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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/416,865	03/25/2014	8682357	IPW2-USAP191682	8530

3624 7590 03/05/2014
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
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 1618 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):

Chandrika K. Worrall, Newbury, UNITED KINGDOM;

Amendments to the Specification:

Change(s) applied to document, /M.M./ 11/25/2013

Please replace paragraph [~~0039~~ 0037] with the following amended paragraph:

[~~0039~~ 0037] FIG. 3 illustrates an example of signaling flow in an embodiment of the network-initiated connection establishment procedure. The network sends a paging message to the UE 110 via the Node Bs 112 to initiate a connection. First, the core network (or, more particularly in some embodiments, ~~the~~ access ~~gate way~~ gateway 118 within the core network) transmits the paging message to the relevant Node Bs in the registration area. After receiving the paging message from the core network, each Node B selects a c-RNTI and SCCH index (in one embodiment), and forms the paging signal to be broadcast in the corresponding cell. Thus the paging signal broadcast in the cell includes the paging message (cause, UE identity) from the core network, c-RNTI and the SCCH index (see FIG. 4). The UE identity may be expressed by the international mobile subscriber identity (IMSI) or temporary mobile ~~suberiber~~ subscriber identity (TMSI), which are known in the 3G standard. The recipient UE may use this c-RNTI as the cell-specific identity and the SCCH as the associated shared control channel for the shared channel operation[[:]].

Please change the title to:

PAGING IN A WIRELESS NETWORK

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 11/12/2013
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
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.
11/416,865	05/02/2006	Chandrika K. Worrall	IPW2-USAP191682	8530

TITLE OF INVENTION: ~~Network initiated communication establishment in a cellular system~~ PAGING 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	~~$1780~~ $960	~~$300~~ $0	$0	~~$2080~~ $960	02/12/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
PATEL, AJIT	2644	455-458000

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: Intellectual Ventures Holding 81 LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): 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 credit any overpayment, to Deposit Account Number 220493 (enclose an extra copy of this form).

PTOL-85 (Rev. 02/11)

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

❑ Applicant certifying micro entity status. See 37 CFR 1.29	NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27	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.
❑ Applicant changing to regular undiscounted fee 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: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Harry Vartanian/ Date February 4, 2014

Typed or printed name Harry Vartanian Registration No. 56,787

This collection of information 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.

Electronic Patent Application Fee Transmittal

Application Number:	11416865
Filing Date:	02-May-2006
Title of Invention:	PAGING IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Filer:	Harry Vartanian/Elizabeth McGinty
Attorney Docket Number:	IPW2-USAP191682

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	1501	1	960	960
Publ. Fee- Early, Voluntary, or Normal	1504	1	0	0

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**960**

Electronic Acknowledgement Receipt	
EFS ID:	18109354
Application Number:	11416865
International Application Number:	
Confirmation Number:	8530
Title of Invention:	PAGING IN A WIRELESS NETWORK
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Customer Number:	3624
Filer:	Harry Vartanian
Filer Authorized By:	
Attorney Docket Number:	IPW2-USAP191682
Receipt Date:	04-FEB-2014
Filing Date:	02-MAY-2006
Time Stamp:	16:34:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$960
RAM confirmation Number	3479
Deposit Account	220493
Authorized User	VARTANIAN, HARRY

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

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

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

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 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-USAP191682_IssueFee.PDF	329988 0938105a7642234e69bb0242e35c306de9a2193f	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	31987 f6506594703dbb7432e31c687685cf7e702b45d1	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	361975		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

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

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
11/416,865	05/02/2006	2644	4830	IPW2-USAP191682	82	6

CONFIRMATION NO. 8530

CORRECTED FILING RECEIPT

OC000000066105487

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

Date Mailed: 01/16/2014

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

Inventor(s)

Chandrika K. Worrall, Newbury, UNITED KINGDOM;

Applicant(s)

Chandrika K. Worrall, Newbury, UNITED KINGDOM;

Assignment For Published Patent Application

IPWireless, Inc., San Bruno, CA

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

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 05/31/2006

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 11/416,865**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

Title

PAGING IN A WIRELESS NETWORK

Preliminary Class

455

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

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

LICENSE FOR FOREIGN FILING UNDER

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 AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

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NOTICE OF ALLOWANCE AND FEE(S) DUE

3624 7590 11/12/2013
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER
PATEL, AJIT

ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 11/12/2013

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/416,865	05/02/2006	Chandrika K. Worrall	IPW2-USAP191682	8530

TITLE OF INVENTION: Network-initiated communication establishment in a cellular system

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1780	$300	$0	$2080	02/12/2014

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

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

PART B - FEE(S) TRANSMITTAL

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

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

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PHILADELPHIA, PA 19103

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/416,865	05/02/2006	Chandrika K. Worrall	IPW2-USAP191682	8530

TITLE OF INVENTION: Network-initiated communication establishment in a cellular system

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
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EXAMINER	ART UNIT	CLASS-SUBCLASS
PATEL, AJIT	2644	455-458000

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_____
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 credit 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	NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27	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.
❑ Applicant changing to regular undiscounted fee 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: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information 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.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/416,865	05/02/2006	Chandrika K. Worrall	IPW2-USAP191682	8530

3624 7590 11/12/2013
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER
PATEL, AJIT

ART UNIT	PAPER NUMBER
2644	

DATE MAILED: 11/12/2013

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

The Patent Term Adjustment to date is 1182 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 1182 day(s).

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 Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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

Notices of Allowance and Fee(s) Due mailed between October 1, 2013 and December 31, 2013

(Addendum to PTOL-85)

If the "Notice of Allowance and Fee(s) Due" has a mailing date on or after October 1, 2013 and before January 1, 2014, the following information is applicable to this application.

If the issue fee is being timely paid on or after January 1, 2014, the amount due is the issue fee and publication fee in effect January 1, 2014. On January 1, 2014, the issue fees set forth in 37 CFR 1.18 decrease significantly and the publication fee set forth in 37 CFR 1.18(d)(1) decreases to $0.

If an issue fee or publication fee has been previously paid in this application, applicant is not entitled to a refund of the difference between the amount paid and the amount in effect on January 1, 2014.

Notice of Allowability	Application No. 11/416,865	Applicant(s) WORRALL, CHANDRIKA K.	
	Examiner AJIT PATEL	Art Unit 2644	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 *11/12/12*.
   ☐ 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 *83-136*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

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

   * Certified copies not received: _____.

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

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

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

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

/AJIT PATEL/
Primary Examiner, Art Unit 2644

Notice of References Cited	Application/Control No. 11/416,865	Applicant(s)/Patent Under Reexamination WORRALL, CHANDRIKA K.	
	Examiner AJIT PATEL	Art Unit 2644	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,471,957	12-2008	Palkisto et al.	455/458
*	B	US-8,107,962	01-2012	Parmar et al.	455/437
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	11416865
	Filing Date	05/02/2006
	First Named Inventor	Chandrika K. Worrall
	Art Unit	2644
	Examiner Name	Dai Phuong
	Attorney Docket Number	IPW2-USAP191682

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	7912471	BB	2011-03-22	Kodikara Patabandi et al.	* Corresponds to JP 2009-522889 and JP 2009-522893

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	5-055610	JP		1993-03-05			☐
	2	2009522889	JP	T2	2009-06-11			☐
	3	2009522893	JP	T2	2009-06-11			☐

EFS Web 2.1.17

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.P./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	11416865 11416865 - GAU: 2644
	Filing Date	05/02/2006
	First Named Inventor	Chandrika K. Worrall
	Art Unit	2644
	Examiner Name	Dai Phuong
	Attorney Docket Number	IPW2-USAP191682

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	OFFICE ACTION, Japanese Patent Application No. 2011-198526, dated November 16, 2012.	☐

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EXAMINER SIGNATURE

Examiner Signature	/Ajit Patel/	Date Considered	11/02/2013

*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.

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	Art Unit	2644
	Examiner Name	Dai Phuong
	Attorney Docket Number	IPW2-USAP191682

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)	2013-03-19
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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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.P./

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	Application Number	11416865
	Filing Date	2006-05-02
	First Named Inventor	Chandrika K. Worrall
	Art Unit	2617
	Examiner Name	Patrick Nestor Edouard
	Attorney Docket Number	IPW2-USAP191682

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

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	11416865 11416865 - GAU: 2644
	Filing Date	2006-05-02
	First Named Inventor	Chandrika K. Worrall
	Art Unit	2617
	Examiner Name	Patrick Nestor Edouard
	Attorney Docket Number	IPW2-USAP191682

	1	OFFICE ACTION, Japanese Patent Application No. 2009-508324, mailed January 4, 2012.	☐
	2	OFFICE ACTION, Korean Patent Application No. 200780021642.8, dated April 13, 2010.	☐
	3	OFFICE ACTION, Korean Patent Application No. 200780021642.8, dated August 12, 2011.	☐
	4	OFFICE ACTION, Korean Patent Application No. 200780021642.8, dated March 30, 2012.	☐

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EXAMINER SIGNATURE

Examiner Signature	/Ajit Patel/	Date Considered	11/02/2013

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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.

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☐ See attached certification statement.

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

☒ None

SIGNATURE

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Signature	/Harry Vartanian/	Date (YYYY-MM-DD)	2012-08-01
Name/Print	Harry Vartanian	Registration Number	56,787

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.P./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	11416865
	Filing Date	2006-05-02
	First Named Inventor	Worrall, Chandrika K.
	Art Unit	2617
	Examiner Name	Aung T. Win
	Attorney Docket Number	9147-96635-US

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
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐
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NON-PATENT LITERATURE DOCUMENTS			Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.P./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	11416865 11416865 - GAU: 2644
	Filing Date	2006-05-02
	First Named Inventor	Worrall, Chandrika K.
	Art Unit	2617
	Examiner Name	Aung T. Win
	Attorney Docket Number	9147-96635-US

	1	English Summary of Office Action Dated June 3, 2011 from the Japanese Patent Office from Japanese Patent Application No. 2009-508324.	☐
	2	Vodafone Group, Modelling of the LTE RRC Active state, 3GPP TSG RAN WG2 #52, 3GPP, 27th April 2006, R2-060957, URL, http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_52/Documents/R2-060957.zip.	☐
	3	IPWireless, Initial Cell Access Procedure in LTE, 3GPP TSG RAN WG2 #51, 3GPP, 13th February 2006, R2-060380, URL, http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_51/Documents/R2-060380.zip.	☐
	4	3GPP, Physical channels and mapping of transport channels onto physical channels (TDD) (Release 7), 3GPP TS 25.221, 3GPP, March 2006, V7.0.0., p.84, URL, http://www.3gpp.org/ftp/Specs/archive/25_series/25.221/25221-700.zip.	☐
	5	Ericsson, Paging for E-UTRA, February 13-17, 2006, R1-060576; TSG-RAN WG1 #44.	☐

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

EXAMINER SIGNATURE

Examiner Signature	/Ajit Patel/	Date Considered	11/02/2013

*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.

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BIB DATA SHEET

CONFIRMATION NO. 8530

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/416,865	05/02/2006 **RULE**	455	2644	IPW2-USAP191682

APPLICANTS
Chandrika K. Worrall, Newbury, UNITED KINGDOM;

**** CONTINUING DATA ***************************

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
05/31/2006

Foreign Priority claimed	35 USC 119(a-d) conditions met	Verified and Acknowledged	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ Yes ☑ No	☐ Yes ☑ No	/AJIT PATEL/ Examiner's Signature ☐ Met after Allowance Initials	UNITED KINGDOM	13	82	6

ADDRESS
VOLPE AND KOENIG, P.C.
UNITED PLAZA
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103
UNITED STATES

TITLE
Network-initiated communication establishment in a cellular system

FILING FEE RECEIVED		
4830	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

CPC- SEARCHED		
Symbol	**Date**	**Examiner**

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

US CLASSIFICATION SEARCHED			
Class	**Subclass**	**Date**	**Examiner**
455	450,458	11/2/2013	AP
370	329,341,346,431,432,438,449	11/2/2013	AP

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
updated search and google search	5/4/2011	atw
EAST	11/2/2013	AP

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
	See EAST for Interference search	11/2/2013	AP

Issue Classification	**Application/Control No.** 11416865	**Applicant(s)/Patent Under Reexamination** WORRALL, CHANDRIKA K.
	Examiner AJIT PATEL	**Art Unit** 2644

CPC

Symbol					Type	Version
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CPC Combination Sets

Symbol					Type	Set	Ranking	Version
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NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 54	
/AJIT PATEL/ Primary Examiner.Art Unit 2644 (Primary Examiner)	11/2/13 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2,9

U.S. Patent and Trademark Office

Part of Paper No. 20131102

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AJIT PATEL	2644

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED
455	458	H 0 4 W 68 / 00 (2009.01.01)	

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
455	450				

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 54	
/AJIT PATEL/ Primary Examiner.Art Unit 2644 (Primary Examiner)	11/2/13 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2,9

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AJIT PATEL	2644

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

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 54	
/AJIT PATEL/ Primary Examiner.Art Unit 2644 (Primary Examiner)	11/2/13 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2,9

U.S. Patent and Trademark Office

Part of Paper No. 20131102

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

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

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

CLAIM		DATE								
Final	Original	05/04/2011	11/02/2013							
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	34	✓								
	35	✓								
	36	✓								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

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

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

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

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

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

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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L3	5	1 and 2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/11/02 18:08
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L5	3	1 and (@ad<"20060502" or @rlad<"20060502")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/11/02 18:15
L6	0	pag$6 with allocat$6 with (resource$1 or channel$1) with temporary adj identi$6 with idle adj mode.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2013/11/02 18:17

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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L8	77	pag$6 with (imsi or tmsi).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2013/11/02 18:18
L9	0	7 and 8	US-PGPUB; USPAT; UPAD	OR	OFF	2013/11/02 18:18

11/2/2013 6:19:18 PM
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PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	11416865
Filing Date	05/02/2006
First Named Inventor	Chandrika K. Worrall
Art Unit	2644
Examiner Name	Dai Phuong
Attorney Docket Number	IPW2-USAP191682

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	7912471	BB	2011-03-22	Kodikara Patabandi et al.	* Corresponds to JP 2009-522889 and JP 2009-522893

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	5-055610	JP		1993-03-05			☐
	2	2009522889	JP	T2	2009-06-11			☐
	3	2009522893	JP	T2	2009-06-11			☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	11416865
	Filing Date	05/02/2006
	First Named Inventor	Chandrika K. Worrall
	Art Unit	2644
	Examiner Name	Dai Phuong
	Attorney Docket Number	IPW2-USAP191682

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	OFFICE ACTION, Japanese Patent Application No. 2011-198526, dated November 16, 2012.	☐
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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	11416865
	Filing Date	05/02/2006
	First Named Inventor	Chandrika K. Worrall
	Art Unit	2644
	Examiner Name	Dai Phuong
	Attorney Docket Number	IPW2-USAP191682

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)	2013-03-19
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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Espacenet

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ORGANIC FILE PHOTOSENSOR

Inventor(s): NAMIKATA TAKASHI ± (NAMIKATA TAKASHI)

Applicant(s): ASAHI CHEMICAL IND ± (ASAHI CHEM IND CO LTD)

Classification: **- international:** ***H01L51/42;*** (IPC1-7): H01L31/0344
- Euro: Y02E10/50

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Abstract of JP5055610 (A)

PURPOSE:To provide a highly sensitive photosensor excellent in response to light. CONSTITUTION:A condensed polycyclic aromatic compound film where the number of condensed benzene rings is not less than four and not more than thirteen is made on a semiconductor substrate. A photosensor detects the light from the change of the electric property accompanying the light application of this sensor, by forming the film of a condensed polycyclic aromatic compound on the semiconductor substrate. The photosensor is highly sensitive, and is excellent in response to light. Furthermore, since the manufacture of the sensor can be performed with a low-temperature substrate, and it is excellent in surface property of the film and the smoothness, it is useful in industry.

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前置審査

(73)特許権者　512158491
インテレクチュアル　ベンチャーズ　ホールディング　81　エルエルシー
アメリカ合衆国，ネバダ州　89128，ラスベガス，ダブリュ　レイク　ミード　ブールバード　7251，スイート　300
(74)代理人　100079108
弁理士　稲葉　良幸
(74)代理人　100109346
弁理士　大貫　敏史
(72)発明者　ウォラル，チャンドリカ　ケイ
イギリス国，バークシャー　アールジー14　6エスエヌ　ニューバリー　バルフォー・クレセント　11エイ

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(54)【発明の名称】セルラーシステムにおけるネットワークにより開始される通信の確立

(57)【特許請求の範囲】

【請求項１】

セルラー通信システムにおいて無線インタフェースを介しユーザ装置とのネットワークにより開始される接続を確立する基地局であって、

ユーザ装置の一意的な識別子を有するネットワーク開始接続確立メッセージを導出するロジックと、

少なくとも１つのセルに前記ネットワーク開始接続確立メッセージを前記ユーザ装置の一意的な識別子と異なる一時的識別子と共に送信するロジックと、

前記少なくとも１つのセル内の前記ユーザ装置（ＵＥ）からの前記ネットワーク開始接続確立メッセージに対するアクノリッジメントレスポンスを受信するロジックと、

前記アクノリッジメントレスポンスに応答して、当該基地局と前記ＵＥとの間の共有チャネルの接続を確立するロジックと、

を有し、

前記一時的識別子は、前記共有チャネル上で前記ＵＥを識別する基地局。

【請求項２】

前記ＵＥがドーマント状態にあることに応答して、前記ＵＥが最後に登録された基地局からの一時的識別子を前記ＵＥに割り当てるロジックを有する、請求項１記載の基地局。

【請求項３】

前記送信するロジックは、共有チャネル処理中に前記ＵＥについて制御情報を通信するための少なくとも１つの共有制御チャネル（ＳＣＣＨ）に、前記ページングメッセージと

共に少なくとも１つのチャネルインデックスを送信するよう動作可能である、請求項１記載の基地局。

【請求項４】

前記アクノリッジメントレスポンスについて前記ＵＥにより使用されるべき専用のアクセスリソースの指示を前記ＵＥに通知するロジックを有する、請求項１乃至３何れか一項記載の基地局。

【請求項５】

前記アクノリッジメントレスポンスを受信するロジックは、競合ベースアップリンクチャネルを介し前記アクノリッジメントレスポンスを受信するよう動作可能である、請求項１乃至４何れか一項記載の基地局。

【請求項６】

前記一時的識別子はセルに固有のものであり、

当該基地局はさらに、当該基地局において前記一時的識別子を選択するロジックを有する、請求項１乃至５何れか一項記載の基地局。

【請求項７】

前記アクノリッジメントレスポンスを受信するロジックは、前記ＵＥからのアップリンク同期要求に基づき、前記ＵＥとの通信を同期させるロジックを有する、請求項１乃至６何れか一項記載の基地局。

【請求項８】

前記一時的識別子は、登録エリア内の複数のセルに共通し、

当該基地局はさらに、コアネットワーク又はリソースマネージャから前記一時的識別子を受信するロジックを有する、請求項１乃至７何れか一項記載の基地局。

【請求項９】

前記送信するロジックは、

各ページングインジケータが少なくとも１つのＵＥに対応する少なくとも１つのページングインジケータを第１物理チャネルで送信するロジックと、

各第２物理チャネルが少なくとも１つのＵＥに対応する、前記第１物理チャネルと異なる少なくとも１つの第２物理チャネルで前記ページングメッセージを送信するロジックと、

を有する、請求項１乃至８何れか一項記載の基地局。

【請求項１０】

前記第１物理チャネルは、複数のページングインジケータを搬送するページングインジケータチャネル又はＳＣＣＨチャネルであり、

前記第２物理チャネルは、ページングチャネル又は共有チャネルである、請求項９記載の基地局。

【請求項１１】

セルラー通信システムにおいて無線インタフェースを介しユーザ装置と基地局との間のネットワークにより開始される接続を確立する方法であって、

基地局において、

ユーザ装置の一意的な識別子を有するネットワーク開始接続確立メッセージを導出するステップと、

少なくとも１つのセルに前記ネットワーク開始接続確立メッセージを前記ユーザ装置の一意的な識別子と異なる一時的識別子と共に送信するステップと、

前記少なくとも１つのセル内の前記ユーザ装置（ＵＥ）からの前記ネットワーク開始接続確立メッセージに対するアクノリッジメントレスポンスを受信するステップと、

前記アクノリッジメントレスポンスに応答して、当該基地局と前記ＵＥとの間の共有チャネルの接続を確立するステップと、

を有し、

前記一時的識別子は、前記共有チャネル上で前記ＵＥを識別する方法。

【請求項１２】

セルラー通信システムにおいて無線インタフェースを介しユーザ装置（ＵＥ）と基地局との間のネットワークにより開始される接続を確立するリソースマネージャであって、
前記ＵＥについて前記ＵＥの一意的な識別子と異なる一時的識別子を選択するロジックと、
前記ＵＥへの前記基地局による送信のため、前記ＵＥの一意的な識別子を有するネットワーク開始接続確立メッセージと共に前記一時的識別子を前記基地局に提供するロジックと、
を有し、
前記一時的識別子は、前記ＵＥと前記基地局との間の共有チャネル処理中に前記ＵＥを識別するリソースマネージャ。
【請求項１３】
セルラー通信システムにおいて無線インタフェースを介しユーザ装置（ＵＥ）と基地局との間のネットワークにより開始される接続を確立する方法であって、
前記ＵＥについて前記ＵＥの一意的な識別子と異なる一時的識別子を選択するステップと、
前記ＵＥへの前記基地局による送信のため、前記ＵＥの一意的な識別子を有するネットワーク開始接続確立メッセージと共に前記一時的識別子を前記基地局に提供するステップと、
を有し、
前記一時的識別子は、前記ＵＥと前記基地局との間の共有チャネル処理中に前記ＵＥを識別する方法。
【請求項１４】
セルラー通信システムにおいて無線インタフェースを介し基地局とのネットワークにより開始される接続を確立するユーザ装置（ＵＥ）であって、
前記基地局から当該ＵＥの一意的な識別子を有するネットワーク開始接続確立メッセージと、当該ＵＥの一意的な識別子と異なる一時的識別子とを受信するロジックと、
前記基地局と当該ＵＥとの間の共有チャネルの接続を確立するため、前記ネットワーク開始接続確立メッセージに対するアクノリッジメントレスポンスを前記基地局に送信するロジックと、
を有し、
前記一時的識別子は、前記共有チャネルを利用可能な複数のＵＥから前記共有チャネル上で当該個別のＵＥを識別するユーザ装置。
【請求項１５】
セルラー通信システムにおいて無線インタフェースを介し基地局とのネットワークにより開始される接続を確立する方法であって、
個別のＵＥによって、
前記基地局から当該ＵＥの一意的な識別子を有するネットワーク開始接続確立メッセージと、当該ＵＥの一意的な識別子と異なる一時的識別子とを受信するステップと、
前記基地局と当該ＵＥとの間の共有チャネル接続を確立するため、前記ネットワーク開始接続確立メッセージに対するアクノリッジメントレスポンスを前記基地局に送信するロジックと、
を有し、
前記一時的識別子は、前記共有チャネルを利用可能な複数のＵＥから前記共有チャネル上で当該個別のＵＥを識別する方法。
【発明の詳細な説明】
【技術分野】
【０００１】
本発明は、一般に無線通信システムに関し、より詳細には、セルラー通信システムにおける接続の確立に関する。
［関連技術の説明］

無線通信システムは、モバイル端末などのユーザ装置（ＵＥ）のバッテリ電力消費を最小化するスリープモードをサポートしている。スリープモードでは、モバイル端末は、ほとんど又は全く活動を行わず、トラフィックデータを送受信しない。このため、スリープモードのモバイル端末は、僅かな無線リンクリソースしか消費しない。このため、多数のユーザがシステムにおいて同時にサポート可能となる。

【０００２】

モバイル端末は、スリープモードを終了し、２つの方法により基地局（３ＧＰＰプロトコルによると“Ｎｏｄｅ　Ｂ”として知られている）の無線アクセスネットワーク（ＲＡＮ）に接続することができる。トラフィックがモバイル端末から送信される必要がある場合、モバイル端末は、ネットワークとの接続を要求することによって、スリープモードを終了する。これは、“モバイル端末により開始される（発生する）接続”と表される。そうでない場合、ネットワークは、モバイル端末にネットワークに接続するよう要求するかもしれない。これは、“ネットワークにより開始される接続（ｎｅｔｗｏｒｋ－ｉｎｉｔｉａｔｅｄ　ｃｏｎｎｅｃｔｉｏｎ）”と表される。“ネットワークにより開始される接続”においてスリープモードからモバイル端末をウェークアップするのに使用される手順は、ページングを利用する。

【０００３】

ページングは、スリープモードからモバイル端末をウェークアップすることに関する。ウェークアップ後、モバイル端末は、ダウンリンクページングチャネルで送信されるページングメッセージを読む。モバイル端末は、ページングメッセージを介しネットワークにより指示されるタスクを実行するか、又はネットワークに接続する。

【０００４】

これに伴う活動量及び接続量に応じて、スリープモードは、“アイドル（スタンバイ）”及び“ドーマント（ｄｏｒｍａｎｔ）”として２つのサブモードに分類可能である。アイドルモードでは、モバイル端末は、ＲＡＮとは接続せず、コアネットワークに接続する。他方、ドーマント状態では、モバイル端末はＲＡＮに接続される。スリープモードにおける可動性を支援するため、モバイル端末は、登録エリア又は“ページングゾーン”において登録される。モバイル端末は、ネットワークの登録処理において自らの位置及び状態を通知する。これは、ネットワークにより開始される接続の確立のケースにおいて効率的なページングを可能にする。登録エリアは、１以上の基地局（又はＮｏｄｅ－Ｂ）によりそれぞれ制御されるゾーン（１以上のセルなど）として定義されるかもしれない。登録エリアはまた、“ルーティングエリア”、“トラッキングエリア”、“ロケーションエリア”又は３Ｇ無線通信を実現するＵＭＴＳ（Ｕｎｉｖｅｒｓａｌ　Ｍｏｂｉｌｅ　Ｔｅｌｅｃｏｍｍｕｎｉｃａｔｉｏｎｓ　Ｓｙｓｔｅｍ）については“ＵＴＲＡＮ登録エリア（ＵＲＡ）”として知られるかもしれない。

【０００５】

モバイル端末は、“登録エリア”が変更される際は常に登録を実行する。すなわち、モバイル端末がいるセルが、当該モバイル端末が以前に登録されていた登録エリアと異なる“登録エリア”アイデンティティを報知するときは常に、モバイル端末は、登録更新を実行すべきである。ここで、各セルが１つの“登録エリア”アイデンティティしか報知しないと仮定される。しかしながら、登録エリアは、重複するゾーンを含むよう規定されるかもしれない。この場合、セルは複数の登録エリアＩＤを報知することとなる。

【０００６】

従来のページング手順では、ページングメッセージを伝えるため２つの信号が使用される。第１ページング信号は、ページングメッセージが特定のＵＥ又はＵＥグループに送信されているか示すのに使用される。第２ページング信号は、第１ページング信号からの固定されたタイムオフセットにより第１ページング信号に続いて送信される。

【０００７】

モバイル端末は、電力消費を低減するため、スリープモードでは間欠受信（ＤＲＸ）を利用する。ＤＲＸが使用されると、モバイル端末は、ＤＲＸサイクル毎に１回のページン

グ機会でしか第１ページング信号をモニタする必要はない。ＤＲＸサイクルの長さは、コアネットワークドメインに固有のものであり、コアネットワークからのシステム情報に与えられる情報を用いてモバイル端末においてローカルに更新されるかもしれない。

【０００８】

コアネットワークは、通常はモバイル端末がＤＲＸサイクル内で第１ページング信号をモニタしている時点を知っている。このため、ネットワークが特定のモバイル端末をページングしようとする場合、それは、モバイル端末がページングチャネルをモニタする時点で第１ページング信号を送信する。モバイル端末が第１ページング信号においてページングを受信しない場合、それはスリープモードに戻る。そうでない場合、モバイル端末は、第２ページング信号を読む。

【０００９】

ネットワークは、ネットワークにより発信された呼を確立するため、又は更新されたシステム情報の読み込みをトリガーするため、モバイル端末にページングするかもしれない。ページングメッセージに応答して、モバイル端末は、ＲＡＮとの接続を確立するか（モバイル端末が“アイドル”状態にある場合）、又はセル更新手順を利用してモバイル端末の位置を更新するかもしれない（モバイル端末が“ドーマント”状態にある場合）。

【００１０】

ページングレスポンスを受信すると、ＲＡＮは、セルレベルでモバイル端末の位置を知る。このため、無線リソースがセルについてモバイル端末に効率的に割当て可能となる。

【００１１】

従来のシステムでは、接続の確立及びページングメッセージへのセル更新レスポンス（ネットワークにより開始される接続）は、接続の確立／セル更新が“端末により開始される接続”に応答して実行される時点と同じ手順に従う。後者のケースでは、確立の原因は、接続要求メッセージがモバイル端末により受信されるまで、ネットワークには知られていない。このため、ネットワークは、モバイル端末からの最初の接続要求の受信後にのみ接続設定を管理することが可能となる。

［発明の概要］

ネットワークにより開始される接続の場合、ネットワークがモバイル端末にページングする前、それは、接続確立の原因を知っており、アイドル状態にあるときでさえ端末がコアネットワークに接続されているため、ある程度は端末のコンテクストを知っている。このため、ネットワークにおいて知られている情報は、モバイル端末とＲＡＮとの間の接続の確立を最適化（スピードアップ）するのに利用されるかもしれない。

【００１２】

本発明の実施例は、モバイル端末とＲＡＮとの間の接続をスピードアップするため、ネットワークにおいて知られている情報を利用するネットワークにより開始される接続の確立手順を提供する。本発明は、モバイル端末にネットワークにより開始された接続を通知するため、ページング手順を利用する。ページングメッセージは、共有チャネルを介し高速な接続確立をサポートするよう設計される。

【００１３】

本発明の実施例は、モバイル端末であるユーザ装置（ＵＥ）と無線アクセスネットワーク（ＲＡＮ）との間のネットワークにより開始される接続を確立する方法であって、（１）ネットワーク（ａＧＷなど）がＵＥが登録されたトラッキングエリアにおいてページングメッセージをＮｏｄｅ　Ｂに送信することにより接続を開始し、（２）Ｎｏｄｅ　Ｂ（トラッキングエリアに属する）がページングメッセージを受信し、ページングメッセージにセル固有の無線ネットワーク一時的アイデンティティ（ｃ－ＲＮＴＩ）と１以上の共有制御チャネル（ＳＣＣＨ）へのインデックスを添付する方法を提供する。ｃ－ＲＮＴＩ及びＳＣＣＨは、セルについて利用可能なｃ－ＲＮＴＩとＳＣＣＨから選択される。ｃ－ＲＮＴＩとＳＣＣＨの選択は、Ｎｏｄｅ　Ｂ、コアネットワーク（ａＧＷなど）又は独立した無線リソースマネージャ（ＲＲＭ）さーばにおいてスケジューラにより管理されるかもしれない。

【００１４】
完全なメッセージがセルにおいて報知される。受信ＵＥは、一時的なセル固有のアイデンティティとしてｃ－ＲＭＴＩを、共有チャネル処理のための係る共有制御チャネルとしてＳＣＣＨとを利用するかもしれない。メッセージがＵＥに対するものである場合、それは、アップリンクにおいてページングアクノリッジメントメッセージを送信する。メッセージは、競合ベースアップリンクチャネル（ＲＡＣＨなど）又は専用物理チャネルを介し送信されるかもしれない。
【００１５】
ＵＥからのページングアクノリッジメントのネットワークの受信により、ＵＥとネットワークとの間に共有チャネルが接続が確立される。共有チャネル接続の確立後、通知及びトラフィックデータはスケジューリングされた共有チャネルリソースを介し送信される。
【００１６】
ページングメッセージは、（１）ページングインジケータチャネル（ＰＩＣＨ）にマップされたページングインジケータ及び独立したページングチャネル（ＰＣＨ）にマップされたページングメッセージ、（２）共有制御チャネル（ＳＣＣＨ）にマップされたページングインジケータ及び独立したページングチャネル（ＰＣＨ）にマップされたページングメッセージ、又は（３）共有制御チャネル（ＳＣＣＨ）にマップされたページングインジケータ及びダウンリンク共有トランスポートチャネル（ＳＣＨ）にマップされたページングメッセージを利用して、ＵＥに伝送されるかもしれない。
【００１７】
ページングアクノリッジメントメッセージは、競合ベースランダムアクセスチャネルを介しアップリンク（ＵＬ）同期メッセージと共に、又はこのようなチャネルを介した独立したページングアクノリッジメントメッセージとして送信される。
【００１８】
ｃ－ＲＮＴＩ及びＳＣＣＨの選択は（ページングメッセージに添付される）、Ｎｏｄｅ　Ｂにより管理されるかもしれない。Ｎｏｄｅ　Ｂは、未使用のｃ－ＲＮＴＩと１以上のＳＣＣＨとを選択し、これらをページングメッセージによりＵＥに通知する。異なるセルに報知されるページングメッセージは、異なるｃ－ＲＮＴＩとＳＣＣＨとを有するかもしれない。
【００１９】
あるいは、ｃ－ＲＮＴＩとＳＣＣＨとの選択は、ａＧＷ又は独立したＲＲＭサーバにより管理され、この場合、ｃ－ＲＮＴＩとＳＣＣＨとはセルに固有のものとして選択され、これにより、各Ｎｏｄｅ　Ｂは異なるｃ－ＲＮＴＩ及びＳＣＣＨとを用いてページングメッセージを送信する。あるいは、ｃ－ＲＮＴＩ及びＳＣＣＨは、トラッキングエリアに固有のものであってもよく、これにより、トラッキングエリアの各Ｎｏｄｅ　Ｂは、同一のｃ－ＲＮＴＩとＳＣＣＨとを含むページングメッセージを送信する。
【発明の詳細な説明】
【００２０】
本発明の実施例は、ＲＡＮが共有トランスポートチャネル（ＳＣＨ）を介しネットワークにより開始される（発生される）接続の確立を実行する。ＳＣＨは、物理的共有制御チャネル（ＳＣＣＨ）セットに関連付けされる。ＳＣＨを介した正しい送受信のためＵＥにより求められる固有の情報は、ＲＡＮからＵＥにＳＣＣＨを介し伝送される。ダウンリンクについては、この情報は、ダウンリンク送信に使用されるリソースと、ＵＥにおける正しい受信を可能にするためのデータのフォーマット化に関する情報とを指定するかもしれない。アップリンクについては、当該情報は再び、何れの送信リソースが他の共有チャネル付与情報（電力配分など）と共に使用されるべきか指定するかもしれない。何れのケースでも、共有チャネル付与が指示される端末は、ＲＡＮ（又はセル）に固有の一時的識別情報（ｃ－ＲＮＴＩ）に基づき共有チャネル上で識別され、それはＳＣＣＨ内のＲＡＮによりＵＥに通知される。
【００２１】

図１は、本発明の実施例によるセルラー通信システムの一例を示す。ネットワークは、ユーザ装置（ＵＥ）ドメインと、無線アクセスネットワーク（ＲＡＮ）ドメインと、コアネットワークドメインとを有する。ＵＥドメインは、無線インタフェースを介しＲＡＮドメインの少なくとも１つの基地局１１２と通信するユーザ装置１１０を有する。ＲＡＮドメインはまた、ＵＭＴＳシステムにおいて使用されるものなど、ネットワークコントローラ（無線ネットワークコントローラ）（図示せず）を有するかもしれない。あるいは、このような機能は、Ｎｏｄｅ　Ｂとコアネットワークのａ ＧＷ又は他のコントローラとの間に分散されるかもしれない。図１はまた、任意的な無線リソースマネージャ（ＲＲＭ）１１４を示す。後述されるように、ＲＲＭは、いくつかの実施例では、Ｎｏｄｅ　Ｂ又はａＧＷにより実行される機能を実行するかもしれない。

【００２２】

コアネットワーク（ＣＮ）１１６は、本例では、アクセスゲートウェイ（ａＧＷ）１１８と、サービングＧＰＲＳサポートノード（ＳＧＳＮ）１２０と、ゲートウェイＧＰＲＳサポートノード（ＧＧＳＮ）１２２とを有する。コアネットワークは、外部ネットワーク１２４に接続される。ＳＧＳＮ１２０は、ＵＥの位置の追跡を含む、セッション制御を行う。ＧＧＳＮ１２２は、外部ネットワーク１２４の最終的な宛先（インターネットサービスプロバイダなど）へのコアネットワーク１１６内のユーザデータを集結及びトンネリングする。さらなる詳細は、参照によりここに援用される、フランスのＳｏｐｈｉａ Ａｎｔｉｐｏｌｉｓ，Ｖａｌｂｏｎｎｅの６５０ Ｒｏｕｔｅ ｄｅｓ Ｌｕｃｉｏｌｅｓの３ＧＰＰサポートオフィスにより刊行されたＴＳ２３．２４６ｖ６．４．０“３ｒｄ Ｇｅｎｅｒａｔｉｏｎ Ｐａｒｔｎｅｒｓｈｉｐ Ｐｒｏｊｅｃｔ；Ｔｅｃｈｎｉｃａｌ Ｓｐｅｃｉｆｉｃａｔｉｏｎ Ｇｒｏｕｐ Ｓｅｒｖｉｃｅｓ ａｎｄ Ｓｙｓｔｅｍ Ａｓｐｅｃｔｓ；Ｍｕｌｔｉｍｅｄｉａ Ｂｒｏａｄｃａｓｔ／Ｍｕｌｔｉｃａｓｔ Ｓｅｒｖｉｃｅ（ＭＢＭＳ）；Ａｒｃｈｉｔｅｃｔｕｒｅ ａｎｄ Ｆｕｎｃｔｉｏｎａｌ Ｄｅｓｃｒｉｐｔｉｏｎ（Ｒｅｌｅａｓｅ ６）”などの３ＧＰＰ ＵＭＴＳ技術仕様書にあるかもしれない。

【００２３】

図２は、本発明の実施例によるネットワークにより開始される接続の確立を示す。ネットワークコントローラ（コアネットワークにおけるアクセスゲートウェイ１１８など）が、セルにおいて報知される登録エリアのＮｏｄｅ　Ｂ１１２にページングメッセージを送信する。ページングメッセージが各セルにおいて報知される前、Ｎｏｄｅ　Ｂは、ｃ－ＲＮＴＩ及びＳＣＣＨインデックスをメッセージに添付する。ｃ－ＲＮＴＩ及びＳＣＣＨは、セルにおける利用可能なｃ－ＲＮＴＩ及びＳＣＣＨから選択され、いくつかの実施例では、Ｎｏｄｅ　Ｂにおけるスケジューラにより管理されるかもしれない。対応するＵＥ１１０（ページングが指定されるＵＥ）は、共有チャネルを介したデータ送信のため、このｃ－ＲＮＴＩ及びＳＣＣＨインデックスを利用する。

