick Beale		
Filer:		Harry Vartanian		
Attorney Docket Number:		IPW2-USCN212602		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description		Fee Code	Quantity	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
PUBL. FEE- EARLY, VOLUNTARY, OR NORMAL	1504	1	0	0
UTILITY APPL ISSUE FEE	1501	1	1000	1000
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1000

Electronic Acknowledgement Receipt	
EFS ID:	34036196
Application Number:	15611309
International Application Number:	
Confirmation Number:	7561
Title of Invention:	COMMUNICATING ON A SHARED CHANNEL IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Martin Warwick Beale
Customer Number:	3624
Filer:	Harry Vartanian/Elizabeth McGinty
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USCN212602
Receipt Date:	17-OCT-2018
Filing Date:	01-JUN-2017
Time Stamp:	15:16:57
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$1000
RAM confirmation Number	101818INTEFSW15180400
Deposit Account	220493
Authorized User	Elizabeth McGinty
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees) 37 CFR 1.20 (Post Issuance fees) 37 CFR 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	IPW2-USCN212602_-_Issue_Fee_Payment_-_20181017.PDF	1621969	no	1
			479c2d03cd4d5edbbef18523ff22b16d269ef1c9		
Warnings:					
Information:					
2	Oath or Declaration filed	IPW2-USCN212602_-_Signed_Substitute_Statement_-_20180920.PDF	1998002	no	3
			c7c4fb3042d3b0606551e28fdbb738751e54e6a1		
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	31998	no	2
			cd09895580aa517af4e3717a0ed5eaf230519514		
Warnings:					
Information:					
Total Files Size (in bytes):			3651969		
This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application. <u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course. <u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.					

<i>Search Notes</i> 	Application/Control No. 15/611,309	Applicant(s)/Patent Under Reexamination Beale, Martin Warwick
	Examiner BO HUI A ZHU	Art Unit 2465

CPC - Searched*		
Symbol	Date	Examiner
H04J3/16, 1688, 17, 24	02/04/2014	BZ

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
370	322, 326, 328-331, 335-338, 342-345, 348	08/04/2013	BZ

* 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
EAST (uspgpub, uspat, usocr, jpo, epo, derwent, ibm-tdm) search updated	02/04/2014	BZ
inventorship search	02/04/2014	BZ

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	see history print-out	09/19/2016	BZ

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	15611309
	Filing Date	2017-06-01
	First Named Inventor	Beale
	Art Unit	2465
	Examiner Name	Bo Hui Alvin Zhu
	Attorney Docket Number	IPW2-USCN212602

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							
If you wish to add additional U.S. Patent citation information please click the Add button.							Add	
U.S.PATENT APPLICATION PUBLICATIONS							Remove	
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	20050117553	A1	2005-06-02	Wang et al.			
If you wish to add additional U.S. Published Application citation information please click the Add button.							Add	
FOREIGN PATENT DOCUMENTS							Remove	
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	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	07052187	WO	A1	2007-05-10	Philips Electronics NV Koninkl		
If you wish to add additional Foreign Patent Document citation information please click the Add button							Add	
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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /BZ/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309
	Filing Date		2017-06-01
	First Named Inventor	Beale	
	Art Unit	2465	
	Examiner Name	Bo Hui Alvin Zhu	
Attorney Docket Number		IPW2-USCN212602	

1	EXTENDED EUROPEAN SEARCH REPORT, European Patent Application No. 17163346, dated October 18, 2017.		
If you wish to add additional non-patent literature document citation information please click the Add button Add			
EXAMINER SIGNATURE			
Examiner Signature	/BO HUI A ZHU/		Date Considered 06/25/2018
*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. /BZ/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309
	Filing Date		2017-06-01
	First Named Inventor	Beale	
	Art Unit	2465	
	Examiner Name	Bo Hui Alvin Zhu	
	Attorney Docket Number	IPW2-USCN212602	

CERTIFICATION STATEMENT

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

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

OR

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

See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Harry Vartanian/	Date (YYYY-MM-DD)	2018-05-24
Name/Print	Harry Vartanian	Registration Number	56,787

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

Privacy Act Statement

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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.



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/611,309	06/01/2017	Martin Warwick Beale	IPW2-USCN212602	7561
7590 08/07/2018 VOLPE AND KOENIG, P.C. UNITED PLAZA 30 SOUTH 17TH STREET, 18th Floor PHILADELPHIA, PA 19103			EXAMINER ZHU, BO HUI ALVIN	
			ART UNIT 2465	PAPER NUMBER
			NOTIFICATION DATE 08/07/2018	DELIVERY MODE ELECTRONIC

NOTICE REQUIRING INVENTOR'S OATH OR DECLARATION

☒ An inventor's oath or declaration in compliance with 37 CFR 1.63 or substitute statement in compliance with 37 CFR 1.64 executed by or with respect to each inventor has not yet been submitted.

The inventor's oath or declaration or substitute statement dated _____ is defective. The inventor's oath or declaration does not comply with 37 CFR 1.63 or the substitute statement does not comply with 37 CFR 1.64 because it:

- ☐ does not include a statement that the person executing the oath or declaration or substitute statement believes the named inventor or joint inventor to be the original inventor or an original joint inventor of a claimed invention in the application for which the oath or declaration is being submitted.
- ☐ does not state that the application was made or was authorized to be made by the person executing the oath or declaration or substitute statement.
- ☐ does not acknowledge that any willful false statement made in such oath or declaration or substitute statement is punishable under section 1001 of title 18 by fine or imprisonment of not more than 5 years, or both.
- ☐ does not identify the person executing the oath or declaration or substitute statement by his or her legal name.
- ☐ does not identify the application to which the oath or declaration or substitute statement is directed.
- ☐ Other: _____

The substitute statement dated _____ does not comply with 37 CFR 1.64 because it:

- ☐ does not identify the inventor with respect to whom the statement applies.
- ☐ does not identify the relationship to the non-signing inventor.
- ☐ does not identify the circumstances permitting execution of the statement.
- ☐ was signed by someone other than the applicant.
- ☐ Other: _____

An oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each inventor **MUST** be filed **no later than the date on which the issue fee is paid**. See 35 U.S.C. 115(f). Failure to timely comply will result in ABANDONMENT of this application. This period for reply is not extendable under 37 CFR 1.136(a).

Questions relating to this Notice should be directed to the Application Assistance Unit at 571-272-4200.

(571)-272-4200 or 1(888)-786-0101
Patent Publication Branch
Office of Data Management



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UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/611,309	06/01/2017	2465	2160	IPW2-USCN212602	8	4

CONFIRMATION NO. 7561

CORRECTED FILING RECEIPT



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

Date Mailed: 08/02/2018

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

Inventor(s)

Martin Warwick Beale, Bristol, UNITED KINGDOM;

Applicant(s)

Intellectual Ventures Holding 81 LLC, Las Vegas, NV;

Assignment For Published Patent Application

Intellectual Ventures Holding 81 LLC, Las Vegas, NV

Power of Attorney: The patent practitioners associated with Customer Number 3624

Domestic Priority data as claimed by applicant

This application is a CON of 13/212,867 08/18/2011 PAT 9674818
which is a CON of 11/863,205 09/27/2007 PAT 8027291

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

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

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

If Required, Foreign Filing License Granted: 06/08/2017

page 1 of 3

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/611,309**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No
Title

COMMUNICATING ON A SHARED CHANNEL IN A WIRELESS NETWORK

Preliminary Class

370

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

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

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

GRANTED

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

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

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

NOT GRANTED

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

SelectUSA

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



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NOTICE OF ALLOWANCE AND FEE(S) DUE

3624 7590 07/17/2018
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET, 18th Floor
PHILADELPHIA, PA 19103

EXAMINER

ZHU, BO HUI ALVIN

ART UNIT

PAPER NUMBER

2465

DATE MAILED: 07/17/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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15/611,309

06/01/2017

Martin Warwick Beale

IPW2-USCN212602

7561

TITLE OF INVENTION: SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1000	\$0	\$0	\$1000	10/17/2018

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), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

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

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

3624 7590 07/17/2018
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET, 18th Floor
PHILADELPHIA, PA 19103

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

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/611,309	06/01/2017	Martin Warwick Beale	IPW2-USC212602	7561

TITLE OF INVENTION: SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1000	\$0	\$0	\$1000	10/17/2018

EXAMINER	ART UNIT	CLASS-SUBCLASS
ZHU, BO HUI ALVIN	2465	370-329000

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

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

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

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

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

(A) NAME OF ASSIGNEE

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

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

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

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

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

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

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

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

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

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/611,309	06/01/2017	Martin Warwick Beale	IPW2-USCN212602	7561
3624 7590 07/17/2018 VOLPE AND KOENIG, P.C. UNITED PLAZA 30 SOUTH 17TH STREET, 18th Floor PHILADELPHIA, PA 19103			EXAMINER ZHU, BO HUI ALVIN	
			ART UNIT 2465	PAPER NUMBER

DATE MAILED: 07/17/2018

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

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

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

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

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

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

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

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 15/611,309	Applicant(s) BEALE, MARTIN WARWICK
	Examiner BO HUI A. ZHU	Art Unit 2465
		AIA (First Inventor to File) Status No

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

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

1. ☒ This communication is responsive to 03/30/2018.
☐ 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 9-20. 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. _____.

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* Certified copies not received: _____.

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

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

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

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

Attachment(s)

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

/BO HUI A ZHU/ Primary Examiner, Art Unit 2465	
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Issue Classification 	Application/Control No. 15611309	Applicant(s)/Patent Under Reexamination BEALE, MARTIN WARWICK	
	Examiner ALVIN A ZHU	Art Unit 2465	

CPC					
Symbol				Type	Version
H04W	72	/	0406	F	2013-01-01
H04W	48	/	10	A	2013-01-01
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CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

NONE		Total Claims Allowed:	
		12	
(Assistant Examiner)	(Date)		
/ALVIN A ZHU/	06/25/2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	9	1

Issue Classification 	Application/Control No. 15611309	Applicant(s)/Patent Under Reexamination BEALE, MARTIN WARWICK
	Examiner ALVIN A ZHU	Art Unit 2465

US ORIGINAL CLASSIFICATION						INTERNATIONAL CLASSIFICATION									
CLASS			SUBCLASS			CLAIMED					NON-CLAIMED				
370			455												
CROSS REFERENCE(S)															
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)														

NONE		Total Claims Allowed:	
		12	
(Assistant Examiner)	(Date)		
/ALVIN A ZHU/ Primary Examiner. Art Unit 2465	06/25/2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	9	1

2465[illegible]1

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	15611309
	Filing Date	2017-06-01
	First Named Inventor	Beale
	Art Unit	2465
	Examiner Name	Bo Hui Alvin Zhu
	Attorney Docket Number	IPW2-USCN212602

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear		
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	1	20050117553	A1	2005-06-02	Wang et al.			
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	1	07052187	WO	A1	2007-05-10	Philips Electronics NV Koninkl		
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309
	Filing Date		2017-06-01
	First Named Inventor	Beale	
	Art Unit	2465	
	Examiner Name	Bo Hui Alvin Zhu	
	Attorney Docket Number	IPW2-USCN212602	

1	EXTENDED EUROPEAN SEARCH REPORT, European Patent Application No. 17163346, dated October 18, 2017.		
If you wish to add additional non-patent literature document citation information please click the Add button Add			
EXAMINER SIGNATURE			
Examiner Signature			Date Considered
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¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.			

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309
	Filing Date		2017-06-01
	First Named Inventor	Beale	
	Art Unit	2465	
	Examiner Name	Bo Hui Alvin Zhu	
	Attorney Docket Number	IPW2-USCN212602	

CERTIFICATION STATEMENT

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

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

OR

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

See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Harry Vartanian/	Date (YYYY-MM-DD)	2018-05-24
Name/Print	Harry Vartanian	Registration Number	56,787

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

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(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
10 May 2007 (10.05.2007)

PCT

(10) International Publication Number
WO 2007/052187 A1

(51) International Patent Classification:
H04Q 7/38 (2006.01)

(21) International Application Number:
PCT/IB2006/053939

(22) International Filing Date: 26 October 2006 (26.10.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
05110229.1 1 November 2005 (01.11.2005) EP

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(74) Agents: **ROLFES, Johannes, G., A.** et al.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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Declaration under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

Published:

— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ASSOCIATED PAGING INDICATOR

(57) Abstract: A receiver for receiving wireless communication signals from a transmitter is arranged to operate in one of a plurality of states. The receiver is arranged to perform a state transition from the current state to another state among the plurality of states upon reception of a Paging Indicator Signal. The Paging Indicator Signal comprising an indication of the one of the plurality of states to which the state transition is to be performed.

WO 2007/052187 A1

Associated paging indicator

The invention relates to a receiver for receiving a wireless communication signal and a transmitter for transmitting a wireless communication signal. The invention further relates to a mobile terminal comprising such receiver and a base station comprising such transmitter. Finally, the invention relates to a communication system comprising such mobile terminal and base station and to a Paging indicator signal for use with the receiver.

The field of the invention is telecommunication systems such as WCDMA/UMTS telecommunication systems which encompasses both data and voice telecommunication services. The invention is suitable for application in mobile terminals such as a mobile phone or a Personal Digital Assistant or a mobile personal computer having a wireless connection and the like.

Mobile terminals generally can be in different logical states depending on the required mode of operation. Examples of logical states in the UTRAN of WCDMA / UMTS are e.g. Idle Mode, CELL_DCH, CELL_PCH, URA_PCH as will be apparent to the person skilled in the art. In addition, the signals for setting up and maintaining a UTRAN connection between transmitters and receiver are transported on a multitude of transport channels such as the Paging channel PCH for transmitting Paging Indicators and the Forward Access Channel (CELL_FACH) for transmitting low-rate data. According to current practice, a receiver upon receiving a Paging Indicator in an Idle Mode state, may be told to wake-up and switch to a CELL_FACH state to start receiving a FACH transmission. When a receiver in Idle Mode is paged and told to switch state to CELL_FACH before receiving a FACH transmission, it has to go through various signaling protocols with the transmitter to initiate a state transition. It will be apparent to the skilled person in the art of telecommunications that this adds latency to the system, which is undesirable.

It is therefore an object of the invention to provide for a receiver that reduces the latency of the telecommunication system. This object is according to the invention realized in that the receiver for receiving wireless communication signals from a transmitter is arranged to operate in one of a plurality of states wherein the receiver is arranged to perform a state transition from the current state to another state among the plurality of states

upon reception of a Paging Indicator Signal, the Paging Indicator Signal comprising an indication of the one of the plurality of states to which the state transition is to be performed.

According to the invention it is the paging indicator signal itself that instructs to perform the required state switch. According to another aspect of the invention, the state transition is a direct state transition. In this context direct means that the state change is immediate after receipt of the Paging Indicator Signal and that no additional signaling is needed to carry out the state change. It will be apparent to the skilled person that by eliminating signaling during each state change less latency is introduced resulting in a faster set up. The Paging Signal Indicator is an encoded indicator that is representative of associated characteristics of state transitions, corresponding (transport) channels and other merged parameters. The paging Indicator Signal may assume different values, wherein a value is to be understood in the broadest possible sense and not limited to numerical values. The associated characteristics of a Paging Indicator Signal may, for example, encapsulate information on the state after the required transition (which may be dependent on the state in which the receiver is when the paging indicator signal is received) and about channels to be received before and after. As such, the Paging Signal Indicator signal comprises an indication of to which state the receiver has to perform a state transition.

The value that the Paging Indicator Signal can assume can either be selected from a group of pre-configured characteristics or may be generated ad-hoc. In case of pre-configured characteristics, the Paging Indicator Signal may for example select a value out of a virtual matrix that is formed by state transitions versus the channels. Consequently an entry in the virtual matrix would indicate a possible state transition and the channels that correspond to that state. The pre-configured virtual matrix could be pre-programmed in the system or could be generated at run-time for example during a set-up phase between transmitter and receiver. By using the proposed scheme, considerable simplifications in the overall system architecture can be achieved. In a telecommunication system comprising more than one receiver, the Paging Indicator Signal may or may not be transmitted to/received by each of the receivers or may – upon reception - be interpreted differently in accordance with a pre-configured programming of the receiver.

In case of a state change for example from Idle Mode to CELL-FACH, the Paging Indicator Signal can instruct the receiver to wake-up, to switch to a CELL-FACH state and to start receiving a FACH transmission. It will be apparent to the skilled person that the Paging Indicator Signal can also be used to enforce other receiver settings such a selection of frequency. In this case, the Paging Indicator Signal serves as a frequency

reselection indicator that may be used in e.g. network-assisted frequency reselection such as for the Frequency Layer Convergence Scheme for MBMS (Multimedia Broadcast Multicast Service), which is well known in the art. The Paging Indicator Signal could be used to define the type of data reception such as broadcast, multicast or unicast reception. Alternatively, the state change could even enforce the receiver to operate in several virtual states at a time.

According to another aspect of the invention the receiver is further arranged to receive a data signal after the state transition, the data signal being of a type suited for the reception by the receiver during the second state to which the receiver has transitioned. This way the Paging Indicator Signal serves as a kind of a preamble carrying information of the service availability of the data signal e.g. a broadcast data signal, which is to be received next.

According to a further aspect of the invention the receiver is further arranged to receive the data signal and the Paging Indicator Signal in a time-multiplexed fashion, wherein the data signal and the paging Indicator Signal are time-multiplexed onto a single channel. Such channel can be a logical or a physical channel. The paging information and the data signal are still separated services from the point of view of the receiver, however they are carried over a single channel. In typical prior art systems, once a state transition has occurred, the MAC (layer 2) layer may indicate to a physical layer (layer 1) of the device that a new transport channel is to be received, possibly on a different physical channel, which demands a switch between channels and results in further delay. According to the invention the benefit of the approach chosen is that it allows the receiver, or actually any device comprising such receiver to listen to e.g. a subsequent Broadcast data transmission immediately after having received a Paging Indicator Signal, without having to switch state or channel, hence reducing signaling overhead and channel set-up delays thereby further reducing the latency of the system. A further advantage is that by using a single combined channel, instead of two independent channels, the number of channels itself can be reduced, which is helpful in freeing up scarce resources of the wireless link between the transmitter and the receiver. In addition, a reduction of the number of channels both logical and physical, results in a simpler mapping of high layer (e.g. MAC) application and physical layer parameters.