【００２４】

図３は、ネットワークにより開始される接続の確立手順の一実施例による通知フローの一例を示す。ネットワークは、接続を開始するため、Ｎｏｄｅ　Ｂを介しＵＥにページングメッセージを送信する。まず、コアネットワーク（又はいくつかの実施例ではより詳細には、コアネットワーク内のアクセスゲートウェイ）は、登録エリアにおける該当するＮｏｄｅ　Ｂにページングメッセージを送信する。コアネットワークからページングメッセージを受信した後、各Ｎｏｄｅ　Ｂは、ｃ－ＲＮＴＩ及びＳＣＣＨインデックスを選択し（一実施例では）、対応するセルにおいて報知されるページング信号を構成する。セルで報知されるページング信号は、コアネットワーク、ｃ－ＲＮＴＩ及びＳＣＣＨインデックス（図４を参照）からのページングメッセージ（原因，ＵＥアイデンティティ）を含む。ＵＥアイデンティティは、３Ｇ規格において知られている、国際的なモバイル加入者アイデンティティ（ＩＭＳＩ）又は一時的モバイル加入者アイデンティティ（ＴＭＳＩ）により表されるかもしれない。受信ＵＥは、このｃ－ＲＮＴＩをセルに固有のアイデンティティとして、ＳＣＣＨを共有チャネル処理のための関連付けされた共有制御チャネルとして

使用するかもしれない。

【００２５】

ページングメッセージの復号化後、ＵＥは、ＲＡＮのＮｏｄｅ　Ｂにページングアクノリッジメントメッセージを送信する。このメッセージは、アップリンク同期情報と合成され、競合ベースアップリンクチャネル（ランダムアクセスチャネル（ＲＡＣＨ）など）を介し送信されるかもしれない。

【００２６】

競合ベースアップリンクチャネル上の可能性のあるＵＥ衝突によって、ページングアクノリッジメントメッセージは遅延を受けるかもしれない。これは、ページングレスポンスメッセージの送信のため、専用の物理アクセスリソースを割り当てることによって回避することができる。これが使用される場合、アップリンク送信（ページングレスポンス）のために割り当てられた物理的アクセスリソースは、ページングメッセージと共にＵＥに通知される。このため、ページング信号は、図５に示される形式をとるかもしれない。

【００２７】

専用のアクセスリソースは、アクセスチャネルのため割り当てられたリソースのサブセットであるかもしれない（図６を参照）、しかしながら、これらのリソースは、通常の競合ベースＲＡＣＨ処理におけるＵＥによる選択とは対照的に、ネットワークによる割当てのため確保されるかもしれない。同一のメッセージフォーマットが、ＲＡＣＨチャネルと専用アクセスチャネルの双方について使用される。ランダムアクセスリソース（ＲＡＣＨチャネル）に関する情報は報知制御チャネル（ＢＣＣＨ）を介し報知され、専用アクセスチャネルのためのチャネル情報は、セルにおいて報知されない。この情報は、本発明の一実施例によると、ページング信号と共にＵＥに送信される。

【００２８】

ＵＥからのページングアクノリッジメントの受信により、ＲＡＮとＵＥとの間で共有チャネル接続が確立され、通知及びトラフィックデータがスケジューリングされた共有チャネルリソースを介し送信される。

・ページングメッセージのマッピング

いくつかの実施例では、２段階のページングが利用される。図７～９を参照するに、ページング信号１は、ページング信号２により送信されるページングメッセージを読むため、ＵＥグループをウェークアップする。２段階ページングの３つの異なる実現形態が、ここに説明される。

・実現形態１

ページング信号１は、ページングインジケータチャネル（ＰＩＣＨ）などの独立した物理チャネルにマップされる。ＵＥグループは、ＤＲＸサイクル及びＩＭＳＩ（コアネットワークにより知られているＵＥ識別子の一例としてここで使用される）に基づき計算されたページング機会でＰＩＣＨチャネルをウェークアップ及び読む。ページングインジケータが真に設定されている場合、ページングインジケータに対応するＵＥが、ページング信号２で送信されるページングメッセージを読む。

【００２９】

ページング信号２は、独立したページングチャネル（ＰＣＨ）にマップされる。ＩＭＳＩから、ＵＥは、何れのページングチャネルを読むべきか計算し、ＵＥのＩＭＳＩを搬送するページングチャネル内のページングメッセージを読むかもしれない。システムは、１つのＰＩＣＨとＰＣＨグループとを用いて、所与のページング機会に複数のＵＥのためのページングを可能にするかもしれない（図７を参照）。

・実現形態２

他の実施例では、ページング信号１はＳＣＣＨにマップされる。この場合、ページングのため指定されたグループＩＤ又はＩＤ（ページングＩＤ）がＳＣＣＨのＩＤフィールドにおいて利用可能である。ページングインジケータは、ＳＣＣＨ情報フィールドにマップされる（図８）。ＳＣＣＨのチャネルフォーマット（ページング信号１に使用される）は、“通常”の共有チャネル処理に使用されるものと異なることに留意されたい。

【００３０】
ページング信号２は、ページングチャネル（ＰＣＨ）を介し送信される。この場合、ＵＥは、ＤＲＸサイクルとＩＭＳＩにより規定されるスリープモードからウェークアップし、ページングインジケータのためＳＣＣＨを読む。ページング信号１内のページングインジケータの位置は、ＩＭＳＩに基づき計算される。１つのＳＣＣＨしかページングインジケータに使用されない場合、所定のページングＩＤが、ページング信号１がページングインジケータに固有のメッセージであることをＵＥに通知するのに利用されるかもしれない。そうでない場合、複数のＳＣＣＨが使用されるかもしれない。

【００３１】
同一のページング機会に対応するＵＥがグループに割り当てられ、各グループにはグループＩＤが割り当てられる。ユーザグループＩＤは、ＳＣＣＨのアイデンティティフィールドに配置されるかもしれない。ユーザグループＩＤにより規定されるユーザグループに属するＵＥが、それらのページングインジケータのついてＵＥのユーザグループに対応するＳＣＣＨを読む。対応するページングインジケータが真に設定されている場合、ＵＥは、ＰＣＨを介し送信され、ＵＥのＩＭＳＩにより規定されるページング信号２を読む。ＩＭＳＩから、ＵＥは、何れのページングチャネルを読むべきか計算し、ＵＥのＩＭＳＩを搬送するページングチャネル内のページングメッセージを読む。システムは、１以上のＳＣＣＨと１以上のＰＣＨとを利用して、所与のページング機会において複数のＵＥのページングを可能にするかもしれない。

・実現形態３

この実現形態は、ＳＣＣＨとＳＣＨとを用いてページング信号を送信する。さらに、通常の共有チャネル処理に使用されるものと同じチャネルフォーマットが利用される。各ＵＥは、ＵＥに報知されるシステム情報又はＳＣＣＨインデックスが適用可能な規格に従うＵＥに予めプログラムされることに基づき、モニタすべきＳＣＣＨを知る。ＵＥは、ＤＲＸサイクル及びＩＭＳＩに基づき計算されたそれらのページング機会においてページングインジケータに適したＳＣＣＨを聴取する。同一のページング機会を有するＵＥは、ＩＭＳＩに基づきグループに分割される。各グループには、ＳＣＣＨ　ＩＤフィールドに示されるようなユーザグループＩＤが与えられる。ＳＣＣＨのメッセージ部分は、ページングメッセージ（ページング信号２）を搬送する対応するＳＣＨチャネルに割り当てられるリソースを示す。ＵＥがＳＣＣＨ　ＩＤフィールドに示されるユーザグループに属する場合、ＵＥは、それのページングメッセージついて割り当てられたＳＣＨを読む。図９において、一例となる実現形態が示される。システムは、ＳＣＣＨ／ＳＣＨセットを用いて、所与のページング機会において複数のＵＥのページングを可能にする。

・ページングアクノリッジメント／ＵＬ同期

ネットワークからページングメッセージを受信した後、ＵＥは、アップリンクによりページングアクノリッジメントメッセージを送信する。メッセージは、競合ベースチャネル（ランダムアクセスチャネル（ＲＡＣＨ）など）又は割り当てられた専用アクセスチャネルを介し送信される。

【００３２】
ページングアクノリッジメントは、ＵＬ同期要求メッセージと独立に送信されるか、又は合成されるかもしれない。ページングアクノリッジメントがＵＬ同期要求メッセージと合成される場合、メッセージは、ページングメッセージにおいて通知されるｃ－ＲＮＴＩと、報知チャネル（ＢＣＨ）により報知されるシーケンスセットから選択されるか、又はＵＥにプログラムされる適用可能な通信規格仕様（ＵＬ同期に使用される）により指定されるシグネチャシーケンスとを含むかもしれない。メッセージフォーマットは、図１０に示される。

【００３３】
他の実施例では、ＵＥは、ページングアクノリッジメントとＵＬ同期とを異なるメッセージにより送信し、この場合、ページングアクノリッジメントメッセージは、ページングメッセージにより通知されたｃ－ＲＮＴＩ値しか含まない。これは、ＲＡＣＨ又は割り当

てられた専用のアクセスチャネルを介し送信されるかもしれない。

【００３４】

ＵＥからページングアクノリッジメントを受信した後、Ｎｏｄｅ　Ｂは、セルレベルにおけるＵＥの位置を知る。その後、Ｎｏｄｅ　Ｂは、共有チャネルを介しＵＥとＮｏｄｅ　Ｂとの間の無線接続を確立する。ＵＥは、ｃ－ＲＮＴＩ及びＳＣＣＨインデックスを利用し、これらは、共有チャネル処理中にそれぞれＵＥとＳＣＣＨとを特定するため、ページングメッセージにより通知される。Ｎｏｄｅ　Ｂは、ＵＥからコアネットワークにページングアクノリッジメントを伝送する。これにより、ＵＥとネットワークとの間の接続が完了する。

・ＳＣＣＨ及びｃ－ＲＮＴＩの管理

ｃ－ＲＮＴＩ及びＳＣＣＨの割当てを管理する１つの方法は、Ｎｏｄｅ　Ｂがｃ－ＲＮＴＩ及びＳＣＣＨを選択することを可能にすることである。ａＧＷからページング要求を受信した後、Ｎｏｄｅ　Ｂは、例えば、ＵＥがアイドル状態にある場合、ＵＥにより使用される１以上のＳＣＣＨ及び未使用のｃ－ＲＮＴＩを選択する。アイドルモード期間中、ＵＥは、Ｎｏｄｅ　Ｂに接続されず、コアネットワークに接続される。ＵＥは、コアネットワークにおいてそれのＵＥ識別子（ＩＭＳＩ又はＴＭＳＩなど）により知られる。いくつかの実施例では、Ｎｏｄｅ　Ｂは、ＵＥ及び基地局を接続するため一時的なＩＤを提供する。Ｎｏｄｅ　ＢがＵＥからページングアクノリッジメントを受信した後、Ｎｏｄｅ　Ｂは、バインディングを完了させるため、コアネットワークにページングアクノリッジメントを送信し、コアネットワークはＵＥがＮｏｄｅ　Ｂのカバーエリア内にあるのを知ることを可能にする。

【００３５】

ページングされたＵＥがすでにＮｏｄｅ　Ｂによってｃ－ＲＮＴＩ及びＳＣＣＨセットに割り当てられている場合（ＵＥがドーマント状態にある場合など）、以前に割り当てられたｃ－ＲＮＴＩ及びＳＣＣＨが、Ｎｏｄｅ　Ｂによりページング信号内で使用されるかもしれない。これは、図１１に示されるように、異なるｃ－ＲＮＴＩとＳＣＣＨとを有する異なるセルに報知されるページングメッセージをもたらす。

【００３６】

あるいは、ｃ－ＲＮＴＩ及びＳＣＣＨは、コアネットワークのａＧＷ又は独立したＲＲＭサーバにより管理／選択されるかもしれない。ｃ－ＲＮＴＩ及びＳＣＣＨは、セルに固有のものとして選択され、この場合、各Ｎｏｄｅ　Ｂは、コアネットワーク又はＲＲＭからの同一の初期ページングメッセージに添付される異なるｃ－ＲＮＴＩ及びＳＣＣＨを含むページングメッセージを送信する。あるいは、トラッキングエリア内のすべてのセルの同一のｃ－ＲＮＴＩ及びＳＣＣＨを含むページングメッセージが送信されるかもしれない（図１２）。この場合、ａＧＷ又はＲＲＭは、ページング要求に使用するため、ｃ－ＲＮＴＩセット及びＳＣＣＨを確保するかもしれない。

【００３７】

ＲＲＭが使用されるとき、それはｃ－ＲＮＴＩ及びＳＣＣＨを割り当てる機能を引き継ぐ。（一実施例では、ａＧＷはページングメッセージを依然として送信する。）ＲＲＭサーバは、一時的識別子セットとＳＣＣＨを確保する。ＲＲＭは、一時的識別子とＳＣＣＨとのページングメッセージへの割当てを選択、割当て及び追跡する。ＲＲＭは、ＵＥ識別子を知っている必要はない（ＩＭＳＩ又はＴＭＳＩなど）。

【００３８】

ネットワークにより開始される接続の確立は、ＵＥ接続状態（アイドル又はドーマント状態など）及びページング原因に応じて変更される。

・アイドル状態ＵＥのページング

アイドル状態のＵＥは、一般にはＲＡＮに接続されていないため、セルレベルでは知られていない。このため、ＵＥは、共有チャネル処理においてそれの使用のため指定されたｃ－ＲＮＴＩ又はＳＣＣＨを有しないであろう。しかしながら、ネットワークへの接続レベルは、２つの定義を有するかもしれない。１つの定義では、ＵＥはＲＡＮとの接続を有

さず、コアネットワークに接続される。ネットワークは、アイドルモードのＵＥに関するＵＥ能力又はセキュリティ情報を格納しない。（これは、従来のシステムにおいてアイドルモードのために使用される定義である。）

アイドル状態の第２定義によると、ＵＥは、コアネットワークに接続され、ＲＡＮとの限定的な接続を有する。しかしながら、この限定的な接続によると、ＵＥはｃ－ＲＮＴＩ、ＳＣＣＨ又は無線リソースを割り当てられない。にもかかわらず、ＵＥはネットワーク内で登録され、この場合、ネットワークはネットワークに格納されるＵＥコンテクスト（ＵＥ能力など）を有することとなる。また、セキュリティモード制御及び認証手順が、ＵＥ登録中に実行されており、セキュリティキー（暗号化、インテグリティ保護）が、ネットワークとＵＥとの間で交換されているかもしれない。セキュリティキーは、ＵＥとネットワークに格納される。（これは、ＬＴＥ、すなわち、“長期間の進化”又はＵＭＴＳ後の通信規格の次世代で用いられるアイドル状態の可能な定義である。）

アイドルモードの２つの定義によると、２つの代替的なネットワークにより開始される接続の確立手順が実現される。

【００３９】

図１３は、ＲＡＮとの限定的な接続を有するアイドルモード（おそらくＬＴＥのアイドル状態定義）のＵＥのケースにおけるネットワークにより開始される接続の確立に関する通知フローを示す。

【００４０】

ページングメッセージは、ＩＭＳＩなどのＵＥ識別子により何れのＵＥがページングされたか示す。ページングメッセージは、暗号化され、Ｎｏｄｅ　Ｂに透過に送信される（ａＧＷ又は他のコアネットワーク要素から）。ページングは、図３に関して説明されるページング手順によりセルにおいて報知される（Ｎｏｄｅ　Ｂにより）。ページングメッセージの受信後、ＵＥはページングアクノリッジメント（ＵＬ同期要求がある又はない）を送信する。Ｎｏｄｅ　Ｂは、ａＧＷにページングアクノリッジメントを伝送する。セキュリティ制御又は認証は、当該認証がすでに実行され、セキュリティ情報がａＧＷに格納されているため、不要であることに留意されたい。

【００４１】

ページングアクノリッジメントがネットワークにより受信されると、共有チャネル処理のため、ＵＥとネットワークとの間の接続が確立される。ページングメッセージにより通知されるｃ－ＲＮＴＩ及びＳＣＣＨインデックスが、共有チャネルＩＤとしてＵＥにより使用される。

【００４２】

ページングアクノリッジメントメッセージの送信後、ＵＥは、ＳＣＨ上のリソース割当てのため割り当てられたＳＣＣＨ（ページングメッセージにより通知される）を聴取する。ａＧＷは、Ｎｏｄｅ　ＢにＲＡＢ（Ｒａｄｉｏ　Ａｃｃｅｓｓ　Ｂｅａｒｅｒ）割当て要求を発行する。Ｎｏｄｅ　Ｂは、メッセージ送信のため無線リソースを割当て、ＵＥはＳＣＣＨを開始割り当てられたリソースを通知される。アップリンク時間同期のためＮｏｄｅ　Ｂにおいて計算されるタイミングアドバンス情報がまた、ＳＣＣＨにマップされるかもしれない。あるいは、タイミングアドバンス情報は、別の物理チャネルを用いて伝送されるかもしれない。（Ｎｏｄｅ　Ｂは、伝搬遅延を計算し、タイミングアドバンス情報をＵＥに通知し、これにより、すべてのＵＥからの信号はＮｏｄｅ　Ｂにおいて同期された時間となるであろう。）

Ｎｏｄｅ　Ｂは、ＤＬ－ＳＣＨ（ダウンリンク共有チャネル）上の割り当てられた物理リソースを用いて無線ベアラセットアップメッセージを送信する。無線ベアラセットアップ完了メッセージは、ＵＬ－ＳＣＨ（アップリンク共有チャネル）を介し送信される。ａＧＷによるＲＡＢ割当てレスポンスを受信すると、データ送信が共有チャネルを介し開始される。

【００４３】

無線ベアラセットアップ／レスポンスメッセージが、共有トランスポートチャネル（Ｓ

ＣＨ）にマップされた論理的な専用制御チャネル（ＤＣＣＨ）を用いて送信される。この場合、デフォルトベアラコンフィギュレーションが、メッセージ（無線ベアラセットアップ／レスポンスメッセージ）のために使用される。

【００４４】

いくつかの実施例では、システムは、データ送信のためデフォルト（又は格納されている）無線ベアラコンフィギュレーション（又は当該コンフィギュレーションの一部）を利用するかもしれない。この場合、デフォルト（又は格納されている）コンフィギュレーション情報の使用は、ページングメッセージ内で通知されるかもしれない。そうである場合、無線ベアラリコンフィギュレーションのケースで必要とされる追加的情報のみが、データ送信の開始前にＲＡＮとＵＥとの間で通信される必要がある。

【００４５】

ＵＥセキュリティ又は認証情報がアイドル状態においてはネットワークに維持されない場合、セキュリティ制御及び認証は、無線ベアラコンフィギュレーションステップ前に実行されるかもしれない。セキュリティ制御はまた、ＳＣＨを介しＵＥ識別情報として割り当てられたｃ－ＲＮＴＩを用いてＳＣＨ上で実行されるかもしれない。リソース割当ては、割り当てられたＳＣＣＨを介し通信される。

・ドーマント状態ＵＥのページング

ドーマント状態では、ＵＥはネットワークに接続される。このため、それは、ＵＥが最後に登録されたＮｏｄｅ　Ｂからのｃ－ＲＮＴＩに与えられる。ＵＥは、Ｎｏｄｅ　Ｂのカバーエリアからいなくなっているかもしれない。このため、ＵＥは、トラッキングエリアに属するセル（Ｎｏｄｅ　Ｂ）においてページングされる。

【００４６】

ドーマント状態のＵＥのページングは、上述されたアイドル状態のＵＥに対するものと同様である。しかしながら、ＵＥはすでにｃ－ＲＮＴＩを割り当てていたため、同一のｃ－ＲＮＴＩが、ＵＥが最後に登録されたセルにおいてページングされる際にページングメッセージと共に利用されるかもしれない。

【００４７】

本発明が特定の実施例及び例示的な図面に関して説明されたが、当業者は、本発明が記載された実施例又は図面に限定されないことを認識するであろう。本発明の実施例が、いくつかの具体例ではＵＭＴＳの用語を用いて説明されたが、当業者は、このような用語がまた一般的な意味で使用され、本発明がＵＭＴＳ又は３Ｇシステムに限定されないことを認識するであろう。

【００４８】

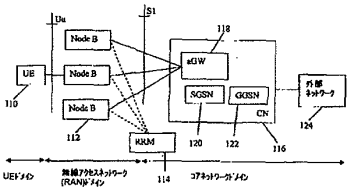
当業者は、各種実施例の処理が、必要に応じてハードウェア、ソフトウェア、ファームウェア又はこれらに組み合わせを用いて実現可能であることを認識するであろう。例えば、いくつかの処理は、ソフトウェア、ファームウェア又は配線ロジックの制御の下でデジタル回路又はプロセッサを用いて実行可能である。（ここでの“ロジック”という用語は、記載された機能を実行するため当業者により認識されるように、固定されたハードウェア、プログラム可能なロジック及び／又はこれらの適切な組み合わせを表す。）ソフトウェア及びファームウェアは、コンピュータ可読媒体に格納可能である。他のいくつかの処理は、当業者に周知なように、アナログ回路を用いて実現可能である。

【００４９】

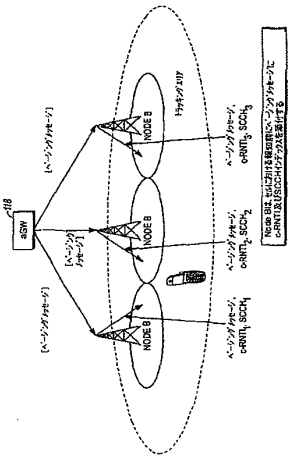
簡単化のため、上記説明は、異なる機能ユニット及びプロセッサを参照して本発明の実施例を説明したことは理解されるであろう。しかしながら、本発明から逸脱することなく、異なる機能ユニット、プロセッサ又はドメインの間の機能の何れか適切な分散が利用可能であることが明らかであろう。例えば、別のプロセッサ又はコントローラにより実行されるよう示されている機能は、同一のプロセッサ又はコントローラにより実行可能である。従って、特定の機能ユニットの参照は、厳密な論理的又は物理的構造又は構成を示すものでなく、記載された機能を提供するのに適した手段の参照としてのみみなされるべきである。

【００５０】
本発明がいくつかの実施例に関して説明されたが、それは、ここに与えられる特定の形式に限定されるものでない。むしろ、本発明の範囲は請求項によってのみ限定される。さらに、ある特徴が特定の実施例に関して説明されているようであるが、当業者は、記載された実施例の各種特徴が本発明により組み合わせ可能であることを認識するであろう。
【００５１】
さらに、個別に列記されているが、複数の手段、要素又は方法ステップが、例えば、単一のユニット又はプロセッサなどにより実現可能である。さらに、各特徴が異なる請求項に含まれるかもしれないが、これらはおそらく効果的に組み合わせ可能であり、異なる請求項への包含は、各特徴の組み合わせが実現可能及び／又は効果的でないことを意味するものでない。また、１つの請求項カテゴリへのある特徴の包含は、このカテゴリへの限定を意味するものでなく、当該特徴が必要に応じて他の請求項のカテゴリに等しく適用可能である。
【図面の簡単な説明】
【００５２】
【図１】図１は、本発明の実施例によるセルラー通信システムの一例を示す。
【図２】図２は、本発明の実施例によるネットワークにより開始される接続の確立を示す。
【図３】図３は、本発明の実施例による通知フローの一例を示す。
【図４】図４は、本発明の実施例によるセルにおいて報知されるページング信号のフォーマットを示す。
【図５】図５は、専用アクセスリソースがＵＥに通知される本発明の実施例によるセルにおいて報知されるページング信号のフォーマットを示す。
【図６】図６は、本発明の実施例による割当てに利用可能なリソースを示す。
【図７】図７は、本発明の実施例によるページングメッセージがマップされる３つの異なる方法を示す。
【図８】図８は、本発明の実施例によるページングメッセージがマップされる３つの異なる方法を示す。
【図９】図９は、本発明の実施例によるページングメッセージがマップされる３つの異なる方法を示す。
【図１０】図１０は、本発明の実施例によるアップリンク同期を含むページングアクノリッジメントのフォーマットを示す。
【図１１】図１１は、本発明の実施例による異なるｃ－ＲＮＴＩ及びＳＣＣＨを有する異なるセルにおいて報知されるページングメッセージを示す。
【図１２】図１２は、本発明の実施例によるトラッキングエリア内のすべてのセルにおいて同一のｃ－ＲＮＴＩ及びＳＣＣＨを有する異なるセルにおいて報知されるページングメッセージを示す。
【図１３】図１３は、本発明の実施例によるアイドルモードによる通知フローを示す。

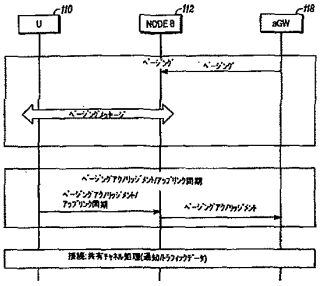
【図１】



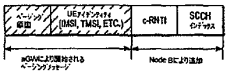
【図２】



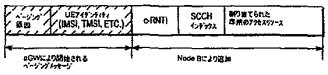
【図３】



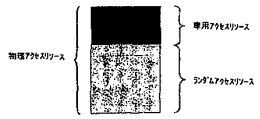
【図４】



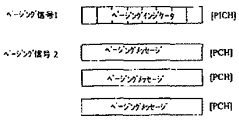
【図５】



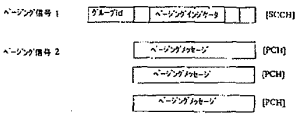
【図６】



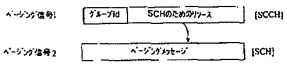
【図７】



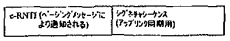
【図８】



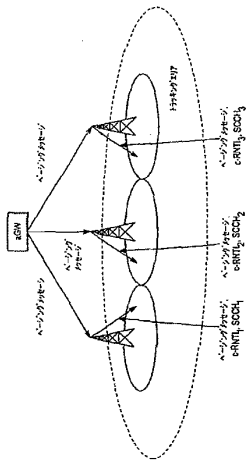
【図９】



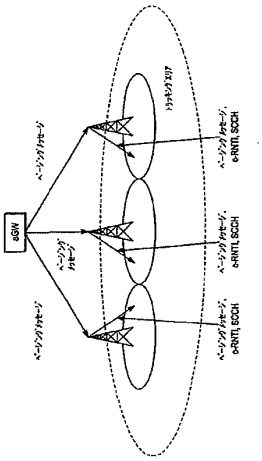
【図１０】



【図１１】



【図１２】


eNB
ページングメッセージ
ページングメッセージ
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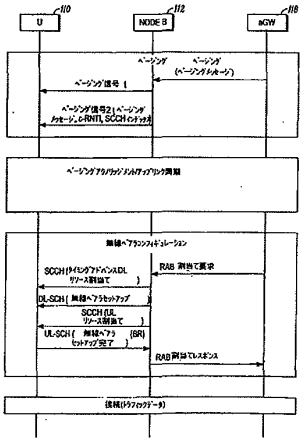
ページングメッセージ
ページングメッセージ
ページングメッセージ
c-RNTI, SCCH
c-RNTI, SCCH
c-RNTI, SCCH

【図１３】


110
U
112
NODE B
118
aGW
ページング
ページング
(ページングメッセージ)
ページング信号１
ページング信号２(ページング
メッセージ, c-RNTI, SCCH ハンドオフ)
ページングプロパゲーションディレイ/ダウンリンク同期
無線ベアラコンフィギュレーション
SCCH(ダイレクトアクセスDL
リソース割当て)
RAB 開始で要求
DL-SCH (無線ベアラセットアップ)
SCCH (UL
リソース割当て)
UL-SCH (無線ベアラ (SR)
セットアップ完了)
RAB開始でレスポンス
接続(ダウンロードデータ)

フロントページの続き

審査官 伊東 和重

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3GPP, Physical channels and mapping of transport channels onto physical channels (TDD) (Release 7), 3GPP TS 25.221, 3GPP, ２００６年 3月, V7.0.0, p.84, ＵＲＬ, http://www.3gpp.org/ftp/Specs/archive/25_series/25.221/25221-700.zip
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(58)調査した分野(Int.Cl., ＤＢ名)
H04B 7/24-7/26
H04W 4/00-99/00

Espacenet

Bibliographic data: JP2009522889 (A) — 2009-06-11

Initial connection establishment in a wireless communication system

Inventor(s):

Applicant(s):

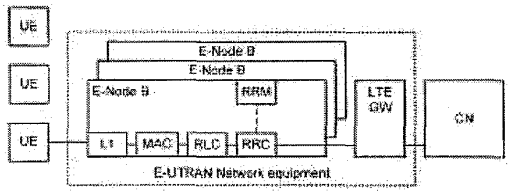
Classification: **- international:** ***H04W72/04; H04W72/12; H04W8/26; H04W80/02***
- Euro: H04W72/12F

Application number: JP20080548957 20061211

Priority number (s): US20060325829 20060104; WO2006EP69530 20061211

Also published as: JP4862050 (B2) US2007155390 (A1) US2011230199 (A1) KR20080091197 (A) KR101022729 (B1) more

Abstract not available for JP2009522889 (A)
Abstract of corresponding document: US2007155390 (A1)



A method, user equipment, network equipment and a system for initiating a wireless connection and subsequent communication over a shared physical resource in a wireless communication system between user equipment and network equipment comprising: processing a UE-derived temporary identifier; communicating the temporary identifier as an identifier to the network equipment; communicating a downlink message conveying the temporary identifier and a description of a scheduled resource on a shared channel, the scheduled resource comprising a resource allocated to the user equipment by the network equipment; and communicating data on the scheduled resource in response to the downlink message.

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特表2009-522889
(P2009-522889A)
(43)公表日　平成21年6月11日(2009.6.11)

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H04W 8/26	(2009.01)	H04Q	7/00	161	5K067
H04W 72/04	(2009.01)	H04Q	7/00	552	
H04W 80/02	(2009.01)	H04Q	7/00	601	

審査請求 有　予備審査請求 未請求　（全 36 頁）

(21)出願番号　特願2008-548957 (P2008-548957)
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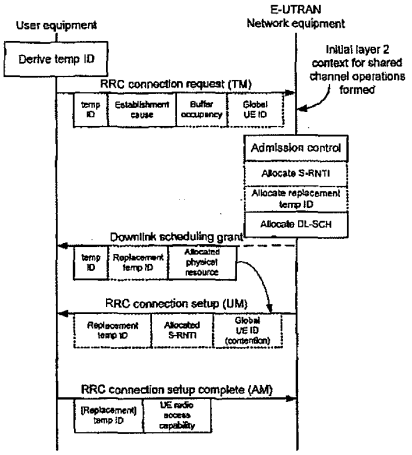
(86)国際出願番号　PCT/EP2006/069530
(87)国際公開番号　WO2007/077096
(87)国際公開日　平成19年7月12日 (2007.7.12)
(31)優先権主張番号　11/325,829
(32)優先日　平成18年1月4日 (2006.1.4)
(33)優先権主張国　米国 (US)

(71)出願人　502106716
アイピーワイヤレス，インコーポレイテッド
アメリカ合衆国，カリフォルニア州　94066，サン・ブルノ，ベイヒル・ドライヴ　1001　セカンド・フロア
(74)代理人　100070150
弁理士　伊東　忠彦
(74)代理人　100091214
弁理士　大貫　進介
(74)代理人　100107766
弁理士　伊東　忠重

最終頁に続く

(54)【発明の名称】無線通信システムでの初期の接続確立

(57)【要約】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する方法、ユーザ装置、ネットワーク装置及びシステムは、UEにより導かれた一時識別子を処理し、識別子として一時識別子をネットワーク装置に通信し、一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを通信し、スケジューリングされたリソースは、ネットワーク装置によりユーザ装置に割り当てられたリソースを有し、下りリンクメッセージに応じてスケジューリングされたリソースでデータを通信することを有する。



Scheduled downlink connection procedure

【特許請求の範囲】
【請求項１】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する方法であって、
ユーザ装置により、
一時識別子として自分のシグナリングアドレスを導き、
前記一時識別子を前記ネットワーク装置に送信し、
前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信することを有する方法。
【請求項２】
前記一時識別子を導くことは、ネットワークに既知のUE識別子の一部から前記一時識別子を形成することを有する、請求項１に記載の方法。
【請求項３】
前記ネットワークに既知のUE識別子は、TMSI（temporary mobile subscriber identity）を有する、請求項２に記載の方法。
【請求項４】
前記ネットワークに既知のUE識別子は、IMSI（international mobile subscriber identity）を有する、請求項２に記載の方法。
【請求項５】
前記ネットワークに既知のUE識別子は、IMEI（international mobile equipment identity）を有する、請求項２に記載の方法。
【請求項６】
前記一時識別子を導くことは、複数の一時識別子から前記一時識別子を選択することを有する、請求項１に記載の方法。
【請求項７】
前記一時識別子を導くことは、時間パラメータに基づいて前記一時識別子を導くこと有する、請求項１に記載の方法。
【請求項８】
前記複数の一時識別子は、テーブルを有する、請求項６に記載の方法。
【請求項９】
前記ネットワーク装置から前記複数の一時識別子の指示を受信することを更に有する、請求項６に記載の方法。
【請求項１０】
前記受信した指示は、ブロードキャストチャネル（BCH）で前記指示を受信することを有する、請求項９に記載の方法。
【請求項１１】
前記複数の一時識別子を不揮発性メモリに保存することを更に有する、請求項６に記載の方法。
【請求項１２】
前記一時識別子を前記ネットワーク装置に送信することは、前記一時識別子と前記スケジューリングされたリソースの要求とを有する第１の上りリンクメッセージ内で前記一時識別子を送信することを有する、請求項１に記載の方法。
【請求項１３】
前記スケジューリングされたリソースは、上りリンクのスケジューリングされたリソースを有する、請求項１２に記載の方法。
【請求項１４】
前記スケジューリングされたリソースは、下りリンクのスケジューリングされたリソー

スを有する、請求項１２に記載の方法。
【請求項１５】
前記一時識別子を送信することは、第１の上りリンクメッセージを送信することを有し、
前記下りリンクメッセージを受信することは、第１の下りリンクメッセージを受信することを有し、
前記スケジューリングされたリソースで前記データを通信することは、第２の上りリンクメッセージで接続要求を送信することを有する、請求項１に記載の方法。
【請求項１６】
前記第２の上りリンクメッセージに応じて送信された第２の下りリンクメッセージを受信し、前記第２の下りリンクメッセージは、前記一時識別子と共有下りリンクチャネルでのスケジューリングされた下りリンクリソースの記述とを伝達し、前記スケジューリングされた下りリンクリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられた下りリンクリソースを有し、
前記スケジューリングされた下りリンクリソースで第３の下りリンクメッセージを受信し、前記第３の下りリンクメッセージは、接続設定メッセージを有する、請求項１５に記載の方法。
【請求項１７】
前記一時識別子を送信することは、第１の上りリンクメッセージを送信することを有し、
前記方法は、
前記第１の上りリンクメッセージを送信した後、且つ前記下りリンクメッセージを受信する前にタイムアウトし、
異なる一時識別子を選択し、
前記一時識別子の代わりに前記異なる一時識別子を有する前記第１の上りリンクメッセージを再送信することを更に有する、請求項１に記載の方法。
【請求項１８】
前記一時識別子を送信することは、RRC接続要求を有する第１の上りリンクメッセージで前記一時識別子を送信することを有する、請求項１に記載の方法。
【請求項１９】
前記一時識別子を送信することは、第１の上りリンクメッセージで前記一時識別子を送信することを有し、
前記方法は、RRC接続要求を有する第２の上りリンクメッセージを送信することを更に有し、前記第２の上りリンクメッセージは、前記第１の上りリンクメッセージと異なる、請求項１に記載の方法。
【請求項２０】
前記データを通信することは、RRC接続要求メッセージを有する、請求項１に記載の方法。
【請求項２１】
RRC接続要求を送信し、
RRC接続設定メッセージを受信することを更に有する、請求項１に記載の方法。
【請求項２２】
前記ネットワーク装置から置換識別子を受信し、
前記一時識別子の代わりに前記置換識別子を使用することを更に有する、請求項１に記載の方法。
【請求項２３】
ネットワークに既知のUE識別子を前記要求に組み込むことを更に有する、請求項１に記載の方法。
【請求項２４】
前記ネットワークに既知のUE識別子は、TMSI（temporary mobile subscriber ident

ity）を有する、請求項２３に記載の方法。
【請求項２５】
前記ネットワークに既知のUE識別子は、IMSI（international mobile subscriber identity）を有する、請求項２３に記載の方法。
【請求項２６】
前記ネットワークに既知のUE識別子は、IMEI（international mobile equipment identity）を有する、請求項２３に記載の方法。
【請求項２７】
前記組み込むことは、前記ネットワークに既知のUE識別子をパラメータとして前記要求に含めることを有する、請求項２３に記載の方法。
【請求項２８】
前記組み込むことは、前記ネットワークに既知のUE識別子を使用して巡回冗長検査（CRC）値を計算することを有する、請求項２３に記載の方法。
【請求項２９】
ネットワークに既知のUE識別子を使用して前記ネットワーク装置からのメッセージをデコードすることを更に有する、請求項１に記載の方法。
【請求項３０】
前記無線通信システムは、E-UTRAN（evolved UMTS Terrestrial Radio Access Network）を有する、請求項１に記載の方法。
【請求項３１】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する際に使用されるユーザ装置であって、
メモリと、
前記メモリに結合されたプロセッサと、
前記プロセッサで実行可能なプログラムコードと
を有し、
前記プログラムコードは、
一時識別子として前記ユーザ装置の自分のシグナリングアドレスを導き、
前記一時識別子を前記ネットワーク装置に送信し、
前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するように動作可能であるユーザ装置。
【請求項３２】
前記一時識別子を導くことは、ネットワークに既知のUE識別子の一部から前記一時識別子を形成することを有する、請求項３１に記載のユーザ装置。
【請求項３３】
前記一時識別子を導くことは、複数の一時識別子から前記一時識別子を選択することを有する、請求項３１に記載のユーザ装置。
【請求項３４】
前記プログラムコードは、前記ネットワーク装置から前記複数の一時識別子の指示を受信するように更に動作可能である、請求項３３に記載のユーザ装置。
【請求項３５】
前記プログラムコードは、前記複数の一時識別子を不揮発性メモリに保存するように更に動作可能である、請求項３３に記載のユーザ装置。
【請求項３６】
前記一時識別子を前記ネットワーク装置に送信することは、前記一時識別子と前記スケジューリングされたリソースの要求とを有する第１の上りリンクメッセージ内で前記一時識別子を送信することを有する、請求項３１に記載のユーザ装置。