An example of a state transition according to the invention is provided below. Assumed is that the receiver is in dormant state (Idle Mode) and that there is a combined channel (PFACH = Paging & Forward Access Channel) for sending the Paging Indicator Signal and broadcast data. Both the Paging Indicator Signal and the Broadcast data services

are transmitted on the PFACH channel under a time-multiplexing scheme. The receiver is connected to the network is in dormant state, i.e. the receiver is occasionally listening for paging information on the PFACH channel, and the terminal is discontinuously receiving for power saving purposes. A transmitter may transmit a specific Paging Indicator Signal to the terminal to inform the receiver that it is to receive some Broadcast data in an upcoming transmission scheduled on the PFACH. Upon reception of the Paging Indicator Signal the receiver informs its internal physical layers of the upcoming changes in the transport format and that reception should be switched to continuous mode. The receiver may then switch to a more active state from the point of view of its internal layers, while keeping the same connected state to the network. Having performed the necessary changes for reception of the Broadcast information on the PFACH, the user terminal receives the Broadcast service. The actual state transition between Paging in Idle Mode and reception of Broadcast data in CELL_FACH no longer needs to occur as such in terms of signaling, as it is superseded by a virtual switch that occurs within the user terminal and that is transparent to the network. Paging and Broadcast data are sent on the same channel and are differentiated by the use of discontinuous reception where the user terminal listens to a simple signal at regular intervals (Paging) and only wakes-up to listen continuously to a data service (Broadcast) if it receives a Paging Indicator Signal.

According to another aspect of the invention the transmitter is arranged to time-multiplex the transmission of the Paging Indicator Signals to at least one of the at least one receivers wherein a time periodicity in the time-multiplexing of the Paging Indicator Signals is a configurable time periodicity. As Paging Indicator Signals are time-multiplexed to the different receivers whereas data signals such as broadcast data is sent to all user terminals all the time, there may be a need to indicate different offsets for different receivers. It is possible under this scheme to introduce a configurable periodicity in the time-multiplexing of paging indicators, where the identification to a receiver of an upcoming broadcast transmission is performed within a given time range.

It should be noted that the above-mentioned embodiments illustrate rather than limit the invention, and that those skilled in the art will be able to design many alternative embodiments without departing from the scope of the appended claims. The word “comprising” does not exclude the presence of elements or steps other than those listed in a claim, “a” or “an” does not exclude a plurality, and a single processor or other unit may fulfill the functions of several units recited in the claims.

CLAIMS:

1. Receiver for receiving wireless communication signals from a transmitter, wherein the receiver is arranged to operate in one of a plurality of states wherein the receiver is arranged to perform a state transition from the current state to another state among the plurality of states upon reception of a Paging Indicator Signal, the Paging Indicator Signal
5 comprising an indication of the one of the plurality of states to which the state transition is to be performed.
2. Receiver according to claim 1, wherein the indication of one of the plurality of states comprises a reference to a pre-configured set of characteristics for the state to which
10 the transition is to be performed.
3. Receiver according to claim 1 and 2, wherein the state transition is performed immediately upon reception of the Paging Indicator Signal.
- 15 4. Receiver according to claims 1-3, arranged to receive a data signal after the state transition.
5. Receiver according to claim 4, arranged to receive the data signal and the Paging Indicator Signal in a time-multiplexed fashion, wherein the data signal and the paging
20 Indicator Signal are time-multiplexed onto a single channel.
6. Transmitter for transmitting wireless communication signals to at least one receiver, the at least one receiver being arranged to operate in a plurality of states wherein, the transmitter is arranged to transmit a Paging Indicator Signal to at least one of the at least
25 one receiver, the Paging Indicator Signal comprising an indication of the one of the plurality of states to which the state transition is to be performed by at least one of the at least one receiver.

7. Transmitter according to claim 6, wherein the indication of one of the plurality of states comprises a reference to a pre-configured set of characteristics for the state to which the transition is to be performed.
- 5 8. Transmitter according to claim 6 or 7, arranged to time-multiplex the transmission of the Paging Indicator Signals to at least one of the at least one receivers wherein a time periodicity in the time-multiplexing of the Paging Indicator Signals is a configurable time periodicity.
- 10 8. Transmitter according to claim 6, 7 or 8, arranged to time multiplex the transmission of the Paging Indicator Signal and the transmission of a data signal to at least one of the at least one receivers onto a single channel.
9. Mobile terminal comprising a receiver according to any of the claims 1-5.
- 15 10. Base station comprising at transmitter according to claims 6-8.
11. Telecommunication system comprising at least a mobile terminal according to claim 9 and a base station according to claim 10.
- 20 12. Paging Indicator Signal for use with a receiver according to claims 1-5, the Paging Indicator Signal comprising an indication of one of a plurality of states to which the receiver has to perform a state transition.

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2006/053939

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04Q7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 420 551 A (SAMSUNG ELECTRONICS CO. LTD) 19 May 2004 (2004-05-19) paragraphs [0026], [0041], [0048]; claims 1,2	1-12
X	US 2004/229605 A1 (HWANG SUNG-OH ET AL) 18 November 2004 (2004-11-18) paragraphs [0019] - [0024], [0039] - [0041], [0056] - [0059] ----- -/--	1-12

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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- *G* document member of the same patent family

Date of the actual completion of the international search

28 March 2007

Date of mailing of the international search report

10/04/2007

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
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Isopescu, Ciprian

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2006/053939

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ETSI: "TS 125 331 Universal Mobile Telecommunications System (UMTS); RRC Protocol Specification (3G TS 25.331 Version 3.1.0 Release 1999)" ETSI TS 125 331 V3.1.0, XX, XX, January 2000 (2000-01), pages 1-282, XP002165164 pages 32-33, paragraph 8.1.2.3 pages 99-105, paragraph 9.1-9.3 -----	1-4,6,7, 9-12
X	WO 2005/006829 A (INTERDIGITAL TECHNOLOGY CORPORATION; SHARMA, SANJEEV) 27 January 2005 (2005-01-27) abstract paragraphs [0008], [0013] - [0016], [0022], [0029], [0036], [0044], [0053] - [0056] -----	1-4,6,7, 9-12

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2006/053939

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1420551	A	19-05-2004	CN 1510940 A	07-07-2004
			JP 2004187279 A	02-07-2004
			US 2004180675 A1	16-09-2004
US 2004229605	A1	18-11-2004	KR 20040098394 A	20-11-2004
WO 2005006829	A	27-01-2005	CA 2532085 A1	27-01-2005
			CN 1833452 A	13-09-2006
			EP 1668929 A2	14-06-2006
			KR 20060031862 A	13-04-2006
			KR 20060025231 A	20-03-2006
			MX PA06000463 A	20-06-2006

Form PCT/ISA/210 (patent family annex) (April 2005)

Electronic Patent Application Fee Transmittal				
Application Number:		15611309		
Filing Date:		01-Jun-2017		
Title of Invention:		SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK		
First Named Inventor/Applicant Name:		Martin Warwick Beale		
Filer:		Harry Vartanian/Carey Kulp		
Attorney Docket Number:		IPW2-USCN212602		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description		Fee Code	Quantity	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	240	240
Total in USD (\$)				240

Electronic Acknowledgement Receipt	
EFS ID:	32712460
Application Number:	15611309
International Application Number:	
Confirmation Number:	7561
Title of Invention:	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Martin Warwick Beale
Customer Number:	3624
Filer:	Harry Vartanian/Carey Kulp
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USCN212602
Receipt Date:	24-MAY-2018
Filing Date:	01-JUN-2017
Time Stamp:	11:03:29
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$240
RAM confirmation Number	052418INTEFSW11060100
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IPW2-USCN212602-SB_08-20180524.PDF	1020755	no	4
			da21e8c0b31dca6f78ce7daddb568452936d5d3f		
Warnings:					
Information:					
2	Foreign Reference	wo07052187.pdf	475255	no	10
			05e902ba88b34fa4028dc36890dd9497dfec159c		
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	EESR_20171018.pdf	229775	no	7
			5543522f58fba292e2bd1a7dfa47cdb3623744f5		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30768	no	2
			a61e120d8ac6736bb21b8c827474ce964bd01355		
Warnings:					
Information:					
Total Files Size (in bytes):			1756553		

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.

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

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 15/611,309		Filing Date 06/01/2017		☐ To be Mailed		
ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO											
APPLICATION AS FILED – PART I											
(Column 1)			(Column 2)								
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A					
☐ SEARCH FEE (37 CFR 1.16(k), (j), or (m))		N/A		N/A		N/A					
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A					
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		X \$ =					
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		X \$ =					
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))											
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL					
APPLICATION AS AMENDED – PART II											
(Column 1)			(Column 2)			(Column 3)					
AMENDMENT	03/30/2018		CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))		* 12		Minus	** 20	= 0		X \$100 =		0
	Independent (37 CFR 1.16(h))		* 2		Minus	*** 4	= 0		X \$460 =		0
	☐ Application Size Fee (37 CFR 1.16(s))										
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
									TOTAL ADD'L FEE		0
(Column 1)			(Column 2)			(Column 3)					
AMENDMENT			CLAIMS REMAINING AFTER AMENDMENT			HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))		*		Minus	**	=		X \$ =		
	Independent (37 CFR 1.16(h))		*		Minus	***	=		X \$ =		
	☐ Application Size Fee (37 CFR 1.16(s))										
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
									TOTAL ADD'L FEE		
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.											

SLIE
LATASHA SMITH

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

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

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:

Martin Warwick Beale

Application No.: 15/611,309

Confirmation No.: 7561

Filed: June 1, 2017

For: SENDING CONTROL
INFORMATION OVER A SHARED
CHANNEL IN A WIRELESS NETWORK

Group: 2465

Examiner: Bo Hui Alvin Zhu

Our File: IPW2-USCN212602

Date: March 30, 2018

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 filed in response to the Non-Final Office Action dated December 1, 2017 and is submitted in conjunction with an appropriate petition for extension of time.

Please amend the application without prejudice or disclaimer as follows:

Electronic Patent Application Fee Transmittal				
Application Number:		15611309		
Filing Date:		01-Jun-2017		
Title of Invention:		SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK		
First Named Inventor/Applicant Name:		Martin Warwick Beale		
Filer:		Harry Vartanian		
Attorney Docket Number:		IPW2-USCN212602		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 1 month with \$0 paid	1251	1	200	200
Miscellaneous:				
Total in USD (\$)				200

Electronic Acknowledgement Receipt	
EFS ID:	32207668
Application Number:	15611309
International Application Number:	
Confirmation Number:	7561
Title of Invention:	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Martin Warwick Beale
Customer Number:	3624
Filer:	Harry Vartanian/Elizabeth McGinty
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USCN212602
Receipt Date:	30-MAR-2018
Filing Date:	01-JUN-2017
Time Stamp:	14:47:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$200
RAM confirmation Number	040218INTEFSW14511400
Deposit Account	220493
Authorized User	Elizabeth McGinty
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)					
37 CFR 1.20 (Post Issuance fees)					
37 CFR 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	IPW2-USCN212602_-_Extension_of_Time_-_20180330.PDF	148735	no	2
			a9f21fb3d7601a122ec83dd87dae9f17e18c24e		
Warnings:					
Information:					
2		IPW2-USCN212602_-_Response_to_NonFinal_-_20180330.PDF	81454	yes	8
			80de1789c67076c68f74378acddb52df57dd7182		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Applicant Arguments/Remarks Made in an Amendment		7	8	
	Abstract		6	6	
	Specification		5	5	
	Claims		2	4	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30940	no	2
			3aed7ac0efffdcd65bc77c44df1bc49668b67267		
Warnings:					
Information:					
Total Files Size (in bytes):			261129		

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.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional) IPW2-USCN212602																																		
Application Number 15/611,309	Filed June 1, 2017																																			
For SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK																																				
Art Unit 2465	Examiner Bo Hui Alvin Zhu																																			
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application. The requested extension and fee are as follows (check time period desired and enter the appropriate fee below): <table style="width: 100%; border-collapse: collapse;"><thead><tr><th></th><th style="text-align: center;"><u>Fee</u></th><th style="text-align: center;"><u>Small Entity Fee</u></th><th style="text-align: center;"><u>Micro Entity Fee</u></th><th></th></tr></thead><tbody><tr><td>☒ One month (37 CFR 1.17(a)(1))</td><td style="text-align: center;">\$200</td><td style="text-align: center;">\$100</td><td style="text-align: center;">\$50</td><td>\$ <u>200</u></td></tr><tr><td>☐ Two months (37 CFR 1.17(a)(2))</td><td style="text-align: center;">\$600</td><td style="text-align: center;">\$300</td><td style="text-align: center;">\$150</td><td>\$ _____</td></tr><tr><td>☐ Three months (37 CFR 1.17(a)(3))</td><td style="text-align: center;">\$1,400</td><td style="text-align: center;">\$700</td><td style="text-align: center;">\$350</td><td>\$ _____</td></tr><tr><td>☐ Four months (37 CFR 1.17(a)(4))</td><td style="text-align: center;">\$2,200</td><td style="text-align: center;">\$1,100</td><td style="text-align: center;">\$550</td><td>\$ _____</td></tr><tr><td>☐ Five months (37 CFR 1.17(a)(5))</td><td style="text-align: center;">\$3,000</td><td style="text-align: center;">\$1,500</td><td style="text-align: center;">\$750</td><td>\$ _____</td></tr></tbody></table> ☐ Applicant asserts small entity status. See 37 CFR 1.27. ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously. ☐ A check in the amount of the fee is enclosed. ☒ Payment by credit card. Form PTO-2038 is attached. ☐ The Director has already been authorized to charge fees in this application to a Deposit Account. ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number <u>220493</u>. ☒ Payment made via EFS-Web. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. I am the ☐ applicant. ☒ attorney or agent of record. Registration number <u>56787</u>. ☐ attorney or agent acting under 37 CFR 1.34. Registration number _____. <table style="width: 100%; border-collapse: collapse;"><tr><td style="width: 50%; vertical-align: bottom;"><u>/Harry Vartanian/</u> Signature</td><td style="width: 50%; vertical-align: bottom;"><u>March 30, 2018</u> Date</td></tr><tr><td style="vertical-align: bottom;"><u>Harry Vartanian</u> Typed or printed name</td><td style="vertical-align: bottom;"><u>215-568-6400</u> Telephone Number</td></tr></table> NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.				<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>		☒ One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ <u>200</u>	☐ Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ _____	☐ Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ _____	☐ Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____	☐ Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____	<u>/Harry Vartanian/</u> Signature	<u>March 30, 2018</u> Date	<u>Harry Vartanian</u> Typed or printed name	<u>215-568-6400</u> Telephone Number
	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>																																	
☒ One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ <u>200</u>																																
☐ Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ _____																																
☐ Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ _____																																
☐ Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____																																
☐ Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____																																
<u>/Harry Vartanian/</u> Signature	<u>March 30, 2018</u> Date																																			
<u>Harry Vartanian</u> Typed or printed name	<u>215-568-6400</u> Telephone Number																																			
☐ * Total of _____ forms are submitted.																																				

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Privacy Act Statement

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

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

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

REMARKS/ARGUMENTS

After the foregoing Amendment, claims 9-20 are currently pending in this application. Claims 1-8 are canceled. New claims 9-20 are added. In the specification, a new title and abstract are submitted herewith. **New claims 9-20 are within the same scope of search and class as canceled claims 1-8. Thus, entry is respectfully requested.**

Double Patenting Rejection

Claims 1-8 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-8 of U.S. Patent No. 9,674,818. Without conceding the propriety of the rejection, and in an effort to advance prosecution, claims 1-8 are canceled making the rejection moot. Accordingly, withdrawal of the nonstatutory double patenting rejection is respectfully requested.

Conclusion

It should also be noted that although arguments have been presented with respect to certain claims herein, the recited subject matter as well as various other subject matter and/or combinations of subject matter may be patentable for other reasons. Further, the failure to address any statement by the Examiner herein should not be interpreted as acquiescence or agreement with such statement. The

Applicant: Intellectual Ventures Holding 81 LLC
Application No.: 15/611,309

Applicant expressly reserves the right to set forth additional and/or alternative reasons for patentability and/or allowance with the present application or in any other future proceeding, and to rebut any statement presented by the Examiner in this or other papers during prosecution of the present application.

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

In view of the foregoing, Applicant respectfully submits that the present application, including claims 9-20, is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

Intellectual Ventures Holding 81, LLC

By: /Harry Vartanian/
Harry Vartanian
Registration No. 56,787

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

HV/JMG/eam

Applicant: Intellectual Ventures Holding 81 LLC
Application No.: 15/611,309

ABSTRACT

User equipment (UE) may receive broadcast information with bits that indicate a respective time interval that physical shared channel resources are utilized to signal channels. The UE may monitor the signaled channels in indicated time intervals. The UE may determine whether signaling information for the UE is present based on an identification of the UE.

Applicant: Intellectual Ventures Holding 81 LLC
Application No.: 15/611,309

Amendments to the Specification:

Please change the title to:

~~SENDING CONTROL INFORMATION OVER~~ COMMUNICATING ON A
SHARED CHANNEL IN A WIRELESS NETWORK

Please substitute the Abstract with the following new Abstract:

Amendments to the Claims:

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

1.-8. (Canceled)

9. (New) A user equipment (UE) comprising:

a receiver, the receiver configured to receive broadcast information including a plurality of bits, wherein each of the plurality of bits indicates a respective time interval that physical shared channel resources are utilized to signal channels; and

a processor, the processor communicatively coupled to the receiver and configured to monitor the signaled channels in indicated time intervals, to determine whether signaling information for the UE is present based on an identification of the UE, and to process the signaling information in response to the determination that signaling information for the UE is present.

10. (New) The UE of claim 9, wherein the respective time interval or each indicated time interval is part of a shared frame that is allocated by a network device.

11. (New) The UE of claim 9, wherein the broadcast information is received on a broadcast channel.

12. (New) The UE of claim 9, wherein the respective time interval or each indicated time interval is two or more timeslots.

13. (New) The UE claim 9, wherein the UE powers down radio circuitry outside of the indicated time intervals.

14. (New) The UE of claim 9, wherein the identification of the UE is assigned by a network device to decode the signaling information.

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

receiving, by the UE, broadcast information including a plurality of bits, wherein each of the plurality of bits indicates a respective time interval that physical shared channel resources are utilized to signal channels;

monitoring, by the UE, the signaled channels in indicated time intervals;

determining, by the UE, whether signaling information for the UE is present based on an identification of the UE; and

processing, by the UE, the signaling information in response to the determination that signaling information for the UE is present.

16. (New) The method of claim 15, wherein the respective time interval or each indicated time interval is part of a shared frame that is allocated by a network device.

17. (New) The method of claim 15, wherein the broadcast information is received on a broadcast channel.

18. (New) The method of claim 15, wherein the respective time interval or each indicated time interval is two or more timeslots.

19. (New) The method claim 15, wherein the UE powers down radio circuitry outside of the indicated time intervals.

20. (New) The method of claim 15, wherein the identification of the UE is assigned by a network device to decode the signaling information.