【請求項３７】
前記一時識別子を送信することは、第１の上りリンクメッセージを送信することを有し、
前記下りリンクメッセージを受信することは、第１の下りリンクメッセージを受信することを有し、
前記スケジューリングされたリソースで前記データを通信することは、第２の上りリンクメッセージで接続要求を送信することを有する、請求項３１に記載のユーザ装置。
【請求項３８】
前記第２の上りリンクメッセージに応じて送信された第２の下りリンクメッセージを受信し、前記第２の下りリンクメッセージは、前記一時識別子と共有下りリンクチャネルでのスケジューリングされた下りリンクリソースの記述とを伝達し、前記スケジューリングされた下りリンクリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられた下りリンクリソースを有し、
前記スケジューリングされた下りリンクリソースで第３の下りリンクメッセージを受信し、前記第３の下りリンクメッセージは、接続設定メッセージを有する、請求項３７に記載のユーザ装置。
【請求項３９】
前記一時識別子を送信することは、第１の上りリンクメッセージを送信することを有し、
前記プログラムコードは、
前記第１の上りリンクメッセージを送信した後、且つ前記下りリンクメッセージを受信する前にタイムアウトし、
異なる一時識別子を選択し、
前記一時識別子の代わりに前記異なる一時識別子を有する前記第１の上りリンクメッセージを再送信するように更に動作可能である、請求項３１に記載のユーザ装置。
【請求項４０】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する際に使用されるネットワーク装置であって、
メモリと、
前記メモリに結合されたプロセッサと、
前記プロセッサで実行可能なプログラムコードと
を有し、
前記プログラムコードは、
前記ユーザ装置により導かれた一時識別子を受信し、前記ユーザ装置の自分のシグナリングアドレスが前記一時識別子として使用され、
前記ユーザ装置にスケジューリングされたリソースを割り当て、前記スケジューリングされたリソースは、共有チャネルのリソースを有し、
前記一時識別子と前記スケジューリングされたリソースの記述とを伝達する下りリンクメッセージを送信し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するように動作可能であるネットワーク装置。
【請求項４１】
前記プログラムコードは、前記ユーザ装置に複数の一時識別子の指示を送信するように更に動作可能である、請求項４０に記載のネットワーク装置。
【請求項４２】
前記指示を送信することは、ブロードキャストチャネル（BCH）で前記指示を送信することを有する、請求項４１に記載のネットワーク装置。
【請求項４３】
前記ユーザ装置から前記一時識別子を受信することは、前記一時識別子と前記スケジューリングされたリソースの要求とを有する第１の上りリンクメッセージ内で前記一時識別

子を受信することを有する、請求項４０に記載のネットワーク装置。
【請求項４４】
前記一時識別子を受信することは、第１の上りリンクメッセージを受信することを有し、
前記下りリンクメッセージを送信することは、第１の下りリンクメッセージを送信することを有し、
前記スケジューリングされたリソースで前記データを通信することは、第２の上りリンクメッセージで接続要求を送信することを有する、請求項４０に記載のネットワーク装置。
【請求項４５】
前記プログラムコードは、
スケジューリングされた下りリンクリソースを前記ユーザ装置に割り当て、前記スケジューリングされた下りリンクリソースは共有チャネルのリソースを有し、
前記第２の上りリンクメッセージに応じて送信された第２の下りリンクメッセージを送信し、前記第２の下りリンクメッセージは、前記一時識別子と前記スケジューリングされた下りリンクの記述とを伝達し、
前記スケジューリングされた下りリンクリソースで第３の下りリンクメッセージを送信し、前記第３の下りリンクメッセージは、接続設定メッセージを有するように更に動作可能である、請求項４０に記載のネットワーク装置。
【請求項４６】
前記プログラムコードは、
複数の識別子から置換識別子を割り当て、
前記ユーザ装置に前記置換識別子を送信するように更に動作可能である、請求項４０に記載のネットワーク装置。
【請求項４７】
前記プログラムコードは、
ネットワークに既知のUE識別子をメッセージに組み込み、
前記メッセージを前記ユーザ装置に送信するように更に動作可能である、請求項４０に記載のネットワーク装置。
【請求項４８】
前記組み込むことは、前記ネットワークに既知のUE識別子を使用して巡回冗長検査（CRC）値を計算することを有する、請求項４７に記載のネットワーク装置。
【請求項４９】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始するプログラムコードを有するコンピュータプログラムプロダクトであって、
一時識別子として前記ユーザ装置の自分のシグナリングアドレスを導き、
前記一時識別子を前記ネットワーク装置に送信し、
前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するプログラムコードを有するコンピュータプログラムプロダクト。
【請求項５０】
前記一時識別子を導くことは、ネットワークに既知のUE識別子の一部から前記一時識別子を形成することを有する、請求項４９に記載のコンピュータプログラムプロダクト。
【請求項５１】
前記一時識別子を導くことは、複数の一時識別子から前記一時識別子を選択することを有する、請求項４９に記載のコンピュータプログラムプロダクト。
【請求項５２】

前記プログラムコードは、前記ネットワーク装置から前記複数の一時識別子の指示を受信するように更に動作可能である、請求項５１に記載のコンピュータプログラムプロダクト。

【請求項５３】

前記プログラムコードは、前記複数の一時識別子を不揮発性メモリに保存するように更に動作可能である、請求項５１に記載のコンピュータプログラムプロダクト。

【請求項５４】

前記一時識別子を前記ネットワーク装置に送信することは、前記一時識別子と前記スケジューリングされたリソースの要求とを有する第１の上りリンクメッセージ内で前記一時識別子を送信することを有する、請求項４９に記載のコンピュータプログラムプロダクト。

【請求項５５】

前記一時識別子を送信することは、第１の上りリンクメッセージを送信することを有し、

前記下りリンクメッセージを受信することは、第１の下りリンクメッセージを受信することを有し、

前記スケジューリングされたリソースで前記データを通信することは、第２の上りリンクメッセージで接続要求を送信することを有する、請求項４９に記載のコンピュータプログラムプロダクト。

【請求項５６】

前記プログラムコードは、

前記第２の上りリンクメッセージに応じて送信された第２の下りリンクメッセージを受信し、前記第２の下りリンクメッセージは、前記一時識別子と共有下りリンクチャネルでのスケジューリングされた下りリンクリソースの記述とを伝達し、前記スケジューリングされた下りリンクリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられた下りリンクリソースを有し、

前記スケジューリングされた下りリンクリソースで第３の下りリンクメッセージを受信し、前記第３の下りリンクメッセージは、接続設定メッセージを有するように更に動作可能である、請求項５５に記載のコンピュータプログラムプロダクト。

【請求項５７】

前記一時識別子を送信することは、第１の上りリンクメッセージを送信することを有し、

前記プログラムコードは、

前記第１の上りリンクメッセージを送信した後、且つ前記下りリンクメッセージを受信する前にタイムアウトし、

異なる一時識別子を選択し、

前記一時識別子の代わりに前記異なる一時識別子を有する前記第１の上りリンクメッセージを再送信するように更に動作可能である、請求項４９に記載のコンピュータプログラムプロダクト。

【請求項５８】

共有物理リソースで無線接続及びその後の通信を開始する無線ネットワークシステムであって、

１つ以上のユーザ装置とネットワーク装置とを有し、

各ユーザ装置は、

ユーザ装置メモリと、

前記ユーザ装置メモリに結合されたユーザ装置プロセッサと、

前記ユーザ装置プロセッサで実行可能なユーザ装置プログラムコードと

を有し、

前記ユーザ装置プログラムコードは、

一時識別子として前記ユーザ装置の自分のシグナリングアドレスを導き、

前記一時識別子を前記ネットワーク装置に送信し、
前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するように動作可能であり、
前記ネットワーク装置は、
ネットワーク装置メモリと、
前記ネットワーク装置メモリに結合されたネットワーク装置プロセッサと、
前記ネットワーク装置プロセッサで実行可能なネットワーク装置プログラムコードと
を有し、
前記ネットワーク装置プログラムコードは、
前記ユーザ装置により導かれた一時識別子を受信し、
前記ユーザ装置にスケジューリングされたリソースを割り当て、前記スケジューリングされたリソースは、共有チャネルのリソースを有し、
前記一時識別子と前記スケジューリングされたリソースの記述とを伝達する前記下りリンクメッセージを送信し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するように動作可能である無線ネットワークシステム。

【発明の詳細な説明】

【技術分野】

【０００１】

本発明は、概して無線通信技術に関し、特に無線通信システムにおけるユーザ装置とネットワーク装置との間の初期の接続手順に関する。

【背景技術】

【０００２】

無線通信システムでは、移動局（ユーザ装置（UE：user equipment）、ユーザ端末、移動端末、無線データ端末及びセルラ電話とも呼ばれる）と無線アクセスネットワークとの間で論理接続を行う必要がある。無線アクセスネットワークは、１つ以上の無線ネットワークコントローラ（RNC：radio network controller）と共に、１つ以上の基地局（例えば3GPPの用語ではNode Bとも呼ばれる）を有してもよい。論理接続は、通信に関与するつもりのないシステムのネットワークエレメント又はUEにデータを誤って通信することなく、データが伝達され得るUE通信リンクへの特定のネットワークのコンテキスト（context）を提供する。

【０００３】

3GPPにより規定された無線アクセスネットワークシステムでは、ユーザ端末と無線アクセスネットワークとの間の論理接続は、RRC（radio resource control）接続状態により規定される。２つの主なRRC接続状態は、RRC接続及びRRCアイドルとして規定される。

【０００４】

ユーザ端末と無線アクセスネットワークとの間に論理接続が存在する場合、ユーザ端末はRRC接続状態であると言われる。RRC接続状態のユーザ端末の存在は、セル又は複数のセル内で決定され得る。従って、特定のユーザ端末の無線リソースは、無線ネットワークにより効率的に管理され得る。RRC接続状態に対して、RRCアイドル状態のユーザ端末は無線アクセスネットワークへの論理接続を有さない。従って、RRCアイドル状態のユーザ端末は、セルより大きいコアネットワーク又はエリア（位置エリア又はルーティングエリア等）内でのみ決定され得る。

【０００５】

ユーザ端末が最初にユーザにより電源が入れられると、PLMN（public land mobile network）が選択され、ユーザ端末は、キャンプする適切なセル（suitable cell to be camped on to）を検索し、対応するセルでRRCアイドル状態に留まる。初期のRRC接

続は、ネットワーク又はユーザ装置により開始され得る。例えば、RRCアイドル状態のUEのときのUEにより開始された接続の場合、UEは、ネットワークへの初期の接続を要求し、RRC接続要求メッセージをネットワークに送信する。更なる例を用いて、ネットワークにより開始された接続の場合、RRC接続要求メッセージはまた、ネットワーク（RRC接続手順の開始を確かめるためにUEにページングメッセージを送信したネットワーク）からのページングメッセージの受信に応じてUEにより送信され得る。

【０００６】

従って、UEによるRRC接続要求には複数の理由が存在する。例えば、(1)初期のセルアクセス：UEが発呼を行おうとするときにUEはRRC接続を確立する必要がある。(2)ページング応答：ページングメッセージに応答メッセージを送信する場合である。(3)セル更新：UEがアイドルモード中に適切なセルを選択する場合である。(4)UTRANルーティングエリア（URA：UTRAN Routing Area）更新：UEがアイドルモード中に適切なURAを選択する場合である。(5)MBMS（Multimedia Broadcast and Multicast）サービスを受信してMBMSポイントツーポイント接続を要求するためのMBMS接続である。

【０００７】

通常のRRC接続手順では、ユーザ端末は、共通上りリンクトランスポートチャネルを使用してRRC接続要求メッセージをネットワークに送信することにより、接続手順を開始する。共通上りリンクトランスポートチャネルは、複数のUEにより共有されており、スケジューリングされないデータ送信に使用される。

【０００８】

ネットワークは接続要求を検討し、（許可の成功の場合）RRC接続設定メッセージ又は（許可の失敗の場合）RRC接続拒否メッセージを下りリンクで返信し得る。双方の場合に、メッセージは、（上りリンク共通チャネルと同様に）複数のUEにより共有され、スケジューリングされないデータ送信に使用される共通下りリンクトランスポートチャネルを使用して送信される。

【０００９】

この初期のRRC接続段階中にユーザ端末からネットワークへのメッセージが送信される共通トランスポートチャネルは、ランダムアクセスチャネルと呼ばれる。ランダムアクセス送信は、送信の明示的なスケジューリング又は調整が実行されないため、同様にスケジューリングされない送信とも呼ばれることがある。この明示的な調整がないため、１つの移動体が他のユーザと同じ上りリンク送信リソース又は上りリンク識別情報を使用して送信する可能性が存在する。この例では、双方の送信の通信信頼度は、上りリンクメッセージが受信側基地局で生成するときの相互の論理的又は実際の干渉のため損なわれることがある。１つより多くの移動体が所定の一式の上りリンクリソースで送信するこれらの場合は、衝突と呼ばれることがある。

【００１０】

衝突、スケジューリングされないアクセス及びスケジューリングされるアクセスの更なる詳細は、発明者Nicholas W. ANDERSONにより“FREQUENCY DOMAIN UNSCHEDULED TRANSMISSION IN A TDD WIRELESS COMMUNICATIONS SYSTEM”という題名で2005年10月31日に出願された米国特許出願第11/263,044号に見出され得る。この内容が参照として取り込まれる。

【００１１】

ネットワークからユーザ端末に対応するメッセージを伝達する共通下りリンクトランスポートチャネルは、フォワードアクセスチャネル（FACH：forward access channel）と呼ばれる。

【発明の開示】

【発明が解決しようとする課題】

【００１２】

典型的には、システムリソースは、これらの上りリンク及び下りリンク共通トランスポートチャネルについて確保される。典型的には、共通チャネルに使用される無線リソース

は、他のトランスポートチャネルに使用される無線リソースと分離される。他の種類のトランスポートチャネルの例は、個別トランスポートチャネルと共有トランスポートチャネルとを含む。個別トランスポートチャネルの場合、データは、長期に特定のユーザ又は接続に割り当てられた全無線リソースの一部にマッピングされる。逆に共有チャネルの場合、各ユーザのデータは、典型的にはネットワークのMACレイヤ（レイヤ2）にあるリソーススケジューラの制御で、一式の全無線リソース内に割り当てられた無線リソースのプールの一部に動的にマッピングされる。従って、この場合の無線リソースは、ユーザ間で共有され、スケジューラにより仲裁される。これは、ユーザが無線リソースを共有するがスケジューリングされない方法で共有する共通チャネルの場合と対照的である。

【００１３】

共有チャネルの使用は、それぞれ特定のトラヒック形式に割り当てられるシステム内での複数のチャネル形式（共通、共有及び個別の形式の組み合わせ等）の使用に比べて、システム容量のみについて利点を提供し得る。この理由は、全てのトラヒック形式を共有チャネルのみに多重することにより、スケジューラは、各トラヒック形式により提示される変化する瞬時負荷に割り当てられたリソースを動的に適合することができるからである。これに対して、例えば１つのトラヒック形式を共通チャネルに排他的に割り当て、他のトラヒック形式を共有チャネルに排他的に割り当てる場合、各トラヒック形式により与えられるトラヒック負荷の変化は、最初に共通チャネルに割り当てられて次に共有チャネルに割り当てられた全無線リソース空間の各部分を再構成せずに、適応不可能である。典型的には、この無線リソースの再構成は低速の処理であり、従って、システムは負荷の高速の変化に対応できない。この結果、現在のシステムでは、共通チャネルに割り当てられた全無線リソース空間の一部は、しばしば最悪の場合を考慮して設計されなければならず、従って、無線リソース使用効率が次善になる。

【００１４】

通常のRRC接続確立手順に続いて、UEの存在はネットワークに認識され、接続確立手順の完了時にのみ、共有チャネルアドレス又はUE IDがネットワークにより割り当てられ得る。従って、共有チャネルは、通常のRRC接続手順が共通チャネル手順を使用して実現された後にのみ使用され得る。従って、接続確立トラヒックを伝達するために、全無線リソース空間のかなりの部分が共通チャネルに予め割り当てられなければならない。共有チャネル動作に使用されるユーザ端末特有のレイヤ2接続コンテキスト（layer 2 connection context）は、RRC接続手順の完了時にのみ確立され得る。

【００１５】

更に、既知の無線通信システムは、共有チャネル動作の初期のレイヤ2コンテキストを確立するために、かなりの量の時間を費やし、非共有及び共通チャネルで複数のシグナリングメッセージを交換する。これは、通信遅延の一因となり得る。更に、複数のチャネル形式と、関連するプロトコル、手順及び属性との存在は、システム実装の複雑性をかなり増加させ得る。

【００１６】

前述の理由で、無線リソース使用効率を改善し、通信遅延を低減し、システム実装の複雑性を簡略化するために、初期のシステムアクセス及びRRC接続手順への改善が望まれる。

【課題を解決するための手段】

【００１７】

本発明の或る実施例は、ネットワークがUEにより導かれた一時識別子をネットワークにより選択された識別子と置換することを決定するまで、UEが一時識別子として自分のレイヤ2アドレスを導くことを可能にすることにより、レイヤ2の共有チャネルコンテキストの迅速な確立を提供する。このことにより、システムは、接続確立の非常に早い段階で共通チャネルの代わりに共有チャネルを利用することが可能になり、従って、共通チャネルで伝達されるトラヒック量を最小化する。

【００１８】

更に、本発明の或る実施例は、ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する方法、装置（ユーザ装置又はネットワーク装置等）、コンピュータプログラムプロダクト又はシステムを提供し、UEにより導かれた一時識別子を処理し、一時識別子をネットワーク装置に通信し、一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを通信し、スケジューリングされたリソースは、ネットワーク装置によりユーザ装置に割り当てられたリソースを有し、下りリンクメッセージに応じてスケジューリングされたリソースでデータを通信することを有する。

【００１９】

本発明の或る実施例は、ネットワークに既知のUE識別子の一部（TMSI（temporary mobile subscriber identity）、IMSI（international mobile subscriber identity）、IMSI（international mobile subscriber identity）又はIMEI（international mobile equipment identity）等）から一時識別子を形成することを提供する。本発明の或る実施例は、複数の一時識別子から一時識別子を選択することを提供する。本発明の或る実施例は、時間パラメータに基づいて一時識別子を導くことを提供する。本発明の或る実施例は、例えばブロードキャストチャネル（BCH：broadcast channel）を介して、ネットワーク装置からUEに複数の一時識別子の指示を通信することを提供する。本発明の或る実施例は、複数の一時識別子を不揮発性メモリに保存することを提供する。

【００２０】

本発明の或る実施例は、一時識別子を有する第１の上りリンクメッセージ内で一時識別子をネットワーク装置に通信し、例えば上りリンク又は下りリンクのスケジューリングされたリソースの要求を通信し、UEとネットワークとの間のその後の通信で一時識別子を通信することを提供する。

【００２１】

本発明の或る実施例は、第１の上りリンクメッセージを送信した後、且つ下りリンクメッセージを受信する前にタイムアウトし、異なる一時識別子を選択し、元々選択された一時識別子の代わりに異なる一時識別子を有する第１の上りリンクメッセージを再送信することを提供する。

【００２２】

本発明の或る実施例は、共有チャネルでRRC接続シグナリングの通信を提供する。

【００２３】

本発明の或る実施例は、ネットワーク装置から置換識別子を通信し、共有チャネルリソースでユーザ装置を識別するために、一時識別子の代わりに置換識別子を使用することを提供する。

【００２４】

本発明の或る実施例は、ネットワークに既知のUE識別子（TMSI（temporary mobile subscriber identity）、IMSI（international mobile subscriber identity）又はIMEI（international mobile equipment identity））を要求に組み込み、エンコードし、又はデコードすることを提供する。本発明の或る実施例は、ネットワークに既知のUE識別子をパラメータとして要求に含めることを提供する。本発明の或る実施例は、ネットワークに既知のUE識別子を使用して巡回冗長検査（CRC：cyclic redundancy check）値を計算することを提供する。

【発明を実施するための最良の形態】

【００２５】

本発明の他の特徴及び態様は、添付図面を考慮して以下の詳細な説明から明らかになる。添付図面は、本発明の実施例による特徴を一例として示している。要約は本発明の範囲を限定することを意図するものではなく、本発明の範囲は単に特許請求の範囲により規定される。

【００２６】

以下の説明では、本発明の複数の実施例を示す添付図面を参照する。他の実施例が利用

されてもよく、この開示の要旨及び範囲を逸脱することなく、機械的、構成的、構造的、電気的及び動作的な変更が行われてもよいことがわかる。以下の詳細な説明は限定の意味で受け取られるべきではなく、本発明の実施例の範囲は、発行された特許の請求項のみにより規定される。

【００２７】

以下の詳細な説明のいくつかの部分は、手順、ステップ、論理ブロック、処理及び他のコンピュータメモリで実行可能なデータビット上の動作の象徴的な表現で提示される。ここでは、手順、コンピュータ実行ステップ、論理ブロック、処理等は、所望の結果をもたらすステップ又は命令の首尾一貫したシーケンスであると考えられる。ステップは、物理量の物理的操作を利用するものである。これらの量は、コンピュータシステムで格納、伝達、結合、比較、操作可能な電気的、磁気的又は無線信号の形式になり得る。これらの信号は、ときどき、ビット、値、要素、シンボル、文字、語、数字等として呼ばれることがある。各ステップは、ハードウェア、ソフトウェア、ファームウェア又はこれらの組み合わせにより実行されてもよい。

【００２８】

以下の図面は、通常のUMTSシステム（Universal Mobile Telecommunications System）を参照して本発明を説明するが、本発明の実施例は、他の無線システムにも同様に適用し得る。通常のUMTSシステムは、通常では複数のユーザ装置（UE：user equipment）（場合によって、ユーザ端末、移動局、移動端末、無線データ端末及びセルラ電話と呼ばれる）を有する。通常のUMTSシステムはまた、Node B（基地局とも呼ばれる）を含むネットワーク装置を有する。ネットワーク装置は、UEとネットワークとの間の無線アクセス接続を提供し、また、無線ネットワークコントローラ（RNC：radio network controller）も同様に含む。

【００２９】

図１Ａ及び１Ｂは、通常のUMTSシステムでRRC（radio resource connection）アイドル状態からRRC接続状態に推移する通常のメッセージシーケンスを示している。通常のUMTSシステムでは、RRCアイドル状態のUEは、図１Ａ及び１Ｂに示す手順を通じてRRC接続を開始してもよい。UE及びネットワークは、論理制御チャネルでメッセージを交換してもよい。各論理制御チャネルは、共通トランスポートチャネルにマッピングされる。

【００３０】

図１Ａは、無線インタフェース（Uu）で交換されるメッセージを示している。図示の最初のメッセージはRRC接続要求メッセージであり、RRC接続要求メッセージは、ネットワークに既知のUE識別子（グローバルUE識別子（ID）として示す）と、確立理由とを有する。ネットワークに既知のUE識別子は、ネットワークにより割り当てられたTMSI（temporary mobile subscriber identity）、UEのIMSI（international mobile subscriber identity）、又はUEのIMEI（international mobile equipment identity）のうち１つでもよい。確立理由は、UEがネットワークに接続を要求する理由を示す。ページングメッセージへの応答メッセージを送信するとき（ページング応答）、アイドルモード中に適切なセルを選択するとき（セル更新）、アイドルモード中に適切なURAを選択するとき（URA更新）、及びMBMSサービス又はMBMSポイントツーポイント接続を受信するとき（MBMS接続）、UEは接続を要求してもよい。

【００３１】

次に、ネットワークは許可制御を実行し、RNTI（Radio Network Temporary Identifier）値を割り当てる。ネットワークは、確立理由から要求されたサービスがネットワークによりサポート可能であるか否かを決定するために、許可制御処理を使用する。許可制御を実行するときに考慮される要因は、特権を決定する移動アクセスクラスと、リソースの可用性を決定するRRM（Radio Resource Management）状態と、ユーザの加入の詳細と、有効な端末及び盗難された端末のリストを含む装置登録とを含んでもよい。

【００３２】

RNTI値の割り当ては、ネットワークがS-RNTI（Serving RNC（Radio Network Contro

ller) RNTI）を割り当てることを含む。S-RNTIは、サービングRNC（Serving RNC）に対して自分を識別するためにUEにより使用される。S-RNTIはまた、UEをアドレス指定するためにSRNCにより使用される。S-RNTI値は、RRC接続を有する各UEにサービングRNCにより割り当てられ、サービングRNC内で一意である。S-RNTIは、RRC接続のサービングRNCが変更した後に再割り当てされてもよい。S-RNTIは、ブロードキャストチャネルで受信したSRNC識別子（SRNC ID）と連結され、UTRAN内で一意のRNTI（U-RNTI：unique RNTI）を形成してもよい。任意選択で、ネットワークは、C-RNTI（Cell Radio Network Temporary Identifier）を割り当ててもよい。C-RNTIは、共通トランスポートチャネルで割り当てられて使用されてもよい。C-RNTI値は、セルでUEを識別するために使用されてもよい。通常のネットワークでは、C-RNTIを使用する決定は、制御側無線ネットワークコントローラ（CRNC：Controlling Radio Network Controller）により行われる。

【００３３】

ネットワーク装置が許可制御処理及び割り当て処理の成功を実行した後に、ネットワークは、グローバルUE ID、新たに割り当てられたS-RNTI値、任意選択のC-RNTI値、及び無線ベアラ構成を有するRRC接続設定メッセージで、RRC接続要求メッセージに応答する。

【００３４】

RRC接続設定メッセージがUEにより処理されると、UEは、RRC接続設定完了メッセージで応答する。RRC接続設定完了メッセージは、ヘッダフィールドにC-RNTI値を伴い、UE無線アクセス機能を有する。この時点で、UEはRRC接続状態に入る。

【００３５】

RRC接続設定完了メッセージを受信したことに応じて、高速下りリンク共有チャネル（HS-DSCH：high speed downlink shared channel）が下りリンクデータ伝送に使用される場合、ネットワークは、UEへのRRC無線ベアラ設定メッセージ内でUEにH-RNTI値を割り当ててもよい。H-RNTI値は、高速下りリンク共有チャネルでUEを識別するために使用される。RRC無線ベアラ設定メッセージは、割り当てられたS-RNTIと、割り当てられたH-RNTIと、共有チャネル無線ベアラ構成とを有する。UEは、RRC無線ベアラ設定完了メッセージで応答することにより処理を完了する。この時点で、UE及びネットワークは、共有チャネル動作のレイヤ2コンテキスト（layer 2 context）を確立する。

【００３６】

図１Ｂは、UE及びネットワーク装置の要素と、これらの要素間のメッセージを示している。UEは、RRCレイヤを含むレイヤ3と、RLC（Radio Link Control）レイヤ及び媒体アクセス制御（MAC：medium access control）レイヤを含むレイヤ2と、物理レイヤ（L1）を含むレイヤ1とを有する。Node Bは、レイヤ1の物理レイヤ（L1）を有する。RNCは、MACレイヤ及びRLCレイヤを含むレイヤ2と、RRCレイヤ及びRRMレイヤを含むレイヤ3とを有する。Node BとRNCとの双方に更なるレイヤ1機能が存在し、これらのエンティティの間の物理接続（lubインタフェース）を提供する点に留意すべきである。しかし、これらは図面を明瞭にするために図示されていない。RRC接続要求メッセージは、UEのRRCレイヤにより開始される。RRCは、RLCレイヤにメッセージを送信し、RLCレイヤは、RLCトランスペアレントモード（TM：transparent mode）を使用してランダムアクセスチャネル（RACH：random access channel）にマッピングされた共通制御チャネル（CCCH：common control channel）でRRC接続要求メッセージを送信する。トランスペアレントモード（TM）を使用するときに、メッセージ送信者は、承認モード（AM：acknowledgement mode）及び不承認モード（UM：unacknowledged mode）と異なり、メッセージシーケンス識別子を含めない。承認モード（AM）及び不承認モード（UM）の双方は、順序が狂ったパケットを識別／並び替え、損失したパケットを識別するために使用され得るメッセージシーケンス識別子を有する。承認モード（AM）は、メッセージ再送信を更に提供する。CCCHは、RLCレイヤとMACレイヤとの間の共通論理制御チャネルであり、RACHは、MACレイヤとL1レイヤとの間の共通トランスポートチャネルである。RRC接続要求メッセージは、無線インタフェース（Uu）でネットワークに送信される。

【００３７】

RRC接続要求メッセージを受信すると、Node Bのレイヤ1は、メッセージをランダムアクセスチャネル（RACH）チャネルでRNCのMACレイヤに送信する。RACHチャネルは、複数のUEにより共有され、スケジューリングされないデータ送信に使用され得るランダムアクセス物理リソースで、UEから制御及びデータ情報を伝達するために使用される共通上りリンクトランスポートチャネルである。MACレイヤは、CCCHチャネルでRLCレイヤにメッセージを送信する。次に、RLCレイヤは、メッセージをRRCレイヤに送信し、RRCレイヤは、許可制御、S-RNTI値の割り当て、及び任意選択のC-RNTI値の割り当てのために、メッセージをRRMレイヤに送信する。

【００３８】

許可制御及びS-RNTI値の割り当ての成功の後に、RRMは、割り当てられたS-RNTI値をRRCレイヤに返信し、RRCレイヤは、不承認モード（UM）で送信されるRRC接続設定メッセージを形成する。典型的には、セル内でUEを識別するC-RNTIも割り当てられる。しかし、個別物理チャネル接続が直ちに構成される場合、C-RNTIは省略されてもよい。RRCは、RRC接続設定メッセージをRLCレイヤに送信する。RLCレイヤは、CCCHチャネルでMACレイヤにメッセージを送信する。ネットワークとUEとの間に共通RNTIコンテキストがまだ存在しないため、CCCHが使用される。すなわち、ネットワークはRNTI値を認識しているが、UEはこの段階でRNTIを認識していない。MACレイヤは、フォワードアクセスチャネル（FACH：Forward Access Channel）でメッセージを送信する。FACHチャネルは、ネットワークがUEの位置セルを認識しているときに、UEに制御及びデータ情報を伝達するために使用され得る共通下りリンクトランスポートチャネルである。FACHは、スケジューリングされない下りリンクデータ送信のため、複数のUEにより共有されてもよい。Node Bのレイヤ1は無線インタフェース（Uu）でUEにメッセージを送信する。

【００３９】

不都合なことに、FACHチャネルを監視する各UEは、同封のメッセージがそれにアドレス指定されているか否かを決定するために、１つ１つのRRC接続設定メッセージ及び他のメッセージをデコードする。UEによるRRC接続設定メッセージの受信時に、UEのレイヤ1は、FACHチャネルでそのMACレイヤにメッセージを送信する。MACレイヤは、CCCHチャネルでRLCレイヤにメッセージを送信し、次に、RLCレイヤは、UEのRRCレイヤにメッセージを送信する。UEのRRCレイヤは、接続設定メッセージに含まれるグローバルIDフィールドを検査し、UEの自分のグローバルIDに合致するか否かを決定してもよい。合致しない場合、メッセージは破棄される。IDが合致する場合、メッセージはデコードされ、UEは、S-RNTI値及び場合によってはC-RNTI値の割り当てを登録する。この時点で、UEは、割り当てられた個別制御チャネル（DCCH：dedicated control channel）を有している。

【００４０】

次に、UEはRRC接続設定完了メッセージを使用して応答し、RRC接続設定完了メッセージは、承認モード（AM）を使用してネットワークに送信される。RRCレイヤは、メッセージをRLCレイヤに送信し、RLCレイヤは、RRC接続設定完了メッセージをMACレイヤに送信するためにDCCHチャネルを使用する。MACレイヤは、RACH（共通トランスポート）チャネルで物理レイヤ（L1）にメッセージを送信し、物理レイヤ（L1）は無線インタフェース（Uu）でNode Bにメッセージを送信する。共通トランスポートチャネルリソースでDCCHで送信されたデータは、ヘッダフィールドを伴い、ヘッダフィールドには、セルでRACH（共通トランスポート）チャネルを使用する複数の他のUEからセルのUEを区別するためにC-RNTIが含まれる。個別又は共有トランスポートチャネルで送信されたデータについては、ユーザ識別／アドレス指定が物理リソースレベルで完了している（物理リソースとユーザ端末との間のマッピングは物理レイヤでわかる）ため、C-RNTIはヘッダに必要ない。UEがRRC接続設定完了メッセージを通信すると、UEはRRC接続状態に入る。

【００４１】

次に、Node Bは、無線インタフェース（Uu）でRRC接続設定完了メッセージを受信する。そのレイヤ1は、RACHチャネルを使用してメッセージをRNCのMACレイヤに送信する。MACレイヤは、ヘッダ（C-RNTIを含む）を読み取り、適切なDCCHチャネルを使用してメッセー

ジを適切なRLCエンティティに送信する。RLCは、メッセージをRRCレイヤに送信する。

【００４２】

ネットワークは、UEが高速下りリンク共有チャネル（HS-DSCH：high speed-downlink shared channel）で通信するときにUEを識別するために他の値を使用する。この値は、RRCレイヤにより割り当てられ、H-RNTI（HS-DSCH RNTI）値として指定される。H-RNTI値は、UEがHS-DSCHチャネルで確立した接続を有する間の一時識別子として使用される。ネットワークは、RLCレイヤとMACレイヤとの間のDCCHチャネルと、MACレイヤとUEのレイヤ1との間のFACHチャネルとを使用して、無線ベアラ設定メッセージ内で割り当てられたH-RNTI値をUEに送信する。Node Bは、無線インタフェース（Uu）でUEにメッセージを送信する。UEのレイヤ1は、FACHチャネルでそのMACレイヤにメッセージを送信し、MACレイヤは、DCCHチャネルでRLCにメッセージを送信する。RLCは、RRCレイヤにメッセージを送信し、RRCレイヤは、RLC承認モード（AM）を使用してネットワークに送信されるRRC無線ベアラ設定完了メッセージで応答する。UEのRRCレイヤとRNCのRRCレイヤとの間のチャネルパスは、RRC接続完了メッセージを伝達するための前述のチャネルパスの折り返しである。

【００４３】

H-RNTIを割り当てられると、次に、UEは、下りリンク通信に高速（hs）下りリンク共有（トランスポート）チャネルを利用してもよい。このチャネルのリソース割り当ては、Node-BのMAC-hsエンティティにあるスケジューラにより許可される。MAC-hsエンティティは、UE識別子としてH-RNTIを使用することにより高速下りリンク共有チャネル割り当てを行うときに、セル内のUEをアドレス指定することができる。

【００４４】

MAC-hsエンティティは、接続設定手順及び関連するメッセージに関与していないため、図面に図示されていない。RRC接続を確立するために使用されるメッセージは、共有トランスポートチャネルで伝達されない。

【００４５】

この時点で、UE及びネットワークは、レイヤ2共有チャネルコンテキストを確立及び形成しており、ネットワークは、共有チャネル識別子をUEに割り当てている。このレイヤ2コンテキストを形成する際に、ネットワークは識別子を割り当て、３つの上りリンクメッセージと２つの下りリンクメッセージとを交換している。

【００４６】

本発明の実施例によれば、UEは、一時識別子（temp ID）を導き、共有トランスポートチャネルでのより迅速な通信のために、レイヤ2コンテキストを迅速に確立する。このより迅速なレイヤ2コンテキストは、共通トランスポートチャネルでの多数の通信の必要性を除去することができ、共通チャネルの利用可能な全無線リソースのかなりの部分を確保する必要性を除去することができる。このような割り当ては、再構成するのが典型的に遅く、従って、トラヒック負荷の急速な変化に応じることができない。UEにより導かれた一時識別子が使用期間中にネットワークで一意である場合、UEは、共有チャネルで一意に識別され、データは、通常のシステムの場合のように静的に割り当てられた共通リソースを介してではなく、共有チャネルリソースの動的な割り当てを介して通信され得る。更に、ネットワークは、RRC接続処理中又はRRC接続処理後にUEにより導かれた一時識別子を更新してもよい。

【００４７】

図２、３Ａ及び３Ｂは、本発明に従ってユーザ装置（UE）とコアネットワーク（CN）とで動作するUTRANネットワークとE-UTRAN（evolved UTRAN）ネットワークとを比較している。

【００４８】

図２は、複数のUEとUTRANネットワーク装置とを示している。UTRANネットワーク装置は、コアネットワークへのUEのリンクを提供する。UTRANネットワーク装置（無線アクセスネットワーク（RAN：Radio Access Network）とも呼ばれる）は、１つ以上の無線ネッ

トワークサブシステム（RNS：Radio Network Subsystem）を有する。各RNSは、無線ネットワークコントローラ（RNC）と、１つ以上のNode Bとを有する。RRCシグナリングについて、RNCはRRM、RRC、RLC及びMACシグナリングレイヤを提供し、Node Bはレイヤ1を提供する。

【００４９】

図３Ａは、本発明の或る実施例に従って本発明を実施するアーキテクチャを示している。E-UTRAN（evolved UTRAN）ネットワークは、UTRANアーキテクチャを簡略化し、構成要素間のインタフェースの数を低減するためのLTE（long term evolution）プラットフォームを提供する。“evolved”及び“E-”の指定は、本発明の対応する構成要素又は要素と類似し得る通常の構成要素又は要素と区別するために使用され得る。E-UTRANネットワークは、コアネットワーク（CN）と通信するためのUEのリンクを提供する。E-UTRANは、１つ以上のE-Node B（evolved Node B）に結合されたLTEゲートウェイ（LTE GW）を有する。E-Node Bは、図２のNode BとRNCとの双方の機能を実行する。LTEゲートウェイは、コアネットワークとE-Node Bとの間のインタフェースを提供する。RRCシグナリングについて、E-Node BはRRM、RRC、RLC、MAC及びL1シグナリングレイヤを提供する。ここで、簡略化のため、“evolved”及び“E-”の指定がE-UTRANネットワーク内のいくつかのラベルの構成要素から省略されている。

【００５０】

図３Ｂは、E-UTRANネットワークの代替アーキテクチャを示している。LTEゲートウェイは、コアネットワークとE-Node Bとの間のインタフェースを提供し、また、RRCシグナリングのためのRRM及びRRCレイヤを提供する。このアーキテクチャでは、E-Node Bは、RLC、MAC及びL1シグナリングレイヤを提供する。

【００５１】

図３Ａ及び３Ｂの実施例は、レイヤ1処理と共に配置されるMACレイヤ及びRLCレイヤを提供し、これはシグナリング待ち時間を低減することに役立つ。図３Ａは、RRC接続確立手順中に使用される各レイヤの集合を示しており、これはシグナリング待ち時間を低減することに更に役立つ。

【００５２】

図４は、本発明によるユーザ装置の構成要素を示している。ユーザ装置は、UEにより導かれた一時識別子を保持するメモリと、プロセッサと、UEにより導かれた一時識別子を導いて識別子をメモリに格納するように実行可能なプログラムコードと、E-UTRANネットワーク装置と通信するトランシーバとを有する。メモリは、RAMのような揮発性メモリでもよく、フラッシュ（EEPROM）のような不揮発性メモリでもよい。メモリは、UEの回路の構成要素でもよく、UEの筐体に設置されたスマートカードでもよい。プロセッサは、RISC（reduced instruction set computer）、汎用プロセッサ、専用プロセッサ、ゲート論理実装プロセッサ等でもよい。プログラムコードは、実行可能な機械コード、オブジェクトコード、スクリプト、又は他のコンピュータ解釈コード若しくはコンパイルコードでもよい。プログラムコードは、圧縮されてもよく、圧縮されなくてもよく、エンコードされてもよく、エンコードされなくてもよい。トランシーバは、TDD（time division duplex）方式又はFDD（frequency division duplex）方式で動作するCDMA（code division multiple access）送信機／受信機の対でもよい。

【００５３】

図５Ａ及び５Ｂは、本発明による初期のシグナリングシーケンスを示している。各図において、まず、UEは一時識別子（temp ID）を導く。一時識別子を導く処理は、本発明の異なる実装の間で変化してもよい。一時識別子の導出は、E-Node BのE-MACエンティティによりスケジューリングされた共有トランスポートチャネルでのレイヤ2メッセージの迅速なレイヤ2コンテキストを提供する。一時識別子の導出は、２つのUEが同じ一時識別子を導く許容レベルの可能性を最小化するように生じることが好ましい。２つのUEがセル内で同じ一時識別子を導き、重複する期間中にこれらを使用しようとする場合、更なる衝突検出及び回復手順が実施されてもよい。

【００５４】
本発明の或る実施例では、UEは、ネットワークに既知のUE識別子の一部から一時識別子を形成することにより、一時識別子を導く。ネットワークに既知のUE識別子は、ネットワークにより割り当てられたTMSI（temporary mobile subscriber identity）、UEのIMSI（international mobile subscriber identity）、又はUEのIMEI（international mobile equipment identity）のうち１つでもよい。UEは、TMSI、IMSI又はIMEIの所定数の最小位ビットを使用してもよい。例えば、TMSIが利用可能である場合、UEは、32ビットのTMSIのうち下位の16ビットを使用することにより、temp IDを導いてもよい。TMSIが利用可能でない場合、UEは、32ビットのIMSIのうち下位の16ビットを使用してもよい。TMSIもIMSIも利用可能でない場合、UEは、32ビットのIMEIのうち下位の16ビットを使用してもよい。

【００５５】
本発明の或る実施例では、UEは、複数の一時識別子から一時識別子を選択することにより、一時識別子を導いてもよい。複数の一時識別子は、共通のビット長の可能な値の一部を有してもよい。例えば、複数の一時識別子は、16ビットの可能な並び替えのうち1/8を有してもよい。ネットワークは、将来のUEにより導かれた値との潜在的な衝突の可能性を除去するために、残りの7/8の可能な並び替えから値を選択することにより、一時識別子を再割り当てしてもよい。複数の一時識別子は、RAM又はROMに格納されたテーブルの形式でもよい。或る実施例では、複数の一時識別子はUEにより生成される。或る実施例では、複数の一時識別子はネットワークからUEに伝達される。或る実施例では、複数の一時識別子の指示はネットワークからUEにブロードキャストチャネル（BCH）でブロードキャストされる。或る実施例では、複数の一時識別子は不揮発性メモリに保存される。

【００５６】
或る実施例では、UEにより導かれた一時識別子はまた、時間又は無線フレーム番号の関数でもよい。この関数は、所定のパターンに従って変化してもよく、例えばブロードキャストチャネル（BCH）でUEに伝達されてもよい。代替として、変化パターンは、その導出にランダムな要素を有してもよい。一時識別子を導くときのユーザ装置による時間変化する構成要素又は時間パラメータ（システムクロック、スーパーフレーム番号、無線フレーム番号、サブフレーム番号、タイムスロット番号等）の使用は、２つ以上のユーザが所定の時間フレーム内で同じ一時識別子を選択する可能性を低減することに有利に役立ち得る。

【００５７】
一時識別子を導いた後に、UEは、第１の上りリンクメッセージでこのUEにより導かれた一時識別子をE-UTRANネットワークに送信する。ネットワークが初期の一時識別子を受信するとすぐに、初期のL2共有チャネルコンテキストが形成される。この時点で、UEとネットワークとの双方は、一時識別子の値を認識する。しかし、この接続は衝突する可能性があり、ネットワークが置換一時識別子を再割り当てしたときに、（衝突の可能性のない）永続的な接続が形成され得る。

【００５８】
temp IDの受信時に、ネットワークは物理リソースを割り当てる。割り当てられた物理リソースは、UEがデータメッセージを正確にエンコード及び送信すること又は正確に受信及びデコードすることを可能にするように、UEに割り当てられたリソースを記述する。この記述は、(1)明示的な又は関連の送信時間、(2)物理チャネルリソースの記述（符号、周波数、サブキャリア、時間／周波数符号等）、(3)リソースでのデータのフォーマット形式、及び／又は(4)FEC符号化形式、ブロックサイズ、変調フォーマット等のような属性を有してもよい。

【００５９】
この物理リソースは、上りリンクリソース（図５Ａに示す）又は下りリンクリソース（図５Ｂに示す）でもよい。ネットワークは、宛先アドレスとしてUEにより導かれた一時識別子を含み、割り当てられた物理リソースの記述も含む第１の下りリンクメッセージをUE

に送信する。次に、UE及びネットワークは、割り当てられた物理リソースでユーザトラヒックデータ又はシグナリングデータ（データ）を通信する。

【００６０】

図５Ａは、ネットワークにより割り当てられて第１の下りリンクメッセージで記述された上りリンクのスケジューリングされた共有リソースで通信されるデータを示している。上りリンクデータでは、UEが割り当てられた物理リソースの記述を含む第１の下りリンクメッセージを受信して処理した後に、UEはデータを送信しさえすればよい。UEがユーザトラヒックデータ又はシグナリングデータをネットワークに送信しようとするときに、UEは、temp IDを導き、上りリンク物理リソースを取得するこのシーケンスを開始してもよい。

【００６１】

図５Ｂは、ネットワークにより割り当てられて第１の下りリンクメッセージで記述された下りリンクのスケジューリングされた共有リソースで通信されるデータを示している。下りリンクデータでは、UEが割り当てられた物理リソースの記述を含む第１の下りリンクメッセージを受信して処理した後に、UEはデータを受信して処理しさえすればよい。或る実施例では、第１の下りリンクメッセージは、第２の下りリンクメッセージをも含むバーストで伝達されて受信される。この場合、UEは、受信したバーストを処理し、割り当てられた物理リソースを取得する。ユーザトラヒックデータ又はシグナリングデータが割り当てを含む第１の下りリンクメッセージと同じバーストに含まれることを割り当てが示す場合、UEは、受信したバーストを再処理し、第２の下りリンクメッセージを取得してもよい。

【００６２】

通常のシステムは、共通チャネルと共有チャネルとの双方を構成する。リソースの分割は、結合のリソースの効果的な使用を制限する。例えば、特定の時間のほとんどのトラヒックが共通チャネルを使用する場合、共有チャネルはアイドルのままになる。逆に、ほとんどのトラヒックが構成された共有チャネルを使用している場合、共通チャネルは十分に利用されないままになる。本発明の或る実施例によれば、最小の一式のリソースが、図５Ａ及び５Ｂの第１の上りリンクメッセージのようなスケジューリングされないメッセージに割り当てられてもよい。このチャネルの上りリンクメッセージは、temp IDのみを含む短いメッセージ、又は代替としてtemp IDと何の形式のリソースが要求されているかの指示を含む短いメッセージに制限されてもよい。各UEはレイヤ2のアドレス指定可能なtemp IDを使用してネットワークとコンタクトを開始するため、スケジューリングされない下りリンクチャネル（例えばFACH）は、構成されたチャネルから削除されてもよい。リソースの残りは、制御チャネルメッセージ（例えば、第１の下りリンクメッセージ）及びユーザトラヒックデータ又はシグナリングデータ（すなわち、第２の下りリンク又は上りリンクメッセージ）の間で動的に割り当てられてもよい。このようなリソースの割り当ては、リソースのより効率的な使用のため、高帯域のシステムを提供する。

【００６３】

図６Ａ及び６Ｂに示すように、本発明の或る実施例は、上りリンクメッセージにランダムアクセスチャネル（RACH）を利用し、下りリンクメッセージにスケジューリングされたチャネルを利用し、その後の上りリンクメッセージに共通チャネルを利用する。図７Ａ及び７Ｂに示すように、本発明の或る実施例は、第１の上りリンクメッセージにランダムアクセスチャネル（RACH）を利用し、その後の下りリンク及び上りリンクメッセージにスケジューリングされたチャネルを利用する。図８Ａ及び８Ｂに示すように、本発明の或る実施例は、短縮された初期の上りリンクメッセージにランダムアクセスチャネル（RACH）を利用し、その後の下りリンク及び上りリンクメッセージにスケジューリングされたチャネルを利用する。

【００６４】

図６Ａ及び６Ｂは、本発明によるスケジューリングされた下りリンクを使用した詳細なシグナリングシーケンスを示している。UEは一時識別子を導き、第１の上りリンクメッセ

ージで一時識別子をネットワークに送信する。temp IDに加えて、第１の上りリンクメッセージは、確立理由パラメータと２つの任意選択のパラメータ（バッファ占有及びグローバルUE ID）とを有する。確立理由及びグローバルUE IDは、図１Ａを参照して前述した対応のパラメータと同じもの又は類似のものでもよい。

【００６５】

バッファ占有は、UEの送信バッファの送信用の現在の保留データの指示として使用されてもよく、上りリンク送信を許可するリソースの程度を決定するためにNode Bのスケジューラにより使用されてもよい。バッファ占有は、例えば複数の送信フロー、形式又は優先ストリーム毎の単一のビット、量子化された値の範囲、バイトでの絶対値、又は値のリストでもよい。

【００６６】

UEは、トランスペアレントモード（TM）を使用してRRC接続要求メッセージを送信してもよい。ネットワーク装置によるRRC接続要求メッセージの受信時に、ネットワークは、（図１Ａを参照して前述した）許可制御を実行し、確立理由パラメータにより示される物理リソース（上りリンク共有チャネル（UL-SCH：uplink shared channel）又は下りリンク共有チャネル（DL-SCH：downlink shared channel））を割り当てる。任意選択で、ネットワークはまた、S-RNTIと置換temp IDとを割り当ててもよい。

【００６７】

ネットワークは、temp IDを含む下りリンクスケジューリング許可指示を含む第１の下りリンクメッセージを送信し、特定のUEと割り当てられた物理リソースの記述とをアドレス指定する。第１の下りリンクメッセージは、可能なスケジューリングメッセージを予期又は待機するUEにより監視される共有物理制御チャネル（SPCCH：shared physical control channel）で送信されてもよい。ネットワークはまた、置換一時識別子を送信してもよい。ネットワークは、UEにより選択不可能な一意の識別子のリスト又はテーブルから置換一時識別子を選択してもよい。このような置換一時識別子は、第１のUEからのUEにより導かれた一時識別子を含むメッセージが、第２のUEにより導かれた同じ一時識別子を含むメッセージと衝突しないことを確保する。実際に、UEにより導かれた一時識別子は、確実なネットワークにより選択された一意の識別子により置換され得る、限られた期間の一意と期待される識別子を提供する。置換一時識別子は、RRC接続設定メッセージで送信されてもよく、SPCCH許可メッセージに含まれてもよい。

【００６８】

下りリンクスケジューリング許可メッセージの受信時に、UEは、短いスケジューリングメッセージをデコードし、temp IDを検査する。temp IDによりアドレス指定されたUEのみが、下りリンク共有チャネル（DL-SCH：downlink shared channel）で送信された又は送信される長いメッセージをデコードする必要がある。スケジューリング許可メッセージによりアドレス指定されていない他のUEは、CPUサイクル又はバッテリリソースを使い、RRC接続設定メッセージ又は他の長いメッセージをデコードして、メッセージがそれに指示されたか否かを決定する必要はない。

【００６９】

temp IDにより識別されたUEは、下りリンクスケジューリング許可メッセージに記述された割り当てられた物理リソースで送信されたメッセージを受信してデコードする。UEへのこの第２の下りリンクメッセージは、不承認モード（UM）を使用してネットワークにより送信されたRRC接続設定メッセージを有してもよい。任意選択で、RRC接続設定メッセージは、置換temp ID、割り当てられたS-RNTI値、及び／又はグローバルUE IDを有してもよい。UEが置換temp IDを受信すると、UEは、ネットワークでメッセージを伝達するときに、その一時識別子としてこの置換temp IDを使用する。更に、RRC接続要求メッセージからネットワークにより受信された場合、且つ重複するtemp IDの間の衝突がネットワークにより検出された場合、グローバルUE IDがこの第１の下りリンクメッセージに含まれてもよい。或る実施例では、グローバルUE IDは、メッセージに明示的に組み込まれる。他の実施例では、グローバルUE IDは、下りリンクメッセージをエンコードするために使

用される（例えばCRC）。

【００７０】

衝突を処理する競合解決処理について、図９及び１０を参照して更に以下に説明する。更に、或る実施例では、無線ベアラ構成は、ブロードキャストチャネル（BCH）を使用して複数のUEに送信されてもよい。

【００７１】

次に、UEは、承認モード（AM）を使用してRRC接続設定完了メッセージを準備して送信することにより、RRC接続設定メッセージを受信して処理するように応答する。置換temp IDがネットワークにより提供された場合、UEは、この新しい値をその一時識別子として使用する。RRC接続設定完了メッセージもまた、UEの様々な機能を示すUE無線アクセス機能パラメータを有してもよい。

【００７２】

本発明によれば、通常のRRC無線ベアラ設定サービス（図１Ａ）内に含まれる情報は、各UEに個々に伝達されるのではなく、BCHでブロードキャストされてもよい。この理由は、共有チャネルを記述する情報は、セルの複数のUEにより使用され得るからである。

【００７３】

図６Ｂは、UE及びネットワーク装置の要素と、これらの要素間のメッセージを示している。UEは、E-RRC（evolved RRC）レイヤを含むレイヤ3と、E-RLC（evolved Radio Link Control）レイヤ及びE-MAC（evolved MAC）レイヤを含むレイヤ2と、物理レイヤ（L1）を含むレイヤ1とを有する。E-UTRANネットワークは、レイヤ1の物理レイヤ（L1）と、E-MAC（evolved MAC）レイヤ及びE-RLC（evolved RLC）レイヤを含むレイヤ2と、E-RRC（evolved RRC）レイヤ及びE-RRM（evolved RRM）レイヤを含むレイヤ3とを有する。

【００７４】

RRC接続要求メッセージは、UEのE-RRCレイヤにより開始される。E-RRCは、E-RLCレイヤにメッセージを送信し、E-RLCレイヤは、トランスペアレントモード（TM）を使用してランダムアクセスチャネル（RACH）にマッピングされた共通制御チャネル（CCCH）でRRC接続要求メッセージを送信する。CCCHは、E-RLCレイヤとE-MACレイヤとの間の論理制御チャネルであり、RACHは、E-MACレイヤとL1レイヤとの間の共通トランスポートチャネルである。RRC接続要求メッセージは、無線インタフェース（Uu）でネットワークに送信される。

【００７５】

RRC接続要求メッセージを受信すると、ネットワーク装置のレイヤ1は、メッセージをランダムアクセスチャネル（RACH）チャネルでMACレイヤに送信する。MACレイヤは、CCCHチャネルでE-RLCレイヤにメッセージを送信する。次に、E-RLCレイヤは、メッセージをE-RRCレイヤに送信し、E-RRCレイヤは、許可制御、置換一時識別子の割り当て、及び任意選択のS-RNTI値の割り当てのために、メッセージをE-RRMレイヤに送信する。

【００７６】

許可制御並びに任意選択の一時IDの置換及び任意選択のS-RNTI値の割り当ての後に、E-RRMは、割り当てられた値をE-RRCレイヤに返信し、E-RRCレイヤは、不承認モード（UM）で送信されるRRC接続設定メッセージを形成する。E-RLCは、RRC接続設定メッセージをE-RLCレイヤに送信する。E-RLCレイヤは、DCCH又はCCCHチャネルでE-MACレイヤにメッセージを送信する。

【００７７】

単にRRC接続設定メッセージを転送する代わりに、E-MACレイヤは、UEに送信するために、共有物理制御チャネル（SPCCH：shared physical control channel）でレイヤ1にスケジューリング許可メッセージを送信する。UEのレイヤ1は、スケジューリング許可を受信し、スケジューリング許可は、RRC接続設定メッセージを伝達する物理リソースを示す。E-MACレイヤはまた、同時に又は次に、下りリンク共有チャネル（DL-SCH）の割り当てられた物理リソースでRRC接続設定メッセージをレイヤ1に送信する。レイヤ1は、無線インタフェース（Uu）でUEにRRC接続設定メッセージを送信する。好都合なことに、無線イ

ンタフェースを監視する各UEは、同封のメッセージがそれにアドレス指定されているか否かを決定するために、長いRRC接続設定メッセージ及び他のメッセージではなく、短いスケジューリングメッセージのみをデコードする。

【００７８】

UEによるRRC接続設定メッセージの受信時に、UEのレイヤ1は、DL-SCHチャネルでそのE-MACレイヤにメッセージを送信する。E-MACレイヤは、DCCH又はCCCHチャネルでE-RLCレイヤにメッセージを送信し、次に、E-RLCレイヤは、UEのE-RRCレイヤにメッセージを送信する。

【００７９】

次に、UEはRRC接続設定完了メッセージを使用して応答し、RRC接続設定完了メッセージは、承認モード（AM）を使用してネットワークに送信される。E-RRCレイヤは、メッセージをE-RLCレイヤに送信し、E-RLCレイヤは、RRC接続設定完了メッセージをE-MACレイヤに送信するためにDCCHチャネルを使用する。E-MACレイヤは、RACHチャネルで物理レイヤ（L1）にメッセージを送信し、物理レイヤ（L1）は無線インタフェース（Uu）でネットワークにメッセージを送信する。UEがRRC接続設定完了メッセージを通信すると、UEはRRC接続状態に入る。

【００８０】

次に、ネットワークは、無線インタフェース（Uu）でRRC接続設定完了メッセージを受信する。そのレイヤ1は、RACHチャネルを使用してメッセージをE-MACレイヤに送信する。E-MACレイヤは、DCCHチャネルを使用してメッセージをE-RLCに送信する。E-RLCは、メッセージをE-RRCレイヤに送信する。

【００８１】

図７Ａ及び７Ｂは、本発明によるスケジューリングされた下りリンクとスケジューリングされない上りリンク及びスケジューリングされた上りリンクとを使用した詳細なシグナリングシーケンスを示している。RRC接続要求メッセージ及びRRC接続設定メッセージのスケジューリング及び交換と、許可制御と、リソースの割り当てとは、図６Ａ及び６Ｂを参照して前述した通りである。図７Ａ及び７Ｂは、共有リソースでその後の上りリンクメッセージを送信することで、前述の実施例と異なる。

【００８２】

特に、UEのE-MACレイヤがそのE-RLCレイヤからRRC接続設定完了メッセージを受信すると、まず、UEのE-MACレイヤは、RACHチャネル又はE-RACH（evolved RACH）チャネルでスケジューリング要求メッセージを送信する。短いスケジューリング要求メッセージは、ネットワークからの上りリンク物理リソースの割り当てを要求する。スケジューリング要求メッセージは、無線インタフェース（Uu）でネットワークに送信される。ネットワークのレイヤ1によりスケジューリング要求メッセージを受信すると、スケジューリング要求メッセージは、RACHチャネルでネットワークのE-MACレイヤに転送される。E-MACレイヤは、上りリンク共有チャネル（UL-SCH）をUEに割り当て、共有物理制御チャネル（SPCCH：shared physical control channel）でE-MACレイヤからレイヤ1に送信され、次に無線インタフェース（Uu）でUEのレイヤ1に送信されるスケジューリング許可メッセージに上りリンク割り当てを記述する。UEのレイヤ1は、SPCCHチャネルでE-MACレイヤにスケジューリング許可メッセージを転送する。E-MACレイヤは、ネットワークに送信するために、割り当てられたUL-SCHリソースでレイヤ1にRRC接続設定完了メッセージを転送する。

【００８３】

本発明の或る実施例に従って共有のスケジューリングされた上りリンク及び／又は下りリンク方式を使用することにより、１つ以上の利点が実現され得る。例えば或る実施例では、初期の上りリンクリソースでの短いメッセージは、無線インタフェースの物理レイヤでの衝突を低減し得る。或る実施例では、（重複する期間中に２つのUEにより個別に導かれた共通の一時識別子のため生じる）論理的衝突は、UEでの衝突回復手順及び／又はネットワークでの衝突回復手順により克服され得る。或る実施例では、別法ではRACH及び／又はFACH共通チャネルに専用のリソースは、低減又は場合によって除去され得る。従って、

これらのリソースは、他のチャネルトラヒック形式への割り当てに利用可能になる。従って、複数のトラヒック形式が同じ共有チャネルリソースを共有することを許可されておらず、その代わりに別のリソースを割り当てられる必要がある場合に比べて、無線リソースの効率的な使用が実現され得る。この理由は、全てのトラヒック形式を共有チャネルのみに多重することにより、スケジューラは、各トラヒック形式により提示される変化する瞬時負荷に割り当てられたリソースを動的に適合することができるからである。これに対して、別の無線リソースが各トラヒック形式に静的に割り当てられる場合、各トラヒック形式により与えられるトラヒック負荷の変化は、最初に共通チャネルに割り当てられて次に共有チャネルに割り当てられた全無線リソース空間の各部分を再構成せずに、適応不可能である。或る実施例では、UEにより観測されるシグナリング待ち時間及び応答時間が低減され得る。或る実施例では、スケジューリングされたチャネルの使用は、UEが短いスケジューリングメッセージをデコードし、もはや他のUEにアドレス指定された各共通チャネルのメッセージを監視してデコードする必要がないことを意味する。これは、UEの電池寿命の効率的な使用をもたらす。更に、或る実施例では、高速チャネルでの接続設定のシグナリング交換は、通常の共通チャネルより速く生じ得る。

【００８４】

図８Ａ及び８Ｂは、本発明によるスケジューリングされた下りリンクとスケジューリングされた上りリンクとを使用した詳細なシグナリングシーケンスを示している。図示の実施例では、初期の上りリンク通信は、その後の通信と同様にスケジューリングされる。RRC接続要求を有する初期のメッセージを送信するのではなく、UEは、まず、短いスケジューリング要求メッセージを送信し、上りリンク物理リソースを割り当てるようにネットワークに要求する。UEは、一時識別子を導き、短い上りリンクメッセージに含める。メッセージは、任意選択で（前述の）バッファ占有パラメータと、理由パラメータとを有してもよい。理由パラメータは、要求の理由（例えば、上りリンク物理リソースの要求）を示してもよい。ネットワークは、上りリンク共有チャネル（UL-SCH）を割り当て、共有物理制御チャネル（SPCCH）でUEにより導かれた一時識別子とUL-SCHの記述とを有するスケジューリング許可を送信する。UEのE-MACレイヤは、SPCCHチャネルで上りリンクスケジューリング許可メッセージを受信し、割り当てられたUL-SCH物理チャネルでRRC接続要求を送信することにより応答する。RRC接続要求メッセージは、図７Ａ及び７Ｂを参照して前述した許可制御及び更なるリソース割り当てを実行するネットワークにより受信される。更に、図８Ａは、RRC接続要求及びRRC接続設定メッセージの一方又は双方を通信するときに、承認モード（AM）を使用し得る実施例を示しており、他の実施例は不承認モード（UM）を使用し得る。

【００８５】

図９及び１０は、本発明による競合解決処理を示している。この競合シナリオは、２つのUEが共通の一時識別子を導いて使用しているときに生じる。各UEは、図５Ａ、５Ｂ、６Ａ－B、７A－B又は８Ａ－Ｂを参照して前述したRRC接続要求メッセージを送信する。一時識別子の導出は、２つのUEが同じ一時識別子を導く許容レベルの可能性を最小化するように生じることが好ましい。しかし、或る実施例では、２つのUEがセル内で同じ一時識別子を導くことがある。従って、更なる衝突検出及び回復手順が実施されてもよい。

【００８６】

図９は、主にUEにより起こされる救済手段を示している。２つのUEは、同一の一時識別子（第１のtemp ID）を使用してネットワークに上りリンクメッセージを送信する。上りリンクメッセージは、RACHチャネル又はE-RACHで送信されるメッセージでもよい。メッセージは、スケジューリング要求メッセージ（図示のもの）又は他のメッセージでもよい。ネットワークは、２つの上りリンクメッセージで重複した同一の一時識別子を検出してもよい。ネットワークは、以下の処理を実行しないように選択してもよく、各UEがタイムアウトすることを許可する。予想される下りリンク応答を受信しなかった後に、各UEは、初期に導かれた一時識別子を破棄し、他の一時識別子（それぞれ、第２のtemp ID及び第３のtemp ID）を導く。各UEは、新しく導かれた一時識別子を使用して元の上りリンクメッ

セージを再送信する。新しい一時識別子の受信時に、初期のレイヤ2コンテキストが共有チャネル動作について各UEとネットワークとの間で確立される。ネットワークは、前述のように一意のtemp IDを有する各UEに応答する。

【００８７】

図１０は、主にネットワークにより起こされる救済手段を示している。この場合も同様に、２つのUEは、同一の一時識別子（temp ID）を使用して上りリンクメッセージをネットワークにそれぞれ送信する。上りリンクメッセージは、RACHチャネル又はE-RACHで送信されるメッセージでもよい。メッセージは、RRC接続要求メッセージ（図示のもの）又は他のメッセージでもよい。ネットワークは、２つの上りリンクメッセージで同一の一時識別子を検出してもよい。この場合、２つのUEは、同じtemp IDを導いており、アドレス指定されたこのtemp IDを含む下りリンクシグナリングをそれぞれ予想してもよい。このような場合、ネットワークは、衝突又は競合が生じたことを決定してもよい。しかし、上りリンクメッセージの一方又は双方がグローバルUE IDを含む場合、UEは、相互に区別され得る。この時点で、初期のレイヤ2コンテキストが共有チャネル動作について各UEとネットワークとの間で確立される。

【００８８】

ネットワークは、制御チャネルで、下りリンクリソースを割り当てられたスケジューリング許可メッセージを送信してもよい。ネットワークはまた、スケジューリング許可メッセージに記述されたトラヒックチャネルで、グローバルUE IDを組み込んだメッセージを送信してもよい。例えば、ネットワークは、衝突するUEにより導かれた一時識別子を使用してUEにアドレス指定されたRRC接続完了メッセージを送信してもよい。或る実施例では、ネットワークは、グローバルUE IDをパラメータとして含めることにより、グローバルUE IDを下りリンクメッセージに明示的に組み込む。代替として、ネットワークは、下りリンクメッセージをエンコードするためにグローバルUE IDを使用することにより、グローバルUE IDを組み込んでもよい。例えば、組み込むことは、ネットワークに既知のUE識別子を使用して巡回冗長検査（CRC）値を計算することを有してもよい。下りリンクメッセージをデコードするときに、各UEは、グローバルUE IDがパラメータとして明示的に組み込まれたか否かを決定するためにそのグローバルUE IDを使用してもよく、代替として、メッセージをデコードして前に送信されたグローバルUE IDがメッセージをエンコードするためにネットワークにより使用されたか否かを決定するためにそのグローバルUE IDを使用してもよい。更に、ネットワークは、そのグローバルUE IDを送信したUEに置換temp IDを割り当てることにより応答してもよい。１つのUEが置換temp IDを受信すると、共有チャネル動作について双方のUEに一意のレイヤ2コンテキストが形成される。第１のUEは、RRC接続設定メッセージを受信して適切にデコードし、RRC接続設定メッセージはそのUEでエンコードされる。第２のUEは、RRC接続設定メッセージをデコードしようとするが、メッセージが未知のグローバルUE IDでエンコードされているため失敗し、第２のUEがメッセージを破棄して下りリンクスケジューリングチャネル（SPCCH）に戻るようにさせる。第２のUEは、ネットワークにより送信された第２の下りリンクスケジューリング許可メッセージを受信する。第２のUEは、それにアドレス指定されたRRC接続設定メッセージを適切に受信してデコードする。双方のUEは、RRC接続設定完了メッセージで応答することにより、処理を完了してもよい。

【００８９】

特定の実施例及び例示的な図面に関して本発明を説明したが、本発明は、記載の実施例又は図面に限定されないことを当業者は認識する。例えば、前述の多数の実施例は、3GPPシステム及びE-UTRAN（evolved UMTS Terrestrial Radio Access Network）の用語を参照する。より一般的に、或る実施例は、TDD（time division duplex）方式又はFDD（frequency division duplex）方式で動作するCDMA（code division multiple access）送信機／受信機の対を使用したトランシーバを有してもよい。代替として、トランシーバは、TDMAシステム、FDMAシステム、OFDMシステム、又はこれらのハイブリッド（例えば、TDMA/FDMA、TDMA/CDMA、TDMA/OFDM及びTDMA/OFDM/CDMA）で使用されるような非符

号分割のトランシーバでもよい。トランシーバは、バーストで動作してもよく、信号ストリームで動作してもよい。

【００９０】

提供される図面は単に表現的なものであり、縮尺通りでないことがある。この特定の部分は誇張されることがあり、他の部分は最小化されることがある。図面は、当業者により理解されて適切に実行され得る本発明の様々な実装を示すことを意図する。従って、本発明は、特許請求の範囲の要旨及び範囲内で変更及び置換して実施され得ることがわかる。説明は、網羅的であることを意図せず、開示された正確な形式に本発明を限定することを意図しない。本発明は、変更及び置換して実施可能であり、本発明は、特許請求の範囲及びその均等のみにより限定されることがわかる。

【図面の簡単な説明】

【００９１】

【図１Ａ】通常のUMTSシステムでRRCアイドル状態からRRC接続状態に推移する場合の通常のメッセージのシーケンス

【図１Ｂ】通常のUMTSシステムでRRCアイドル状態からRRC接続状態に推移する場合の通常のメッセージのシーケンス

【図２】ユーザ装置（UE）とコアネットワーク（CN）とで動作するUTRANネットワークとE-UTRANとの比較

【図３Ａ】本発明に従ってユーザ装置とコアネットワークとで動作するE-UTRANネットワーク

【図３Ｂ】本発明に従ってユーザ装置とコアネットワークとで動作するE-UTRANネットワーク

【図４】本発明によるユーザ装置の構成要素

【図５Ａ】本発明による初期のシグナリングシーケンス

【図５Ｂ】本発明による初期のシグナリングシーケンス

【図６Ａ】本発明によるスケジューリングされた下りリンクを使用した詳細なシグナリングシーケンス

【図６Ｂ】本発明によるスケジューリングされた下りリンクを使用した詳細なシグナリングシーケンス

【図７Ａ】本発明によるスケジューリングされた下りリンクとスケジューリングされない上りリンク及びスケジューリングされた上りリンクとを使用した詳細なシグナリングシーケンス

【図７Ｂ】本発明によるスケジューリングされた下りリンクとスケジューリングされない上りリンク及びスケジューリングされた上りリンクとを使用した詳細なシグナリングシーケンス

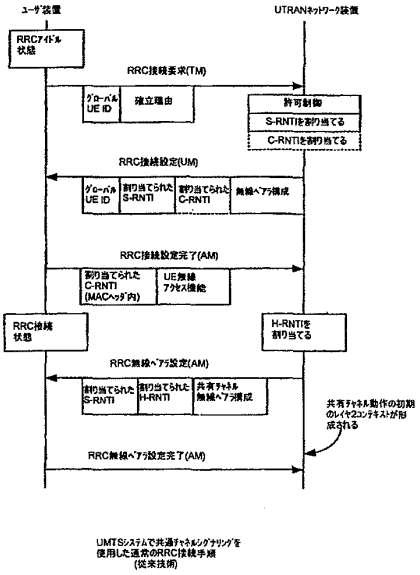
【図８Ａ】本発明によるスケジューリングされた下りリンクとスケジューリングされた上りリンクとを使用した詳細なシグナリングシーケンス

【図８Ｂ】本発明によるスケジューリングされた下りリンクとスケジューリングされた上りリンクとを使用した詳細なシグナリングシーケンス

【図９】本発明による競合解決の処理

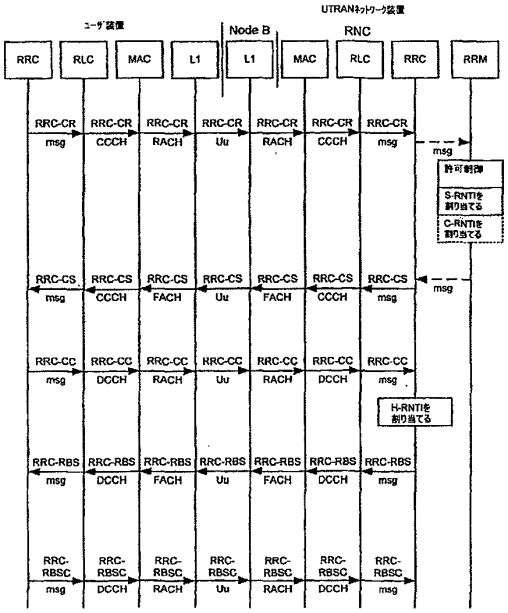
【図１０】本発明による競合解決の処理

【図１Ａ】



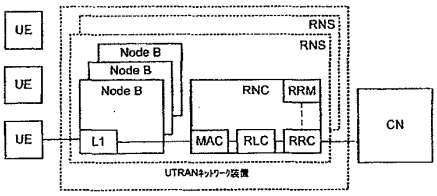
UMTSシステムで共通チャネルシグナリングを使用した通常のRRC接続手順
(従来技術)

【図１Ｂ】

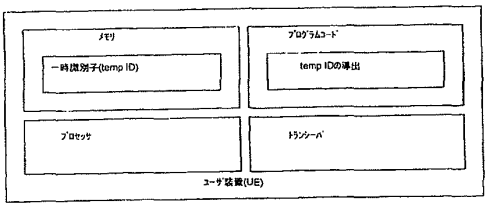


UMTSシステムで共通チャネルシグナリングを使用した通常のRRC接続手順
(従来技術)