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/611,309	06/01/2017	Martin Warwick Beale	IPW2-USCN212602

CONFIRMATION NO. 7561

PUBLICATION NOTICE



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

Title:SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK

Publication No.US-2018-0027539-A1

Publication Date:01/25/2018

NOTICE OF PUBLICATION OF APPLICATION

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.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <https://portal.uspto.gov/pair/PublicPair>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/611,309	06/01/2017	Martin Warwick Beale	IPW2-USCN212602	7561
3624 7590 12/01/2017 VOLPE AND KOENIG, P.C. UNITED PLAZA 30 SOUTH 17TH STREET, 18th Floor PHILADELPHIA, PA 19103			EXAMINER ZHU, BO HUI ALVIN	
			ART UNIT 2465	PAPER NUMBER
			NOTIFICATION DATE 12/01/2017	DELIVERY MODE ELECTRONIC

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

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

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

coffice@volpe-koenig.com

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

DETAILED ACTION

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims 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); *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 nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file

provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(I)(1) - 706.02(I)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) 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 www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

3. Claims 1-8 are rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-8 of U.S. Patent No. 9,674,818. Although the claims at issue are not identical, they are not patentably distinct from each other because: 1) Claim 1 of the current application merely broaden the scope of claim 1 of Patent No. 9,674,818 by changing the feature of sending indicator bits on a broadcast channel to broadcasting indicator bits. 2) Claim 3 of the current application is essentially identical to claim 3 of the Patent No. 9,674,818 except that it recites channelization code instead of channelization code resource. 3) Claim 5 of the current application merely broaden the scope of claim 3 of Patent No. 9,674,818 by changing the feature of sending by the Node B to a UE indicator bits on a broadcast channel to broadcasting to a UE indicator

bits. 4) Claim 7 of the current application broadens the scope of claim 3 of the Patent No. 9,674,818 by changing receiving by the UE on a broadcast channel indicator bits to receiving on a broadcast channel indicator bits.

Allowable Subject Matter

4. Claims 1-8 are allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BO HUI A. ZHU whose telephone number is (571)270-1086. The examiner can normally be reached on Mon-Fri 10am-7pm.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Banks Marsha can be reached on (571)2727905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

/BO HUI A ZHU/
Primary Examiner, Art Unit 2465

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309
	Filing Date		2017-06-01
	First Named Inventor	Martin W. Beale	
	Art Unit	2414	
	Examiner Name	Not Yet Known	
	Attorney Docket Number	IPW2-USCN212602	

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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	6504827	B1	2003-01-07	Kuo et al.	* corresponds to JP 2000-201196
	2	7088697	B1	2006-08-08	Benz et al.	* corresponds to JP 2002-532987
	3	6111865	A	2000-08-29	Butler et al.	
	4	8493909	B2	2013-07-23	Choi	
	5	8446849	B2	2013-05-21	Damnjanovic et al.	
	6	7072329	B2	2006-07-04	Willars et al.	
	7	7113496	B2	2006-09-26	Koo et al.	
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	1	20080188220	A1	2008-08-07	DiGirolamo et al.		
	2	20130028234	A1	2013-01-31	DiGirolamo et al.		
	3	20050105502	A1	2005-05-19	Kim et al.		
	4	20050135320	A1	2005-06-23	Tiedemann et al.		
	5	20070042786	A1	2007-02-22	Chillariga et al.		
	6	20080014969	A1	2008-01-17	Laroia et al.		
	7	20080186936	A1	2008-08-27	Chun et al.		
	8	20080311926	A1	2008-12-18	Fischer et al.		
	9	20090207774	A1	2009-08-20	Lee et al.		

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309	
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	Examiner Name	Not Yet Known		
	Attorney Docket Number	IPW2-USCN212602		

	10	20100234032	A1	2010-09-16	Chun et al.
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	1	11243579	JP	A2	1999-09-07	Fujitsu Ltd.		
	2	2000201196	JP	A2	2000-07-18	Lucent Technologies Inc.		
	3	2002532987	JP	T2	2002-10-02	Siemens Aktiengesellschaft		
	4	1860808	CN	B	2012-01-11	Siemens AG	* English abstract provided.	
	5	1089412	CN	A	1994-07-13	Technophone Ltd.	* English abstract provided.	
	6	2005034542	WO	A1	2005-04-14	Siemens Aktiengesellschaft		
	7	2005101879	WO	A1	2005-10-27	IPWireless, Inc.		
	8	2260245	GB	A1	1993-04-07	Technophone Limited		

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309
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	Art Unit	2414	
	Examiner Name	Not Yet Known	
	Attorney Docket Number	IPW2-USCN212602	

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	1	OFFICE ACTION, Japanese Patent Application No. 2010-526245, dated January 15, 2013.		
	2	THIRD GENERATION PARTNERSHIP PROJECT, "Technical Specification Group Radio Access Network; High Speed Downlink Packet Access (HSDPA); Overall description; Stage 2 (Release 6)," 3GPP TS 25.308 V6.4.0, March 2007.		
	3	THIRD GENERATION PARTNERSHIP PROJECT, "Technical Specification Group Radio Access Network; High Speed Downlink Packet Access (HSDPA); Overall description; Stage 2 (Release 7)," 3GPP TS 25.308 V7.3.0, June 2007.		
	4	NOKIA, "Analysis of HSDPA in CELL_FACH State," R1-062884, 3GPP TSG-RAN WG1 Meeting #46bis, Seoul, South Korea, October 9-13, 2006.		
	5	THIRD GENERATION PARTNERSHIP PROJECT, "Technical Specification Group Radio Access Network; Physical Channels and Mapping of Transport Channels onto Physical Channels (TDD) (Release 6)," 3GPP TS 25.221 v6.4.0, June 2005.		
	6	THIRD GENERATION PARTNERSHIP PROJECT, "Technical Specification Group Services and System Aspects; Multimedia Broadcast/Multicast Service; Stage 1 (Release 8)," 3GPP TS 22.146 v8.3.0, June 2007.		
	7	Non-Final Rejection issued by USPTO, dated September 30, 2010 for 11/863,205.		
	8	Notice of Allowance issued by USPTO, dated June 13, 2011 for 11/863,205.		
	9	International Search Report, PCT Application No. PCT/EP2008/062177, dated March 4, 2009.		

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	Art Unit	2414	
	Examiner Name	Not Yet Known	
	Attorney Docket Number	IPW2-USCN212602	

10	NON-FINAL REJECTION, U.S. Patent Application No. 13/212,867, dated July 9, 2015.
11	NON-FINAL REJECTION, U.S. Patent Application No. 13/212,867, dated August 8, 2013.
12	NON-FINAL REJECTION, U.S. Patent Application No. 13/212,867, dated May 22, 2014.
13	FINAL REJECTION, U.S. Patent Application No. 13/212,867, dated March 21, 2016.
14	FINAL REJECTION, U.S. Patent Application No. 13/212,867, dated December 17, 2014.
15	FINAL REJECTION, U.S. Patent Application No. 13/212,867, dated February 10, 2014.

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EXAMINER SIGNATURE

Examiner Signature	/BO HUI A ZHU/	Date Considered	11/27/2017
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309
	Filing Date		2017-06-01
	First Named Inventor	Martin W. Beale	
	Art Unit	2414	
	Examiner Name	Not Yet Known	
	Attorney Docket Number	IPW2-USCN212602	

CERTIFICATION STATEMENT

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

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

OR

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

See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Harry Vartanian/	Date (YYYY-MM-DD)	2017-06-22
Name/Print	Harry Vartanian	Registration Number	56,787

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

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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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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/611,309	06/01/2017	2414	2160	IPW2-USCN212602	8	4

CONFIRMATION NO. 7561

UPDATED FILING RECEIPT



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

Date Mailed: 10/16/2017

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

Inventor(s)

Martin Warwick Beale, Bristol, UNITED KINGDOM;

Applicant(s)

Intellectual Ventures Holding 81 LLC, Las Vegas, NV;

Assignment For Published Patent Application

Intellectual Ventures Holding 81 LLC, Las Vegas, NV

Power of Attorney: The patent practitioners associated with Customer Number 3624

Domestic Priority data as claimed by applicant

This application is a CON of 13/212,867 08/18/2011 PAT 9674818
which is a CON of 11/863,205 09/27/2007 PAT 8027291

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

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

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

If Required, Foreign Filing License Granted: 06/08/2017

page 1 of 3

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/611,309**

Projected Publication Date: 01/25/2018

Non-Publication Request: No

Early Publication Request: No
Title

SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK

Preliminary Class

370

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

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

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

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

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

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

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

GRANTED

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

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

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

NOT GRANTED

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

SelectUSA

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



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/611,309	06/01/2017	Martin Warwick Beale	IPW2-USCN212602

CONFIRMATION NO. 7561

INFORMAL NOTICE



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

Date Mailed: 10/16/2017

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
Martin Warwick Beale

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/lphan/

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/611,309				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280			
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	600			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720			
TOTAL CLAIMS (37 CFR 1.16(i))	8	minus 20 = *				x 80 =	0.00			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4	minus 3 = * 1				x 420 =	420			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	2020			
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=		x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=		x	=
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
TOTAL ADD'L FEE									TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=		x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=		x	=
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
TOTAL ADD'L FEE									TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.										

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of:

Martin Warwick Beale

Application No.: 15/611,309

Confirmation No.: 7561

Filed: June 1, 2017

For: SENDING CONTROL INFORMATION
OVER A SHARED CHANNEL IN A
WIRELESS NETWORK

Group: 2414

Examiner: not yet known

Our File: IPW2-USCN212602

Date: October 12, 2017

**COMMUNICATION IN RESPONSE TO
NOTICE TO FILE MISSING PART**

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

In response to the Notice to File Missing Parts of Non-Provisional Application
mailed from the Office on June 15, 2017, the following are enclosed:

1. Filing fee of \$280;
2. Search fee of \$600;
3. Examination fee of \$720;
4. Additional independent claim fee of \$420;
5. Surcharge of \$140;

4906020-1

Applicant: Intellectual Ventures Holding 81 LLC
Application No.: 15/611,309

6. Two-month Extension of Time fee of \$600; and
7. A copy of the Notice to File Missing Parts of Non-Provisional Application.

All fees are being paid by credit card via EFS payment. Please charge any fee deficiencies or credit any overpayments to Deposit Account No. 22-0493.

An early action on the merits is respectfully requested.

Respectfully submitted,

Intellectual Ventures Holding 81 LLC

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

Volpe and Koenig, P.C.
United Plaza
30 South 17th Street
Philadelphia, PA 19103-4009

HV/eam

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional) IPW2-USCN212602																																		
Application Number 15/611,309	Filed June 1, 2017																																			
For SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK																																				
Art Unit 2414	Examiner Not yet known																																			
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application. The requested extension and fee are as follows (check time period desired and enter the appropriate fee below): <table style="width: 100%; border-collapse: collapse;"><thead><tr><th></th><th style="text-align: center;"><u>Fee</u></th><th style="text-align: center;"><u>Small Entity Fee</u></th><th style="text-align: center;"><u>Micro Entity Fee</u></th><th></th></tr></thead><tbody><tr><td>☐ One month (37 CFR 1.17(a)(1))</td><td style="text-align: center;">\$200</td><td style="text-align: center;">\$100</td><td style="text-align: center;">\$50</td><td>\$ _____</td></tr><tr><td>☒ Two months (37 CFR 1.17(a)(2))</td><td style="text-align: center;">\$600</td><td style="text-align: center;">\$300</td><td style="text-align: center;">\$150</td><td>\$ <u>600</u></td></tr><tr><td>☐ Three months (37 CFR 1.17(a)(3))</td><td style="text-align: center;">\$1,400</td><td style="text-align: center;">\$700</td><td style="text-align: center;">\$350</td><td>\$ _____</td></tr><tr><td>☐ Four months (37 CFR 1.17(a)(4))</td><td style="text-align: center;">\$2,200</td><td style="text-align: center;">\$1,100</td><td style="text-align: center;">\$550</td><td>\$ _____</td></tr><tr><td>☐ Five months (37 CFR 1.17(a)(5))</td><td style="text-align: center;">\$3,000</td><td style="text-align: center;">\$1,500</td><td style="text-align: center;">\$750</td><td>\$ _____</td></tr></tbody></table> ☐ Applicant asserts small entity status. See 37 CFR 1.27. ☐ Applicant certifies micro entity status. See 37 CFR 1.29. Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously. ☐ A check in the amount of the fee is enclosed. ☒ Payment by credit card. Form PTO-2038 is attached. ☐ The Director has already been authorized to charge fees in this application to a Deposit Account. ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number <u>22-0493</u>. ☒ Payment made via EFS-Web. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. I am the ☐ applicant. ☒ attorney or agent of record. Registration number <u>56787</u>. ☐ attorney or agent acting under 37 CFR 1.34. Registration number _____. <table style="width: 100%; border-collapse: collapse;"><tr><td style="width: 50%; vertical-align: bottom;"><u>/Harry Vartanian/</u> Signature</td><td style="width: 50%; vertical-align: bottom;"><u>October 12, 2017</u> Date</td></tr><tr><td style="vertical-align: bottom;"><u>Harry Vartanian</u> Typed or printed name</td><td style="vertical-align: bottom;"><u>215-568-6400</u> Telephone Number</td></tr></table> NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.				<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>		☐ One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ _____	☒ Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ <u>600</u>	☐ Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ _____	☐ Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____	☐ Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____	<u>/Harry Vartanian/</u> Signature	<u>October 12, 2017</u> Date	<u>Harry Vartanian</u> Typed or printed name	<u>215-568-6400</u> Telephone Number
	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>																																	
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<u>/Harry Vartanian/</u> Signature	<u>October 12, 2017</u> Date																																			
<u>Harry Vartanian</u> Typed or printed name	<u>215-568-6400</u> Telephone Number																																			
☐ * Total of _____ forms are submitted.																																				

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Privacy Act Statement

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

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

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



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/611,309	06/01/2017	Martin Warwick Beale	IPW2-USCN212602

CONFIRMATION NO. 7561

FORMALITIES LETTER



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

Date Mailed: 06/15/2017

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Additional claim fees of \$ **420** as an undiscouted entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
The surcharge is due for any one of:
 - late submission of the basic filing fee, search fee, or examination fee,
 - late submission of inventor's oath or declaration,
 - filing an application that does not contain at least one claim on filing, or
 - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. No entity status discount is in effect. If applicant is qualified for small entity status, a written assertion of small entity status must be submitted to establish small entity status. (See 37 CFR 1.27). If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- \$ **280** basic filing fee.
- \$ **140** surcharge.
- \$ **600** search fee.
- \$ **720** examination fee.
- \$ **420** for **1** independent claims over 3.

- \$(0) previous unapplied payment amount.
- **\$ 2160** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
Martin Warwick Beale

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice".
<https://portal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/amanalac/

Electronic Patent Application Fee Transmittal				
Application Number:		15611309		
Filing Date:		01-Jun-2017		
Title of Invention:		SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK		
First Named Inventor/Applicant Name:		Martin Warwick Beale		
Filer:		Harry Vartanian		
Attorney Docket Number:		IPW2-USCN212602		
Filed as Large Entity				
Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	280	280
UTILITY SEARCH FEE	1111	1	600	600
UTILITY EXAMINATION FEE	1311	1	720	720
Pages:				
Claims:				
INDEPENDENT CLAIMS IN EXCESS OF 3	1201	1	420	420
Miscellaneous-Filing:				
LATE FILING FEE FOR OATH OR DECLARATION	1051	1	140	140

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 2 months with \$0 paid	1252	1	600	600
Miscellaneous:				
Total in USD (\$)				2760

Electronic Acknowledgement Receipt	
EFS ID:	30640937
Application Number:	15611309
International Application Number:	
Confirmation Number:	7561
Title of Invention:	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Martin Warwick Beale
Customer Number:	3624
Filer:	Harry Vartanian/Elizabeth McGinty
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USCN212602
Receipt Date:	12-OCT-2017
Filing Date:	01-JUN-2017
Time Stamp:	16:37:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$2760
RAM confirmation Number	101317INTEFSW16392100
Deposit Account	220493
Authorized User	Elizabeth McGinty
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

37 CFR 1.19 (Document supply fees)					
37 CFR 1.20 (Post Issuance fees)					
37 CFR 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	IPW2-USCN212602_-_Response_to_Notice_to_File_Missing_Parts_-_20171012.PDF	67154	no	2
			8be7b2ca01369f3178dc1d68ad6da9e2161865b4		
Warnings:					
Information:					
2	Extension of Time	IPW2-USCN212602_-_Extension_of_Time_-_20171012.PDF	163321	no	2
			13c74c5d18d4acf6ea80960cc305c757f69b6d05		
Warnings:					
Information:					
3	Miscellaneous Incoming Letter	IPW2-USCN212602_-_Notice_to_File_Missing_Parts_-_20170615.PDF	92581	no	2
			aa2a885c7c6acae9df3dd96ef9032f62dd092d4f		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	40835	no	2
			9ffdc425cfe2db4155ecc6f71abef9ccd7381278		
Warnings:					
Information:					
Total Files Size (in bytes):			363891		

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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309
	Filing Date		2017-06-01
	First Named Inventor	Martin W. Beale	
	Art Unit	2414	
	Examiner Name	Not Yet Known	
	Attorney Docket Number	IPW2-USCN212602	

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	6504827	B1	2003-01-07	Kuo et al.	* corresponds to JP 2000-201196
	2	7088697	B1	2006-08-08	Benz et al.	* corresponds to JP 2002-532987
	3	6111865	A	2000-08-29	Butler et al.	
	4	8493909	B2	2013-07-23	Choi	
	5	8446849	B2	2013-05-21	Damnjanovic et al.	
	6	7072329	B2	2006-07-04	Willars et al.	
	7	7113496	B2	2006-09-26	Koo et al.	
	8	7318187	B2	2008-01-08	Vayanos et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309
	Filing Date		2017-06-01
	First Named Inventor	Martin W. Beale	
	Art Unit		2414
	Examiner Name	Not Yet Known	
	Attorney Docket Number		IPW2-USCN212602

U.S.PATENT APPLICATION PUBLICATIONS							Remove
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	20080188220	A1	2008-08-07	DiGirolamo et al.		
	2	20130028234	A1	2013-01-31	DiGirolamo et al.		
	3	20050105502	A1	2005-05-19	Kim et al.		
	4	20050135320	A1	2005-06-23	Tiedemann et al.		
	5	20070042786	A1	2007-02-22	Chillariga et al.		
	6	20080014969	A1	2008-01-17	Laroia et al.		
	7	20080186936	A1	2008-08-27	Chun et al.		
	8	20080311926	A1	2008-12-18	Fischer et al.		
	9	20090207774	A1	2009-08-20	Lee et al.		

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

Application Number	15611309
Filing Date	2017-06-01
First Named Inventor	Martin W. Beale
Art Unit	2414
Examiner Name	Not Yet Known
Attorney Docket Number	IPW2-USCN212602

	10	20100234032	A1	2010-09-16	Chun et al.
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FOREIGN PATENT DOCUMENTS

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ² i	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	11243579	JP	A2	1999-09-07	Fujitsu Ltd.		
	2	2000201196	JP	A2	2000-07-18	Lucent Technologies Inc.		
	3	2002532987	JP	T2	2002-10-02	Siemens Aktiengesellschaft		
	4	1860808	CN	B	2012-01-11	Siemens AG	* English abstract provided.	
	5	1089412	CN	A	1994-07-13	Technophone Ltd.	* English abstract provided.	
	6	2005034542	WO	A1	2005-04-14	Siemens Aktiengesellschaft		
	7	2005101879	WO	A1	2005-10-27	IPWireless, Inc.		
	8	2260245	GB	A1	1993-04-07	Technophone Limited		

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309
	Filing Date		2017-06-01
	First Named Inventor	Martin W. Beale	
	Art Unit	2414	
	Examiner Name	Not Yet Known	
	Attorney Docket Number	IPW2-USCN212602	

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.	T5	
	1	OFFICE ACTION, Japanese Patent Application No. 2010-526245, dated January 15, 2013.		
	2	THIRD GENERATION PARTNERSHIP PROJECT, "Technical Specification Group Radio Access Network; High Speed Downlink Packet Access (HSDPA); Overall description; Stage 2 (Release 6)," 3GPP TS 25.308 V6.4.0, March 2007.		
	3	THIRD GENERATION PARTNERSHIP PROJECT, "Technical Specification Group Radio Access Network; High Speed Downlink Packet Access (HSDPA); Overall description; Stage 2 (Release 7)," 3GPP TS 25.308 V7.3.0, June 2007.		
	4	NOKIA, "Analysis of HSDPA in CELL_FACH State," R1-062884, 3GPP TSG-RAN WG1 Meeting #46bis, Seoul, South Korea, October 9-13, 2006.		
	5	THIRD GENERATION PARTNERSHIP PROJECT, "Technical Specification Group Radio Access Network; Physical Channels and Mapping of Transport Channels onto Physical Channels (TDD) (Release 6)," 3GPP TS 25.221 v6.4.0, June 2005.		
	6	THIRD GENERATION PARTNERSHIP PROJECT, "Technical Specification Group Services and System Aspects; Multimedia Broadcast/Multicast Service; Stage 1 (Release 8)," 3GPP TS 22.146 v8.3.0, June 2007.		
	7	Non-Final Rejection issued by USPTO, dated September 30, 2010 for 11/863,205.		
	8	Notice of Allowance issued by USPTO, dated June 13, 2011 for 11/863,205.		
	9	International Search Report, PCT Application No. PCT/EP2008/062177, dated March 4, 2009.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309
	Filing Date		2017-06-01
	First Named Inventor	Martin W. Beale	
	Art Unit	2414	
	Examiner Name	Not Yet Known	
	Attorney Docket Number	IPW2-USCN212602	

10	NON-FINAL REJECTION, U.S. Patent Application No. 13/212,867, dated July 9, 2015.
11	NON-FINAL REJECTION, U.S. Patent Application No. 13/212,867, dated August 8, 2013.
12	NON-FINAL REJECTION, U.S. Patent Application No. 13/212,867, dated May 22, 2014.
13	FINAL REJECTION, U.S. Patent Application No. 13/212,867, dated March 21, 2016.
14	FINAL REJECTION, U.S. Patent Application No. 13/212,867, dated December 17, 2014.
15	FINAL REJECTION, U.S. Patent Application No. 13/212,867, dated February 10, 2014.

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

EXAMINER SIGNATURE

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		15611309
	Filing Date		2017-06-01
	First Named Inventor	Martin W. Beale	
	Art Unit	2414	
	Examiner Name	Not Yet Known	
	Attorney Docket Number	IPW2-USCN212602	

CERTIFICATION STATEMENT

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

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

OR

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

See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/Harry Vartanian/	Date (YYYY-MM-DD)	2017-06-22
Name/Print	Harry Vartanian	Registration Number	56,787

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

Privacy Act Statement

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

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

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

Electronic Acknowledgement Receipt	
EFS ID:	29574403
Application Number:	15611309
International Application Number:	
Confirmation Number:	7561
Title of Invention:	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Martin Warwick Beale
Customer Number:	3624
Filer:	Harry Vartanian/Carey Kulp
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USCN212602
Receipt Date:	22-JUN-2017
Filing Date:	01-JUN-2017
Time Stamp:	13:42:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	SB08.pdf	1116309	no	7
			729ece6af3b9f51801f5bf890bd576c2a31b9d2e		

Warnings:

Information:					
2	Other Reference-Patent/App/Search documents	FR_21014.pdf	258499	no	8
			1f77a380f353f5e6c86f5f13e7389bac69948cb8		
Warnings:					
Information:					
3	Other Reference-Patent/App/Search documents	FR_32116.pdf	213865	no	6
			8694acd4729e24ff819e389f8dcec096d56845bd		
Warnings:					
Information:					
4	Other Reference-Patent/App/Search documents	FR_121714.pdf	322102	no	9
			90e3e6bb1214e39dd929de41c9838a1978c2840		
Warnings:					
Information:					
5	Other Reference-Patent/App/Search documents	NFR_7915.pdf	270524	no	8
			b0d6cb54f0d1ce996995ca85a42ee63cc4138c5d		
Warnings:					
Information:					
6	Other Reference-Patent/App/Search documents	NFR_8813.pdf	230613	no	7
			ba959bef1c92e7fa29d5b8bfe221241be8a5ff03		
Warnings:					
Information:					
7	Other Reference-Patent/App/Search documents	NFR_52214.pdf	239360	no	7
			6ab06f5461e4d063275457aadd043315980f6de4		
Warnings:					
Information:					
Total Files Size (in bytes):			2651272		

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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

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New International Application Filed with the USPTO as a Receiving Office

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



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/611,309	06/01/2017	Martin Warwick Beale	IPW2-USCN212602

CONFIRMATION NO. 7561

FORMALITIES LETTER



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

Date Mailed: 06/15/2017

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.
- Additional claim fees of \$ **420** as an undiscounted entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
The surcharge is due for any one of:
 - late submission of the basic filing fee, search fee, or examination fee,
 - late submission of inventor's oath or declaration,
 - filing an application that does not contain at least one claim on filing, or
 - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. No entity status discount is in effect. If applicant is qualified for small entity status, a written assertion of small entity status must be submitted to establish small entity status. (See 37 CFR 1.27). If applicant is qualified for micro entity status, an acceptable Certification of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- \$ **280** basic filing fee.
- \$ **140** surcharge.
- \$ **600** search fee.
- \$ **720** examination fee.
- \$ **420** for **1** independent claims over 3.

- \$(0) previous unapplied payment amount.
- **\$ 2160** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
Martin Warwick Beale

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

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

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice".
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For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/amanalac/

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/611,309				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280			
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	600			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720			
TOTAL CLAIMS (37 CFR 1.16(i))	8	minus 20 = *				x 80 =	0.00			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4	minus 3 = * 1				x 420 =	420			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00			
			TOTAL			TOTAL	2020			
* If the difference in column 1 is less than zero, enter "0" in column 2.										
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=		x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=		x	=
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE			TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=		x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=		x	=
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE			TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.										



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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
15/611,309	06/01/2017	2414	0.00	IPW2-USCN212602	8	4

CONFIRMATION NO. 7561

FILING RECEIPT



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

Date Mailed: 06/15/2017

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

Inventor(s)

Martin Warwick Beale, Bristol, UNITED KINGDOM;

Applicant(s)

Intellectual Ventures Holding 81 LLC, Las Vegas, NV;

Assignment For Published Patent Application

Intellectual Ventures Holding 81 LLC, Las Vegas, NV

Power of Attorney: The patent practitioners associated with Customer Number 3624

Domestic Priority data as claimed by applicant

This application is a CON of 13/212,867 08/18/2011 PAT 9674818
which is a CON of 11/863,205 09/27/2007 PAT 8027291

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

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

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

If Required, Foreign Filing License Granted: 06/08/2017

page 1 of 3

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/611,309**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No
Title

SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK

Preliminary Class

370

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

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

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

GRANTED

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

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

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

NOT GRANTED

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

SelectUSA

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

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.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

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

I hereby appoint:

☒

Practitioners associated with the Customer Number:

3624

OR

☐

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

Name	Registration Number	Name	Registration Number

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

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

☒

The address associated with Customer Number:

3624

OR

☐

Firm or Individual Name

Address

City

State

Zip

Country

Telephone

Email

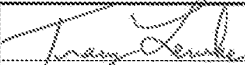
Assignee Name and Address:

Intellectual Ventures Holding 81 LLC
7251 W Lake Mead Blvd
Ste 200
Las Vegas, NV 89128

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

SIGNATURE of Assignee of Record

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

Signature		Date	2/4/15
Name	Tracy Lemke	Telephone	
Title	Authorized Person for Intellectual Ventures Holding 81 LLC		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 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.

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

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



Authorized Person for Intellectual Ventures Holding 81 LLC

Date 8/9/15

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Intellectual Ventures Holding 81 LLC

Application No./Patent No.: _____ Filed/Issue Date: June 1, 2017

Titled: SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK

Intellectual Ventures Holding 81 LLC, a limited liability company

(Name of Assignee)

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

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

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

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

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

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

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

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

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

1. From: Martin Warwick Beale To: IPWireless, Inc.

The document was recorded in the United States Patent and Trademark Office at
Reel 026878, Frame 0200, or for which a copy thereof is attached.

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

The document was recorded in the United States Patent and Trademark Office at
Reel 028069, Frame 0942, or for which a copy thereof is attached.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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

The document was recorded in the United States Patent and Trademark Office at
 Reel 026878, Frame 0336, or for which a copy thereof is attached.

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

The document was recorded in the United States Patent and Trademark Office at
 Reel 028067, Frame 0467, or for which a copy thereof is attached.

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

The document was recorded in the United States Patent and Trademark Office at
 Reel 027910, Frame 0649, or for which a copy thereof is attached.

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

The document was recorded in the United States Patent and Trademark Office at
 Reel 028175, Frame 0388, or for which a copy thereof is attached.

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

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

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

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

/Harry Vartanian/June 1, 2017

Signature

Date

Harry Vartanian56,787

Printed or Typed Name

Title or Registration Number

Privacy Act Statement

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

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

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

Electronic Acknowledgement Receipt	
EFS ID:	29367162
Application Number:	15611309
International Application Number:	
Confirmation Number:	7561
Title of Invention:	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Martin Warwick Beale
Customer Number:	3624
Filer:	Harry Vartanian/Elizabeth McGinty
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USCN212602
Receipt Date:	01-JUN-2017
Filing Date:	
Time Stamp:	16:23:46
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	WebADS.pdf	117115	no	7
			926383fef8fc39c042e604ed39f8c7bea8ebd538		

Warnings:

Information:					
2		IPW2-USCN212602_-_Application_-_20170601.PDF	116856	yes	35
			2ecf7e8e36b8de407ebd6f4351b303bd6b542d36		
	Multipart Description/PDF files in .zip description				
	Document Description	Start	End		
	Specification	1	31		
	Claims	32	34		
	Abstract	35	35		
Warnings:					
Information:					
3	Drawings-only black and white line drawings	IPW2-USCN212602-Drawings-20170601.PDF	574243	no	8
			da469dfa3e055dda6f48f0f4255817fe0261f55a		
Warnings:					
Information:					
4	Power of Attorney	IPW2-USCN212602-AIA_POA-20170601.PDF	1274812	no	1
			ea4e365151bd386f64307fc430644c9f5798bd19		
Warnings:					
Information:					
5	Assignee showing of ownership per 37 CFR 3.73	IPW2-USCN212602-AIA_DRATS-20170601.PDF	429222	no	1
			3014f64f5b4d8d859662ed065844bf5d06a75680		
Warnings:					
Information:					
6	Assignee showing of ownership per 37 CFR 3.73	IPW2-USCN212602-373c_Statement-20170601.PDF	124797	no	3
			cbf8e96ad363266df2b101a9d95852d275ae0ce0		
Warnings:					
Information:					
Total Files Size (in bytes):			2637045		

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IPW2-USCN212602
		Application Number	
Title of Invention	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK		
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.			

Secrecy Order 37 CFR 5.2:

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

Inventor 1				
Legal Name				
Prefix	Given Name	Middle Name	Family Name	Suffix
	Martin	Warwick	Beale	
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service				
City	Bristol	Country of Residence ⁱ	GB	
Mailing Address of Inventor:				
Address 1	9 Walker Street			
Address 2	Kingstown			
City	Bristol	State/Province		
Postal Code	BS2 8HE	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	3624		
Email Address	eoffice@vklaw.com	Add Email	Remove Email

Application Information:

Title of the Invention	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK		
Attorney Docket Number	IPW2-USCN212602	Small Entity Status Claimed	☐
Application Type			
Subject Matter			
Total Number of Drawing Sheets (if any)	8	Suggested Figure for Publication (if any)	4

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IPW2-USCN212602
		Application Number	
Title of Invention	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK		

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		3624			
Prefix	Given Name	Middle Name	Family Name	Suffix	Remove
Registration Number					
Prefix	Given Name	Middle Name	Family Name	Suffix	Remove
Registration Number					
Additional Representative Information blocks may be generated within this form by selecting the Add button.					

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IPW2-USCN212602
		Application Number	
Title of Invention	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK		

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 this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

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

Prior Application Status		Pending		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
	Continuation of	13212867	2011-08-18		
Prior Application Status		Patented		Remove	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
13212867	Continuation of	11863205	2007-09-27	8027291	2011-09-27
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.					

Foreign Priority Information:

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

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			

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.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IPW2-USCN212602
		Application Number	
Title of Invention	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK		

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.

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IPW2-USCN212602
		Application Number	
Title of Invention	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK		

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			
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	
☐ 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. ☒			
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Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IPW2-USCN212602
		Application Number	
Title of Invention	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK		

Assignee Information including Non-Applicant Assignee Information:

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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.			
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	7251 W. Lake Mead Blvd.		
Address 2	Suite 300		
City	Las Vegas	State/Province	NV
Country i	US	Postal Code	89128
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IPW2-USCN212602
		Application Number	
Title of Invention	SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A WIRELESS NETWORK		

Signature:

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).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

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

Signature	/Harry Vartanian/			Date (YYYY-MM-DD)	
First Name	Harry	Last Name	Vartanian	Registration Number	56787
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SENDING CONTROL INFORMATION OVER A SHARED CHANNEL IN A
WIRELESS NETWORK

CROSS REFERENCE TO RELATED APPLICATION(S)

[0001] This application is a continuation of U.S. Patent Application Serial No. 13/212,867, filed August 18, 2011, which is a continuation of U.S. Patent Application Serial No. 11/863,205, filed September 27, 2007, which issued as U.S. Patent No. 8,027,291 on September 27, 2011, which are incorporated by reference as if fully set forth.

FIELD OF THE INVENTION

[0002] The field of the invention relates, in general, to a method and apparatus for transmitting transport channels over a physical channel of a cellular communication system. In particular, but not exclusively, the field of the invention relates to allocating channel resources within a physical channel of a cellular communication system.

BACKGROUND OF THE INVENTION

[0003] Known cellular communication systems, such as a Universal Mobile Telecommunications System (UMTS) Radio Access Network (UTRAN), standardised by the 3rd Generation Partnership Project (3GPP), typically consist of a set of radio network controllers (RNCs), Node B, also known as Node-Bs, and mobile stations (MSs), also known as User Equipment (UEs). FIG. 1 illustrates an example of a known network topology for part of such a cellular communication system 100.

[0004] The RNCs 105 provide a connection with, for example, a Media Gateway (not shown), which acts as a translation unit between, in this case, the UMTS network and, for example, a Public Switched Telephone Network (PSTN). The RNC 105 also performs some of the higher layer processing for the UMTS

network, performing functions, such as, setting up and managing radio bearers, radio resource management, supporting mobility, controlling initial access of UEs to the communication system, radio link control (RLC), etc.

[0005] The Node Bs 110 typically perform lower layer processing for the network, performing such functions as Medium Access Control (MAC), formatting blocks of data for transmission and physically transmitting transport blocks to UEs.

[0006] As can be seen in FIG. 1, Node Bs 110 are connected to an RNC 105 via an interface (Iub) 115. This interface between a Node B 110 and an RNC 105 may be a leased line, for example provided by a fixed line telecommunications provider, a microwave link, an Ethernet cable or some other form of communication link. The Node Bs are connected wirelessly to the UEs 120.

[0007] In order to conserve battery life, when a UE 120 is not involved in active connections, it is known for the UE 120 to go into an idle state, whereby the UE powers down its radio frequency circuitry (RF). When a UE 120 is in the idle state, it is important to allow the Node B to initiate a connection to the UE 120, for example when there is an in-coming call for the UE 120.

[0008] In order to achieve this, it is known for a UE 120 to periodically power up its radio circuitry in order to monitor specific channels in order to determine whether it is required to establish a connection with the network. UMTS provides two services with which a Node B is able to indicate to a specific UE 120 that it is required to establish a connection with the network. One is termed a Paging CHannel (PCH) and the other is termed a Forward Access CHannel (FACH). Details of these and other services are provided in 3GPP TS 25 221 (Universal Mobile Telecommunications System (UMTS); Physical channels and mapping of transport channels onto physical channels (TDD)) and other documents referenced therein.

[0009] The PCH is a downlink transport channel that is used to carry control information to a UE when the network does not know the specific location of the UE, i.e. the specific Node B to which the UE is attached.

[0010] In the known art, the PCH comprises two blocks: the Paging Indicator CHannel (PICH) and the PCH itself. The PICH comprises multiple indicator bits. Each UE is associated with one of the indicator bits within the PICH. Accordingly, when the UE is paged by the network using the PCH, the network sets the relevant indicator bit in the PICH. When in the idle state, the UE periodically decodes the PICH to see if the indicator bit with which it is associated has been set. If the relevant indicator has been set, the UE then reads the PCH.

[0011] Each UE has a unique identifier (UE-ID). When the network pages a UE, as previously mentioned, the network sets the relevant indicator within the PICH for that UE, and transmits the UE-ID for the UE being paged, and the relevant message within the PCH. In this manner, since more than one UE may be associated with an indicator bit in the PICH, the UE-ID enables a UE to determine whether the message is intended for that UE or not. If the PCH contains the UE-ID for the UE, the UE then reads the message, and performs the required actions. Thus, in the known art, the indicator bits are used in a paging channel to inform the UE whether it needs to turn its radio on for reading the PCH (i.e. as a battery saving mode).

[0012] The UMTS standard dictates that the PCH (and PICH) are always transmitted at a reference power level.

[0013] In a wireless communications system, the communication medium is divided into units of resource. A unit of resource can be a single code (e.g. UMTS FDD), a plurality of codes, a set of codes and timeslots (e.g. UMTS TDD), a set of timeslots (e.g. a TDD system) or a set of tones, tones and symbols or tones, symbols and timeslots (e.g. an OFDM system).