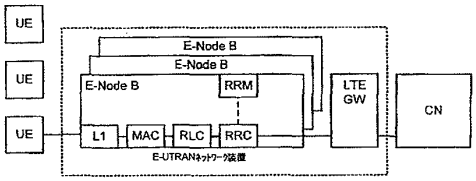
【図２】



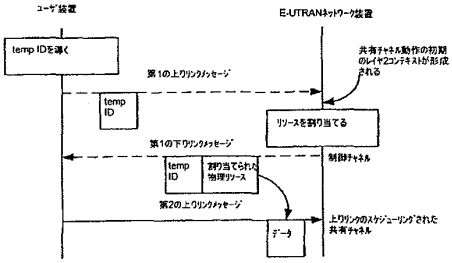
【図４】



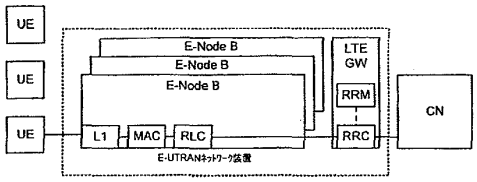
【図３Ａ】



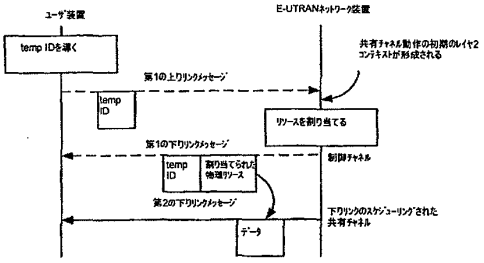
【図５Ａ】



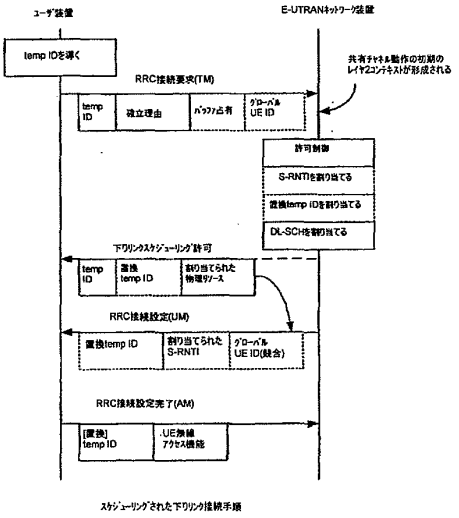
【図３Ｂ】



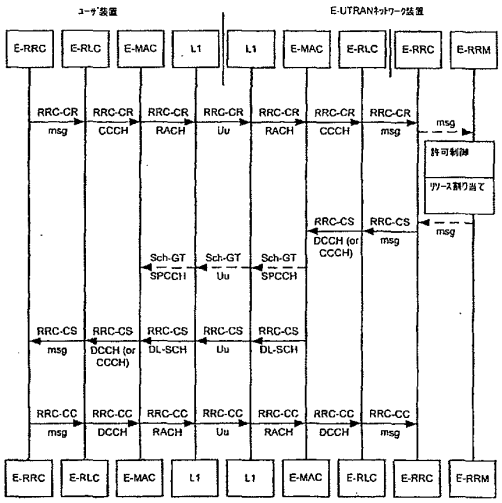
【図５Ｂ】



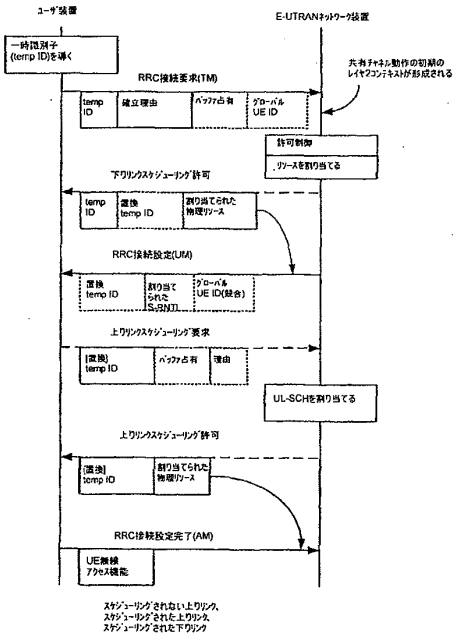
【図６Ａ】



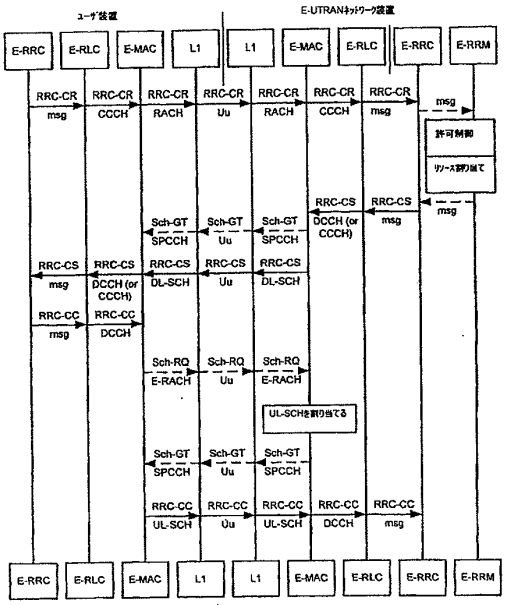
【図６Ｂ】



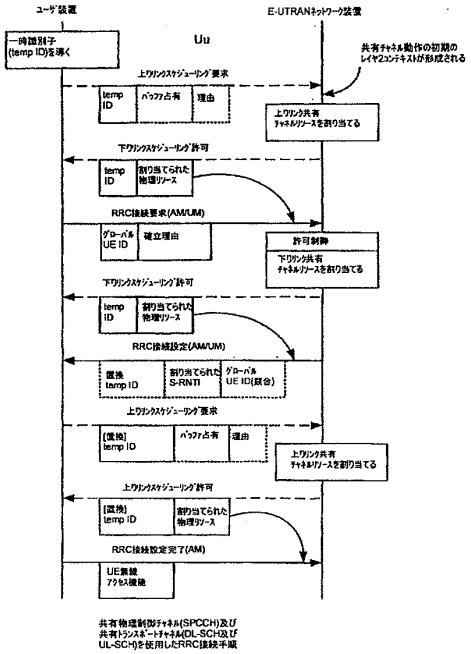
【図７Ａ】



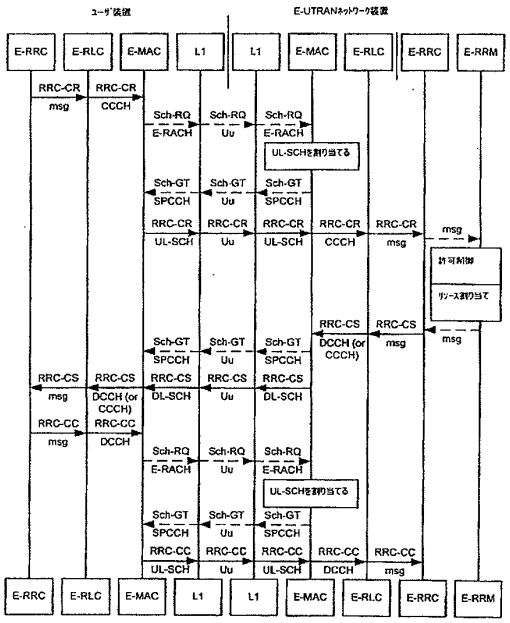
【図７Ｂ】



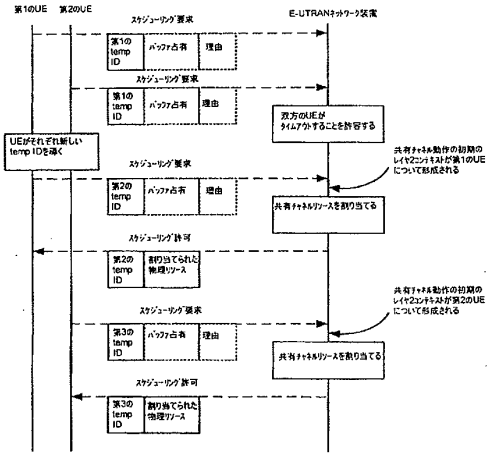
【図８Ａ】



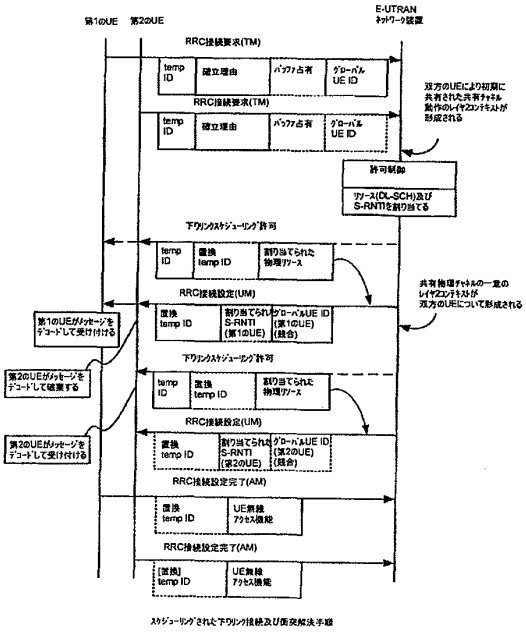
【図８Ｂ】



【図９】



【図１０】



【手続補正書】
【提出日】平成20年9月2日(2008.9.2)
【手続補正１】
【補正対象書類名】特許請求の範囲
【補正対象項目名】全文
【補正方法】変更
【補正の内容】
【特許請求の範囲】
【請求項１】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する方法であって、
ユーザ装置により、
一時識別子として自分のシグナリングアドレスを導き、
前記一時識別子を前記ネットワーク装置に送信し、
前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信することを有する方法。
【請求項２】
前記一時識別子を導くことは、ネットワークに既知のUE識別子の一部から前記一時識別子を形成することを有する、請求項１に記載の方法。
【請求項３】
前記ネットワークに既知のUE識別子は、TMSI（temporary mobile subscriber identity）、IMSI（international mobile subscriber identity）及びIMEI（internationa

1 mobile equipment identity) のグループのうち１つを有する、請求項２に記載の方法。
【請求項４】
前記一時識別子を導くことは、複数の一時識別子から前記一時識別子を選択することを有する、請求項１に記載の方法。
【請求項５】
前記一時識別子を導くことは、時間パラメータに基づいて前記一時識別子を導くこと有する、請求項１に記載の方法。
【請求項６】
前記複数の一時識別子は、テーブルを有する、請求項４に記載の方法。
【請求項７】
前記ネットワーク装置から前記複数の一時識別子の指示を受信することを更に有する、請求項４に記載の方法。
【請求項８】
前記受信した指示は、ブロードキャストチャネル（BCH）で前記指示を受信することを有する、請求項７に記載の方法。
【請求項９】
前記複数の一時識別子を不揮発性メモリに保存することを更に有する、請求項４に記載の方法。
【請求項１０】
前記一時識別子を前記ネットワーク装置に送信することは、前記一時識別子と前記スケジューリングされたリソースの要求とを有する第１の上りリンクメッセージ内で前記一時識別子を送信することを有する、請求項１に記載の方法。
【請求項１１】
前記スケジューリングされたリソースは、上りリンクのスケジューリングされたリソース及び下りリンクのスケジューリングされたリソースのグループのうち１つを有する、請求項１０に記載の方法。
【請求項１２】
前記一時識別子を送信することは、第１の上りリンクメッセージを送信することを有し、
前記下りリンクメッセージを受信することは、第１の下りリンクメッセージを受信することを有し、
前記スケジューリングされたリソースで前記データを通信することは、第２の上りリンクメッセージで接続要求を送信することを有する、請求項１に記載の方法。
【請求項１３】
前記第２の上りリンクメッセージに応じて送信された第２の下りリンクメッセージを受信し、前記第２の下りリンクメッセージは、前記一時識別子と共有下りリンクチャネルでのスケジューリングされた下りリンクリソースの記述とを伝達し、前記スケジューリングされた下りリンクリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられた下りリンクリソースを有し、
前記スケジューリングされた下りリンクリソースで第３の下りリンクメッセージを受信し、前記第３の下りリンクメッセージは、接続設定メッセージを有する、請求項１２に記載の方法。
【請求項１４】
前記一時識別子を送信することは、第１の上りリンクメッセージを送信することを有し、
前記方法は、
前記第１の上りリンクメッセージを送信した後、且つ前記下りリンクメッセージを受信する前にタイムアウトし、
異なる一時識別子を選択し、

前記一時識別子の代わりに前記異なる一時識別子を有する前記第１の上りリンクメッセージを再送信することを更に有する、請求項１に記載の方法。

【請求項１５】

前記一時識別子を送信することは、RRC接続要求を有する第１の上りリンクメッセージで前記一時識別子を送信することを有する、請求項１に記載の方法。

【請求項１６】

前記一時識別子を送信することは、第１の上りリンクメッセージで前記一時識別子を送信することを有し、

前記方法は、RRC接続要求を有する第２の上りリンクメッセージを送信することを更に有し、前記第２の上りリンクメッセージは、前記第１の上りリンクメッセージと異なる、請求項１に記載の方法。

【請求項１７】

前記データを通信することは、RRC接続要求メッセージを有する、請求項１に記載の方法。

【請求項１８】

RRC接続要求を送信し、

RRC接続設定メッセージを受信することを更に有する、請求項１に記載の方法。

【請求項１９】

前記ネットワーク装置から置換識別子を受信し、

前記一時識別子の代わりに前記置換識別子を使用することを更に有する、請求項１に記載の方法。

【請求項２０】

ネットワークに既知のUE識別子を前記要求に組み込むことを更に有する、請求項１に記載の方法。

【請求項２１】

前記ネットワークに既知のUE識別子は、TMSI（temporary mobile subscriber identity）、IMSI（international mobile subscriber identity）及びIMEI（international mobile equipment identity）のグループのうち１つを有する、請求項２０に記載の方法。

【請求項２２】

前記組み込むことは、前記ネットワークに既知のUE識別子をパラメータとして前記要求に含めることを有する、請求項２０に記載の方法。

【請求項２３】

前記組み込むことは、前記ネットワークに既知のUE識別子を使用して巡回冗長検査（CRC）値を計算することを有する、請求項２０に記載の方法。

【請求項２４】

ネットワークに既知のUE識別子を使用して前記ネットワーク装置からのメッセージをデコードすることを更に有する、請求項１に記載の方法。

【請求項２５】

前記無線通信システムは、E-UTRAN（evolved UMTS Terrestrial Radio Access Network）を有する、請求項１に記載の方法。

【請求項２６】

ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する際に使用されるユーザ装置であって、

メモリと、

前記メモリに結合されたプロセッサと、

前記プロセッサで実行可能なプログラムコードと

を有し、

前記プログラムコードは、

一時識別子として前記ユーザ装置の自分のシグナリングアドレスを導き、

前記一時識別子を前記ネットワーク装置に送信し、
前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するように動作可能であるユーザ装置。
【請求項２７】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する際に使用されるネットワーク装置であって、
メモリと、
前記メモリに結合されたプロセッサと、
前記プロセッサで実行可能なプログラムコードと
を有し、
前記プログラムコードは、
前記ユーザ装置により導かれた一時識別子を受信し、前記ユーザ装置の自分のシグナリングアドレスが前記一時識別子として使用され、
前記ユーザ装置にスケジューリングされたリソースを割り当て、前記スケジューリングされたリソースは、共有チャネルのリソースを有し、
前記一時識別子と前記スケジューリングされたリソースの記述とを伝達する下りリンクメッセージを送信し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するように動作可能であるネットワーク装置。
【請求項２８】
前記プログラムコードは、前記ユーザ装置に複数の一時識別子の指示を送信するように更に動作可能である、請求項２７に記載のネットワーク装置。
【請求項２９】
前記ユーザ装置から前記一時識別子を受信することは、前記一時識別子と前記スケジューリングされたリソースの要求とを有する第１の上りリンクメッセージ内で前記一時識別子を受信することを有する、請求項２７に記載のネットワーク装置。
【請求項３０】
前記一時識別子を受信することは、第１の上りリンクメッセージを受信することを有し、
前記下りリンクメッセージを送信することは、第１の下りリンクメッセージを送信することを有し、
前記スケジューリングされたリソースで前記データを通信することは、第２の上りリンクメッセージで接続要求を送信することを有する、請求項２７に記載のネットワーク装置。
【請求項３１】
前記プログラムコードは、
スケジューリングされた下りリンクリソースを前記ユーザ装置に割り当て、前記スケジューリングされた下りリンクリソースは共有チャネルのリソースを有し、
前記第２の上りリンクメッセージに応じて送信された第２の下りリンクメッセージを送信し、前記第２の下りリンクメッセージは、前記一時識別子と前記スケジューリングされた下りリンクの記述とを伝達し、
前記スケジューリングされた下りリンクリソースで第３の下りリンクメッセージを送信し、前記第３の下りリンクメッセージは、接続設定メッセージを有するように更に動作可能である、請求項２７に記載のネットワーク装置。
【請求項３２】
前記プログラムコードは、
複数の識別子から置換識別子を割り当て、

前記ユーザ装置に前記置換識別子を送信するように更に動作可能である、請求項２７に記載のネットワーク装置。

【請求項３３】

前記プログラムコードは、

ネットワークに既知のUE識別子をメッセージに組み込み、

前記メッセージを前記ユーザ装置に送信するように更に動作可能である、請求項２７に記載のネットワーク装置。

【請求項３４】

ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始するプログラムコードを有するコンピュータプログラムプロダクトであって、

一時識別子として前記ユーザ装置の自分のシグナリングアドレスを導き、

前記一時識別子を前記ネットワーク装置に送信し、

前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、

前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するプログラムコードを有するコンピュータプログラムプロダクト。

【請求項３５】

共有物理リソースで無線接続及びその後の通信を開始する無線ネットワークシステムであって、

１つ以上のユーザ装置とネットワーク装置とを有し、

各ユーザ装置は、

ユーザ装置メモリと、

前記ユーザ装置メモリに結合されたユーザ装置プロセッサと、

前記ユーザ装置プロセッサで実行可能なユーザ装置プログラムコードと

を有し、

前記ユーザ装置プログラムコードは、

一時識別子として前記ユーザ装置の自分のシグナリングアドレスを導き、

前記一時識別子を前記ネットワーク装置に送信し、

前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、

前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するように動作可能であり、

前記ネットワーク装置は、

ネットワーク装置メモリと、

前記ネットワーク装置メモリに結合されたネットワーク装置プロセッサと、

前記ネットワーク装置プロセッサで実行可能なネットワーク装置プログラムコードと

を有し、

前記ネットワーク装置プログラムコードは、

前記ユーザ装置により導かれた一時識別子を受信し、

前記ユーザ装置にスケジューリングされたリソースを割り当て、前記スケジューリングされたリソースは、共有チャネルのリソースを有し、

前記一時識別子と前記スケジューリングされたリソースの記述とを伝達する前記下りリンクメッセージを送信し、

前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するように動作可能である無線ネットワークシステム。

【国際調査報告】

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2006/069530

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, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2004/102837 A (LG ELECTRONICS INC [KR]; YI SEUNG-JUNE [KR]; LEE YOUNG-DAE [KR]; CHUN) 25 November 2004 (2004-11-25) page 8, paragraph 44 - paragraph 47 page 3, paragraph 18 - paragraph 19 page 18, paragraph 104	1-58
A	ETSI: "TS 125 331 Universal Mobile Telecommunications System (UMTS)" ETSI TS 125 331 V3.1.0, XX, XX, January 2000 (2000-01), pages 1-282, XP002165164 page 33, paragraph 8.1.3	1-58
A	WO 01/89235 A2 (ERICSSON TELEFON AB L M [SE]) 22 November 2001 (2001-11-22) page 4, line 4 - page 7, line 23 page 13, line 5 - line 15	1-58

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[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
2 July 2007	09/07/2007
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Garcia, Montse

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

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2006/069530

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2003/211846 A1 (NAGPAL VIKAS [US] ET AL) 13 November 2003 (2003-11-13) page 3, paragraph 43 - page 4, paragraph 44	1-58

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

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2006/069530

Patent document cited in search report		Publication date	Patent family member(s)			Publication date
WO 2004102837	A	25-11-2004	AU	2004240044	A1	25-11-2004
			BR	PI0410265	A	16-05-2006
			CN	1717880	A	04-01-2006
			EP	1566001	A1	24-08-2005
			JP	2006512875	T	13-04-2006
			KR	20040098126	A	20-11-2004
			MX	PA05006110	A	16-08-2005
			US	2004229626	A1	18-11-2004
WO 0189235	A2	22-11-2001	AU	6091901	A	26-11-2001
			US	2002025815	A1	28-02-2002
US 2003211846	A1	13-11-2003	AU	2003229081	A1	11-11-2003
			BR	0309956	A	05-04-2005
			CN	1663310	A	31-08-2005
			EP	1504622	A1	09-02-2005
			JP	2005525760	T	25-08-2005
			WO	03096728	A1	20-11-2003

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

フロントページの続き

(81)指定国 AP(BW,GH,GM,KE,LS,MW,MZ,NA,SD,SL,SZ,TZ,UG,ZM,ZW),EA(AM,AZ,BY,KG,KZ,MD,RU,TJ,TM),EP(AT,BE,BG,CH,CY,CZ,DE,DK,EE,ES,FI,FR,GB,GR,HU,IE,IS,IT,LT,LU,LV,MC,NL,PL,PT,RO,SE,SI,SK,TR),OA(BF,BJ,CF,CG,CI,CM,GA,GN,GQ,GW,ML,MR,NE,SN,TD,TG),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

(72)発明者 ウォラル，チャンドリカ
イギリス国，バークシャー アールジー１４ ６エスエヌ ニューバリー バルフォー・クレセント １１エイ
(72)発明者 アンダーソン，ニコラス ウィリアム
イギリス国，ブリストル アヴォン ビーエス３０ ５ジェイエル ワームレイ ロンドン・ロード ７２

Ｆターム(参考) 5K067 AA13 AA14 BB04 BB21 DD17 EE02 EE10 EE16 HH32

Espacenet

Bibliographic data: JP2009522893 (A) — 2009-06-11

INITIAL CONNECTION ESTABLISHMENT IN A WIRELESS COMMUNICATION SYSTEM

Inventor(s):

Applicant(s):

Classification: **- international:** ***H04W72/04; H04W76/02; H04W8/26;*** *H04W72/12; H04W8/02*
- Euro: H04W76/02A

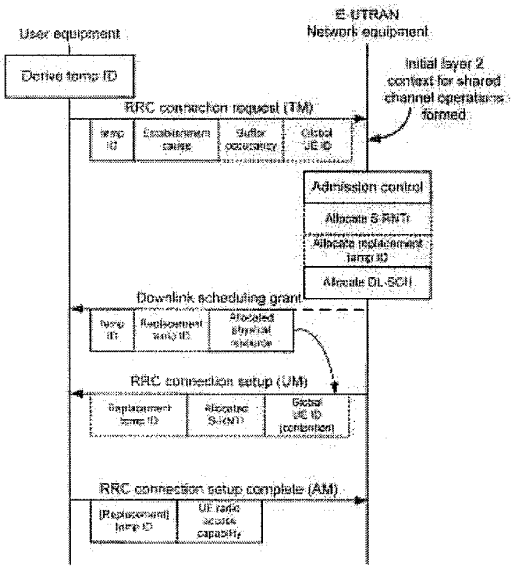
Application number: JP20080549013 20070104

Priority number (s): US20060325829 20060104; US20060330820 20060111; WO2007EP50100 20070104

Also published as: JP4990911 (B2) WO2007077250 (A2) WO2007077250 (A3) US2011190001 (A1) US2011183700 (A1) more

Abstract not available for JP2009522893 (A)
Abstract of corresponding document: WO2007077250 (A2)

A method, user equipment, network equipment and a system for initiating a wireless connection and subsequent communication over a shared physical resource in a wireless communication system between user equipment and network equipment comprising: processing a UE-derived temporary identifier; determining a set of channels that the user equipment will monitor; implicitly or explicitly communicating this channel set; communicating the temporary identifier as an identifier to the network equipment; communicating a downlink message on a channel belonging to the determined channel set conveying the temporary identifier and a description of a scheduled resource on a shared channel, the scheduled resource comprising a resource allocated to the user equipment by the network equipment; and communicating data on the scheduled resource in response to the downlink message.



Scheduled downlink connection procedure

(19)日本国特許庁(JP)　(12)公表特許公報(A)　(11)特許出願公表番号
特表2009-522893
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H04W 8/26	(2009.01)	H04Q	7/00	161	5K067
H04W 72/04	(2009.01)	H04Q	7/00	548	
H04W 76/02	(2009.01)	H04Q	7/00	549	
		H04Q	7/00	581	

審査請求 有　予備審査請求 未請求　（全 36 頁）

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(87)国際公開番号　WO2007/077250
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(31)優先権主張番号　11/330,820
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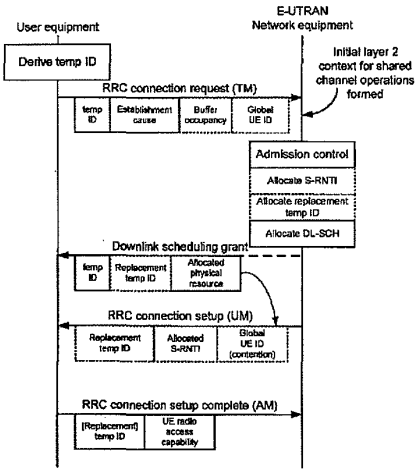
(33)優先権主張国　米国 (US)

(71)出願人　502106716
アイピーワイヤレス，インコーポレイテッド
アメリカ合衆国，カリフォルニア州　94066，サン・ブルノ，ペイヒル・ドライヴ　1001　セカンド・フロア
(74)代理人　100070150
弁理士　伊東　忠彦
(74)代理人　100091214
弁理士　大貫　進介
(74)代理人　100107766
弁理士　伊東　忠重

最終頁に続く

(54)【発明の名称】無線通信システムでの初期の接続確立

(57)【要約】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する方法、ユーザ装置、ネットワーク装置及びシステムは、UEにより導かれた一時識別子を処理し、ユーザ装置が監視するチャネルセットを決定し、このチャネルセットを暗示的又は明示的に通信し、識別子として一時識別子をネットワーク装置に通信し、決定されたチャネルセットに属するチャネルで、一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを通信し、スケジューリングされたリソースは、ネットワーク装置によりユーザ装置に割り当てられたリソースを有し、下りリンクメッセージに応じてスケジューリングされたリソースでデータを通信することを有する。



Scheduled downlink connection procedure

【特許請求の範囲】
【請求項１】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する方法であって、
前記ユーザ装置により、
一時識別子を導き、
チャネルセットを導き、
初期のメッセージを前記ネットワーク装置に送信し、前記初期のメッセージは前記一時識別子を有し、
前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信することを有する方法。
【請求項２】
前記チャネルセットは、単一のチャネルを有する、請求項１に記載の方法。
【請求項３】
前記チャネルセットは、複数のチャネルを有する、請求項１に記載の方法。
【請求項４】
前記チャネルセットを導くことは、複数のチャネルセットから前記チャネルセットをランダムに選択することを有する、請求項１に記載の方法。
【請求項５】
前記チャネルセットを導くことは、グローバルUE識別子に基づいて前記チャネルセットを決定することを有する、請求項１に記載の方法。
【請求項６】
前記グローバルUE識別子は、TMSI（temporary mobile subscriber identity）、IMSI（international mobile subscriber identity）、又はIMEI（international mobile equipment identity）のうち１つを有する、請求項５に記載の方法。
【請求項７】
前記チャネルセットを導くことは、物理リソースの１つ以上の特性の関数として前記チャネルセットを決定することを有し、
前記初期のメッセージを送信することは、前記物理リソースで前記初期のメッセージを送信することを有する、請求項１に記載の方法。
【請求項８】
前記物理リソースの特性は、時間のパラメータを有する、請求項７に記載の方法。
【請求項９】
前記物理リソースの特性は、周波数のパラメータを有する、請求項７に記載の方法。
【請求項１０】
前記物理リソースの特性は、符号のパラメータを有する、請求項７に記載の方法。
【請求項１１】
前記チャネルセットを導くことは、物理リソースの特性、グローバルUE識別子、及び前記一時識別子のうち１つ以上に基づいて前記チャネルセットを決定することを有する、請求項１に記載の方法。
【請求項１２】
前記初期のメッセージは、グローバルUE識別子を更に有する、請求項１に記載の方法。
【請求項１３】
物理リソースを決定することを更に有し、
前記初期のメッセージを送信することは、前記決定された物理リソースに従って前記初期のメッセージを送信することを有する、請求項１に記載の方法。
【請求項１４】

前記チャネルセットの指示を伝達することを更に有する、請求項１に記載の方法。
【請求項１５】
前記チャネルセットの指示を暗示的に通信することを更に有する、請求項１に記載の方法。
【請求項１６】
前記初期のメッセージを前記ネットワーク装置に送信することは、スケジューリング要求メッセージを送信することを有する、請求項１に記載の方法。
【請求項１７】
前記初期のメッセージを前記ネットワーク装置に送信することは、RRC接続要求メッセージを送信することを有する、請求項１に記載の方法。
【請求項１８】
前記初期のメッセージを送信した後、且つ前記下りリンクメッセージを受信する前にタイムアウトし、
異なる物理リソースを決定し、
前記異なる物理リソースで新しい初期のメッセージを再送信することを更に有する、請求項１に記載の方法。
【請求項１９】
チャネルセットと一時識別子との間の関連付けを変更することを更に有する、請求項１に記載の方法。
【請求項２０】
チャネルセットと物理リソースの１つ以上の特性との間の関連付けを変更することを更に有する、請求項１に記載の方法。
【請求項２１】
時間の関数としてチャネルセットの関連付けを変更することを更に有する、請求項１に記載の方法。
【請求項２２】
前記ネットワーク装置から信号を受信したことに応じてチャネルセットの関連付けを変更することを更にする、請求項１に記載の方法。
【請求項２３】
前記無線通信システムは、E-UTRAN（evolved UMTS Terrestrial Radio Access Network）を有する、請求項１に記載の方法。
【請求項２４】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する際に使用されるユーザ装置であって、
メモリと、
前記メモリに結合されたプロセッサと、
前記プロセッサで実行可能なプログラムコードと
を有し、
前記プログラムコードは、
一時識別子を導き、
チャネルセットを導き、
初期のメッセージを前記ネットワーク装置に送信し、前記初期のメッセージは前記一時識別子を有し、
前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するように動作可能であるユーザ装置。
【請求項２５】
前記チャネルセットを導くことは、複数のチャネルセットから前記チャネルセットをラ

ンダムに選択することを有する、請求項２４に記載のユーザ装置。

【請求項２６】

前記チャネルセットを導くことは、物理リソースの１つ以上の特性の関数として前記チャネルセットを決定することを有し、

前記初期のメッセージを送信することは、前記物理リソースで前記初期のメッセージを送信することを有する、請求項２４に記載のユーザ装置。

【請求項２７】

前記一時識別子を前記ネットワーク装置に送信することは、前記一時識別子と前記スケジューリングされたリソースの要求とを有する第１の上りリンクメッセージ内で前記一時識別子を送信することを有する、請求項２４に記載のユーザ装置。

【請求項２８】

前記チャネルセットを導くことは、物理リソースの特性、グローバルUE識別子、及び一時識別子のうち１つ以上に基づいて前記チャネルセットを決定することを有する、請求項２４に記載のユーザ装置。

【請求項２９】

前記プログラムコードは、物理リソースを決定するように更に動作可能であり、

前記初期のメッセージを送信することは、前記決定された物理リソースに従って前記初期のメッセージを送信することを有する、請求項２４に記載のユーザ装置。

【請求項３０】

前記プログラムコードは、前記チャネルセットの指示を伝達するように更に動作可能である、請求項２４に記載のユーザ装置。

【請求項３１】

前記プログラムコードは、前記チャネルセットの指示を暗示的に通信するように更に動作可能である、請求項２４に記載のユーザ装置。

【請求項３２】

ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する際に使用されるネットワーク装置であって、

メモリと、

前記メモリに結合されたプロセッサと、

前記プロセッサで実行可能なプログラムコードと

を有し、

前記プログラムコードは、

前記ユーザ装置により送信された初期のメッセージを受信し、

チャネルセットを決定し、

前記ユーザ装置にスケジューリングされたリソースを割り当て、前記スケジューリングされたリソースは、共有チャネルのリソースを有し、

前記チャネルセットにより示されるチャネルで下りリンクメッセージを送信し、前記下りリンクメッセージは、一時識別子と前記スケジューリングされたリソースの記述とを伝達し、

前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するように動作可能であるネットワーク装置。

【請求項３３】

前記チャネルセットを決定することは、前記初期のメッセージからチャネル指示を抽出することを有し、前記チャネル指示は、前記チャネルセットを示す、請求項３２に記載のネットワーク装置。

【請求項３４】

前記チャネルセットを決定することは、前記初期のメッセージを伝達する前記物理リソースから前記チャネルセットを決定することを有する、請求項３２に記載のネットワーク装置。

【請求項３５】

前記プログラムコードは、チャネルセットと物理リソースの１つ以上の特性との間の関連付けの変更を前記UEに通信するように更に動作可能である、請求項３２に記載のネットワーク装置。

【請求項３６】

ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始するプログラムコードを有するコンピュータプログラムプロダクトであって、

一時識別子を導き、

チャネルセットを導き、

初期のメッセージをネットワーク装置に送信し、前記初期のメッセージは前記一時識別子を有し、

前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、

前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するプログラムコードを有するコンピュータプログラムプロダクト。

【発明の詳細な説明】

【技術分野】

【０００１】

本発明は、概して無線通信技術に関し、特に無線通信システムにおけるユーザ装置とネットワーク装置との間の初期の接続手順に関する。

【背景技術】

【０００２】

無線通信システムでは、移動局（ユーザ装置（UE：user equipment）、ユーザ端末、移動端末、無線データ端末及びセルラ電話とも呼ばれる）と無線アクセスネットワークとの間で論理接続を行う必要がある。無線アクセスネットワークは、１つ以上の無線ネットワークコントローラ（RNC：radio network controller）と共に、１つ以上の基地局（例えば3GPPの用語ではNode Bとも呼ばれる）を有してもよい。論理接続は、通信に関与するつもりのないシステムのネットワークエレメント又はUEにデータを誤って通信することなく、データが伝達され得るUE通信リンクへの特定のネットワークのコンテキスト（context）を提供する。

【０００３】

3GPPにより規定された無線アクセスネットワークシステムでは、ユーザ端末と無線アクセスネットワークとの間の論理接続は、RRC（radio resource control）接続状態により規定される。２つの主なRRC接続状態は、RRC接続及びRRCアイドルとして規定される。

【０００４】

ユーザ端末と無線アクセスネットワークとの間に論理接続が存在する場合、ユーザ端末はRRC接続状態であると言われる。RRC接続状態のユーザ端末の存在は、セル又は複数のセル内で決定され得る。従って、特定のユーザ端末の無線リソースは、無線ネットワークにより効率的に管理され得る。RRC接続状態に対して、RRCアイドル状態のユーザ端末は無線アクセスネットワークへの論理接続を有さない。従って、RRCアイドル状態のユーザ端末は、セルより大きいコアネットワーク又はエリア（位置エリア又はルーティングエリア等）内でのみ決定され得る。

【０００５】

ユーザ端末が最初にユーザにより電源が入れられると、PLMN（public land mobile network）が選択され、ユーザ端末は、キャンプする適切なセル（suitable cell to be camped on to）を検索し、対応するセルでRRCアイドル状態に留まる。初期のRRC接続は、ネットワーク又はユーザ装置により開始され得る。例えば、RRCアイドル状態のUEのときのUEにより開始された接続の場合、UEは、ネットワークへの初期の接続を要求し、RRC接続要求メッセージをネットワークに送信する。更なる例を用いて、ネットワークに

より開始された接続の場合、RRC接続要求メッセージはまた、ネットワーク（RRC接続手順の開始を確かめるためにUEにページングメッセージを送信したネットワーク）からのページングメッセージの受信に応じてUEにより送信され得る。

【０００６】

従って、UEによるRRC接続要求には複数の理由が存在する。例えば、(1)初期のセルアクセス：UEが発呼を行おうとするときにUEはRRC接続を確立する必要がある。(2)ページング応答：ページングメッセージに応答メッセージを送信する場合である。(3)セル更新：UEがアイドルモード中に適切なセルを選択する場合である。(4)UTRANルーティングエリア（URA：UTRAN Routing Area）更新：UEがアイドルモード中に適切なURAを選択する場合である。(5)MBMS（Multimedia Broadcast and Multicast）サービスを受信してMBMSポイントツーポイント接続を要求するためのMBMS接続である。

【０００７】

通常のRRC接続手順では、ユーザ端末は、共通上りリンクトランスポートチャネルを使用してRRC接続要求メッセージをネットワークに送信することにより、接続手順を開始する。共通上りリンクトランスポートチャネルは、複数のUEにより共有されており、スケジューリングされないデータ送信に使用される。

【０００８】

ネットワークは接続要求を検討し、（許可の成功の場合）RRC接続設定メッセージ又は（許可の失敗の場合）RRC接続拒否メッセージを下りリンクで返信し得る。双方の場合に、メッセージは、（上りリンク共通チャネルと同様に）複数のUEにより共有され、スケジューリングされないデータ送信に使用される共通下りリンクトランスポートチャネルを使用して送信される。

【０００９】

この初期のRRC接続段階中にユーザ端末からネットワークへのメッセージが送信される共通トランスポートチャネルは、ランダムアクセスチャネルと呼ばれる。ランダムアクセス送信は、送信の明示的なスケジューリング又は調整が実行されないため、同様にスケジューリングされない送信とも呼ばれることがある。この明示的な調整がないため、１つの移動体が他のユーザと同じ上りリンク送信リソース又は上りリンク識別情報を使用して送信する可能性が存在する。この例では、双方の送信の通信信頼度は、上りリンクメッセージが受信側基地局で生成するときの相互の論理的又は実際の干渉のため損なわれることがある。１つより多くの移動体が所定の一式の上りリンクリソースで送信するこれらの場合は、衝突と呼ばれることがある。

【００１０】

衝突、スケジューリングされないアクセス及びスケジューリングされるアクセスの更なる詳細は、発明者Nicholas W. ANDERSONにより“FREQUENCY DOMAIN UNSCHEDULED TRANSMISSION IN A TDD WIRELESS COMMUNICATIONS SYSTEM”という題名で2005年10月31日に出願された米国特許出願第11/263,044号に見出され得る。この内容が参照として取り込まれる。

【００１１】

ネットワークからユーザ端末に対応するメッセージを伝達する共通下りリンクトランスポートチャネルは、フォワードアクセスチャネル（FACH：forward access channel）と呼ばれる。

【発明の開示】

【発明が解決しようとする課題】

【００１２】

典型的には、システムリソースは、これらの上りリンク及び下りリンク共通トランスポートチャネルについて確保される。典型的には、共通チャネルに使用される無線リソースは、他のトランスポートチャネルに使用される無線リソースと分離される。他の種類のトランスポートチャネルの例は、個別トランスポートチャネルと共有トランスポートチャネルとを含む。個別トランスポートチャネルの場合、データは、長期に特定のユーザ又は接

続に割り当てられた全無線リソースの一部にマッピングされる。逆に共有チャネルの場合、各ユーザのデータは、典型的にはネットワークのMACレイヤ（レイヤ2）にあるリソーススケジューラの制御で、一式の全無線リソース内に割り当てられた無線リソースのプールの一部に動的にマッピングされる。従って、この場合の無線リソースは、ユーザ間で共有され、スケジューラにより仲裁される。これは、ユーザが無線リソースを共有するがスケジューリングされない方法で共有する共通チャネルの場合と対照的である。

【００１３】

共有チャネルの使用は、それぞれ特定のトラヒック形式に割り当てられるシステム内での複数のチャネル形式（共通、共有及び個別の形式の組み合わせ等）の使用に比べて、システム容量のみについて利点を提供し得る。この理由は、全てのトラヒック形式を共有チャネルのみに多重することにより、スケジューラは、各トラヒック形式により提示される変化する瞬時負荷に割り当てられたリソースを動的に適合することができるからである。これに対して、例えば１つのトラヒック形式を共通チャネルに排他的に割り当て、他のトラヒック形式を共有チャネルに排他的に割り当てる場合、各トラヒック形式により与えられるトラヒック負荷の変化は、最初に共通チャネルに割り当てられて次に共有チャネルに割り当てられた全無線リソース空間の各部分を再構成せずに、適応不可能である。典型的には、この無線リソースの再構成は低速の処理であり、従って、システムは負荷の高速の変化に対応できない。この結果、現在のシステムでは、共通チャネルに割り当てられた全無線リソース空間の一部は、しばしば最悪の場合を考慮して設計されなければならず、従って、無線リソース使用効率が次善になる。

【００１４】

通常のRRC接続確立手順に続いて、UEの存在はネットワークに認識され、接続確立手順の完了時にのみ、共有チャネルアドレス又はUE IDがネットワークにより割り当てられ得る。従って、共有チャネルは、通常のRRC接続手順が共通チャネル手順を使用して実現された後にのみ使用され得る。従って、接続確立トラヒックを伝達するために、全無線リソース空間のかなりの部分が共通チャネルに予め割り当てられなければならない。共有チャネル動作に使用されるユーザ端末特有のレイヤ2接続コンテキスト（layer 2 connection context）は、RRC接続手順の完了時にのみ確立され得る。

【００１５】

更に、既知の無線通信システムは、共有チャネル動作の初期のレイヤ2コンテキストを確立するために、かなりの量の時間を費やし、非共有及び共通チャネルで複数のシグナリングメッセージを交換する。これは、通信遅延の一因となり得る。更に、複数のチャネル形式と、関連するプロトコル、手順及び属性との存在は、システム実装の複雑性をかなり増加させ得る。