[0014] The FACH is a downlink transport channel that is used to carry control information to a UE when the system knows the location cell of the UE, e.g. the specific Node B to which the UE is attached. The FACH allows short messages to be sent from the Node B to the UE. These short messages are typically control

type messages that are used, for example, to allocate physical resources to the UE, set up dedicated physical channels, etc.

[0015] The FACH is transmitted on a set of physical resources that are pre-defined and broadcast by the Node B on a Broadcast CHannel (BCH). The FACH is controlled by the RNC, which defines the codes and timeslots that are reserved for FACH transmissions. The RNC also reserves an amount of power headroom for the transmission of the FACH. When the FACH is transmitted, the RNC defines the power with which the FACH must be transmitted by the Node B. Power headroom is the amount of power that the RNC reserves for allocation of FACH resources. The power that is not reserved for 'power headroom' is allocated to the Node B to do with as it sees fit (for example scheduling HS-DSCH resource into). Thus, when the RNC allocates power headroom, it informs the Node B that the Node B cannot allocate that power headroom, as the power headroom is reserved by the RNC for the RNC to allocate resource into.

[0016] Unlike the PCH (and PICH), the FACH is not required to always be transmitted, and typically is only used when a message is required to be sent to a UE.

[0017] FIG. 2 illustrates a high level signal flow example 200 of an implementation for FACH transmissions. An RNC sends a 'NODE B SETUP' message to a Node B, instructing the Node B to reserve a certain set of codes and timeslots for FACH transmissions. This message may also reserve power headroom for use by the RNC. In UMTS, the 'NODE B SETUP' message for configuring the FACH transport channel is the 'COMMON TRANSPORT CHANNEL SETUP' message, sent to the Node B over the Iub interface 115.

[0018] The Node B 110 then periodically transmits a 'SYSTEM INFORMATION' message 210 on the Broadcast CHannel (BCH). This SYSTEM INFORMATION message 210 informs UEs of the physical resources used for FACH transmissions, such as the codes and timeslots in a Code Division Multiple Access (CDMA) system or the sub-carriers and timeslots in an Orthogonal Frequency-

Division Multiplexing (OFDM) system. The SYSTEM INFORMATION message 210 typically also contains other broadcast information relevant to that cell, such as the network identity etc.

[0019] A UE 120 is able to receive the SYSTEM INFORMATION message 210, and configure its FACH decoding function based on the information contained within the SYSTEM INFORMATION message 210.

[0020] When the RNC 105 needs to send a message to a UE 120 using the FACH, the RNC sends a 'SEND FACH' message 215 to the Node B. In UMTS, the 'SEND FACH' message is carried using FACH frame protocol (FACH FP) messages over the Iub interface 115. The SEND FACH message 215 defines the specific code and timeslot to be used for the FACH transmission 220 from the Node B 110 to the UE 120, as well as the power level to be applied to the FACH transmission, the message contents and the identity of the UE (the UE-ID) that are to be included in the FACH transmission. The Node B 110 subsequently transmits the FACH message 220 to the UE 120, as defined by the RNC 105 in the SEND FACH message 215.

[0021] The UE 120 decodes the FACH 220 every frame, according to the definition of the FACH provided within the SYSTEM INFORMATION message 210. If the UE-ID in the FACH message 220 matches the identity that has been assigned to the UE 120, the UE 120 acts on the message contents in the FACH 220.

[0022] FIG. 3 illustrates an example of a known assignment of physical resources 300 for a single Time Division Duplex (TDD) system, and shows that one timeslot per frame is assigned for FACH usage. As previously mentioned, the physical resources 300 for the FACH are pre-assigned by the RNC 105, in the NODE B SETUP message 205, and cannot be reused by other channels. Even when the FACH is lightly used, for example when most UEs are in a connected state, receiving data traffic on a traffic channel, indicated as a High Speed Downlink Shared Channel (HS-DSCH) 305 in FIG. 3, the FACH timeslot 310 is still required to be reserved.

[0023] As will be appreciated by a skilled artisan, the fact that the FACH timeslot 310 is required to be reserved, particularly during light use of the FACH, is an inefficient use of physical resources. Consequently, the inventor of the present invention has recognised and appreciated that it is desirable for the timeslot 310 assigned to the FACH to be able to be used for other purposes when it is not required for the transmission of FACH messages. For the example illustrated in FIG. 3, the traffic channel resources, namely the HS-DSCH resources 305, comprise seven timeslots. If the timeslot 310 reserved for FACH transmissions could be utilised for a traffic channel during periods when no FACH transmissions were required to be sent, the traffic channel resources could be increased from seven timeslots to eight timeslots. This would increase the traffic channel resources by fourteen percent (14%) during those periods.

[0024] A known solution for the reuse of the FACH timeslot is for the traffic channel resources, which for the example illustrated in FIG. 3 is in the form of the HS-DSCH 305, to be used for the transmission of FACH messages. In this case, the information that would have been transmitted on the FACH transport channel is instead transmitted on the HS-DSCH transport channel. In this solution the Node B 110, as opposed to the RNC 105, controls the FACH, and the FACH timeslot of FIG. 3 becomes an HS-DSCH timeslot. In this manner, in the example of FIG. 3, the HS-DSCH 305 always comprises eight timeslots, as opposed to seven.

[0025] The HS-DSCH 305 is a shared channel that is controlled by the Node B 110. The content of the HS-DSCH 305 is allocated via Shared Control CHannels for the HS-DSCH (HS-SCCH) 315, which is a downlink physical channel that carries higher layer control information for the HS-DSCH.

[0026] The HS-SCCH 315 contains a UE-ID relating to the UE 120 for which content within the HS-DSCH 305 is intended. The UE-ID ensures that only that UE 120 for which the content of the HS-DSCH 305 is intended decodes the HS-SCCH 315 successfully. The HS-SCCH 315 also instructs the UE of those codes and timeslots that are allocated to it for the HS-DSCH 305 transmission allocated to it,

and the coding and modulation of the HS-DSCH 305, e.g. code rate and modulation order, such as quadrature phase shift keying (QPSK), 16-QAM (Quadrature Amplitude Modulation), etc. Having decoded the HS-SCCH 315, the UE 120 is able to decode relevant timeslot(s) of the HS-DSCH 305 using the information contained within the HS-SCCH 315, and retrieve the relevant content.

[0027] When the HS-DSCH 305 is used to transmit the FACH, the codes and timeslots that are used for the HS-SCCH 315, as well as a FACH-ID are broadcast by the Node B, for example within the SYSTEM INFORMATION message 210 illustrated in FIG. 2. UEs that are required to monitor the FACH subsequently attempt to decode the HS-SCCH 315 using the FACH-ID. If a UE 120 is successful in decoding the HS-SCCH 315 using the FACH-ID, a FACH message is present within the HS-DSCH 315.

[0028] Having decoded the HS-SCCH 315 using the FACH-ID, the UE 120 then decodes the relevant part of the HS-DSCH 305 as allocated by the HS-SCCH 315, and using the information provided within the HS-SCCH 315.

[0029] The UE-ID of the relevant UE 120 is included with the HS-DSCH 305. If this matches the UE-ID of the UE 120 decoding the HS-DSCH 305, the UE 120 acts on the FACH message contents in the HS-DSCH 305.

[0030] When a FACH message is to be sent to a UE 120, the RNC 105 requests the Node B 110 to send a FACH to a UE 120 with a certain message. The Node B 110 then schedules the transmission of the FACH message in the HS-DSCH 305, along with any traffic data that is to be sent in the HS-DSCH 305. The Node B 110 chooses the codes and timeslots that are to be used for the HS-DSCH 305 carrying the FACH message, as well as the coding and modulation to be applied to the HS-DSCH 305. The Node B then transmits an HS-SCCH 315 that allocates the codes and timeslots on the HS-DSCH 305 for the FACH message, along with the coding and modulation used, and encodes the HS-SCCH 315 using the FACH-ID.

[0031] When there are no requests from the RNC 105 for the Node B 110 to transmit a FACH message, the Node B is able to use all of the HS-DSCH 305

resource for traffic data. In this manner, physical resources are used more efficiently, and in particular physical resources are not permanently assigned for transmitting FACH messages, in particular when no, or few, FACH messages are required to be transmitted.

[0032] However, a problem with this known technique for reusing the FACH timeslot is that it requires the use of the HS-SCCH 315 and the HS-DSCH 305 channels for transmitting FACH messages, as opposed to just a FACH channel, and as such carries a penalty in terms of power consumption.

[0033] FACH messages may be transmitted to a UE 120 when the UE is in an idle state (or alternatively in a connected state). Accordingly, the Node B 110 is unaware of the state of the transmission path between itself and the UE 120. As a result, normal power control is ineffective since the Node B 110 has no information with which to make an informed decision on the appropriate power level to use. Consequently, the power requirements must initially depend on the number of bits to be transmitted, and the coding rate, without explicit knowledge of the path loss between the UE and Node B.

[0034] A number of bits transmitted on the HS-SCCH 315 is comparable to a number of bits that are transmitted on a traditional FACH, in the order of 60 bits (57 bits for a 3.84 Mcps TDD HS-SCCH). The exact number of bits to be transmitted on the FACH depends on the particular implementation. The power requirements for HS-SCCH 315 and FACH at the start of a connection are therefore substantially the same, due to the similar number of bits to be carried on each channel, for example approximately 33% of the Node B transmit power.

[0035] A problem with this known technique for reusing the FACH timeslot is that both the HS-SSCH 315 and the HS-DSCH 305 must be used in order to transmit a FACH message, each requiring approximately 33% of the Node B transmit power, albeit in different timeslots. This is in contrast to the traditional method of transmitting FACH messages, where using the dedicated FACH timeslot

only required the one timeslot. Thus, the known technique for reusing the FACH timeslot requires an additional timeslot at 33% of the Node B transmit power.

[0036] A skilled artisan will appreciate that, although the reuse of the FACH timeslot by mapping the FACH onto HS-DSCH resources provides a considerable improvement in the use of the physical resources, this increase in the power requirements is undesirable.

SUMMARY OF THE INVENTION

[0037] Accordingly, the invention seeks to mitigate, alleviate or eliminate one or more of the abovementioned disadvantages, singly or in any combination.

[0038] According to a first aspect of the invention, there is provided a cellular communication network node comprising a transmitter operably coupled to signal processing logic and arranged to transmit at least one direct signalling channel indicator bit generated by the signal processing logic. The signal processing logic is arranged, upon receipt of a message to be transmitted, to set at least one direct signalling channel indicator bit to indicate that a direct signalling channel is active in at least one unit of resource. The signal processing logic is further arranged to reallocate the at least one unit of resource for use by at least one other channel when no message is required to be transmitted.

[0039] Thus, embodiments of the invention may allow improved use of the communication resource in the communication system, for example by allowing physical resource to be dynamically switched between different channel types.

[0040] According to an optional feature of the invention, the signal processing logic may be arranged to generate direct signalling channel resource information comprising a description of the physical resources and transport formats applied to the direct signalling channel(s). Thus, embodiments of the invention may allow the physical resources of the direct signalling channel to be transmitted relatively infrequently to all UEs. Thus, in this manner, a reduction in the signalling load is

provided, as compared to the classic case where the physical resources for the direct signalling channel are sent whenever the direct signalling channel is allocated.

[0041] According to an optional feature of the invention, the signal processing logic may be arranged, upon receipt of a message to be transmitted, to set the at least one direct signalling channel indicator bit in a first frame, and to transmit the message in a second frame. For example, the second frame may be a next consecutive frame to the first frame. Thus, embodiments of the invention may allow the UE to have a longer time to process the indicator bit, thereby allowing the UE complexity to be reduced and/or to allow the UE to turn its receiver off in the time during which the direct signalling channel is transmitted.

[0042] According to an optional feature of the invention, the signal processing logic may allocate a plurality of direct signalling channels to at least one unit of resource. Thus, embodiments of the invention may allow the system to operate with a reduced number of direct signalling channel indicator bits. The bits that are freed up on the indicator channel may then be used for other indication purposes (e.g. paging or E-DCH ACK/NACK signalling).

[0043] According to an optional feature of the invention, the signal processing logic may generate a single direct signalling channel indicator bit for transmission, or a plurality of direct signalling channel indicator bits, one for each direct signalling channel, or a number of indicator bits for transmission, where each indicator bit corresponds to a plurality of direct signalling channels. Thus, embodiments of the invention may allow for finer granularity control of the allocated direct signalling channel, for example the network may allocate some of the resource as direct signalling channel instead of either allocating all or none of the resource. This allows for more targeted allocation of resource to direct signalling channels and traffic channels (e.g. HS-DSCH).

[0044] According to an optional feature of the invention, the signal processing logic may be arranged to allocate a plurality of direct signalling channels to a plurality of units of resource. Thus, embodiments of the invention may allow a

single indicator bit to control more than one direct signalling channel, thus either allowing more direct signalling channels (when the number of indicator bits that can be sent are constrained) or reduced usage of the indicator bits.

[0045] According to an optional feature of the invention, the signal processing logic, upon receipt of at least one message to be transmitted, may be arranged to re-allocate at least one unit of resource not required for transmitting the one or more message, for use by at least one channel other than the direct signalling channel. Thus, embodiments of the invention may allow better usage of the resource, for example some of the resource may be assigned to the direct signalling channel and some of the resource may be reassigned to the other channel when it is not needed for the direct signalling channel. Furthermore, the usage of the resource may be more tailored to the traffic profile, if the direct signalling channel is not greatly required, but there is a lot of traffic on the traffic channel.

[0046] According to an optional feature of the invention, the at least one direct signalling channel may be a Forward Access Channel(s) (FACH) within a Universal Mobile Telecommunications System (UMTS) network. For example, the at least one direct signalling channel unit of resource may be re-allocated for use by a High Speed Downlink Shared CHannel (HS-DSCH). Thus, embodiments of the invention may allow direct applicability to an application. In this case, for example, under-utilised FACH resource may be transferred to HS-DSCH resource, thus increasing the potential throughput of HS-DSCH.

[0047] According to an optional feature of the invention, the signal processing logic may generate the at least one direct signalling channel indicator bit within a Broadcast CHannel (BCH) for broadcast. For example, the signal processing logic may locate the at least one direct signalling channel indicator bit within a Transport Format Combination Indicator (TFCI) type field within the BCH. Furthermore, according to an optional feature of the invention, the signal processing logic may generate the direct signalling channel indicator bit(s) as part of a data portion of the BCH for broadcast. Thus, embodiments of the invention may

allow transmission directly on the broadcast channel, thereby removing a need for a separate indicator channel. Alternatively, when an indicator channel naturally exists (e.g. PICH or E-HICH), the paging or E-DCH acknowledgement capacity of those indicator channels is not reduced, as direct signalling channel indicator bits do not replace indicator bits that might be required for the other functions, such as PICH or E-HICH.

[0048] According to an optional feature of the invention, the signal processing logic may generate the at least one direct signalling channel indicator bit within a dedicated direct signalling channel indicator channel or within a dedicated paging indicator channel or within a E-DCH Hybrid ARQ Indicator CHannel (E-HICH) of a Universal Mobile Telecommunications System (UMTS) network. Thus, embodiments of the invention may allow a reduction in usage of the broadcast channel. In this manner, an indicator channel may also be more lightly coded (than a broadcast channel), thereby allowing for lower power/lower complexity decoding of the indicator channel (compared to a case where the indicator bits are sent on the broadcast channel).

[0049] In accordance with a second aspect of the invention there is provided a method for transmitting transport channels over a physical channel of a cellular communication system. The method comprises determining whether at least one message is to be transmitted. If it is determined that at least one message is required to be transmitted, scheduling the at least one message for transmission in at least one unit of resource allocated to at least one direct signalling channel, and setting at least one direct signalling channel indicator bit for transmission. If it is determined that no message is to be transmitted, re-allocating at least one unit of resource allocated for use by the at least one direct signalling channel for use by at least one channel other than the direct signalling channel. Thus, embodiments of the invention may provide a more flexible usage of resources, for example direct signalling channel resource that is under-utilised may be re-assigned to other (e.g. traffic) channels.

[0050] In accordance with a third aspect of the invention there is provided a computer program product comprising program code for signalling in a wireless communication system from a network element to a wireless communication unit. The computer program product comprising program code for setting, upon receipt of a message to be transmitted, at least one direct signalling channel indicator bit. The program code further comprises code for transmitting a message in at least one unit of resource allocated for use as a direct signalling channel, and re-allocating the at least one unit of resource allocated to the direct signalling channel for use by at least one other channel when no message is required to be transmitted. Thus, embodiments of the invention may allow the system to run on general purpose hardware, thus reducing cost.

[0051] In accordance with a fourth aspect of the invention there is provided a wireless communication unit arranged to receive a signalling message allocating a first set of resources in a wireless communication system from a cellular communication network node. The wireless communication unit further comprises logic for receiving a at least one direct signalling channel indicator bit on a communication channel, the at least one direct signalling channel indicator bit allocating a direct signalling channel. The wireless communication unit further comprises logic for modifying the wireless communication unit's first set of resources in response to a status of the at least one direct signalling channel indicator bit.

[0052] In the existing 3GPP system, for example, whenever any resource is applied to FACH, resources in the FACH slot and HS-DSCH resources cannot easily be allocated to the same UE, since the amount of resource in the FACH slot and HS-DSCH slot differ and existing signalling restrictions mean that the same amount of physical resource has to be allocated in each timeslot. Thus, embodiments of the invention address this limitation and may allow the system to allocate more resource to a UE.

[0053] In this manner, in contrast to normal 3GPP operation where the same number of codes has to be allocated to a wireless communication unit in all of the timeslots that it is allocated due to signalling restrictions, the wireless communication unit is signalled whether FACH is active. Advantageously, the wireless communication unit is able to use this indication to modify, for example, the HS-DSCH resource allocation, as the wireless communication unit knows that if the FACH indicator bit was set then any HS-DSCH resources that are common to FACH resources in the FACH timeslot must be allocated to FACH and not to HS-DSCH.

[0054] In accordance with a fifth aspect of the invention there is provided a method for resource allocation in a wireless communication system by a wireless communication unit. The method employed by the wireless communication unit comprises receiving by a wireless communication unit a signalling message allocating a first set of resources in a wireless communication system via at least one direct signalling channel indicator bit on a communication channel, the at least one direct signalling channel indicator bit allocating a direct signalling channel; and modifying the wireless communication unit's first set of resources in response to a status of the at least one direct signalling channel indicator bit.

[0055] These and other aspects, features and advantages of the invention will be apparent from, and elucidated with reference to, the embodiments described hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0056] FIG. 1 shows an example of a known network topology for part of a cellular

[0057] FIG. 2 shows a high level example of a known implementation for FACH channel transmissions.

[0058] FIG. 3 shows an example of a known assignment of physical resources.

[0059] Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawing(s), in which:

[0060] FIG. 4 shows part of a cellular communication system in accordance with embodiments of the invention.

[0061] FIG. 5 and FIG. 6 show an example of resource allocation in accordance with embodiments of the invention.