【００１６】

前述の理由で、無線リソース使用効率を改善し、通信遅延を低減し、システム実装の複雑性を簡略化するために、初期のシステムアクセス及びRRC接続手順への改善が望まれる。

【課題を解決するための手段】

【００１７】

本発明の或る実施例は、ネットワークがUEにより導かれた一時識別子をネットワークにより選択された識別子と置換することを決定するまで、UEが一時識別子として自分のレイヤ2アドレスを導くことを可能にし、また、UEがネットワークからの下りリンクメッセージを監視する一式のチャネルを通信することを可能にすることにより、レイヤ2の共有チャネルコンテキストの迅速な確立を提供する。この組み合わせにより、システムは、接続確立の非常に早い段階で共通チャネルの代わりに共有チャネルを利用することが可能になり、共通チャネルで伝達されるトラヒック量を最小化することに役立ち、また、衝突回避にも役立つ。

【００１８】

本発明の或る実施例は、ユーザ装置とネットワーク装置との間で無線通信システムの共

有物理リソースで無線接続及びその後の通信を開始する方法を提供し、ユーザ装置により、一時識別子を導き、チャネルセットを導き、初期のメッセージをネットワーク装置に送信し、初期のメッセージは一時識別子を有し、導かれたチャネルセットに属するチャネルで、一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、スケジューリングされたリソースは、ネットワーク装置によりユーザ装置に割り当てられたリソースを有し、下りリンクメッセージに応じてスケジューリングされたリソースでデータを通信することを有する。

【００１９】

本発明の或る実施例は、様々な組み合わせで以下の選択肢の１つ以上を提供する。チャネルセットは複数のチャネルを有する。チャネルセットを導くことは、複数のチャネルセットからチャネルセットをランダムに選択することを有する。チャネルセットを導くことは、グローバルUE識別子に基づいてチャネルセットを決定することを有する。例えば、グローバルUE識別子は、TMSI（temporary mobile subscriber identity）、IMSI（international mobile subscriber identity）、又はIMEI（international mobile equipment identity）のうち１つを有する。チャネルセットを導くことは、物理リソースの１つ以上の特性の関数としてチャネルセットを決定することを有し、初期のメッセージを送信することは、物理リソースで初期のメッセージを送信することを有する。例えば、物理リソースの特性は、時間のパラメータ、周波数のパラメータ及び／又は符号のパラメータのうち１つ以上を有する。チャネルセットを導くことは、物理リソースの特性、グローバルUE識別子、及び一時識別子のうち１つ以上に基づいてチャネルセットを決定することを有する。初期のメッセージは、グローバルUE識別子を更に有する。物理リソースを決定することを更に有し、初期のメッセージを送信することは、決定された物理リソースに従って初期のメッセージを送信することを有する。チャネルセットの指示を伝達することを更に有する。チャネルセットの指示を暗示的に通信することを更に有する。初期のメッセージをネットワーク装置に送信することは、スケジューリング要求メッセージを送信することを有する。初期のメッセージをネットワーク装置に送信することは、RRC接続要求メッセージを送信することを有する。初期のメッセージを送信した後、且つ下りリンクメッセージを受信する前にタイムアウトし、異なる物理リソースを決定し、異なる物理リソースで初期のメッセージを再送信することを更に有する。及び／又は、無線通信システムは、E-UTRAN（evolved UMTS Terrestrial Radio Access Network）を有する。

【００２０】

本発明の或る実施例は、ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する際に使用されるユーザ装置を提供し、メモリと、メモリに結合されたプロセッサと、プロセッサで実行可能なプログラムコードとを有し、プログラムコードは、一時識別子を導き、チャネルセットを導き、初期のメッセージをネットワーク装置に送信し、初期のメッセージは一時識別子を有し、導かれたチャネルセットに属するチャネルで、一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、スケジューリングされたリソースは、ネットワーク装置によりユーザ装置に割り当てられたリソースを有し、下りリンクメッセージに応じてスケジューリングされたリソースでデータを通信するように動作可能である。

【００２１】

本発明の或る実施例は、様々な組み合わせで以下の選択肢の１つ以上を提供する。チャネルセットを導くことは、複数のチャネルセットからチャネルセットをランダムに選択することを有する。チャネルセットを導くことは、物理リソースの１つ以上の特性（例えば、時間、周波数及び符号）の関数としてチャネルセットを決定することを有し、初期のメッセージを送信することは、物理リソースで初期のメッセージを送信することを有する。一時識別子をネットワーク装置に送信することは、一時識別子とスケジューリングされたリソースの要求とを有する第１の上りリンクメッセージ内で一時識別子を送信することを有する。チャネルセットを導くことは、物理リソースの特性、グローバルUE識別子、及び

一時識別子のうち１つ以上に基づいてチャネルセットを決定することを有する。プログラムコードは、物理リソースを決定するように更に動作可能であり、初期のメッセージを送信することは、決定された物理リソースに従って初期のメッセージを送信することを有する。及び／又はプログラムコードは、チャネルセットの指示を伝達するように更に動作可能である。例えば、プログラムコードは、チャネルセットの指示を暗示的に通信するように更に動作可能である。

【００２２】

本発明の或る実施例は、ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する際に使用されるネットワーク装置を提供し、メモリと、メモリに結合されたプロセッサと、プロセッサで実行可能なプログラムコードとを有し、プログラムコードは、ユーザ装置により送信された初期のメッセージを受信し、チャネルセットを決定し、ユーザ装置にスケジューリングされたリソースを割り当て、スケジューリングされたリソースは、共有チャネルのリソースを有し、決定されたチャネルセットに属するチャネルで下りリンクメッセージを送信し、下りリンクメッセージは、一時識別子とスケジューリングされたリソースの記述とを伝達し、下りリンクメッセージに応じてスケジューリングされたリソースでデータを通信するように動作可能である。

【００２３】

本発明の或る実施例は、チャネルセットを決定することを提供し、チャネルセットを決定することは、初期のメッセージからチャネル指示を抽出し、チャネル指示は、チャネルセットを示す。或いは、チャネルセットを決定することを提供し、チャネルセットを決定することは、初期のメッセージを伝達する物理リソースからチャネルセットを決定することを有する。

【００２４】

本発明の或る実施例は、ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始するプログラムコードを有するコンピュータプログラムプロダクトを提供し、一時識別子を導き、チャネルセットを導き、初期のメッセージをネットワーク装置に送信し、初期のメッセージは一時識別子を有し、導かれたチャネルセットに属する下りリンクチャネルで、一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、スケジューリングされたリソースは、ネットワーク装置によりユーザ装置に割り当てられたリソースを有し、下りリンクメッセージに応じてスケジューリングされたリソースでデータを通信するプログラムコードを有する。

【発明を実施するための最良の形態】

【００２５】

本発明の他の特徴及び態様は、添付図面を考慮して以下の詳細な説明から明らかになる。添付図面は、本発明の実施例による特徴を一例として示している。要約は本発明の範囲を限定することを意図するものではなく、本発明の範囲は単に特許請求の範囲により規定される。

【００２６】

以下の説明では、本発明の複数の実施例を示す添付図面を参照する。他の実施例が利用されてもよく、この開示の要旨及び範囲を逸脱することなく、機械的、構成的、構造的、電気的及び動作的な変更が行われてもよいことがわかる。以下の詳細な説明は限定の意味で受け取られるべきではなく、本発明の実施例の範囲は、発行された特許の請求項のみにより規定される。

【００２７】

以下の詳細な説明のいくつかの部分は、手順、ステップ、論理ブロック、処理及び他のコンピュータメモリで実行可能なデータビット上の動作の象徴的な表現で提示される。ここでは、手順、コンピュータ実行ステップ、論理ブロック、処理等は、所望の結果をもたらすステップ又は命令の首尾一貫したシーケンスであると考えられる。ステップは、物理

量の物理的操作を利用するものである。これらの量は、コンピュータシステムで格納、伝達、結合、比較、操作可能な電気的、磁気的又は無線信号の形式になり得る。これらの信号は、ときどき、ビット、値、要素、シンボル、文字、語、数字等として呼ばれることがある。各ステップは、ハードウェア、ソフトウェア、ファームウェア又はこれらの組み合わせにより実行されてもよい。

【００２８】

以下の図面は、通常のUMTSシステム（Universal Mobile Telecommunications System）を参照して本発明を説明するが、本発明の実施例は、他の無線システムにも同様に適用し得る。通常のUMTSシステムは、通常では複数のユーザ装置（UE：user equipment）（場合によって、ユーザ端末、移動局、移動端末、無線データ端末及びセルラ電話と呼ばれる）を有する。通常のUMTSシステムはまた、Node B（基地局とも呼ばれる）を含むネットワーク装置を有する。ネットワーク装置は、UEとネットワークとの間の無線アクセス接続を提供し、また、無線ネットワークコントローラ（RNC：radio network controller）も同様に含む。

【００２９】

図１Ａ及び１Ｂは、通常のUMTSシステムでRRC（radio resource connection）アイドル状態からRRC接続状態に推移する通常のメッセージシーケンスを示している。通常のUMTSシステムでは、RRCアイドル状態のUEは、図１Ａ及び１Ｂに示す手順を通じてRRC接続を開始してもよい。UE及びネットワークは、論理制御チャネルでメッセージを交換してもよい。各論理制御チャネルは、共通トランスポートチャネルにマッピングされる。

【００３０】

図１Ａは、無線インタフェース（Uu）で交換されるメッセージを示している。図示の最初のメッセージはRRC接続要求メッセージであり、RRC接続要求メッセージは、ネットワークに既知のUE識別子（グローバルUE識別子（ID）として示す）と、確立理由とを有する。ネットワークに既知のUE識別子は、ネットワークにより割り当てられたTMSI（temporary mobile subscriber identity）、UEのIMSI（international mobile subscriber identity）、又はUEのIMEI（international mobile equipment identity）のうち１つでもよい。確立理由は、UEがネットワークに接続を要求する理由を示す。ページングメッセージへの応答メッセージを送信するとき（ページング応答）、アイドルモード中に適切なセルを選択するとき（セル更新）、アイドルモード中に適切なURAを選択するとき（URA更新）、及びMBMSサービス又はMBMSポイントツーポイント接続を受信するとき（MBMS接続）、UEは接続を要求してもよい。

【００３１】

次に、ネットワークは許可制御を実行し、RNTI（Radio Network Temporary Identifier）値を割り当てる。ネットワークは、確立理由から要求されたサービスがネットワークによりサポート可能であるか否かを決定するために、許可制御処理を使用する。許可制御を実行するときに考慮される要因は、特権を決定する移動アクセスクラスと、リソースの可用性を決定するRRM（Radio Resource Management）状態と、ユーザの加入の詳細と、有効な端末及び盗難された端末のリストを含む装置登録とを含んでもよい。

【００３２】

RNTI値の割り当ては、ネットワークがS-RNTI（Serving RNC（Radio Network Controller） RNTI）を割り当てることを含む。S-RNTIは、サービングRNC（Serving RNC）に対して自分を識別するためにUEにより使用される。S-RNTIはまた、UEをアドレス指定するためにSRNCにより使用される。S-RNTI値は、RRC接続を有する各UEにサービングRNCにより割り当てられ、サービングRNC内で一意である。S-RNTIは、RRC接続のサービングRNCが変更した後に再割り当てされてもよい。S-RNTIは、ブロードキャストチャネルで受信したSRNC識別子（SRNC ID）と連結され、UTRAN内で一意のRNTI（U-RNTI：unique RNTI）を形成してもよい。任意選択で、ネットワークは、C-RNTI（Cell Radio Network Temporary Identifier）を割り当ててもよい。C-RNTIは、共通トランスポートチャネルで割り当てられて使用されてもよい。C-RNTI値は、セルでUEを識別するために使用されてもよい。

通常のネットワークでは、C-RNTIを使用する決定は、制御側無線ネットワークコントローラ（CRNC：Controlling Radio Network Controller）により行われる。

【００３３】

ネットワーク装置が許可制御処理及び割り当て処理の成功を実行した後に、ネットワークは、グローバルUE ID、新たに割り当てられたS-RNTI値、任意選択のC-RNTI値、及び無線ベアラ構成を有するRRC接続設定メッセージで、RRC接続要求メッセージに応答する。

【００３４】

RRC接続設定メッセージがUEにより処理されると、UEは、RRC接続設定完了メッセージで応答する。RRC接続設定完了メッセージは、ヘッダフィールドにC-RNTI値を伴い、UE無線アクセス機能を有する。この時点で、UEはRRC接続状態に入る。

【００３５】

RRC接続設定完了メッセージを受信したことに応じて、高速下りリンク共有チャネル（HS-DSCH：high speed downlink shared channel）が下りリンクデータ伝送に使用される場合、ネットワークは、UEへのRRC無線ベアラ設定メッセージ内でUEにH-RNTI値を割り当ててもよい。H-RNTI値は、高速下りリンク共有チャネルでUEを識別するために使用される。RRC無線ベアラ設定メッセージは、割り当てられたS-RNTIと、割り当てられたH-RNTIと、共有チャネル無線ベアラ構成とを有する。UEは、RRC無線ベアラ設定完了メッセージで応答することにより処理を完了する。この時点で、UE及びネットワークは、共有チャネル動作のレイヤ2コンテキスト（layer 2 context）を確立する。

【００３６】

図１Ｂは、UE及びネットワーク装置の要素と、これらの要素間のメッセージを示している。UEは、RRCレイヤを含むレイヤ3と、RLC（Radio Link Control）レイヤ及び媒体アクセス制御（MAC：medium access control）レイヤを含むレイヤ2と、物理レイヤ（L1）を含むレイヤ1とを有する。Node Bは、レイヤ1の物理レイヤ（L1）を有する。RNCは、MACレイヤ及びRLCレイヤを含むレイヤ2と、RRCレイヤ及びRRMレイヤを含むレイヤ3とを有する。Node BとRNCとの双方に更なるレイヤ1機能が存在し、これらのエンティティの間の物理接続（lubインタフェース）を提供する点に留意すべきである。しかし、これらは図面を明瞭にするために図示されていない。RRC接続要求メッセージは、UEのRRCレイヤにより開始される。RRCは、RLCレイヤにメッセージを送信し、RLCレイヤは、RLCトランスペアレントモード（TM：transparent mode）を使用してランダムアクセスチャネル（RACH：random access channel）にマッピングされた共通制御チャネル（CCCH：common control channel）でRRC接続要求メッセージを送信する。トランスペアレントモード（TM）を使用するときに、メッセージ送信者は、承認モード（AM：acknowledgement mode）及び不承認モード（UM：unacknowledged mode）と異なり、メッセージシーケンス識別子を含めない。承認モード（AM）及び不承認モード（UM）の双方は、順序が狂ったパケットを識別／並び替え、損失したパケットを識別するために使用され得るメッセージシーケンス識別子を有する。承認モード（AM）は、メッセージ再送信を更に提供する。CCCHは、RLCレイヤとMACレイヤとの間の共通論理制御チャネルであり、RACHは、MACレイヤとL1レイヤとの間の共通トランスポートチャネルである。RRC接続要求メッセージは、無線インタフェース（Uu）でネットワークに送信される。

【００３７】

RRC接続要求メッセージを受信すると、Node Bのレイヤ1は、メッセージをランダムアクセスチャネル（RACH）チャネルでRNCのMACレイヤに送信する。RACHチャネルは、複数のUEにより共有され、スケジューリングされないデータ送信に使用され得るランダムアクセス物理リソースで、UEから制御及びデータ情報を伝達するために使用される共通上りリンクトランスポートチャネルである。MACレイヤは、CCCHチャネルでRLCレイヤにメッセージを送信する。次に、RLCレイヤは、メッセージをRRCレイヤに送信し、RRCレイヤは、許可制御、S-RNTI値の割り当て、及び任意選択のC-RNTI値の割り当てのために、メッセージをRRMレイヤに送信する。

【００３８】

許可制御及びS-RNTI値の割り当ての成功の後に、RRMは、割り当てられたS-RNTI値をRRCレイヤに返信し、RRCレイヤは、不承認モード（UM）で送信されるRRC接続設定メッセージを形成する。典型的には、セル内でUEを識別するC-RNTIも割り当てられる。しかし、個別物理チャネル接続が直ちに構成される場合、C-RNTIは省略されてもよい。RRCは、RRC接続設定メッセージをRLCレイヤに送信する。RLCレイヤは、CCCHチャネルでMACレイヤにメッセージを送信する。ネットワークとUEとの間に共通RNTIコンテキストがまだ存在しないため、CCCHが使用される。すなわち、ネットワークはRNTI値を認識しているが、UEはこの段階でRNTIを認識していない。MACレイヤは、フォワードアクセスチャネル（FACH：Forward Access Channel）でメッセージを送信する。FACHチャネルは、ネットワークがUEの位置セルを認識しているときに、UEに制御及びデータ情報を伝達するために使用され得る共通下りリンクトランスポートチャネルである。FACHは、スケジューリングされない下りリンクデータ送信のため、複数のUEにより共有されてもよい。Node Bのレイヤ1は無線インタフェース（Uu）でUEにメッセージを送信する。

【００３９】

不都合なことに、FACHチャネルを監視する各UEは、同封のメッセージがそれにアドレス指定されているか否かを決定するために、１つ１つのRRC接続設定メッセージ及び他のメッセージをデコードする。UEによるRRC接続設定メッセージの受信時に、UEのレイヤ1は、FACHチャネルでそのMACレイヤにメッセージを送信する。MACレイヤは、CCCHチャネルでRLCレイヤにメッセージを送信し、次に、RLCレイヤは、UEのRRCレイヤにメッセージを送信する。UEのRRCレイヤは、接続設定メッセージに含まれるグローバルIDフィールドを検査し、UEの自分のグローバルIDに合致するか否かを決定してもよい。合致しない場合、メッセージは破棄される。IDが合致する場合、メッセージはデコードされ、UEは、S-RNTI値及び場合によってはC-RNTI値の割り当てを登録する。この時点で、UEは、割り当てられた個別制御チャネル（DCCH：dedicated control channel）を有している。

【００４０】

次に、UEはRRC接続設定完了メッセージを使用して応答し、RRC接続設定完了メッセージは、承認モード（AM）を使用してネットワークに送信される。RRCレイヤは、メッセージをRLCレイヤに送信し、RLCレイヤは、RRC接続設定完了メッセージをMACレイヤに送信するためにDCCHチャネルを使用する。MACレイヤは、RACH（共通トランスポート）チャネルで物理レイヤ（L1）にメッセージを送信し、物理レイヤ（L1）は無線インタフェース（Uu）でNode Bにメッセージを送信する。共通トランスポートチャネルリソースでDCCHで送信されたデータは、ヘッダフィールドを伴い、ヘッダフィールドには、セルでRACH（共通トランスポート）チャネルを使用する複数の他のUEからセルのUEを区別するためにC-RNTIが含まれる。個別又は共有トランスポートチャネルで送信されたデータについては、ユーザ識別／アドレス指定が物理リソースレベルで完了している（物理リソースとユーザ端末との間のマッピングは物理レイヤでわかる）ため、C-RNTIはヘッダに必要ない。UEがRRC接続設定完了メッセージを通信すると、UEはRRC接続状態に入る。

【００４１】

次に、Node Bは、無線インタフェース（Uu）でRRC接続設定完了メッセージを受信する。そのレイヤ1は、RACHチャネルを使用してメッセージをRNCのMACレイヤに送信する。MACレイヤは、ヘッダ（C-RNTIを含む）を読み取り、適切なDCCHチャネルを使用してメッセージを適切なRLCエンティティに送信する。RLCは、メッセージをRRCレイヤに送信する。

【００４２】

ネットワークは、UEが高速下りリンク共有チャネル（HS-DSCH：high speed-downlink shared channel）で通信するときにUEを識別するために他の値を使用する。この値は、RRCレイヤにより割り当てられ、H-RNTI（HS-DSCH RNTI）値として指定される。H-RNTI値は、UEがHS-DSCHチャネルで確立した接続を有する間の一時識別子として使用される。ネットワークは、RLCレイヤとMACレイヤとの間のDCCHチャネルと、MACレイヤとUEのレイヤ1との間のFACHチャネルとを使用して、無線ベアラ設定メッセージ内で割り当てられたH-RNTI値をUEに送信する。Node Bは、無線インタフェース（Uu）でUEにメッセージを送信

する。UEのレイヤ1は、FACHチャネルでそのMACレイヤにメッセージを送信し、MACレイヤは、DCCHチャネルでRLCにメッセージを送信する。RLCは、RRCレイヤにメッセージを送信し、RRCレイヤは、RLC承認モード（AM）を使用してネットワークに送信されるRRC無線ベアラ設定完了メッセージで応答する。UEのRRCレイヤとRNCのRRCレイヤとの間のチャネルパスは、RRC接続完了メッセージを伝達するための前述のチャネルパスの折り返しである。

【００４３】

H-RNTIを割り当てられると、次に、UEは、下りリンク通信に高速（hs）下りリンク共有（トランスポート）チャネルを利用してもよい。このチャネルのリソース割り当ては、Node-BのMAC-hsエンティティにあるスケジューラにより許可される。MAC-hsエンティティは、UE識別子としてH-RNTIを使用することにより高速下りリンク共有チャネル割り当てを行うときに、セル内のUEをアドレス指定することができる。

【００４４】

MAC-hsエンティティは、接続設定手順及び関連するメッセージに関与していないため、図面に図示されていない。RRC接続を確立するために使用されるメッセージは、共有トランスポートチャネルで伝達されない。

【００４５】

この時点で、UE及びネットワークは、レイヤ2共有チャネルコンテキストを確立及び形成しており、ネットワークは、共有チャネル識別子をUEに割り当てている。このレイヤ2コンテキストを形成する際に、ネットワークは識別子を割り当て、３つの上りリンクメッセージと２つの下りリンクメッセージとを交換している。

【００４６】

本発明の実施例によれば、UEは、一時識別子（temp ID）を導き、共有トランスポートチャネルでのより迅速な通信のために、レイヤ2コンテキストを迅速に確立する。このより迅速なレイヤ2コンテキストは、共通トランスポートチャネルでの多数の通信の必要性を除去することができ、共通チャネルの利用可能な全無線リソースのかなりの部分を確保する必要性を除去することができる。このような割り当ては、再構成するのが典型的に遅く、従って、トラヒック負荷の急速な変化に応じることができない。UEにより導かれた一時識別子が使用期間中にネットワークで一意である場合、UEは、共有チャネルで一意に識別され、データは、通常のシステムの場合のように静的に割り当てられた共通リソースを介してではなく、共有チャネルリソースの動的な割り当てを介して通信され得る。更に、ネットワークは、RRC接続処理中又はRRC接続処理後にUEにより導かれた一時識別子を更新してもよい。

【００４７】

図２、３Ａ及び３Ｂは、本発明に従ってユーザ装置（UE）とコアネットワーク（CN）とで動作するUTRANネットワークとE-UTRAN（evolved UTRAN）ネットワークとを比較している。

【００４８】

図２は、複数のUEとUTRANネットワーク装置とを示している。UTRANネットワーク装置は、コアネットワークへのUEのリンクを提供する。UTRANネットワーク装置（無線アクセスネットワーク（RAN：Radio Access Network）とも呼ばれる）は、１つ以上の無線ネットワークサブシステム（RNS：Radio Network Subsystem）を有する。各RNSは、無線ネットワークコントローラ（RNC）と、１つ以上のNode Bとを有する。RRCシグナリングについて、RNCはRRM、RRC、RLC及びMACシグナリングレイヤを提供し、Node Bはレイヤ1を提供する。

【００４９】

図３Ａは、本発明の或る実施例に従って本発明を実施するアーキテクチャを示している。E-UTRAN（evolved UTRAN）ネットワークは、UTRANアーキテクチャを簡略化し、構成要素間のインタフェースの数を低減するためのLTE（long term evolution）プラットフォームを提供する。“evolved”及び“E-”の指定は、本発明の対応する構成要素又は要素

と類似し得る通常の構成要素又は要素と区別するために使用され得る。E-UTRANネットワークは、コアネットワーク（CN）と通信するためのUEのリンクを提供する。E-UTRANは、１つ以上のE-Node B（evolved Node B）に結合されたLTEゲートウェイ（LTE GW）を有する。E-Node Bは、図２のNode BとRNCとの双方の機能を実行する。LTEゲートウェイは、コアネットワークとE-Node Bとの間のインタフェースを提供する。RRCシグナリングについて、E-Node BはRRM、RRC、RLC、MAC及びL1シグナリングレイヤを提供する。ここで、簡略化のため、“evolved”及び“E-”の指定がE-UTRANネットワーク内のいくつかのラベルの構成要素から省略されている。

【００５０】

図３Ｂは、E-UTRANネットワークの代替アーキテクチャを示している。LTEゲートウェイは、コアネットワークとE-Node Bとの間のインタフェースを提供し、また、RRCシグナリングのためのRRM及びRRCレイヤを提供する。このアーキテクチャでは、E-Node Bは、RLC、MAC及びL1シグナリングレイヤを提供する。

【００５１】

図３Ａ及び３Ｂの実施例は、レイヤ1処理と共に配置されるMACレイヤ及びRLCレイヤを提供し、これはシグナリング待ち時間を低減することに役立つ。図３Ａは、RRC接続確立手順中に使用される各レイヤの集合を示しており、これはシグナリング待ち時間を低減することに更に役立つ。

【００５２】

図４は、本発明によるユーザ装置の構成要素を示している。ユーザ装置は、UEにより導かれた一時識別子を保持するメモリと、プロセッサと、UEにより導かれた一時識別子を導いて識別子をメモリに格納するように実行可能なプログラムコードと、E-UTRANネットワーク装置と通信するトランシーバとを有する。メモリは、RAMのような揮発性メモリでもよく、フラッシュ（EEPROM）のような不揮発性メモリでもよい。メモリは、UEの回路の構成要素でもよく、UEの筐体に設置されたスマートカードでもよい。プロセッサは、RISC（reduced instruction set computer）、汎用プロセッサ、専用プロセッサ、ゲート論理実装プロセッサ等でもよい。プログラムコードは、実行可能な機械コード、オブジェクトコード、スクリプト、又は他のコンピュータ解釈コード若しくはコンパイルコードでもよい。プログラムコードは、圧縮されてもよく、圧縮されなくてもよく、エンコードされてもよく、エンコードされなくてもよい。トランシーバは、TDD（time division duplex）方式又はFDD（frequency division duplex）方式で動作するCDMA（code division multiple access）送信機／受信機の対でもよい。

【００５３】

図５Ａ及び５Ｂは、本発明による初期のシグナリングシーケンスを示している。各図において、まず、UEは一時識別子（temp ID）を導く。一時識別子を導く処理は、本発明の異なる実装の間で変化してもよい。一時識別子の導出は、E-Node BのE-MACエンティティによりスケジューリングされた共有トランスポートチャネルでのレイヤ2メッセージの迅速なレイヤ2コンテキストを提供する。一時識別子の導出は、２つのUEが同じ一時識別子を導く許容レベルの可能性を最小化するように生じることが好ましい。２つのUEがセル内で同じ一時識別子を導き、重複する期間中にこれらを使用しようとする場合、更なる衝突検出及び回復手順が実施されてもよい。

【００５４】

本発明の或る実施例では、UEは、ネットワークに既知のUE識別子の一部から一時識別子を形成することにより、一時識別子を導く。ネットワークに既知のUE識別子は、ネットワークにより割り当てられたTMSI（temporary mobile subscriber identity）、UEのIMSI（international mobile subscriber identity）、又はUEのIMEI（international mobile equipment identity）のうち１つでもよい。UEは、TMSI、IMSI又はIMEIの所定数の最小位ビットを使用してもよい。例えば、TMSIが利用可能である場合、UEは、32ビットのTMSIのうち下位の16ビットを使用することにより、temp IDを導いてもよい。TMSIが利用可能でない場合、UEは、32ビットのIMSIのうち下位の16ビットを使用してもよい。TMSI

もIMSIも利用可能でない場合、UEは、32ビットのIMEIのうち下位の16ビットを使用してもよい。

【００５５】

本発明の或る実施例では、UEは、複数の一時識別子から一時識別子を選択することにより、一時識別子を導いてもよい。複数の一時識別子は、共通のビット長の可能な値の一部を有してもよい。例えば、複数の一時識別子は、16ビットの可能な並び替えのうち1/8を有してもよい。ネットワークは、将来のUEにより導かれた値との潜在的な衝突の可能性を除去するために、残りの7/8の可能な並び替えから値を選択することにより、一時識別子を再割り当てしてもよい。複数の一時識別子は、RAM又はROMに格納されたテーブルの形式でもよい。或る実施例では、複数の一時識別子はUEにより生成される。或る実施例では、複数の一時識別子はネットワークからUEに伝達される。或る実施例では、複数の一時識別子の指示はネットワークからUEにブロードキャストチャネル（BCH）でブロードキャストされる。或る実施例では、複数の一時識別子は不揮発性メモリに保存される。

【００５６】

或る実施例では、UEにより導かれた一時識別子はまた、時間又は無線フレーム番号の関数でもよい。この関数は、所定のパターンに従って変化してもよく、例えばブロードキャストチャネル（BCH）でUEに伝達されてもよい。代替として、変化パターンは、その導出にランダムな要素を有してもよい。一時識別子を導くときのユーザ装置による時間変化する構成要素又は時間パラメータ（システムクロック、スーパーフレーム番号、無線フレーム番号、サブフレーム番号、タイムスロット番号等）の使用は、２つ以上のユーザが所定の時間フレーム内で同じ一時識別子を選択する可能性を低減することに有利に役立ち得る。

【００５７】

一時識別子を導いた後に、UEは、第１の上りリンクメッセージでこのUEにより導かれた一時識別子をE-UTRANネットワークに送信する。ネットワークが初期の一時識別子を受信するとすぐに、初期のL2共有チャネルコンテキストが形成される。この時点で、UEとネットワークとの双方は、一時識別子の値を認識する。しかし、この接続は衝突する可能性があり、ネットワークが置換一時識別子を再割り当てしたときに、（衝突の可能性のない）永続的な接続が形成され得る。

【００５８】

temp IDの受信時に、ネットワークは物理リソースを割り当てる。割り当てられた物理リソースは、UEがデータメッセージを正確にエンコード及び送信すること又は正確に受信及びデコードすることを可能にするように、UEに割り当てられたリソースを記述する。この記述は、(1)明示的な又は関連の送信時間、(2)物理チャネルリソースの記述（符号、周波数、サブキャリア、時間／周波数符号等）、(3)リソースでのデータのフォーマット形式、及び／又は(4)FEC符号化形式、ブロックサイズ、変調フォーマット等のような属性を有してもよい。

【００５９】

この物理リソースは、上りリンクリソース（図５Ａに示す）又は下りリンクリソース（図５Ｂに示す）でもよい。ネットワークは、宛先アドレスとしてUEにより導かれた一時識別子を含み、割り当てられた物理リソースの記述も含む第１の下りリンクメッセージをUEに送信する。次に、UE及びネットワークは、割り当てられた物理リソースでユーザトラヒックデータ又はシグナリングデータ（データ）を通信する。

【００６０】

図５Ａは、ネットワークにより割り当てられて第１の下りリンクメッセージで記述された上りリンクのスケジューリングされた共有リソースで通信されるデータを示している。上りリンクデータでは、UEが割り当てられた物理リソースの記述を含む第１の下りリンクメッセージを受信して処理した後に、UEはデータを送信しさえすればよい。UEがユーザトラヒックデータ又はシグナリングデータをネットワークに送信しようとするときに、UEは、temp IDを導き、上りリンク物理リソースを取得するこのシーケンスを開始してもよい

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【００６１】

図５Ｂは、ネットワークにより割り当てられて第１の下りリンクメッセージで記述された下りリンクのスケジューリングされた共有リソースで通信されるデータを示している。下りリンクデータでは、UEが割り当てられた物理リソースの記述を含む第１の下りリンクメッセージを受信して処理した後に、UEはデータを受信して処理しさえすればよい。或る実施例では、第１の下りリンクメッセージは、第２の下りリンクメッセージをも含むバーストで伝達されて受信される。この場合、UEは、受信したバーストを処理し、割り当てられた物理リソースを取得する。ユーザトラヒックデータ又はシグナリングデータが割り当てを含む第１の下りリンクメッセージと同じバーストに含まれることを割り当てが示す場合、UEは、受信したバーストを再処理し、第２の下りリンクメッセージを取得してもよい。

【００６２】

通常のシステムは、共通チャネルと共有チャネルとの双方を構成する。リソースの分割は、結合のリソースの効果的な使用を制限する。例えば、特定の時間のほとんどのトラヒックが共通チャネルを使用する場合、共有チャネルはアイドルのままになる。逆に、ほとんどのトラヒックが構成された共有チャネルを使用している場合、共通チャネルは十分に利用されないままになる。本発明の或る実施例によれば、最小の一式のリソースが、図５Ａ及び５Ｂの第１の上りリンクメッセージのようなスケジューリングされないメッセージに割り当てられてもよい。このチャネルの上りリンクメッセージは、temp IDのみを含む短いメッセージ、又は代替としてtemp IDと何の形式のリソースが要求されているかの指示を含む短いメッセージに制限されてもよい。各UEはレイヤ2のアドレス指定可能なtemp IDを使用してネットワークとコンタクトを開始するため、スケジューリングされない下りリンクチャネル（例えばFACH）は、構成されたチャネルから削除されてもよい。リソースの残りは、制御チャネルメッセージ（例えば、第１の下りリンクメッセージ）及びユーザトラヒックデータ又はシグナリングデータ（すなわち、第２の下りリンク又は上りリンクメッセージ）の間で動的に割り当てられてもよい。このようなリソースの割り当ては、リソースのより効率的な使用のため、高帯域のシステムを提供する。

【００６３】

図６Ａ及び６Ｂに示すように、本発明の或る実施例は、上りリンクメッセージにランダムアクセスチャネル（RACH）を利用し、下りリンクメッセージにスケジューリングされたチャネルを利用し、その後の上りリンクメッセージに共通チャネルを利用する。図７Ａ及び７Ｂに示すように、本発明の或る実施例は、第１の上りリンクメッセージにランダムアクセスチャネル（RACH）を利用し、その後の下りリンク及び上りリンクメッセージにスケジューリングされたチャネルを利用する。図８Ａ及び８Ｂに示すように、本発明の或る実施例は、短縮された初期の上りリンクメッセージにランダムアクセスチャネル（RACH）を利用し、その後の下りリンク及び上りリンクメッセージにスケジューリングされたチャネルを利用する。

【００６４】

図６Ａ及び６Ｂは、本発明によるスケジューリングされた下りリンクを使用した詳細なシグナリングシーケンスを示している。UEは一時識別子を導き、第１の上りリンクメッセージで一時識別子をネットワークに送信する。temp IDに加えて、第１の上りリンクメッセージは、確立理由パラメータと２つの任意選択のパラメータ（バッファ占有及びグローバルUE ID）とを有する。確立理由及びグローバルUE IDは、図１Ａを参照して前述した対応のパラメータと同じもの又は類似のものでもよい。

【００６５】

バッファ占有は、UEの送信バッファの送信用の現在の保留データの指示として使用されてもよく、上りリンク送信を許可するリソースの程度を決定するためにNode Bのスケジューラにより使用されてもよい。バッファ占有は、例えば複数の送信フロー、形式又は優先ストリーム毎の単一のビット、量子化された値の範囲、バイトでの絶対値、又は値のリ

ストでもよい。

【００６６】

UEは、トランスペアレントモード（TM）を使用してRRC接続要求メッセージを送信してもよい。ネットワーク装置によるRRC接続要求メッセージの受信時に、ネットワークは、（図１Ａを参照して前述した）許可制御を実行し、確立理由パラメータにより示される物理リソース（上りリンク共有チャネル（UL-SCH：uplink shared channel）又は下りリンク共有チャネル（DL-SCH：downlink shared channel））を割り当てる。任意選択で、ネットワークはまた、S-RNTIと置換temp IDとを割り当ててもよい。

【００６７】

ネットワークは、temp IDを含む下りリンクスケジューリング許可指示を含む第１の下りリンクメッセージを送信し、特定のUEと割り当てられた物理リソースの記述とをアドレス指定する。第１の下りリンクメッセージは、可能なスケジューリングメッセージを予期又は待機するUEにより監視される共有物理制御チャネル（SPCCH：shared physical control channel）で送信されてもよい。ネットワークはまた、置換一時識別子を送信してもよい。ネットワークは、UEにより選択不可能な一意の識別子のリスト又はテーブルから置換一時識別子を選択してもよい。このような置換一時識別子は、第１のUEからのUEにより導かれた一時識別子を含むメッセージが、第２のUEにより導かれた同じ一時識別子を含むメッセージと衝突しないことを確保する。実際に、UEにより導かれた一時識別子は、確実なネットワークにより選択された一意の識別子により置換され得る、限られた期間の一意と期待される識別子を提供する。置換一時識別子は、RRC接続設定メッセージで送信されてもよく、SPCCH許可メッセージに含まれてもよい。

【００６８】

下りリンクスケジューリング許可メッセージの受信時に、UEは、短いスケジューリングメッセージをデコードし、temp IDを検査する。temp IDによりアドレス指定されたUEのみが、下りリンク共有チャネル（DL-SCH：downlink shared channel）で送信された又は送信される長いメッセージをデコードする必要がある。スケジューリング許可メッセージによりアドレス指定されていない他のUEは、CPUサイクル又はバッテリリソースを使い、RRC接続設定メッセージ又は他の長いメッセージをデコードして、メッセージがそれに指示されたか否かを決定する必要はない。

【００６９】

temp IDにより識別されたUEは、下りリンクスケジューリング許可メッセージに記述された割り当てられた物理リソースで送信されたメッセージを受信してデコードする。UEへのこの第２の下りリンクメッセージは、不承認モード（UM）を使用してネットワークにより送信されたRRC接続設定メッセージを有してもよい。任意選択で、RRC接続設定メッセージは、置換temp ID、割り当てられたS-RNTI値、及び／又はグローバルUE IDを有してもよい。UEが置換temp IDを受信すると、UEは、ネットワークでメッセージを伝達するときに、その一時識別子としてこの置換temp IDを使用する。更に、RRC接続要求メッセージからネットワークにより受信された場合、且つ重複するtemp IDの間の衝突がネットワークにより検出された場合、グローバルUE IDがこの第１の下りリンクメッセージに含まれてもよい。或る実施例では、グローバルUE IDは、メッセージに明示的に組み込まれる。他の実施例では、グローバルUE IDは、下りリンクメッセージをエンコードするために使用される（例えばCRC）。