[0062] FIG. 7 shows an example of resource allocation in accordance with embodiments of the invention.

[0063] FIG. 8 shows an example of resource allocation in accordance with embodiments of the invention.

[0064] FIG. 9 shows an example of resource allocation in accordance with embodiments of the invention.

[0065] FIG. 10 shows a flowchart of a method for transmitting transport channels over a physical channel of a cellular communication system in accordance with embodiments of the invention.

[0066] FIG. 11 shows a flowchart of a method for transmitting transport channels over a physical channel of a cellular communication system in accordance with embodiments of the invention.

[0067] FIG. 12 illustrates a typical computing system that may be employed to implement processing functionality in accordance with embodiments of the invention.

DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0068] The following embodiments of the invention will be described in a context of a Forward Access Channel (FACH) provided as part of a Universal Mobile Telecommunications System (UMTS) communication network, as defined in 3GPP TS 22.146 and 3GPP TS 25.221 and other documents referenced therein. However, it will be appreciated by a skilled artisan that the inventive concept described herein may be applied to any direct signalling channel, such as a paging channel,

an allocation channel such as HS-SCCH or applied to alternative comparable services.

[0069] The following embodiments of the invention will be described in a context of timeslots, for example with respect to a TDD implementation, but the inventive concept is equally applicable to any communication 'unit of resource', for example for non-TDD implementations. Thus, hereinafter the term timeslot in a TDD context encompasses any communication 'unit of resource' outside of a TDD domain.

[0070] In one embodiment of the invention, in contrast to the known art where the indicator bits are used in a paging channel to inform the UE whether it needs to turn its radio on for reading the PCH (i.e. as a battery saving mode), the indicator bits are used to inform the UE whether it should be reading the resources 'reserved' for FACH as a FACH channel, or whether it should be ignoring those resources (for example when they are being used for another channel such as HS-DSCH).

[0071] Referring now to FIG. 4, there is illustrated a part of a cellular communication network 400 according to embodiments of the invention. The cellular communication network 400 comprises a communication network node, which for the illustrated embodiment is in a form of a Node B (NODE B) 410, operably coupled to a radio network controller (RNC) 420, for example by way of a leased line provided by a fixed line telecommunications provider, a microwave link, an Ethernet cable or some other form of communication link. The RNC 420 may be further operably coupled to, for example, a Media Gateway (not shown).

[0072] The Node B 410 comprises signal processing logic 440 arranged to transmit one or more indicator bits, for example on a broadcast channel. The signal processing logic 440 is further arranged, upon receipt of a FACH message to be transmitted, for example from the RNC 420, to set at least one of the one or more indicator bits and to transmit the FACH message in at least one of one or more timeslots allocated for use by one or more FACH channels. The signal processing

logic 440 is still further arranged to reallocate the one or more timeslots allocated to the one or more FACH channels, for use by one or more channels other than the one or more FACH channels, when no FACH messages are required to be transmitted.

[0073] The RNC 420 may, for example by way of a 'NODE B SETUP' message (e.g. 'COMMON TRANSPORT CHANNEL SETUP' in UMTS), instruct the Node B 410 those timeslot(s) that is/are to be allocated to the FACH channel(s), along with a set of channelisation codes that is reserved for the FACH channel(s) (codes used to separate the different channels that may be present on a certain frequency in a Code Division Multiple Access (CDMA) system), power headroom reserved for the RNC, etc. In a context of a 3GPP system, the generic expressions of 'NODE B SETUP' and 'SEND FACH' message may be referred to, for example, as 'COMMON TRANSPORT CHANNEL SETUP' and 'FACH frame protocol'.

[0074] Accordingly, the Node B 410 may comprise a memory element 450, in which the Node B 410 stores the settings provided by the RNC 420.

[0075] Alternatively, the Node B 410 may define which timeslot(s) are to be allocated to the FACH channel, along with a set of channelisation codes that are reserved for the FACH channel(s), power assigned to Node B FACH transmissions etc. The Node B may then inform the RNC of these definitions.

[0076] The signal processing logic 440 of the Node B 410 is arranged to transmit, upon receipt of a FACH message transmitted from the RNC 420, the one or more indicator bits within, for example, the broadcast channel. In this manner, by monitoring the channel carrying indicator bits, e.g. the broadcast channel, the UE 430 is able to determine whether there is a FACH message. If there is no indicator bit set, the UE 430 is able to power down its radio circuitry until the next time the channel carrying indicator bits is scheduled to be transmitted. If there is a FACH message, the UE 430 is able to read the contents of the FACH channel, and determine whether, or not, the message is intended for itself, as described in greater detail below.

[0077] Referring now to FIG. 5, there is illustrated an example of resource allocation in accordance with embodiments of the invention, where a FACH message is required to be transmitted. In particular, FIG. 5 illustrates a plurality of timeslots 510 within a 3.84 Mcps TDD UMTS frame.

[0078] The plurality of timeslots 510 are allocated to transport channels, which for the illustrated embodiments may comprise a Broadcast CHannel (BCH) 525, a High Speed Downlink Shared Channel (HS-DSCH) 505, a Shared Control Channel for the HS-DSCH (HS-SCCH) 515, and a Forward Access CHannel (FACH) 520. In embodiments of the invention, one timeslot also carries (what will hereinafter be referred to as) an INdicator Channel (INCH) 521, carrying indicator bits. FIG. 5 is labeled in terms of transport channels, but the skilled artisan will appreciate that transport channels are mapped to physical channels before transmission and that for the transport channels illustrated there is a one-to-one mapping between transport channel and physical channel. A skilled artisan will also appreciate that the timings between channels as shown in FIG. 5, and subsequent figures, are illustrative and may vary in an actual implementation of the invention.

[0079] Furthermore, the indicator bits may be sent on any channel used to send indicator bits, which may exist on a same timeslot as the BCH (but can also or alternatively exist on a timeslot other than that occupied by the broadcast channel (BCH)). For example, such indicator bits may take over some of the indicators that are used on other indicator channels (for example some of the E-HICH indicator bits would not be used for E-HICH purposes (e.g. acknowledging uplink transmissions), but would be used for transmission of FACH indicator bits instead).

[0080] Furthermore, the indicator bits may be either broadcast to all UEs in a cell, or transmitted to a targeted group of one or more UEs in a cell. For example, the targeted group of UEs may be a group of UEs with a particular capability or may be a group of UEs geographically located close to the Node B. An example method of targeting a group of UEs would be to mask the indicator bits with a

scrambling code that is known to a group of UEs or to transmit the indicator bits at a power level such that only that group of UEs is able to receive the indicator bits reliably.

[0081] As previously mentioned, the FACH is a downlink transport channel that is used to carry control information to a UE. The FACH allows short messages to be sent from the network to the UE. These short messages are typically control type messages that are used, for example, to allocate physical resources to the UE, set up dedicated physical channels, etc. In particular, the FACH provides a service for a network to communicate with UEs, without having to set up dedicated physical resources.

[0082] As previously mentioned, with respect to FIG. 4, the RNC 420 may instruct the Node B 410 those timeslot resources that are to be reserved for the FACH, for example by way of a 'NODE B SETUP' message, along with the channelisation codes and transport formats to be applied to the FACH. Furthermore, when the network needs to send a FACH message to a UE, for example UE 430 of FIG. 4, the RNC 420 sends a message, for example a 'SEND FACH' message, to the Node B 410 comprising the content of the message, and the identity of the UE 430, such as a UE-ID for which the message is intended. The RNC 420 may also define other criteria such as the specific timeslot resources to be used (from those reserved), specific channelisation codes to be used, etc. Alternatively, the choice of timeslot resources, channelisation codes, etc. may be left to the Node B 410, and as such the Node B 410 schedules the transmission of FACH messages within the, or each, FACH channel 520.

[0083] The BCH is a downlink transport channel that is used to broadcast system and cell specific information. In particular, the Node B 410 may use the BCH 525 to transmit resource information relating to common channels (where a common channel is a channel that a plurality of UEs are meant to decode, in contrast to a dedicated physical channel, which is meant to be decoded by a specific UE). The resource information may comprise descriptions of channelisation codes

for common physical channels, timeslot resource allocations, and formats for transport channels such as coding and modulation.

[0084] For the illustrated embodiments, the INCH 521 further comprises one or more indicator bits, at least one of which comprises a FACH indicator bit 522. In this manner, the resource information on BCH further comprises description of the at least one indicator bit within the INCH 521.

[0085] The FACH indicator bit is used to indicate whether a FACH channel to which it relates is 'active'. Thus, for the embodiments illustrated in FIG. 5, the FACH indicator bit 522 is used to indicate whether the FACH is 'active'.

[0086] When the NODE B 410 is required to send a FACH message, for example having received a SEND FACH message from the RNC 420, the NODE B 410 sets the FACH indicator bit 522, as illustrated in FIG. 5. The NODE B 410 also transmits the FACH message within the FACH timeslot, along with the identity of the UE, for example the UE-ID, for which the message is intended.

[0087] In this manner, a UE 430 attached to the NODE B 410, is able to determine whether there is a FACH message by monitoring the INCH 521, and in particular by reading the FACH indicator bit 522. Upon reading a set FACH indicator bit, the UE 430 determines that the NODE B 430 is transmitting a FACH message, and using the resource information being transmitted in the BCH 525, is able to decode the FACH message. If the identity of the UE 430 matches the identity transmitted within the FACH message, the UE 430 acts on the message content.

[0088] Referring now to FIG. 6 there is illustrated the resource allocation of FIG. 5, where no FACH message is required to be transmitted. As the NODE B 410 has no FACH message to transmit, the FACH indicator bit 522 in the INCH 521 is not set. In this manner, a UE 420 attached to the NODE B 410, for example UE 430, is able to determine that the NODE B 110 is not transmitting a FACH message, by reading the FACH indicator bit 522, and accordingly the UE does not attempt to decode HS-DSCH resource as FACH. This may allow the UE to conserve

battery power and avoids the UE incorrectly decoding HS-DSCH as FACH, thus improving reliability of the FACH transmission.

[0089] As will be appreciated by a skilled artisan, since the NODE B 410 is not transmitting a FACH message, the timeslot allocated to the FACH 520 is free. Therefore, in accordance with embodiments of the invention, the NODE B 410 is arranged to reallocate the FACH timeslot 520 for use by a channel other than the FACH, when no FACH message is required to be transmitted.

[0090] For the illustrated embodiments, the FACH timeslot 520 is reallocated for use by the HS-DSCH 505. The HS-DSCH 505 is a shared channel, the content and physical resources of which are allocated via the HS-SCCH 515, which is a downlink physical channel that carries control information for the HS-DSCH 505. A skilled artisan will appreciate that, although the HS-SCCH 515 is illustrated herein as occupying an entire timeslot, the HS-SCCH 515 may be multiplexed with other channels.

[0091] As previously mentioned, when the NODE B 410 is not transmitting a FACH message, it reallocates the FACH timeslot 520 for use by another channel, which for the illustrated embodiments is the HS-DSCH 505.

[0092] In this manner, when a FACH message is not being transmitted, the resources available to the HS-DSCH 505 can be expanded from, for the illustrated embodiments, seven timeslots to eight, an increase of approximately 14%. Thus, embodiments of the invention provide a more efficient use of physical resources, as compared with traditional techniques for providing services, such as that of FACH in traditional cellular communication systems.

[0093] Furthermore, unlike for the known solution for reusing the FACH timeslot described above, as the HS-DSCH 505 and HS-SCCH 515 are not used for transmitting FACH messages, these two channels do not each require a significant proportion (e.g. approximately 33%) of the Node B transmit power when a FACH message is to be transmitted. Rather, only the FACH, when a FACH message is being transmitted, requires 33% of the Node B transmit power.

[0094] Thus, an embodiment of the invention may provide an advantage of a more efficient use of physical resources, whilst substantially avoiding an increase in power requirements.

[0095] For the embodiments illustrated in FIG. 5 and FIG. 6, the FACH indicator bit 522 is illustrated as indicating 523 a state of the FACH within the same frame. A skilled artisan will appreciate that, for some UE implementations, this may not be feasible due to the processing requirements this would place on the UE.

[0096] Referring now to FIG. 7, there is illustrated an example of resource allocation in accordance with embodiments of the invention. In the same way as for the embodiments illustrated in FIG. 5 and FIG. 6, timeslots 710 within a frame are allocated to a BCH 725, HS-DSCH 705, HS-SCCH 715, FACH 720, INCH 721, etc.

[0097] For the embodiments illustrated in FIG. 7, the INCH 721 comprises a plurality of indicator bits, one of which, for the illustrated embodiments, is in the form of a FACH indicator bit 722, which indicates the state of the FACH 720 in a subsequent frame of the physical channel. For the illustrated embodiments, the FACH indicator bit 722 in frame 'n' indicates 723 the state of the FACH 720 within the next consecutive frame, frame 'n+1'. Thus, in FIG. 7, the FACH indicator bit 722 in frame 'n' is set, and thereby indicates that the FACH 720 is active in frame 'n+1'. In this manner, the processing requirements placed on a UE 430 are reduced, since the UE 430 is provided more time in which to prepare to decode the FACH 720 if the FACH 720 is active. As illustrated, the HS-SCCH 715 may also relate 716 to the HS-DSCH 705 in the next consecutive frame.

[0098] Referring now to FIG. 8, there is illustrated an example of resource allocation in accordance with embodiments of the invention. For the embodiments illustrated in FIGS. 5 to 7, a single FACH indicator bit is used to indicate a state of a single FACH, and the FACH is allocated an entire timeslot within the physical channel. A skilled artisan will appreciate that a NODE B may be arranged to

provide more than one FACH, and that the plurality of FACHs may be allocated to one or more timeslots.

[0099] For the embodiments illustrated in FIG. 8, four FACH channels are allocated to a single timeslot, and the FACH indicator bit 822 indicates 823 whether at least one of the FACH channels is active. In this manner, if the NODE B is required to transmit one or more FACH messages, the NODE B sets the FACH indicator bit 822, and transmits the one or more FACH messages in one or more FACH channels 820 within the allocated timeslot. In this manner, a UE is able to determine whether a FACH message is to be transmitted by reading the FACH indicator bit 822 in the INCH 821. If the FACH indicator bit 822 is set, the UE then decodes the FACH timeslot and reads each of the four FACH channels therein to determine whether the one or more transmitted FACH messages are intended for itself.

[00100] If the NODE B is not required to transmit a FACH message, the NODE B sets the FACH indicator bit 822 to 'inactive', and reallocates the FACH timeslot for use by another transport channel, for example the HS-DSCH 805.

[00101] Referring now to FIG. 9, there is illustrated an example of resource allocation in accordance with embodiments of the invention. As in the embodiment illustrated in FIG. 8, four FACH channels are allocated to a single timeslot. However, for the embodiments illustrated in FIG. 9, the INCH 921 comprises a plurality of FACH indicator bits 922. For the illustrated embodiments, the INCH 921 comprises four FACH indicator bits 922, each FACH indicator bit 922 relating to one of the FACH channels 920.

[00102] In this manner, when the NODE B receives one or more FACH messages to be transmitted, the NODE B schedules transmission of the one or more FACH messages in one or more of the FACH channels 920, and sets one or more of the FACH indicator bits 922, to indicate those FACH channels 920 that are active.

[00103] [0102] Thus, FIG. 9 illustrates a case where the NODE B is required to transmit two FACH messages. Accordingly, the NODE B has set two of the FACH

indicator bits 922, and transmits the FACH messages within the two corresponding FACH channels 920. As will be appreciated by a skilled artisan, for the embodiments illustrated in FIG. 9, only two out of four of the FACH channels 920 within the FACH timeslot are used. Accordingly, and in accordance with an embodiment of the invention, the NODE B re-allocates the timeslot resource for those FACH channels not required for transmitting FACH messages, for use by another transport channel, such as the HS-DSCH 905. In this manner, even when the NODE B is required to transmit FACH messages, free resource within the FACH allocated timeslot may be reused for other channels.

[00104] In the embodiments shown in FIG. 9, where a timeslot is partially used by FACH, a UE that is allocated HS-DSCH may advantageously modify its resource allocation based on the status of the FACH indicator bit. For example, if the UE is allocated all eight timeslots and all sixteen codes on HS-DSCH 905, and the FACH indicator bit is set, the UE may understand that in the FACH timeslot 920 it is actually allocated a reduced number of HS-DSCH codes. This is in contrast to the existing operation in 3GPP, where the same number of codes has to be allocated to a UE in all of the timeslots that it is allocated, due to signalling restrictions. However, in accordance with embodiments of the invention, the UE is signaled whether the FACH is active. Advantageously, the UE is able to use this indication to modify the HS-DSCH resource allocation (as the UE understands that if the FACH indicator bit was set, then the UE cannot be allocated all of the resource in the FACH timeslot as that resource is allocated elsewhere as FACH).

[00105] For the various embodiments illustrated and described herein, a single timeslot has been allocated for FACH channels. However, a skilled artisan will appreciate that more than one timeslot may be allocated for FACH channels. Accordingly, and in accordance with an embodiment of the invention, where more than one timeslot is allocated for FACH channels, the one or more timeslots may, individually or collectively, and as a whole or partly, be re-allocated for use by other channels when not required for the transmission of FACH messages.

[00106] Referring now to FIG. 10, there is illustrated a flow chart 1000 of a method for transmitting transport channels over a physical channel of a cellular communication system in accordance with embodiments of the invention.

[00107] The method starts at block 1010 and moves to block 1020, where it is determined whether a FACH message is required to be transmitted, for example whether a 'SEND FACH' command has been received from an RNC.

[00108] If it is determined that a FACH message is required to be transmitted, the method moves on to block 1030, where the FACH message(s) to be transmitted is/are scheduled for transmission in one or more timeslots allocated to one or more FACH channels. The method then moves on to block 1050.

[00109] Referring back to block 1020, if it is determined that no FACH message is required to be transmitted, the method moves on to block 1040, where the timeslot(s) allocated to the one or more FACH channels are re-allocated for use by one or more channels other than the one or more FACH channels. The method then moves on to block 1050.

[00110] In block 1050, the FACH indicator bit is configured as required for transmission in, for example a broadcast channel or indicator channel, indicating whether the FACH is active, e.g. a FACH message is to be transmitted, or not. That is to say, if a FACH message is to be transmitted, the FACH indicator bit is set (e.g. transmitted as a logic '1'), whereas if a FACH message is not to be transmitted, the FACH indicator bit is not set (e.g. transmitted as a logic '0' or alternatively the FACH indicator bit is simply not sent at all (for example in a Discontinuous Transmission (DTX) mode)). The method then moves on to block 1060, where the transmission of the transport channels is initiated. The method then returns to block 1020, as shown.

[00111] A skilled artisan will appreciate that only those blocks pertinent to the invention have been illustrated and described in order not to obscure the inventive concept.

[00112] Referring now to FIG. 11, there is illustrated a flowchart 1100 of a method for transmitting transport channels over a physical channel of a cellular communication system, in accordance with embodiments of the invention.

[00113] The method starts at block 1110 and moves to block 1120, where it is determined whether a FACH message is required to be transmitted. If it is determined that one or more FACH messages are required to be transmitted, the method moves on to block 1130, where the one or more FACH message(s) is/are scheduled for transmission within the allocated timeslot(s).

[00114] The method then moves on to block 1140, where it is determined whether resources allocated for FACH messages are free for use by other channels. If it is determined that no FACH resources are free in block 1140, the method moves on to block 1160. However, if it is determined that FACH resources are free, the method moves on to block 1150.

[00115] Referring back to block 1120, if it is determined that no FACH messages are required to be transmitted, the method moves on to block 1150, where resources allocated for FACH messages that are not required for the transmission of FACH messages are re-allocated for use by other channels.

[00116] The method then moves to block 1160, where the, or each, FACH indicator bit is configured as being required within a broadcast channel or indicator channel, indicating whether the FACH is active, e.g. a FACH message is to be transmitted, or not. The method then moves on to block 1170, where the transmission of the transport channels is initiated. The method then returns to block 1120.

[00117] A skilled artisan will appreciate that only those blocks pertinent to the invention have been illustrated and described in order not to obscure the inventive concept.

[00118] For the various embodiments hereinbefore described, the, or each, indicator bit has been described as being provided within an indicator channel. Alternatively the indicator bits may be sent on the BCH or other channel. By way of

example, the indicator bit(s) may be sent within a Transport Format Combination Indicator (TFCI) type field within the BCH, wherein the TFCI field is a field that is separately encoded to data traffic to which it relates. As another example, the indicator bits may be sent in the data portion of the BCH or other channel.

[00119] In an embodiment of the invention, the indicator bit(s) may be provided within a dedicated indicator channel. The indicator bits may also be transmitted as repetition encoded bits, or alternatively they may be more robustly encoded, such as jointly convolutionally encoded.

[00120] Alternatively, indicator bits may be transmitted within an indicator channel along with other indicator bits. For example indicator bits from the PICH (Paging Indicator CHannel) or E-HICH (E-DCH Hybrid ARQ Indicator CHannel) channels may be reassigned as FACH indicator bits.

[00121] While the invention has been described in terms of particular embodiments and illustrative figures, those of ordinary skill in the art will recognize that the invention is not limited to the embodiments or figures described. Although embodiments of the present invention are described, in some instances, using UMTS terminology, those skilled in the art will recognize that such terms are also used in a generic sense herein, and that the present invention is not limited to such systems.

[00122] Those skilled in the art will recognize that the operations of the various embodiments may be implemented using hardware, software, firmware, or combinations thereof, as appropriate. For example, some processes can be carried out using processors or other digital circuitry under the control of software, firmware, or hard-wired logic. (The term 'logic' herein refers to fixed hardware, programmable logic and/or an appropriate combination thereof, as would be recognized by one skilled in the art to carry out the recited functions.) Software and firmware can be stored on computer-readable media. Some other processes can be implemented using analog circuitry, as is well known to one of ordinary skill in the

art. Additionally, memory or other storage, as well as communication components, may be employed in embodiments of the invention.

[00123] FIG. 12 illustrates a typical computing system 1200 that may be employed to implement processing functionality in embodiments of the invention. Computing systems of this type may be used in the NodeB (in particular, the scheduler of the NodeB), core network elements, such as the GGSN, and RNCs, for example. Those skilled in the relevant art will also recognize how to implement the invention using other computer systems or architectures. Computing system 1200 may represent, for example, a desktop, laptop or notebook computer, hand-held computing device (PDA, cell phone, palmtop, etc.), mainframe, server, client, or any other type of special or general purpose computing device as may be desirable or appropriate for a given application or environment. Computing system 1200 can include one or more processors, such as a processor 1204. Processor 1204 can be implemented using a general or special purpose processing engine such as, for example, a microprocessor, microcontroller or other control logic. In this example, processor 1204 is connected to a bus 1202 or other communications medium.

[00124] Computing system 1200 can also include a main memory 1208, such as random access memory (RAM) or other dynamic memory, for storing information and instructions to be executed by processor 1204. Main memory 1208 also may be used for storing temporary variables or other intermediate information during execution of instructions to be executed by processor 1204. Computing system 1200 may likewise include a read only memory (ROM) or other static storage device coupled to bus 1202 for storing static information and instructions for processor 1204.

[00125] The computing system 1200 may also include information storage system 1210, which may include, for example, a media drive 1212 and a removable storage interface 1220. The media drive 1212 may include a drive or other mechanism to support fixed or removable storage media, such as a hard disk drive, a floppy disk drive, a magnetic tape drive, an optical disk drive, a compact disc (CD)

or digital video disk (DVD) read or write drive (R or RW), or other removable or fixed media drive. Storage media 1218 may include, for example, a hard disk, floppy disk, magnetic tape, optical disk, CD or DVD, or other fixed or removable medium that is read by and written to by a media drive. As these examples illustrate, the storage media 1218 may include a computer-readable storage medium having stored therein particular computer software or data.

[00126] In alternative embodiments, information storage system 1210 may include other similar components for allowing computer programs or other instructions or data to be loaded into computing system 1200. Such components may include, for example, a removable storage unit 1222 and an interface 1220, such as a program cartridge and cartridge interface, a removable memory (for example, a flash memory or other removable memory module) and memory slot, and other removable storage units 1222 and interfaces 1220 that allow software and data to be transferred from the removable storage unit 1222 to computing system 1200.

[00127] Computing system 1200 can also include a communications interface 1224. Communications interface 1224 can be used to allow software and data to be transferred between computing system 1200 and external devices. Examples of communications interface 1224 can include a modem, a network interface (such as an Ethernet or other NIC card), a communications port (such as for example, a universal serial bus (USB) port), a PCMCIA slot and card, etc. Software and data transferred via communications interface 1224 are in the form of signals which can be electronic, electromagnetic, optical or other signals capable of being received by communications interface 1224. These signals are provided to communications interface 1224 via a channel 1228. This channel 1228 may carry signals and may be implemented using a wireless medium, wire or cable, fiber optics, or other communications medium. Some examples of a channel include a phone line, a cellular phone link, an RF link, a network interface, a local or wide area network, and other communications channels.

[00128] In this document, the terms ‘computer program product’ ‘computer-readable medium’ and the like may be used generally to refer to media such as, for example, memory 1208, storage device 1218, or storage unit 1222. These and other forms of computer-readable media may store one or more instructions for use by processor 1204, to cause the processor to perform specified operations. Such instructions, generally referred to as ‘computer program code’ (which may be grouped in the form of computer programs or other groupings), when executed, enable the computing system 1200 to perform functions of embodiments of the present invention. Note that the code may directly cause the processor to perform specified operations, be compiled to do so, and/or be combined with other software, hardware, and/or firmware elements (e.g., libraries for performing standard functions) to do so.

[00129] In an embodiment where the elements are implemented using software, the software may be stored in a computer-readable medium and loaded into computing system 1200 using, for example, removable storage drive 1212 or communications interface 1224. The control logic (in this example, software instructions or computer program code), when executed by the processor 1204, causes the processor 1204 to perform the functions of the invention as described herein.

[00130] It will be appreciated that, for clarity purposes, the above description has described embodiments of the invention with reference to different functional units and processors. However, it will be apparent that any suitable distribution of functionality between different functional units, processors or domains may be used without detracting from the invention. For example, functionality illustrated to be performed by separate processors or controllers may be performed by the same processor or controller. Hence, references to specific functional units are only to be seen as references to suitable means for providing the described functionality, rather than indicative of a strict logical or physical structure or organization.

[00131] Although the invention has been described in connection with embodiments, it is not intended to be limited to the specific form set forth herein. Rather, the scope of the present invention is limited only by the claims. Additionally, although a feature may appear to be described in connection with particular embodiments, one skilled in the art would recognize that various features of the described embodiments may be combined in accordance with the invention. In the claims, the term 'comprising' does not exclude the presence of other elements or steps.

[00132] Furthermore, although individually listed, a plurality of means, elements or method steps may be implemented by, for example, a single unit or processor. Additionally, although individual features may be included in different claims, these may possibly be advantageously combined, and the inclusion in different claims does not imply that a combination of features is not feasible and/or advantageous. Also, the inclusion of a feature in one category of claims does not imply a limitation to this category, but rather the feature may be equally applicable to other claim categories, as appropriate.

[00133] Furthermore, the order of features in the claims does not imply any specific order in which the features must be performed and in particular the order of individual steps in a method claim does not imply that the steps must be performed in this order. Rather, the steps may be performed in any suitable order. In addition, singular references do not exclude a plurality. Thus, references to 'a', 'an', 'first', 'second', etc. do not preclude a plurality.

[00134] It will be understood that the method and apparatus for transmitting transport channels over a physical channel of a cellular communication system described above provides, by way of example only, at least the advantages of a more efficient use of physical resources, whilst substantially avoiding an increase in power requirements.

* * *

CLAIMS

What is claimed is:

1. A Node B comprising:

a transmitter configured to broadcast, to a user equipment (UE), indicator bits related to a High Speed Downlink Shared Channel (HS-DSCH) channelization code;

the transmitter is further configured to send, on a paging indicator channel, an indication that the HS-DSCH channelization code is to be used in a subsequent time interval to send control information to the UE;

wherein paging information for a communication with the UE is not sent by the Node B on a paging transport; and

a processor configured, in response to the sent indication, to send the control information with an associated UE identification.

2. The Node B of claim 1, wherein the subsequent time interval is a predetermined number of time intervals subsequent to transmission of the indication.

3. A user equipment (UE) comprising:

a receiver configured to receive, on a broadcast channel, indicator bits related to a High Speed Downlink Shared Channel (HS-DSCH) channelization code;

the receiver is further configured to receive, on a paging indicator channel, an indication that the HS-DSCH channelization code is to be used in a subsequent time interval to receive control information;

wherein paging information for a communication is not received on a paging transport channel; and

a processor configured, in response to the reception of the indication, to receive the control information with an associated UE identification.

4. The UE of claim 3, wherein the subsequent time interval is a predetermined number of time intervals subsequent to reception of the indication.

5. A method performed by a Node B, the method comprising:

broadcasting, to a user equipment (UE), indicator bits related to a High Speed Downlink Shared Channel (HS-DSCH) channelization code;

sending, by the Node B on a paging indicator channel, an indication that the HS-DSCH channelization code is to be used in a subsequent time interval to send control information to the UE;

wherein paging information for a communication with the UE is not sent on a paging transport channel; and

sending, by the Node B in response to the sending of the indication, the control information with an associated UE identification.

6. The method of claim 5, wherein the subsequent time interval is a predetermined number of time intervals subsequent to transmission of the indication.

7. A method performed by a user equipment (UE), the method comprising:
receiving, on a broadcast channel, indicator bits related to a High Speed Downlink Shared Channel (HS-DSCH) channelization code;

receiving, on a paging indicator channel, an indication that the HS-DSCH channelization code is to be used in a subsequent time interval to receive control information;

wherein paging information for a communication is not received on a paging transport channel; and

receiving, in response to the receiving of the indication, the control information with an associated UE identification.

8. The method of claim 7, wherein the subsequent time interval is a predetermined number of time intervals subsequent to reception of the indication.

ABSTRACT

A user equipment (UE) may receive, on a broadcast channel, indicator bits related to a High Speed Downlink Shared Channel (HS-DSCH) channelization code. The UE may receive, on a paging indicator channel, an indication that the HS-DSCH channelization code is to be used in a subsequent time interval to receive control information. In response to the reception of the indication, the UE may receive the control information with an associated UE identification.