【００７０】

衝突を処理する競合解決処理について、図９及び１０を参照して更に以下に説明する。更に、或る実施例では、無線ベアラ構成は、ブロードキャストチャネル（BCH）を使用して複数のUEに送信されてもよい。

【００７１】

次に、UEは、承認モード（AM）を使用してRRC接続設定完了メッセージを準備して送信することにより、RRC接続設定メッセージを受信して処理するように応答する。置換temp IDがネットワークにより提供された場合、UEは、この新しい値をその一時識別子として

使用する。RRC接続設定完了メッセージもまた、UEの様々な機能を示すUE無線アクセス機能パラメータを有してもよい。

【００７２】

本発明によれば、通常のRRC無線ベアラ設定サービス（図１Ａ）内に含まれる情報は、各UEに個々に伝達されるのではなく、BCHでブロードキャストされてもよい。この理由は、共有チャネルを記述する情報は、セルの複数のUEにより使用され得るからである。

【００７３】

図６Ｂは、UE及びネットワーク装置の要素と、これらの要素間のメッセージを示している。UEは、E-RRC（evolved RRC）レイヤを含むレイヤ3と、E-RLC（evolved Radio Link Control）レイヤ及びE-MAC（evolved MAC）レイヤを含むレイヤ2と、物理レイヤ（L1）を含むレイヤ1とを有する。E-UTRANネットワークは、レイヤ1の物理レイヤ（L1）と、E-MAC（evolved MAC）レイヤ及びE-RLC（evolved RLC）レイヤを含むレイヤ2と、E-RRC（evolved RRC）レイヤ及びE-RRM（evolved RRM）レイヤを含むレイヤ3とを有する。

【００７４】

RRC接続要求メッセージは、UEのE-RRCレイヤにより開始される。E-RRCは、E-RLCレイヤにメッセージを送信し、E-RLCレイヤは、トランスペアレントモード（TM）を使用してランダムアクセスチャネル（RACH）にマッピングされた共通制御チャネル（CCCH）でRRC接続要求メッセージを送信する。CCCHは、E-RLCレイヤとE-MACレイヤとの間の論理制御チャネルであり、RACHは、E-MACレイヤとL1レイヤとの間の共通トランスポートチャネルである。RRC接続要求メッセージは、無線インタフェース（Uu）でネットワークに送信される。

【００７５】

RRC接続要求メッセージを受信すると、ネットワーク装置のレイヤ1は、メッセージをランダムアクセスチャネル（RACH）チャネルでMACレイヤに送信する。MACレイヤは、CCCHチャネルでE-RLCレイヤにメッセージを送信する。次に、E-RLCレイヤは、メッセージをE-RRCレイヤに送信し、E-RRCレイヤは、許可制御、置換一時識別子の割り当て、及び任意選択のS-RNTI値の割り当てのために、メッセージをE-RRMレイヤに送信する。

【００７６】

許可制御並びに任意選択の一時IDの置換及び任意選択のS-RNTI値の割り当ての後に、E-RRMは、割り当てられた値をE-RRCレイヤに返信し、E-RRCレイヤは、不承認モード（UM）で送信されるRRC接続設定メッセージを形成する。E-RLCは、RRC接続設定メッセージをE-RLCレイヤに送信する。E-RLCレイヤは、DCCH又はCCCHチャネルでE-MACレイヤにメッセージを送信する。

【００７７】

単にRRC接続設定メッセージを転送する代わりに、E-MACレイヤは、UEに送信するために、共有物理制御チャネル（SPCCH：shared physical control channel）でレイヤ1にスケジューリング許可メッセージを送信する。UEのレイヤ1は、スケジューリング許可を受信し、スケジューリング許可は、RRC接続設定メッセージを伝達する物理リソースを示す。E-MACレイヤはまた、同時に又は次に、下りリンク共有チャネル（DL-SCH）の割り当てられた物理リソースでRRC接続設定メッセージをレイヤ1に送信する。レイヤ1は、無線インタフェース（Uu）でUEにRRC接続設定メッセージを送信する。好都合なことに、無線インタフェースを監視する各UEは、同封のメッセージがそれにアドレス指定されているか否かを決定するために、長いRRC接続設定メッセージ及び他のメッセージではなく、短いスケジューリングメッセージのみをデコードする。

【００７８】

UEによるRRC接続設定メッセージの受信時に、UEのレイヤ1は、DL-SCHチャネルでそのE-MACレイヤにメッセージを送信する。E-MACレイヤは、DCCH又はCCCHチャネルでE-RLCレイヤにメッセージを送信し、次に、E-RLCレイヤは、UEのE-RRCレイヤにメッセージを送信する。

【００７９】

次に、UEはRRC接続設定完了メッセージを使用して応答し、RRC接続設定完了メッセージは、承認モード（AM）を使用してネットワークに送信される。E-RRCレイヤは、メッセージをE-RLCレイヤに送信し、E-RLCレイヤは、RRC接続設定完了メッセージをE-MACレイヤに送信するためにDCCHチャネルを使用する。E-MACレイヤは、RACHチャネルで物理レイヤ（L1）にメッセージを送信し、物理レイヤ（L1）は無線インタフェース（Uu）でネットワークにメッセージを送信する。UEがRRC接続設定完了メッセージを通信すると、UEはRRC接続状態に入る。

【００８０】

次に、ネットワークは、無線インタフェース（Uu）でRRC接続設定完了メッセージを受信する。そのレイヤ1は、RACHチャネルを使用してメッセージをE-MACレイヤに送信する。E-MACレイヤは、DCCHチャネルを使用してメッセージをE-RLCに送信する。E-RLCは、メッセージをE-RRCレイヤに送信する。

【００８１】

図７Ａ及び７Ｂは、本発明によるスケジューリングされた下りリンクとスケジューリングされない上りリンク及びスケジューリングされた上りリンクとを使用した詳細なシグナリングシーケンスを示している。RRC接続要求メッセージ及びRRC接続設定メッセージのスケジューリング及び交換と、許可制御と、リソースの割り当てとは、図６Ａ及び６Ｂを参照して前述した通りである。図７Ａ及び７Ｂは、共有リソースでその後の上りリンクメッセージを送信することで、前述の実施例と異なる。

【００８２】

特に、UEのE-MACレイヤがそのe-RLCレイヤからRRC接続設定完了メッセージを受信すると、まず、UEのE-MACレイヤは、RACHチャネル又はE-RACH（evolved RACH）チャネルでスケジューリング要求メッセージを送信する。短いスケジューリング要求メッセージは、ネットワークからの上りリンク物理リソースの割り当てを要求する。スケジューリング要求メッセージは、無線インタフェース（Uu）でネットワークに送信される。ネットワークのレイヤ1によりスケジューリング要求メッセージを受信すると、スケジューリング要求メッセージは、RACHチャネルでネットワークのE-MACレイヤに転送される。E-MACレイヤは、上りリンク共有チャネル（UL-SCH）をUEに割り当て、共有物理制御チャネル（SPCCH：shared physical control channel）でE-MACレイヤからレイヤ1に送信され、次に無線インタフェース（Uu）でUEのレイヤ1に送信されるスケジューリング許可メッセージに上りリンク割り当てを記述する。UEのレイヤ1は、SPCCHチャネルでE-MACレイヤにスケジューリング許可メッセージを転送する。E-MACレイヤは、ネットワークに送信するために、割り当てられたUL-SCHリソースでレイヤ1にRRC接続設定完了メッセージを転送する。

【００８３】

本発明の或る実施例に従って共有のスケジューリングされた上りリンク及び／又は下りリンク方式を使用することにより、１つ以上の利点が実現され得る。例えば或る実施例では、初期の上りリンクリソースでの短いメッセージは、無線インタフェースの物理レイヤでの衝突を低減し得る。或る実施例では、（重複する期間中に２つのUEにより個別に導かれた共通の一時識別子のため生じる）論理的衝突は、UEでの衝突回復手順及び／又はネットワークでの衝突回復手順により克服され得る。或る実施例では、別法ではRACH及び／又はFACH共通チャネルに専用のリソースは、低減又は場合によって除去され得る。従って、これらのリソースは、他のチャネルトラヒック形式への割り当てに利用可能になる。従って、複数のトラヒック形式が同じ共有チャネルリソースを共有することを許可されておらず、その代わりに別のリソースを割り当てられる必要がある場合に比べて、無線リソースの効率的な使用が実現され得る。この理由は、全てのトラヒック形式を共有チャネルのみに多重することにより、スケジューラは、各トラヒック形式により提示される変化する瞬時負荷に割り当てられたリソースを動的に適合することができるからである。これに対して、別の無線リソースが各トラヒック形式に静的に割り当てられる場合、各トラヒック形式により与えられるトラヒック負荷の変化は、最初に共通チャネルに割り当てられて次に共有チャネルに割り当てられた全無線リソース空間の各部分を再構成せずに、適応不可能

である。或る実施例では、UEにより観測されるシグナリング待ち時間及び応答時間が低減され得る。或る実施例では、スケジューリングされたチャネルの使用は、UEが短いスケジューリングメッセージをデコードし、もはや他のUEにアドレス指定された各共通チャネルのメッセージを監視してデコードする必要がないことを意味する。これは、UEの電池寿命の効率的な使用をもたらす。更に、或る実施例では、高速チャネルでの接続設定のシグナリング交換は、通常の共通チャネルより速く生じ得る。

【００８４】

図８Ａ及び８Ｂは、本発明によるスケジューリングされた下りリンクとスケジューリングされた上りリンクとを使用した詳細なシグナリングシーケンスを示している。図示の実施例では、初期の上りリンク通信は、その後の通信と同様にスケジューリングされる。RRC接続要求を有する初期のメッセージを送信するのではなく、UEは、まず、短いスケジューリング要求メッセージを送信し、上りリンク物理リソースを割り当てるようにネットワークに要求する。UEは、一時識別子を導き、短い上りリンクメッセージに含める。メッセージは、任意選択で（前述の）バッファ占有パラメータと、理由パラメータとを有してもよい。理由パラメータは、要求の理由（例えば、上りリンク物理リソースの要求）を示してもよい。ネットワークは、上りリンク共有チャネル（UL-SCH）を割り当て、共有物理制御チャネル（SPCCH）でUEにより導かれた一時識別子とUL-SCHの記述とを有するスケジューリング許可を送信する。UEのE-MACレイヤは、SPCCHチャネルで上りリンクスケジューリング許可メッセージを受信し、割り当てられたUL-SCH物理チャネルでRRC接続要求を送信することにより応答する。RRC接続要求メッセージは、図７Ａ及び７Ｂを参照して前述した許可制御及び更なるリソース割り当てを実行するネットワークにより受信される。更に、図８Ａは、RRC接続要求及びRRC接続設定メッセージの一方又は双方を通信するときに、承認モード（AM）を使用し得る実施例を示しており、他の実施例は不承認モード（UM）を使用し得る。

【００８５】

図９及び１０は、本発明による競合解決処理を示している。この競合シナリオは、２つのUEが共通の一時識別子を導いて使用しているときに生じる。各UEは、図５Ａ、５Ｂ、６Ａ－B、７A－B又は８Ａ－Ｂを参照して前述したRRC接続要求メッセージを送信する。一時識別子の導出は、２つのUEが同じ一時識別子を導く許容レベルの可能性を最小化するように生じることが好ましい。しかし、或る実施例では、２つのUEがセル内で同じ一時識別子を導くことがある。従って、更なる衝突検出及び回復手順が実施されてもよい。

【００８６】

図９は、主にUEにより起こされる救済手段を示している。２つのUEは、同一の一時識別子（第１のtemp ID）を使用してネットワークに上りリンクメッセージを送信する。上りリンクメッセージは、RACHチャネル又はE-RACHで送信されるメッセージでもよい。メッセージは、スケジューリング要求メッセージ（図示のもの）又は他のメッセージでもよい。ネットワークは、２つの上りリンクメッセージで重複した同一の一時識別子を検出してもよい。ネットワークは、以下の処理を実行しないように選択してもよく、各UEがタイムアウトすることを許可する。予想される下りリンク応答を受信しなかった後に、各UEは、初期に導かれた一時識別子を破棄し、他の一時識別子（それぞれ、第２のtemp ID及び第３のtemp ID）を導く。各UEは、新しく導かれた一時識別子を使用して元の上りリンクメッセージを再送信する。新しい一時識別子の受信時に、初期のレイヤ2コンテキストが共有チャネル動作について各UEとネットワークとの間で確立される。ネットワークは、前述のように一意のtemp IDを有する各UEに応答する。

【００８７】

図１０は、主にネットワークにより起こされる救済手段を示している。この場合も同様に、２つのUEは、同一の一時識別子（temp ID）を使用して上りリンクメッセージをネットワークにそれぞれ送信する。上りリンクメッセージは、RACHチャネル又はE-RACHで送信されるメッセージでもよい。メッセージは、RRC接続要求メッセージ（図示のもの）又は他のメッセージでもよい。ネットワークは、２つの上りリンクメッセージで同一の一時識

別子を検出してもよい。この場合、２つのUEは、同じtemp IDを導いており、アドレス指定されたこのtemp IDを含む下りリンクシグナリングをそれぞれ予想してもよい。このような場合、ネットワークは、衝突又は競合が生じたことを決定してもよい。しかし、上りリンクメッセージの一方又は双方がグローバルUE IDを含む場合、UEは、相互に区別され得る。この時点で、初期のレイヤ2コンテキストが共有チャネル動作について各UEとネットワークとの間で確立される。

【００８８】

ネットワークは、制御チャネルで、下りリンクリソースを割り当てられたスケジューリング許可メッセージを送信してもよい。ネットワークはまた、スケジューリング許可メッセージに記述されたトラヒックチャネルで、グローバルUE IDを組み込んだメッセージを送信してもよい。例えば、ネットワークは、衝突するUEにより導かれた一時識別子を使用してUEにアドレス指定されたRRC接続完了メッセージを送信してもよい。或る実施例では、ネットワークは、グローバルUE IDをパラメータとして含めることにより、グローバルUE IDを下りリンクメッセージに明示的に組み込む。代替として、ネットワークは、下りリンクメッセージをエンコードするためにグローバルUE IDを使用することにより、グローバルUE IDを組み込んでもよい。例えば、組み込むことは、ネットワークに既知のUE識別子を使用して巡回冗長検査（CRC）値を計算することを有してもよい。下りリンクメッセージをデコードするときに、各UEは、グローバルUE IDがパラメータとして明示的に組み込まれたか否かを決定するためにそのグローバルUE IDを使用してもよく、代替として、メッセージをデコードして前に送信されたグローバルUE IDがメッセージをエンコードするためにネットワークにより使用されたか否かを決定するためにそのグローバルUE IDを使用してもよい。更に、ネットワークは、そのグローバルUE IDを送信したUEに置換temp IDを割り当てることにより応答してもよい。１つのUEが置換temp IDを受信すると、共有チャネル動作について双方のUEに一意のレイヤ2コンテキストが形成される。第１のUEは、RRC接続設定メッセージを受信して適切にデコードし、RRC接続設定メッセージはそのUEでエンコードされる。第２のUEは、RRC接続設定メッセージをデコードしようとするが、メッセージが未知のグローバルUE IDでエンコードされているため失敗し、第２のUEがメッセージを破棄して下りリンクスケジューリングチャネル（SPCCH）に戻るようにさせる。第２のUEは、ネットワークにより送信された第２の下りリンクスケジューリング許可メッセージを受信する。第２のUEは、それにアドレス指定されたRRC接続設定メッセージを適切に受信してデコードする。双方のUEは、RRC接続設定完了メッセージで応答することにより、処理を完了してもよい。

【００８９】

図１１及び１２は、本発明による複数のスケジューリング許可チャネルを使用した競合回避及び解決処理を示している。或るシステムは、ネットワークからUEにスケジューリング許可メッセージを通信するために複数のチャネル（例えば、複数のSPCCHチャネル）を構成してもよい。これらのチャネルは予め構成されてもよく、標準により規定されてもよく、UEに送信されてもよい（例えば、ブロードキャストチャネル又は他のシステム制御シグナリングを介して送信されてもよい）。

【００９０】

UEは、後にスケジューリング許可メッセージを監視するために、構成された複数のチャネルから一部（すなわち単一のチャネル又は複数のチャネル）を導出又は選択してもよい。UEが監視する導かれたチャネルの一部は、チャネルセットと呼ばれてもよい。上りリンクメッセージを使用して、UEは、パラメータを使用して明示的に、又は特定の物理リソースを使用することにより暗示的に、チャネルセットを通信してもよい。チャネルセット又はチャネルセットの指示を通信することにより、ネットワークは、同じ一時識別子を導くことになったが、好都合に異なるチャネルを導いたUEを区別してもよい。図１１は、チャネルセットの指示を有する初期のメッセージを送信することにより、チャネルセットをネットワークに明示的に通信するUEの例を示している。図１２は、初期のメッセージをネットワークに送信するために特定の上りリンク物理リソースを使用することにより、チャネ

ルセットを暗示的に通信するUEの例を示している。

【００９１】

図１１において、ネットワーク装置と接続を確立する前に、第１のUEは、前述の一時識別子（temp ID）を導く。第１のUEはまた、チャネルセットを導く。すなわち、UEは、将来にスケジューリング許可メッセージを監視するスケジューリング許可チャネル（SPCCH）を選択する。代替として、１つより多くの構成されたスケジューリング許可チャネル（SPCCH）を選択してもよい。これはチャネルセットと呼ばれる。

【００９２】

UEがスケジューリング許可メッセージを監視する単一のチャネル又は複数のチャネルを有するチャネルセットを導くために、UEは、以下のパラメータの１つ又は組み合わせに基づいてチャネルセットを選択してもよい。(1)TMSI、IMSI又はIMEIのようなUEのグローバルUE識別子、(2)導かれた一時識別子、及び(3)UEが初期のメッセージを送信するために使用する物理リソースの１つ以上の特性。物理リソースの特性は、時間パラメータ（システムクロック、スーパーフレーム番号、無線フレーム番号、サブフレーム番号、タイムスロット番号等）と、周波数パラメータ（周波数帯域、チャネル番号又はサブキャリア番号等）と、符号（ミッドアンブル符号、スクランブル符号、チャネリゼーション符号、時間周波数符号又は直交符号等）とを有する。

【００９３】

この例は、第１のUEがチャネルセット共に一時識別子（temp ID）を導くことを示している。チャネルセットは、単一のSPCCHチャネル番号又は一式の複数のSPCCHチャネル番号でもよい。チャネルセットは、チャネル指示（例えばチャネル指示#1）により表されてもよい。例えば、チャネルセットは、UEとネットワークとの双方に既知のテーブルへのインデックスを表すチャネル指示値を送信することにより通信されてもよい。テーブルのエントリは単一のチャネル番号を表してもよく、一式の可能なチャネルからの複数のチャネルを表してもよい。

【００９４】

次に、第１のUEは、選択された一時識別子とチャネル指示との双方を有する初期のメッセージを送信し、スケジューリング許可メッセージを送信するためにネットワークがどの１つ以上のチャネルを使用するべきかをネットワークに通信する。例えば、初期のメッセージは、スケジューリングされた上りリンク無線リソースのスケジューリング要求でもよく、スケジューリングされない上りリンク無線リソースでの接続設定処理中に第１のメッセージとして送信されたRRC接続要求メッセージでもよい。或る実施例では、UEは、図１０を参照して前述した衝突検出及び解決に使用するために、グローバルUE識別子（TMSI、IMSI又はIMEI）を送信してもよい。初期のメッセージを受信すると、ネットワークは、一時識別子とチャネルセットとの対を特定のUE（例えば第１のUE）に関連付けてもよい。

【００９５】

この例は、第２のUEが同時に又は少し後に接続を開始することを更に示している。第２のUEは、一時識別子とチャネル指示（例えばチャネル指示#2）により表されるチャネルセットとを同様に導く。説明目的で、この例は、第２のUEが第１のUEと同じ一時識別子（temp ID#1）を導いたことを示している。しかし、第２のUEは、異なるチャネルセットを選択している。第２のUEは、初期のメッセージで一時識別子とチャネル指示とをネットワークに送信する。初期のメッセージの受信時に、ネットワークは、受信した一時識別子とチャネルセットとの対を第２のUEに関連付けてもよい。

【００９６】

この時点で、双方のUEは同じ一時IDに関連するが、それぞれのチャネル指示パラメータに示される異なる重複しないSPCCHチャネルセットの選択のため、意図しない交差通信は回避され得る。第１及び第２のUEは異なるSPCCHチャネルを監視するため、双方のUEをアドレス指定するために共通に導かれた一時識別子がネットワークにより使用され得る。ネットワークは、同じ一時識別子で双方のUEをアドレス指定するが、チャネル指示#1により示されたチャネルの１つで第１のUEにスケジューリングメッセージを送信し、チャネル指

示#2により示されたチャネルの１つで第２のUEに他のスケジューリングメッセージを送信する。従って、各UEは、他のUEにアドレス指定されたスケジューリング許可メッセージを処理しない。

【００９７】

従って、２つのUEが異なるSPCCHチャネルセットを選択するため、各UEについて一意の共有チャネル通信コンテキストがシステムにより形成される。チャネル指示を通信することは、競合の可能性を完全には除去しない可能性がある。この理由は、２つのUEが依然として同じ一時識別子と同じチャネルセットとを導く可能性があるからである。この場合、本発明に関して図９及び１０を参照して前述した競合解決手順が適用されてもよい。

【００９８】

更に図１１に示すように、ネットワークは、(1)一時識別子（temp ID#1）とチャネル指示（チャネル指示#1）とを受信するステップ、(2)下りリンク又は上りリンク共有チャネルリソースを割り当てるステップ、(3)受信したチャネル指示からスケジューリング許可チャネル（チャネル#1）を決定するステップ、(4)チャネル#1でtemp ID#1にアドレス指定され、割り当てられた上りリンク又は下りリンク共有チャネルリソースの記述を含むスケジューリング許可メッセージを送信するステップ、及び(5)割り当てられた共有チャネルリソースでデータを送信又は受信することによりデータを通信するステップを使用して、スケジューリングされた共有チャネルで第１のUEとデータを通信してもよい。同様に、ネットワークは、(1)一時識別子（temp ID#2）とチャネル指示（チャネル指示#2）とを受信するステップ、(2)下りリンク又は上りリンク共有チャネルリソースを割り当てるステップ、(3)受信したチャネル指示からスケジューリング許可チャネル（チャネル#2）を決定するステップ、(4)チャネル#2でtemp ID#1にアドレス指定され、割り当てられた上りリンク又は下りリンク共有チャネルリソースの記述を含むスケジューリング許可メッセージを送信するステップ、及び(5)割り当てられた共有チャネルリソースでデータを送信又は受信することによりデータを通信するステップを使用して、スケジューリングされた共有チャネルで第２のUEと同時に又は実質的に同時に通信してもよい。

【００９９】

図６Ａ、７Ａ及び８Ａを参照して前述したものと同じ方法で、ネットワークは、各UEが一意の一時識別子を割り当てられるために、１つ又は双方のUEに置換一時識別子を更に再割り当てしてもよい。従って、スケジューリング許可メッセージを各UEに送信するときに、潜在的に許可チャネルの制限の必要性を除去する。更に、或る実施例では、ネットワークは、UEが異なる一式のSPCCHチャネルを使用することを許可してもよい。例えば、ネットワークは、UEに一意の置換一時識別子を再割り当てし、ネットワークが何らかの下りリンクSPCCHチャネルで上りリンク又は下りリンク共有チャネルリソースのスケジューリング許可を伝達することを可能にしてもよい。

【０１００】

図１２では、UEは、チャネルセットを暗示的に通信する。第１のUEは一時識別子を導き、ネットワーク装置と接続を確立する前に物理リソース（物理リソース#1）を導く。物理リソースは、その時間、周波数及び符号パラメータにより特徴付けられてもよい。図示の実施例では、UEは、物理リソースをまさに使用することにより、チャネルセットを暗示的に通信してもよい。ネットワークは、UEにより使用されるチャネルセットを推測するために、物理リソースの１つ以上の特性を使用してもよい。

【０１０１】

或る実施例では、UEは、チャネルセットを決定し、決定されたチャネルセットに基づいて何の物理リソースで初期のメッセージを送信するべきかを決定してもよい。他の実施例では、UEは、初期のメッセージを送信するために物理リソースを決定し、決定された物理リソースに基づいてチャネルセットを決定してもよい。ネットワークは、チャネルセットを決定するために、UEにより使用される物理リソースの特性を使用してもよい。例えば、初期のメッセージの時間（例えばタイムスロット）は、特定の下りリンクスケジューリングチャネル又はチャネルのセットがUEにより監視されることをネットワークに示してもよ

い。一時識別子を受信すると、ネットワークは、物理リソース（物理リソース#1）の１つ以上の特性に基づいて、一時識別子を特定の１つ以上のスケジューリング許可チャネル（SPCCH）に関連付けてもよい。或る実施例では、SPCCHチャネル番号又はチャネルセットとの一時識別子又は物理リソースの関連付けは、時間の関数として変化してもよい。代替として、関連付けは、RRC接続要求メッセージ内で受信したグローバルUE IDに基づいてもよい。各UEは、送信された一時識別子とチャネルセットとの間で、ネットワークにより形成されたものと同じ関連付けを形成する。この関連付けは、UEとネットワークとの双方で同様に行われてもよい。ネットワークは、一時識別子とチャネルセットとの対を特定のUE（この場合は第１のUE）に更に関連付ける。

【０１０２】

同時に又は少し後に、第２のUEが接続確立手順を開始するように図示されている。第２のUEは一時識別子を導き、初期のメッセージをネットワークに送信する。初期のメッセージを受信すると、ネットワークは、同様にチャネルセットを決定し、物理リソース（物理リソース#2）の特性に基づいて一時識別子と１つ以上の特定のSPCCHチャネル番号とを関連付ける。

【０１０３】

或る実施例では、一時識別子と示されたチャネルセットとの間の関連付けは、時間の周期関数に基づく。従って、一時識別子とチャネルセットとの間の関連付けが繰り返されないように、２つの初期のメッセージの送信の間に及ぶ期間内に有限の一式のアクセス期間インスタンス（access period instance）が構成される。従って、後の時点での第２のUEによるtemp ID#1の送信は、そのtemp ID#1が第１のUEに関連付けられたものと異なるSPCCHチャネル番号に関連付けられることをもたらす。図示の例では、temp ID#1は、第１のUEのSPCCHチャネル#1に関連するが、temp ID#1は第２のUEのSPCCHチャネル#2に関連する。従って、ネットワークは、事前にUEとネットワークとの双方に既知のスケジューリング許可チャネルを使用して、UEにスケジューリング許可メッセージを送信してもよく、スケジューリング許可メッセージにより示された１つ以上のスケジューリングされた共有チャネルで第１及び第２のUEと一意にデータを通信してもよい。

【０１０４】

この時点で、双方のUEは同じ一時識別子に関連するが、異なるSPCCHチャネル番号との関連付けのため、前述のように意図しない交差通信は回避され得る。従って、異なる物理リソースを使用して接続確立が開始されており、従って、UEは異なるSPCCHに関連し得るという事実のため、各UEについて一意の共有チャネル通信コンテキストがシステムにより形成される。或る実施例では、この方法は、所定の期間内に非同時アクセスを試みる接続の可能性を完全に除去する。複数のUEが共通の一時識別子を導くが、それぞれ異なる物理リソースで初期のメッセージを送信する場合、UEが置換一時識別子を再割り当てされると、衝突が回避され得る。他方、複数のUEが共通の一時識別子を導き、また、同じ物理リソースで初期のメッセージを送信する場合、競合を受ける可能性があり、衝突は図９及び１０を参照して前述したような競合解決手順を使用して解決され得る。

【０１０５】

実質的に競合のないアクセスの長さは、利用可能なSPCCHの数と、一時識別子とSPCCHチャネル番号との間の関連付けを記述するパターンの長さ及び性質との関数でもよい。従って、関連付けのパターンが時間で繰り返す前に、ネットワークがシステムにアクセスする各UEに一意置換識別子を割り当てることが有利になる。従って、関連付けのパターンが置換一時識別子を割り当てるために必要な最大予想時間に相応した長さを有するように設計することにより、この方式の効率が最適化され得る。

【０１０６】

特定の実施例及び例示的な図面に関して本発明を説明したが、本発明は、記載の実施例又は図面に限定されないことを当業者は認識する。例えば、前述の多数の実施例は、3GPPシステム及びE-UTRAN（evolved UMTS Terrestrial Radio Access Network）の用語を参照する。より一般的に、或る実施例は、TDD（time division duplex）方式又はFDD

（frequency division duplex）方式で動作するCDMA（code division multiple access）送信機／受信機の対を使用したトランシーバを有してもよい。代替として、トランシーバは、TDMAシステム、FDMAシステム、OFDMシステム、又はこれらのハイブリッド（例えば、TDMA/FDMA、TDMA/CDMA、TDMA/OFDM及びTDMA/OFDM/CDMA）で使用されるような非符号分割のトランシーバでもよい。トランシーバは、バーストで動作してもよく、信号ストリームで動作してもよい。

【０１０７】

提供される図面は単に表現的なものであり、縮尺通りでないことがある。この特定の部分は誇張されることがあり、他の部分は最小化されることがある。図面は、当業者により理解されて適切に実行され得る本発明の様々な実装を示すことを意図する。従って、本発明は、特許請求の範囲の要旨及び範囲内で変更及び置換して実施され得ることがわかる。説明は、網羅的であることを意図せず、開示された正確な形式に本発明を限定することを意図しない。本発明は、変更及び置換して実施可能であり、本発明は、特許請求の範囲及びその均等のみにより限定されることがわかる。

【図面の簡単な説明】

【０１０８】

【図１Ａ】通常のUMTSシステムでRRCアイドル状態からRRC接続状態に推移する場合の通常のメッセージのシーケンス

【図１Ｂ】通常のUMTSシステムでRRCアイドル状態からRRC接続状態に推移する場合の通常のメッセージのシーケンス

【図２】ユーザ装置（UE）とコアネットワーク（CN）とで動作するUTRANネットワークとE-UTRANとの比較

【図３Ａ】本発明に従ってユーザ装置とコアネットワークとで動作するE-UTRANネットワーク

【図３Ｂ】本発明に従ってユーザ装置とコアネットワークとで動作するE-UTRANネットワーク

【図４】本発明によるユーザ装置の構成要素

【図５Ａ】本発明による初期のシグナリングシーケンス

【図５Ｂ】本発明による初期のシグナリングシーケンス

【図６Ａ】本発明によるスケジューリングされた下りリンクを使用した詳細なシグナリングシーケンス

【図６Ｂ】本発明によるスケジューリングされた下りリンクを使用した詳細なシグナリングシーケンス

【図７Ａ】本発明によるスケジューリングされた下りリンクとスケジューリングされない上りリンク及びスケジューリングされた上りリンクとを使用した詳細なシグナリングシーケンス

【図７Ｂ】本発明によるスケジューリングされた下りリンクとスケジューリングされない上りリンク及びスケジューリングされた上りリンクとを使用した詳細なシグナリングシーケンス

【図８Ａ】本発明によるスケジューリングされた下りリンクとスケジューリングされた上りリンクとを使用した詳細なシグナリングシーケンス

【図８Ｂ】本発明によるスケジューリングされた下りリンクとスケジューリングされた上りリンクとを使用した詳細なシグナリングシーケンス

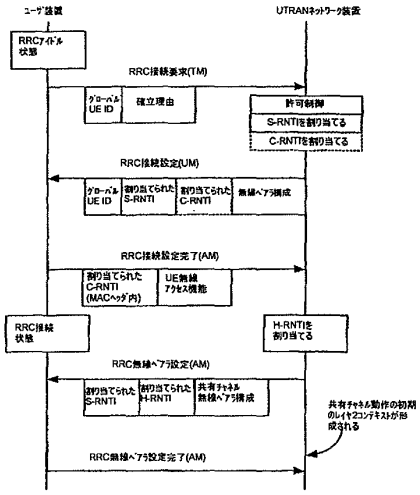
【図９】本発明による競合解決の処理

【図１０】本発明による競合解決の処理

【図１１】本発明による複数のスケジューリング許可チャネルを使用した競合回避及び解決処理

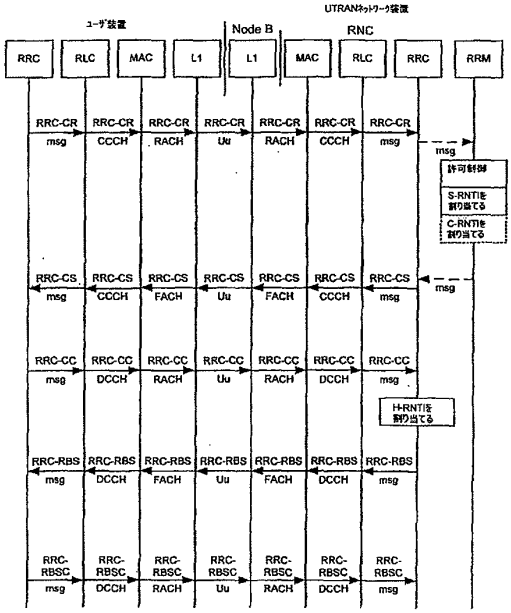
【図１２】本発明による複数のスケジューリング許可チャネルを使用した競合回避及び解決処理

【図１Ａ】



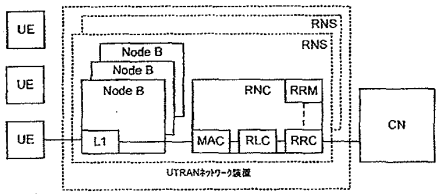
UMTSシステムで共通チャネルシグナリングを使用した通常のRRC接続手順
(従来技術)

【図１Ｂ】

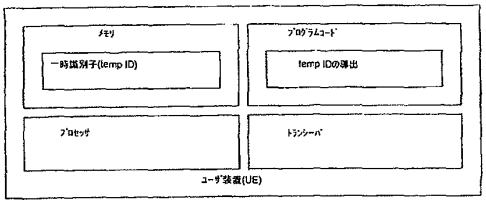


UMTSシステムで共通チャネルシグナリングを使用した通常のRRC接続手順
(従来技術)