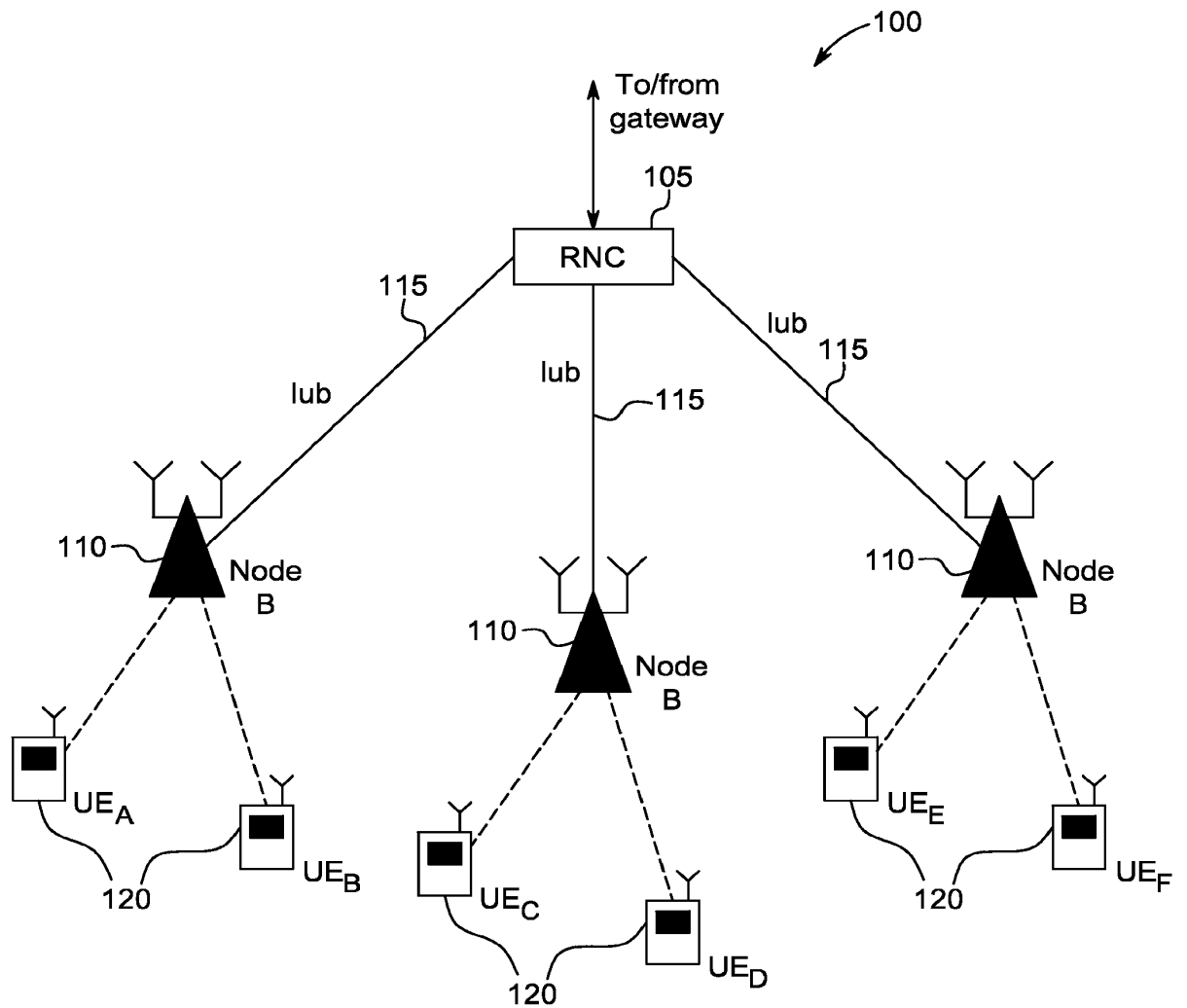


FIG. 1
PRIOR ART

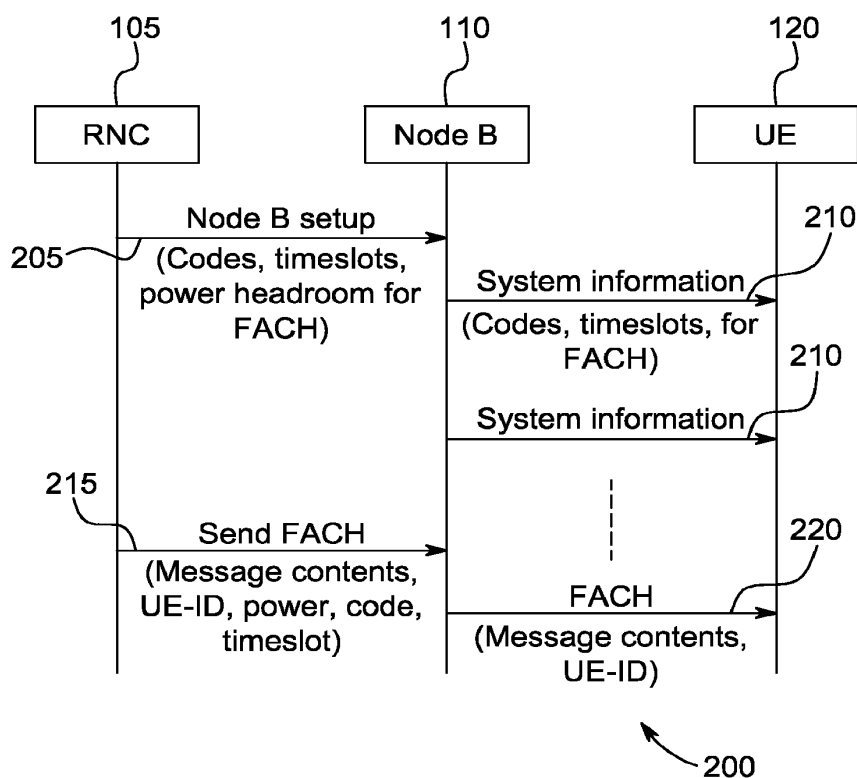


FIG. 2
PRIOR ART

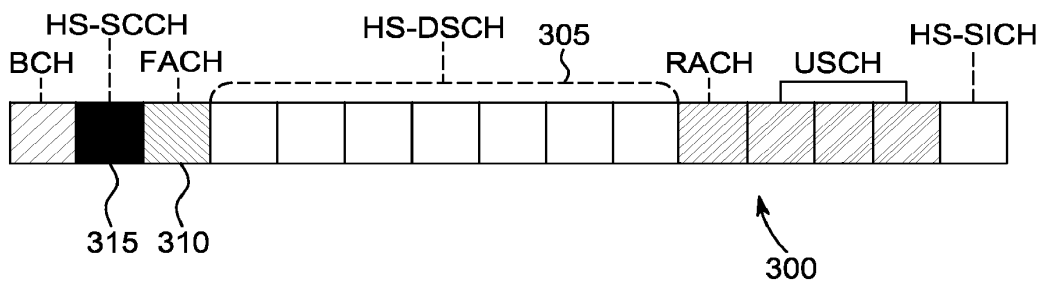


FIG. 3
PRIOR ART

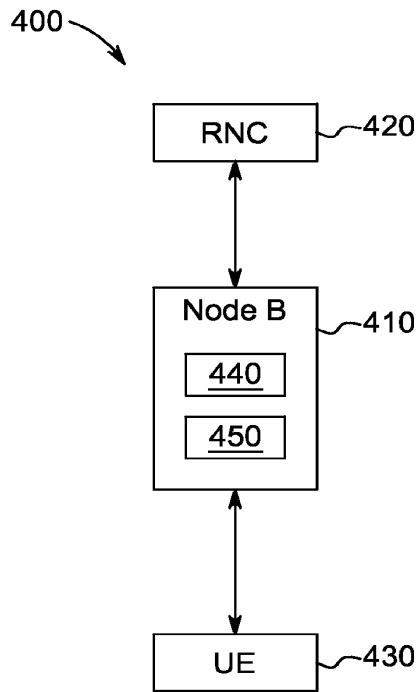


FIG. 4

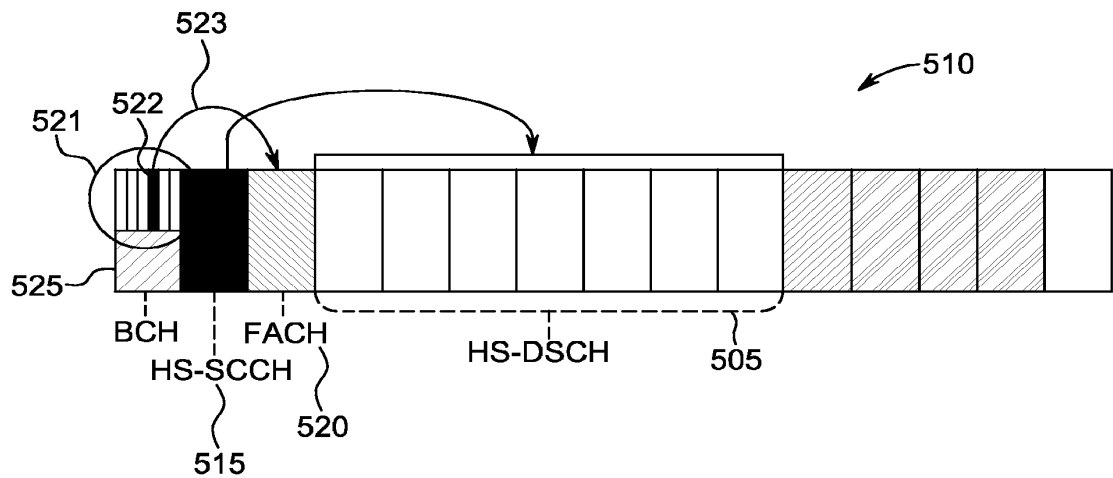


FIG. 5

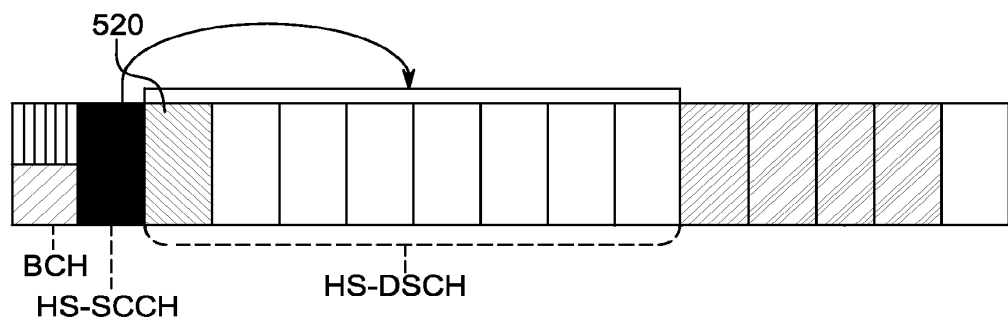


FIG. 6

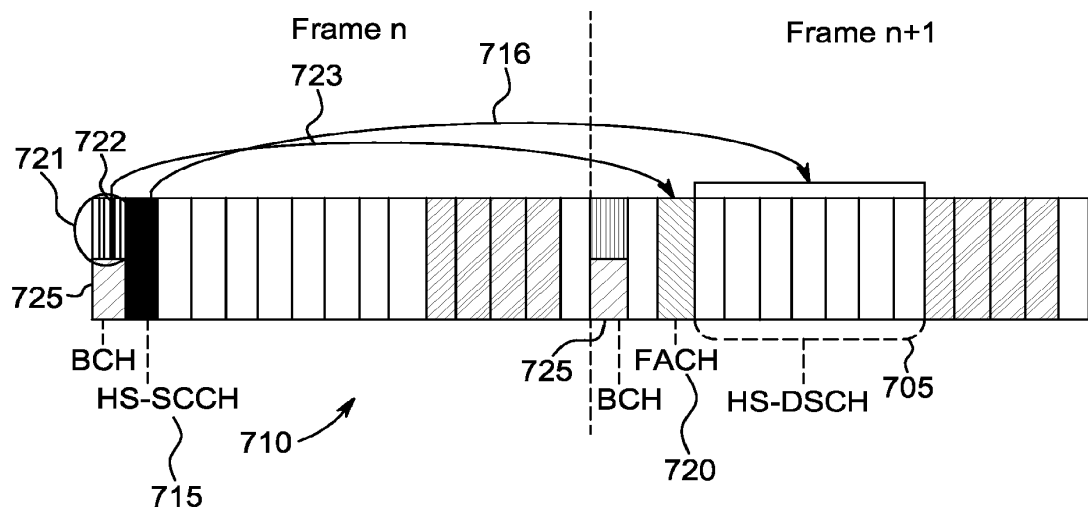


FIG. 7

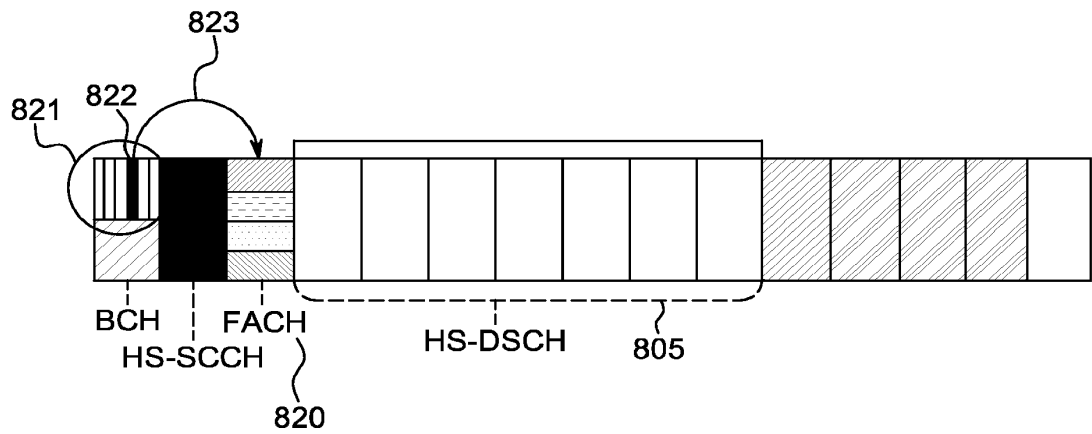


FIG. 8

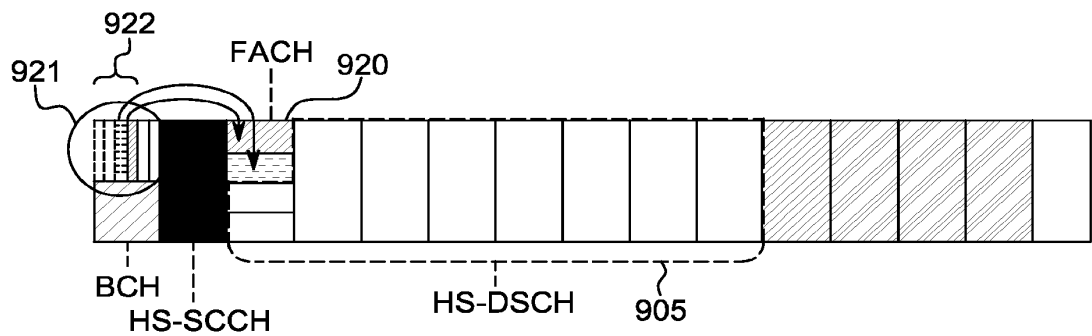


FIG. 9

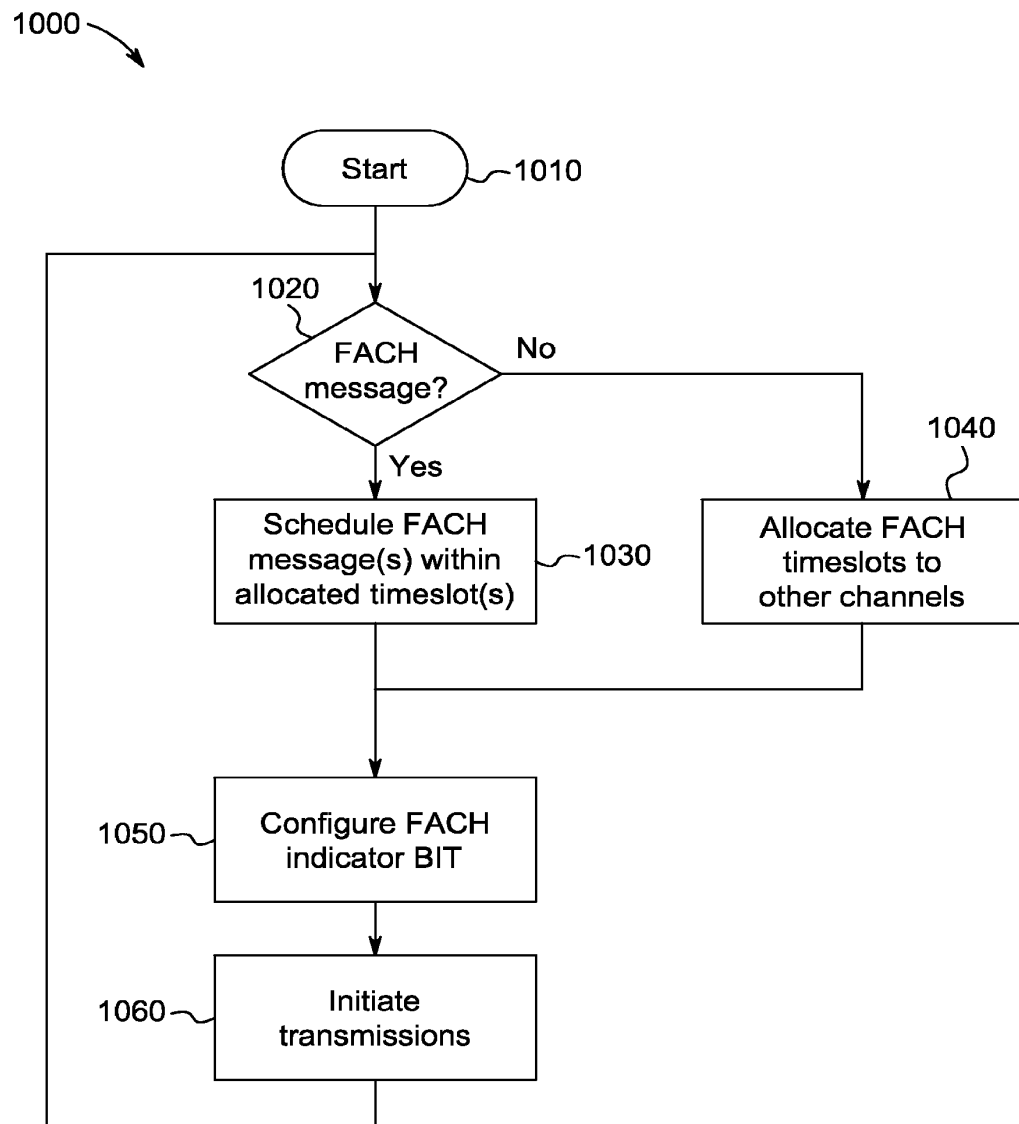


FIG. 10

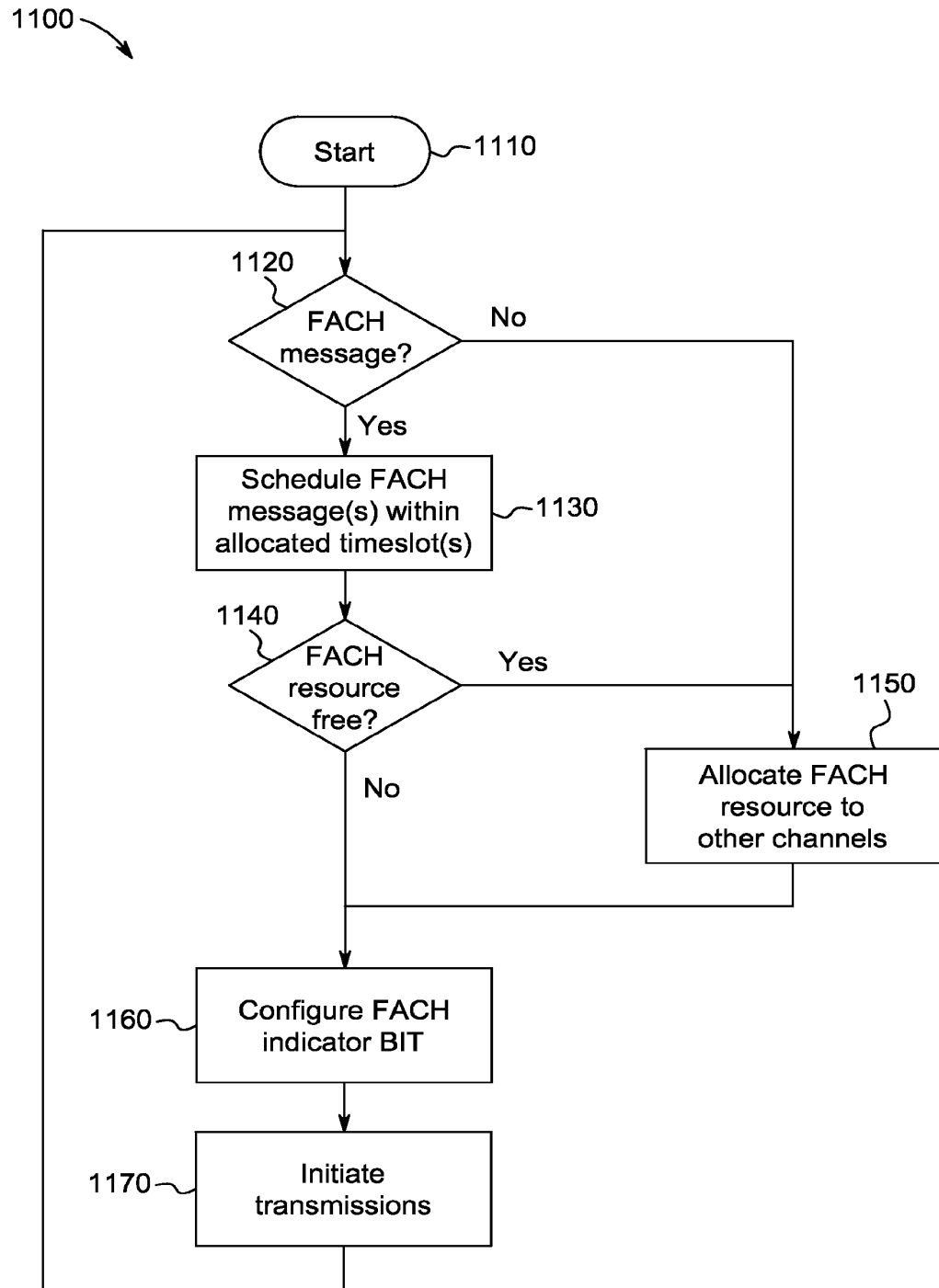


FIG. 11

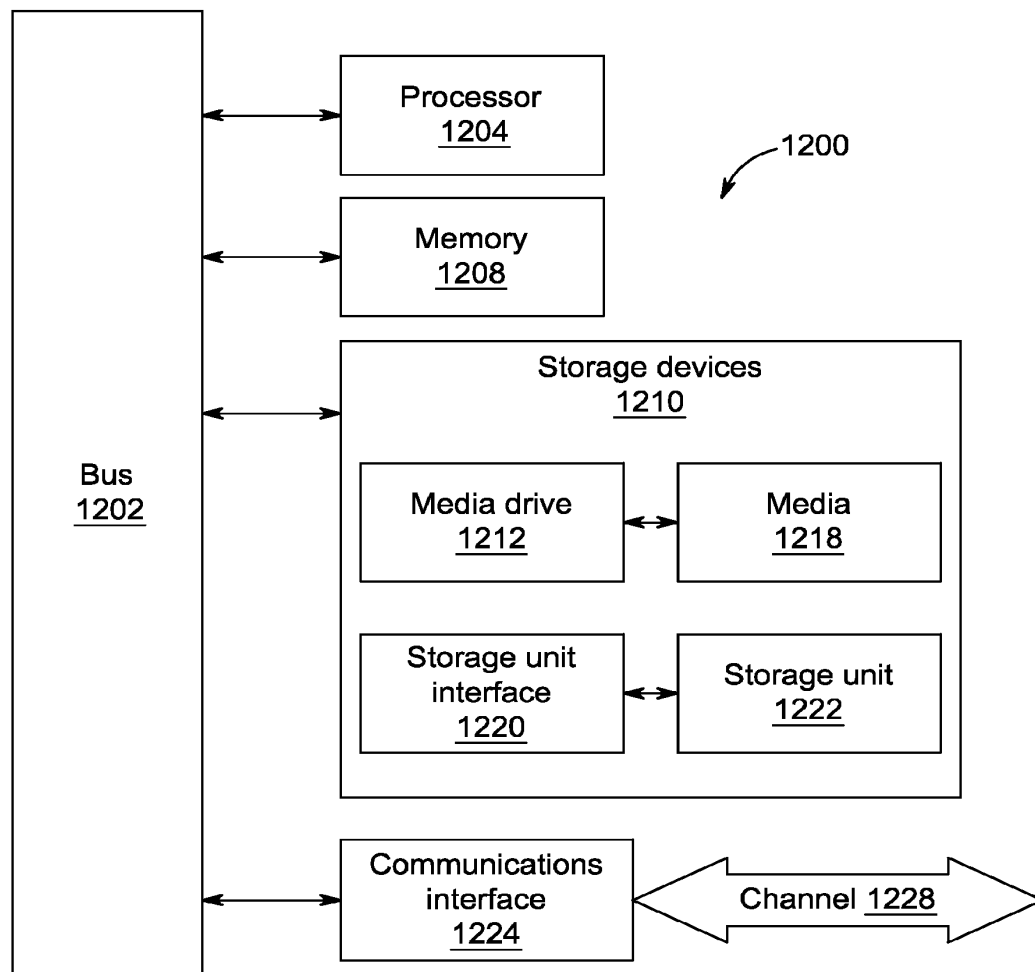


FIG. 12