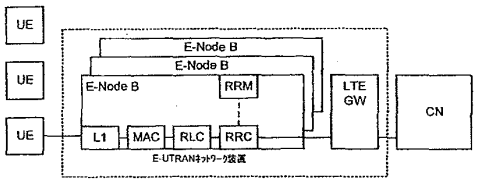
【図２】



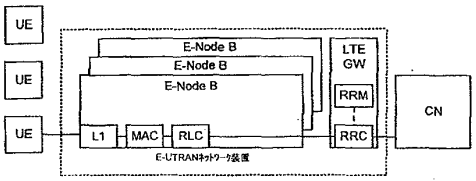
【図４】



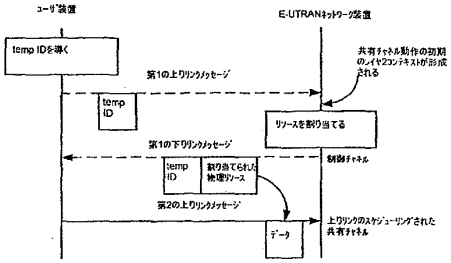
【図３Ａ】



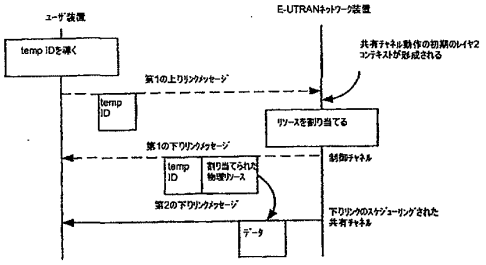
【図３Ｂ】



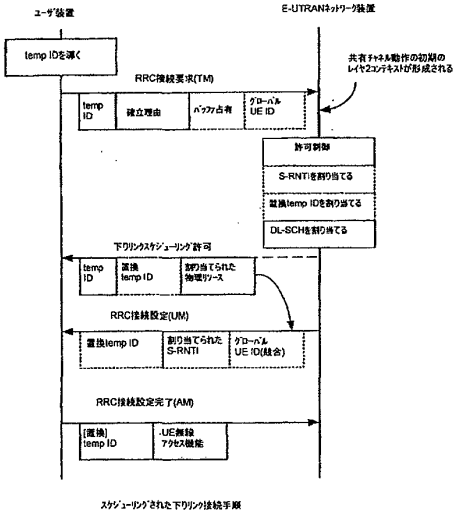
【図５Ａ】



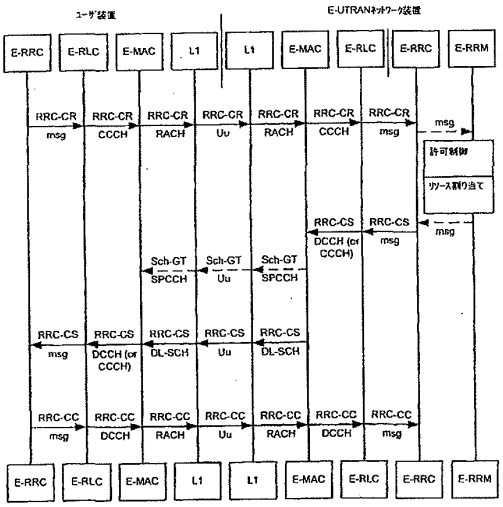
【図５Ｂ】



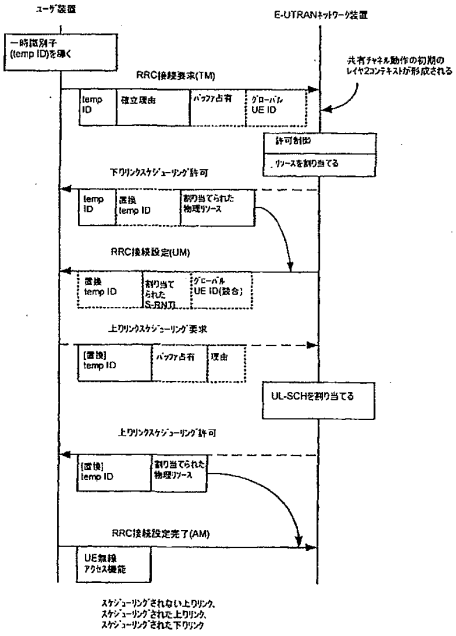
【図６Ａ】



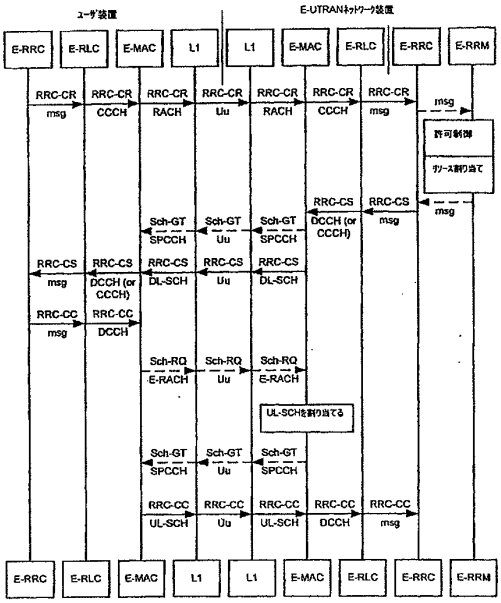
【図６Ｂ】



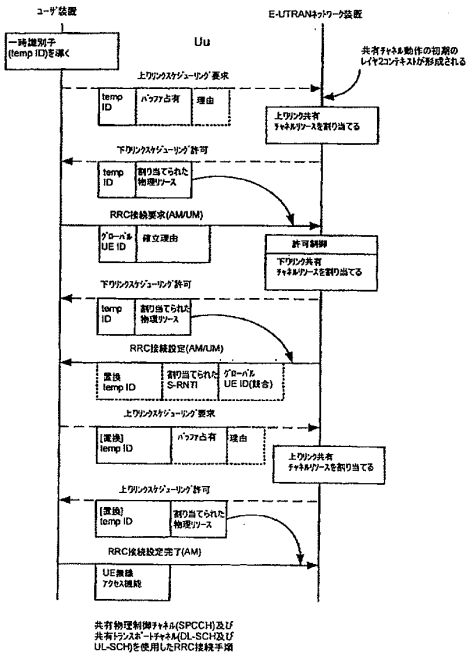
【図７Ａ】



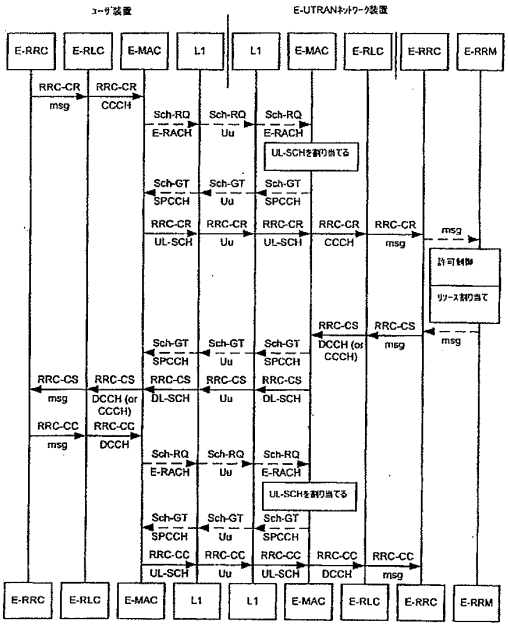
【図７Ｂ】



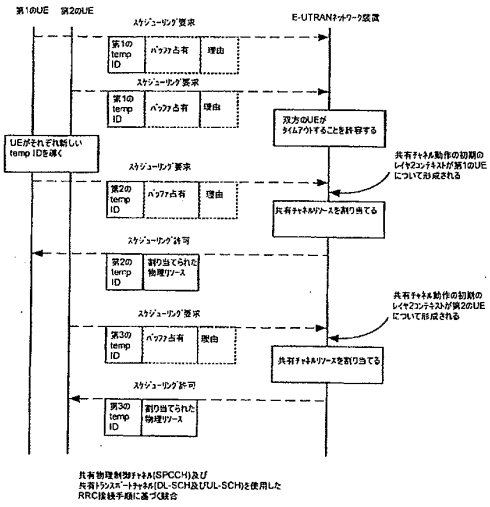
【図８Ａ】



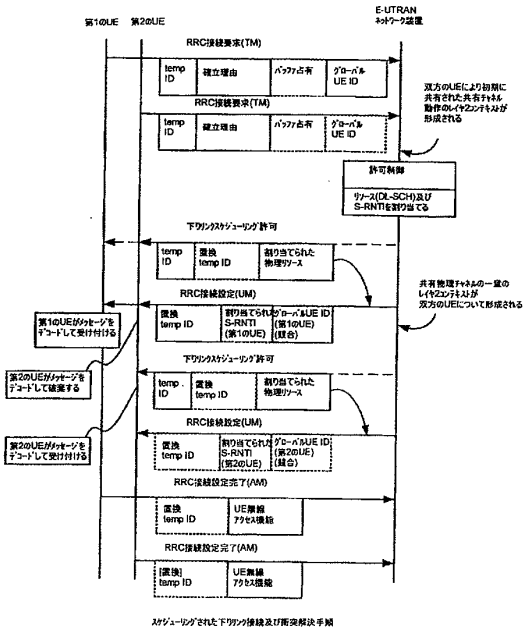
【図８Ｂ】



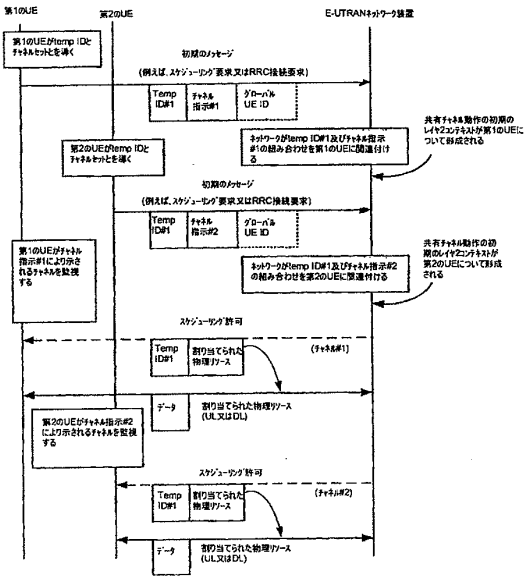
【図９】



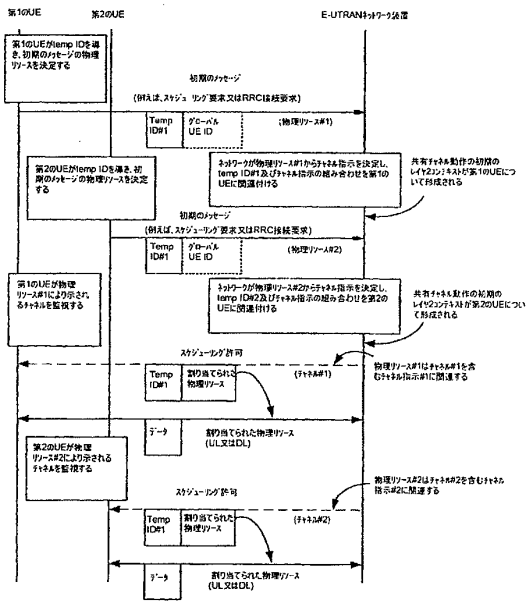
【図１０】


第1のUE
第2のUE
E-UTRAN ネットワーク装置
RRC接続要求(TM)
temp ID
確立理由
バッファ占有
グローバル UE ID
双方のUEにより初期に共有された共有チャネル動作のレイヤ2コンテキストが形成される
許可制御
リソース(DL-SCH)及びS-RNTIを割り当てる
下りリンクスケジューリング許可
割り当てられた物理リソース
共有物理チャネルの一覧のレイヤ2コンテキストが双方のUEについて形成される
RRC接続設定(UM)
割り当てられたS-RNTI (第1のUE)
グローバルUE ID (第1のUE) (任合)
第1のUEがメッセージをデコードして受け付ける
第2のUEがメッセージをデコードして破棄する
第2のUEがメッセージをデコードして受け付ける
割り当てられたS-RNTI (第2のUE)
グローバルUE ID (第2のUE) (任合)
RRC接続設定完了(AM)
UE無線アクセス機能
スケジューリングされた下りリンク接続及び衝突解決手順

【図１１】


第1のUE
第2のUE
E-UTRANネットワーク装置
第1のUEがtemp IDとチャネルセットとを導く
初期のメッセージ
(例えば、スケジューリング要求又はRRC接続要求)
Temp ID#1
チャネル指示#1
グローバル UE ID
共有チャネル動作の初期のレイヤ2コンテキストが第1のUEについて形成される
第2のUEがtemp IDとチャネルセットとを導く
チャネル指示#2
第1のUEがチャネル指示#1により示されるチャネルを監視する
共有チャネル動作の初期のレイヤ2コンテキストが第2のUEについて形成される
スケジューリング許可
割り当てられた物理リソース
データ
(UL又はDL)
第2のUEがチャネル指示#2により示されるチャネルを監視する

【図１２】


第1のUE
第2のUE
E-UTRANネットワーク装置
第1のUEがtemp IDを導き、初期のメッセージの物理リソースを決定する
初期のメッセージ
(例えば、スケジューリング要求又はRRC接続要求)
Temp ID#1
グローバル UE ID
(物理リソース#1)
第2のUEがtemp IDを導き、初期のメッセージの物理リソースを決定する
共有チャネル動作の初期のレイヤ2コンテキストが第1のUEについて形成される
(物理リソース#2)
第1のUEが物理リソース#1により示されるチャネルを監視する
物理リソース#1はチャネル#1を含むチャネル指示#1に関連する
スケジューリング許可
割り当てられた物理リソース
データ
(UL又はDL)
第2のUEが物理リソース#2により示されるチャネルを監視する
物理リソース#2はチャネル#2を含むチャネル指示#2に関連する

【手続補正書】
【提出日】平成20年9月2日(2008.9.2)
【手続補正１】
【補正対象書類名】特許請求の範囲
【補正対象項目名】全文
【補正方法】変更
【補正の内容】
【特許請求の範囲】
【請求項１】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する方法であって、
前記ユーザ装置により、
一時識別子を導き、
チャネルセットを導き、
初期のメッセージを前記ネットワーク装置に送信し、前記初期のメッセージは前記一時識別子を有し、
前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信することを有する方法。
【請求項２】
前記チャネルセットは、単一のチャネルを有する、請求項１に記載の方法。
【請求項３】
前記チャネルセットは、複数のチャネルを有する、請求項１に記載の方法。
【請求項４】
前記チャネルセットを導くことは、複数のチャネルセットから前記チャネルセットをランダムに選択することを有する、請求項１に記載の方法。
【請求項５】
前記チャネルセットを導くことは、グローバルUE識別子に基づいて前記チャネルセットを決定することを有する、請求項１に記載の方法。
【請求項６】
前記グローバルUE識別子は、TMSI（temporary mobile subscriber identity）、IMSI（international mobile subscriber identity）、又はIMEI（international mobile equipment identity）のうち１つを有する、請求項５に記載の方法。
【請求項７】
前記チャネルセットを導くことは、物理リソースの１つ以上の特性の関数として前記チャネルセットを決定することを有し、
前記初期のメッセージを送信することは、前記物理リソースで前記初期のメッセージを送信することを有する、請求項１に記載の方法。
【請求項８】
前記物理リソースの特性は、時間のパラメータ、周波数のパラメータ及び符号のパラメータのグループのうち少なくとも１つを有する、請求項７に記載の方法。
【請求項９】
前記チャネルセットを導くことは、物理リソースの特性、グローバルUE識別子、及び前記一時識別子のうち１つ以上に基づいて前記チャネルセットを決定することを有する、請求項１に記載の方法。
【請求項１０】
前記初期のメッセージは、グローバルUE識別子を更に有する、請求項１に記載の方法。
【請求項１１】

物理リソースを決定することを更に有し、
前記初期のメッセージを送信することは、前記決定された物理リソースに従って前記初期のメッセージを送信することを有する、請求項１に記載の方法。
【請求項１２】
前記チャネルセットの指示を伝達することを更に有する、請求項１に記載の方法。
【請求項１３】
前記チャネルセットの指示を暗示的に通信することを更に有する、請求項１に記載の方法。
【請求項１４】
前記初期のメッセージを前記ネットワーク装置に送信することは、スケジューリング要求メッセージを送信すること及びRRC接続要求メッセージを送信することのグループのうち１つを有する、請求項１に記載の方法。
【請求項１５】
前記初期のメッセージを送信した後、且つ前記下りリンクメッセージを受信する前にタイムアウトし、
異なる物理リソースを決定し、
前記異なる物理リソースで新しい初期のメッセージを再送信することを更に有する、請求項１に記載の方法。
【請求項１６】
チャネルセットと一時識別子との間の関連付けを変更することを更に有する、請求項１に記載の方法。
【請求項１７】
チャネルセットと物理リソースの１つ以上の特性との間の関連付けを変更することを更に有する、請求項１に記載の方法。
【請求項１８】
時間の関数としてチャネルセットの関連付けを変更することを更に有する、請求項１に記載の方法。
【請求項１９】
前記ネットワーク装置から信号を受信したことに応じてチャネルセットの関連付けを変更することを更にする、請求項１に記載の方法。
【請求項２０】
前記無線通信システムは、E-UTRAN（evolved UMTS Terrestrial Radio Access Network）を有する、請求項１に記載の方法。
【請求項２１】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する際に使用されるユーザ装置であって、
メモリと、
前記メモリに結合されたプロセッサと、
前記プロセッサで実行可能なプログラムコードと
を有し、
前記プログラムコードは、
一時識別子を導き、
チャネルセットを導き、
初期のメッセージを前記ネットワーク装置に送信し、前記初期のメッセージは前記一時識別子を有し、
前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するように動作可能であるユーザ装置。

【請求項２２】
前記チャネルセットを導くことは、複数のチャネルセットから前記チャネルセットをランダムに選択することを有する、請求項２１に記載のユーザ装置。
【請求項２３】
前記チャネルセットを導くことは、物理リソースの１つ以上の特性の関数として前記チャネルセットを決定することを有し、
前記初期のメッセージを送信することは、前記物理リソースで前記初期のメッセージを送信することを有する、請求項２１に記載のユーザ装置。
【請求項２４】
前記一時識別子を前記ネットワーク装置に送信することは、前記一時識別子と前記スケジューリングされたリソースの要求とを有する第１の上りリンクメッセージ内で前記一時識別子を送信することを有する、請求項２１に記載のユーザ装置。
【請求項２５】
前記チャネルセットを導くことは、物理リソースの特性、グローバルUE識別子、及び一時識別子のうち１つ以上に基づいて前記チャネルセットを決定することを有する、請求項２１に記載のユーザ装置。
【請求項２６】
前記プログラムコードは、物理リソースを決定するように更に動作可能であり、
前記初期のメッセージを送信することは、前記決定された物理リソースに従って前記初期のメッセージを送信することを有する、請求項２１に記載のユーザ装置。
【請求項２７】
前記プログラムコードは、前記チャネルセットの指示を伝達するように更に動作可能である、請求項２１に記載のユーザ装置。
【請求項２８】
前記プログラムコードは、前記チャネルセットの指示を暗示的に通信するように更に動作可能である、請求項２１に記載のユーザ装置。
【請求項２９】
ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始する際に使用されるネットワーク装置であって、
メモリと、
前記メモリに結合されたプロセッサと、
前記プロセッサで実行可能なプログラムコードと
を有し、
前記プログラムコードは、
前記ユーザ装置により送信された初期のメッセージを受信し、
チャネルセットを決定し、
前記ユーザ装置にスケジューリングされたリソースを割り当て、前記スケジューリングされたリソースは、共有チャネルのリソースを有し、
前記チャネルセットにより示されるチャネルで下りリンクメッセージを送信し、前記下りリンクメッセージは、一時識別子と前記スケジューリングされたリソースの記述とを伝達し、
前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するように動作可能であるネットワーク装置。
【請求項３０】
前記チャネルセットを決定することは、前記初期のメッセージからチャネル指示を抽出することを有し、前記チャネル指示は、前記チャネルセットを示す、請求項２９に記載のネットワーク装置。
【請求項３１】
前記チャネルセットを決定することは、前記初期のメッセージを伝達する前記物理リソースから前記チャネルセットを決定することを有する、請求項２９に記載のネットワーク

装置。

【請求項３２】

前記プログラムコードは、チャネルセットと物理リソースの１つ以上の特性との間の関連付けの変更を前記UEに通信するように更に動作可能である、請求項２９に記載のネットワーク装置。

【請求項３３】

ユーザ装置とネットワーク装置との間で無線通信システムの共有物理リソースで無線接続及びその後の通信を開始するプログラムコードを有するコンピュータプログラムプロダクトであって、

一時識別子を導き、

チャネルセットを導き、

初期のメッセージをネットワーク装置に送信し、前記初期のメッセージは前記一時識別子を有し、

前記一時識別子と共有チャネルでのスケジューリングされたリソースの記述とを伝達する下りリンクメッセージを受信し、前記スケジューリングされたリソースは、前記ネットワーク装置により前記ユーザ装置に割り当てられたリソースを有し、

前記下りリンクメッセージに応じて前記スケジューリングされたリソースでデータを通信するプログラムコードを有するコンピュータプログラムプロダクト。

【国際調査報告】

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/050100

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, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2004/102837 A (LG ELECTRONICS INC [KR]; YI SEUNG-JUNE [KR]; LEE YOUNG-DAE [KR]; CHUN) 25 November 2004 (2004-11-25) page 8, paragraph 44 - paragraph 47 page 3, paragraph 18 - paragraph 19 page 18, paragraph 104	1-36
A	ETSI: "TS 125 331 Universal Mobile Telecommunications System (UMTS)" ETSI TS 125 331 V3.1.0, XX, XX, January 2000 (2000-01), pages 1-282, XP002165164 page 33, paragraph 8.1.3	1-36

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 June 2007	05/07/2007
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Garcia, Montse

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

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2007/050100

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2004102837 A	25-11-2004	AU 2004240044 A1	25-11-2004
		BR PI0410265 A	16-05-2006
		CN 1717880 A	04-01-2006
		EP 1566001 A1	24-08-2005
		JP 2006512875 T	13-04-2006
		KR 20040098126 A	20-11-2004
		MX PA05006110 A	16-08-2005
		US 2004229626 A1	18-11-2004

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

フロントページの続き

(81)指定国 AP(BW,GH,GM,KE,LS,MW,MZ,NA,SD,SL,SZ,TZ,UG,ZM,ZW),EA(AM,AZ,BY,KG,KZ,MD,RU,TJ,TM),EP(AT,BE,BG,CH,CY,CZ,DE,DK,EE,ES,FI,FR,GB,GR,HU,IE,IS,IT,LT,LU,LV,MC,NL,PL,PT,RO,SE,SI,SK,TR),OA(BF,BJ,CF,CG,CI,CM,GA,GN,GQ,GW,ML,MR,NE,SN,TD,TG),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

(72)発明者 ウォラル，チャンドリカ
イギリス国，バークシャー アールジー１４ ６エスエヌ ニューバリー バルフォー・クレセント １１エイ
(72)発明者 アンダーソン，ニコラス ウィリアム
イギリス国，ブリストル アヴォン ビーエス３０ ５ジェイエル ワームレイ ロンドン・ロード ７２

Ｆターム(参考) 5K067 AA13 AA14 BB04 BB21 DD17 EE02 EE10 EE16 FF02 HH32

Electronic Acknowledgement Receipt

EFS ID:	15307229
Application Number:	11416865
International Application Number:	
Confirmation Number:	8530
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Customer Number:	3624
Filer:	John Porrazza/Carey Kulp
Filer Authorized By:	John Porrazza
Attorney Docket Number:	IPW2-USAP191682
Receipt Date:	20-MAR-2013
Filing Date:	02-MAY-2006
Time Stamp:	12:56:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IDS.pdf	822910 0bf67e6bc16ff9eeace2a14a443903eca663bf0d	no	4

Warnings:

Information:

2	Other Reference-Patent/App/Search documents	JPOA.pdf	86796 b04473567e847dde442781d15d5b0cc4c12d02d7	no	2
Warnings:					
Information:					
3	Foreign Reference	JP5055610.pdf	957687 6220db9b883c54bf5f3d0e19418498dd7f341826	no	17
Warnings:					
Information:					
4	Foreign Reference	JP2009522889.pdf	2214679 d132f0745f0335c8017e2533aad38517d7c53c20	no	37
Warnings:					
Information:					
5	Foreign Reference	JP2009522893.pdf	2332470 a513659fec47e49213566b6c39b96d16fbb4873d	no	37
Warnings:					
Information:					
			Total Files Size (in bytes):	6414542	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

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

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the **PATENT APPLICATION** of: Chandrika K. Worrall **Application No.:** 11/416,865 **Confirmation No.: 8530** **Filed:** May 2, 2006 For: NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM Group: 2644 Examiner: Dai Phuong	Our File: IPW2-USAP191682 Date: November 12, 2012

SUPPLEMENTAL REPLY PURSUANT TO 37 C.F.R. §1.111

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

Sir:

This Supplemental Reply is being timely filed in response to the Final Office Action dated May 6, 2011.

Please amend the application without prejudice or disclaimer as follows:

2033359-1

Amendments to the Claims:

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

1.-82. (CANCELED)

83. (NEW) A wireless network, the wireless network comprising:

a first network device configured to send a paging signal to a second network device;

the second network device comprising:

circuitry configured to page a user equipment (UE) in idle mode by sending a message on a control channel, the message having an allocation of resources for a shared channel and a radio network temporary identity (RNTI) associated with a plurality of UEs including the UE;

circuitry configured to send a paging message in the allocated resources for the shared channel; and

wherein the paging message includes an International Mobile Subscriber Identity (IMSI) or a Temporary Mobile Subscriber Identity (TMSI).

84. (NEW) The wireless network of claim 83 further comprising:

the second network device configured to receive a response to the paging message on an uplink shared channel.

85. (NEW) The wireless network of claim 83 wherein the control channel is a shared control channel (SCCH).

86. (NEW) The wireless network of claim 85 wherein the SCCH is cell-specific.

87. (NEW) The wireless network of claim 83 wherein the shared channel is a contention-based channel.

88. (NEW) The wireless network of claim 83 wherein the control channel is a broadcast channel.

89. (NEW) The wireless network of claim 83 wherein the RNTI is cell-specific.

90. (NEW) The wireless network of claim 83 wherein the RNTI is received by the second network device from a core network or resource manager.

91. (NEW) The wireless network of claim 83 further comprising:

the second network device configured to receive an uplink synchronization request from the UE for synchronizing communications between the second network device and the UE.

92. (NEW) The wireless network of claim 83 wherein the first network device is a radio network controller (RNC) and the second network device is a base station or Node B.

93. (NEW) A method performed by a wireless network, the method comprising:

sending, by a first network device, a paging signal to a second network device;

paging, by the second network device, a user equipment (UE) in idle mode by sending a message on a control channel, the message having an allocation of resources for a shared channel and a radio network temporary identity (RNTI) associated with a plurality of UEs including the UE;

sending, by the second network device, a paging message in the allocated resources for the shared channel; and

wherein the paging message includes an International Mobile Subscriber Identity (IMSI) or a Temporary Mobile Subscriber Identity (TMSI).

94. (NEW) The method of claim 93 further comprising:

receiving, by the second network device, a response to the paging message on an uplink shared channel.

95. (NEW) The method of claim 93 wherein the control channel is a shared control channel (SCCH).

96. (NEW) The method of claim 95 wherein the SCCH is cell-specific.

97. (NEW) The method of claim 93 wherein the shared channel is a contention-based channel.

98. (NEW) The method of claim 93 wherein the control channel is a broadcast channel.

99. (NEW) The method of claim 93 wherein the RNTI is cell-specific.

100. (NEW) The method of claim 93 wherein the RNTI is received by the second network device from a core network or resource manager.

101. (NEW) The method of claim 93 further comprising:

receiving, by the second network device, an uplink synchronization request from the UE for synchronizing communications between the second network device and the UE.

102. (NEW) The method of claim 93 wherein the first network device is a radio network controller (RNC) and the second network device is a base station or Node B.

103. (NEW) A network device, the network device comprising:

circuitry configured to page a user equipment (UE) in idle mode by sending a message on a control channel, the message having an allocation of resources for a shared channel and a radio network temporary identity (RNTI) associated with a plurality of UEs including the UE;

circuitry configured to send a paging message in the allocated resources for the shared channel; and

wherein the paging message includes an International Mobile Subscriber

Identity (IMSI) or a Temporary Mobile Subscriber Identity (TMSI).

104. (NEW) The network device of claim 103 further comprising:

circuitry configured to receive a response to the paging message on an uplink shared channel.

105. (NEW) The network device of claim 103 wherein the control channel is a shared control channel (SCCH).

106. (NEW) The network device of claim 105 wherein the SCCH is cell-specific.

107. (NEW) The network device of claim 103 wherein the shared channel is a contention-based channel.

108. (NEW) The network device of claim 103 wherein the control channel is a broadcast channel.

109. (NEW) The network device of claim 103 wherein the RNTI is cell-specific.

110. (NEW) The network device of claim 103 wherein the RNTI is received by the network device from a core network or resource manager.

111. (NEW) The network device of claim 103 further comprising:

circuitry configured to receive an uplink synchronization request from the UE for synchronizing communications between the network device and the UE.

112. (NEW) A method performed by a network device, the method comprising:

paging, by the network device, a user equipment (UE) in idle mode by sending a message on a control channel, the message having an allocation of resources for a shared channel and a radio network temporary identity (RNTI) associated with a plurality of UEs including the UE;

sending, by the network device, a paging message in the allocated resources for the shared channel; and

wherein the paging message includes an International Mobile Subscriber Identity (IMSI) or a Temporary Mobile Subscriber Identity (TMSI).

113. (NEW) The method of claim 112 further comprising:

receiving, by the network device, a response to the paging message on an uplink shared channel.

114. (NEW) The method of claim 112 wherein the control channel is a shared control channel (SCCH).

115. (NEW) The method of claim 114 wherein the SCCH is cell-specific.

116. (NEW) The method of claim 112 wherein the shared channel is a contention-based channel.

117. (NEW) The method of claim 112 wherein the control channel is a broadcast channel.

118. (NEW) The method of claim 112 wherein the RNTI is cell-specific.

119. (NEW) The method of claim 112 wherein the RNTI is received by the network device from a core network or resource manager.

120. (NEW) The method of claim 112 further comprising:

receiving, by the network device, an uplink synchronization request from the UE for synchronizing communications between the network device and the UE.

121. (NEW) A user equipment (UE), the UE comprising:

circuitry configured to receive in idle mode a message on a control channel to indicate a page in a wireless network, the message having an allocation of resources for a shared channel and a radio network temporary identity (RNTI) associated with a plurality of UEs including the UE;

circuitry configured to receive a paging message in the allocated resources for the shared channel; and

wherein the paging message includes an International Mobile Subscriber Identity (IMSI) or a Temporary Mobile Subscriber Identity (TMSI).

122. (NEW) The UE of claim 121 further comprising:

circuitry configured to send a response to the paging message on an uplink shared channel.

123. (NEW) The UE of claim 121 wherein the control channel is a shared control channel (SCCH).

124. (NEW) The UE of claim 123 wherein the SCCH is cell-specific.

125. (NEW) The UE of claim 121 wherein the shared channel is a contention-based channel.

126. (NEW) The UE of claim 121 wherein the control channel is a broadcast channel.

127. (NEW) The UE of claim 121 wherein the RNTI is cell-specific.

128. (NEW) The UE of claim 121 further comprising:

circuitry configured to send an uplink synchronization request to the wireless network for synchronizing communications between the wireless network and the UE.

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

receiving, by the UE, in idle mode a message on a control channel to indicate a page in a wireless network, the message having an allocation of resources for a shared channel and a radio network temporary identity (RNTI) associated with a

plurality of UEs including the UE;

receiving, by the UE, a paging message in the allocated resources for the shared channel; and

wherein the paging message includes an International Mobile Subscriber Identity (IMSI) or a Temporary Mobile Subscriber Identity (TMSI).

130. (NEW) The method of claim 129 further comprising:

sending, by the UE, a response to the paging message on an uplink shared channel.

131. (NEW) The method of claim 129 wherein the control channel is a shared control channel (SCCH).

132. (NEW) The method of claim 131 wherein the SCCH is cell-specific.

133. (NEW) The method of claim 129 wherein the shared channel is a contention-based channel.

134. (NEW) The method of claim 129 wherein the control channel is a broadcast channel.

135. (NEW) The method of claim 129 wherein the RNTI is cell-specific.

136. (NEW) The method of claim 129 further comprising:

sending, by the UE, an uplink synchronization request to the wireless network for synchronizing communications between the wireless network and the UE.

Amendments to the Specification:

Please replace paragraph [0039] with the following amended paragraph:

[0039] FIG. 3 illustrates an example of signaling flow in an embodiment of the network-initiated connection establishment procedure. The network sends a paging message to the UE 110 via the Node Bs 112 to initiate a connection. First, the core network (or, more particularly in some embodiments, ~~the~~ access ~~gate way~~ gateway 118 within the core network) transmits the paging message to the relevant Node Bs in the registration area. After receiving the paging message from the core network, each Node B selects a c-RNTI and SCCH index (in one embodiment), and forms the paging signal to be broadcast in the corresponding cell. Thus the paging signal broadcast in the cell includes the paging message (cause, UE identity) from the core network, c-RNTI and the SCCH index (see FIG. 4). The UE identity may be expressed by the international mobile subscriber identity (IMSI) or temporary mobile ~~suberiber~~ subscriber identity (TMSI), which are known in the 3G standard. The recipient UE may use this c-RNTI as the cell-specific identity and the SCCH as the associated shared control channel for the shared channel operation[[:]].

Please change the title to:
PAGING IN A WIRELESS NETWORK

Please replace the Abstract with the following new Abstract:

ABSTRACT

Paging in a wireless network is described. A user equipment (UE) in idle mode is paged by sending a message on a control channel having an allocation of resources for a shared channel and a radio network temporary identity (RNTI) associated with other UEs including the UE. The paging message may include an International Mobile Subscriber Identity (IMSI) or a Temporary Mobile Subscriber Identity (TMSI).

Amendments to Drawings:

The attached sheets of drawings are formal drawings replacing the current drawings. These sheets, which include Figs. 1-16, replace the original sheets including Figs. 1-16. In Fig. 1, reference numbers 112 are added to the two unmarked Node Bs. In Fig. 2, reference number 110 is added to indicate UE 110 as described in the specification.

REMARKS/ARGUMENTS

This supplemental reply incorporates changes to the claims, specification, and drawings in addition to those made in the Request for Continued Examination (RCE) filed August 8, 2011. After the foregoing Amendment, claims 83-136 are currently pending in this application. Claims 1-82 are canceled without prejudice. New claims 83-136 are added. In the specification, paragraph [0039] is amended to better correspond to the drawings.

In the drawings, formal drawings are provided. In Fig. 1, reference numbers 112 are added to the two unmarked Node Bs. In Fig. 2, reference number 110 is added to indicate UE 110 as described in the specification. In addition, the RCE appropriately replied to the drawings objection made in the Final Office Action dated May 6, 2011.

Claim Rejections - 35 USC § 112 1st ¶

Claims 1-82 are rejected under 35 USC § 112 1st ¶ as failing to comply with the written description requirement. Claims 1-82 are canceled making the rejection moot. Withdrawal of the 35 USC § 112 1st ¶ rejection of claims 1-82 is respectfully requested.

Claim Rejections - 35 U.S.C. § 103(a)

Claims 1-6, 9, 10, 13, 14, 29, 30-34, 45-50, 54-58, 62-64, 66, 67, and 74-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over 3GPP publications 3GPP ETSI TR 125 931 V7.0.0 (2006-03) (hereinafter "3GPP reference I") in view of 3GPP ETSl TS 144 018 V6.16.0 (2006-01) (hereinafter "3GPP reference II").

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatantable over 3GPP reference I in view of 3GPP reference II and 3GPP TS 25.303 V3.12.0 (2002-06) (hereinafter "3GPP reference III").

Claims 23-28, 40-48, 68-73 and 78-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over 3GPP reference I in view of 3GPP reference II.

Claims 11, 12, 15-22, 35, 36, 38, 39, 51-53, 59-61, and 65 are rejected under 35 U.S.C. 103(a) as being unpatantable over 3GPP reference I in view of 3GPP reference II further in view of U.S. Pat. Publication No. 2007/0218901 to Tenny (hereinafter "Tenny").

Claims 1-36 and 38-82 are canceled making the rejection moot. In addition to the points made in the reply filed August 8, 2011, for new independent claims 83, 93, 103, 112, 121, and 129 3GPP reference I, 3GPP reference II, 3GPP reference III, or Tenny, alone or combination, do not at least teach or suggest sending or receiving a message on a control channel having ***an allocation of resources for a shared channel*** and a radio network temporary identity (RNTI) associated with a plurality

of UEs including a UE. This "message" may initiate a paging process. The references further do not at least teach or suggest then ***sending a paging message having an International Mobile Subscriber Identity (IMSI) or a Temporary Mobile Subscriber Identity (TMSI)***.

Claims 84-92, 94-102, 104-111, 113-120, 122-128, and 130-136 are dependent upon claims 83, 93, 103, 112, 121, and 129, and the Applicant believes these claim are allowable over the cited references of record for the same reasons provided above.

Based on the arguments presented above, withdrawal of the 35 U.S.C. § 103(a) rejection of claims 1-36 and 38-82 is respectfully requested.

Conclusion

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

In view of the foregoing amendment and remarks, Applicant respectfully submits that the present application is in condition for allowance and a notice to that effect is respectfully requested.

Respectfully submitted,

Chandrika K. Worrall

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

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

HV/amw

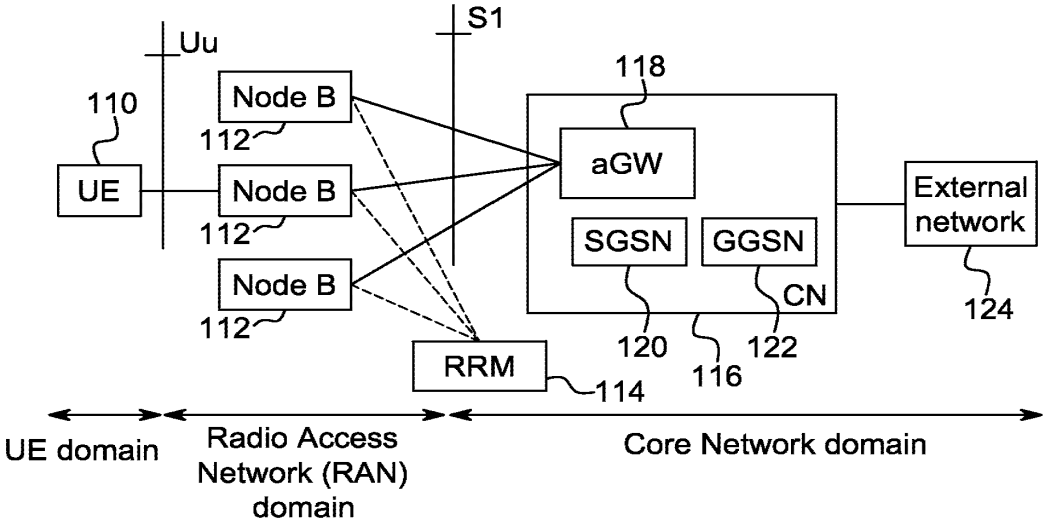

Uu
S1
110
UE
Node B
112
Node B
112
Node B
112
118
aGW
SGSN
GGSN
CN
120
122
116
External network
124
RRM
114
UE domain
Radio Access Network (RAN) domain
Core Network domain

FIG. 1

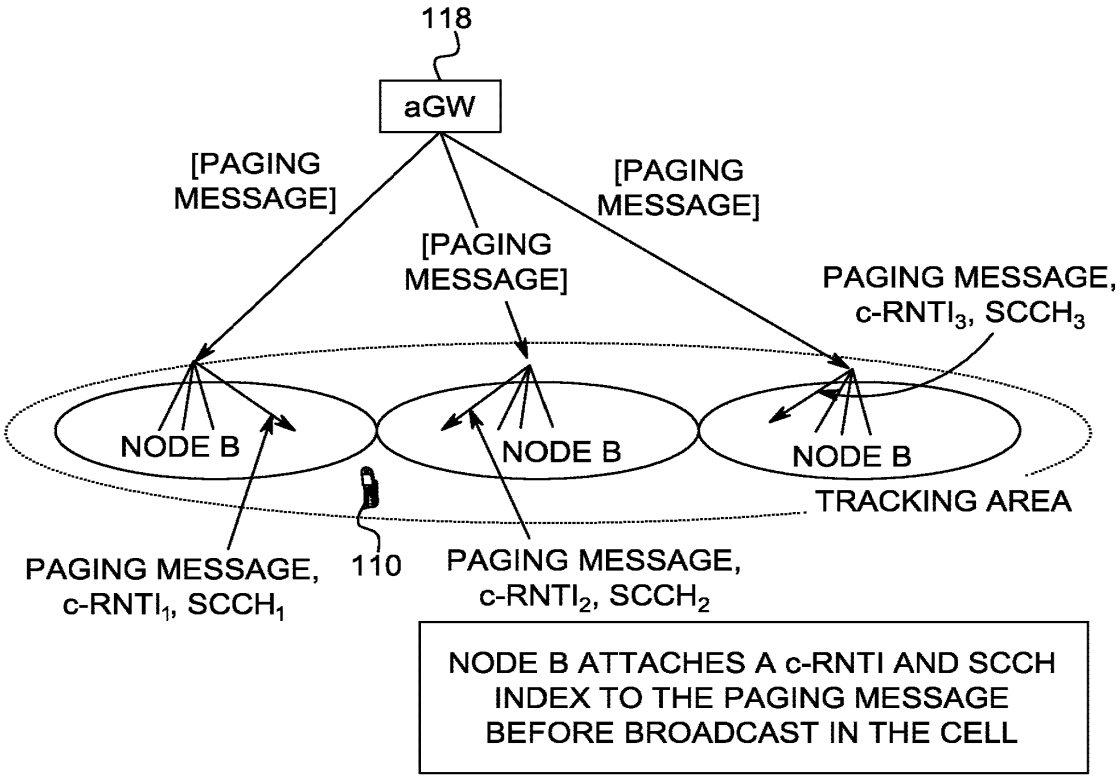

118
aGW
[PAGING MESSAGE]
[PAGING MESSAGE]
[PAGING MESSAGE]
PAGING MESSAGE, c-RNTI3, SCCH3
NODE B
NODE B
NODE B
TRACKING AREA
110
PAGING MESSAGE, c-RNTI1, SCCH1
PAGING MESSAGE, c-RNTI2, SCCH2
NODE B ATTACHES A c-RNTI AND SCCH INDEX TO THE PAGING MESSAGE BEFORE BROADCAST IN THE CELL

FIG. 2

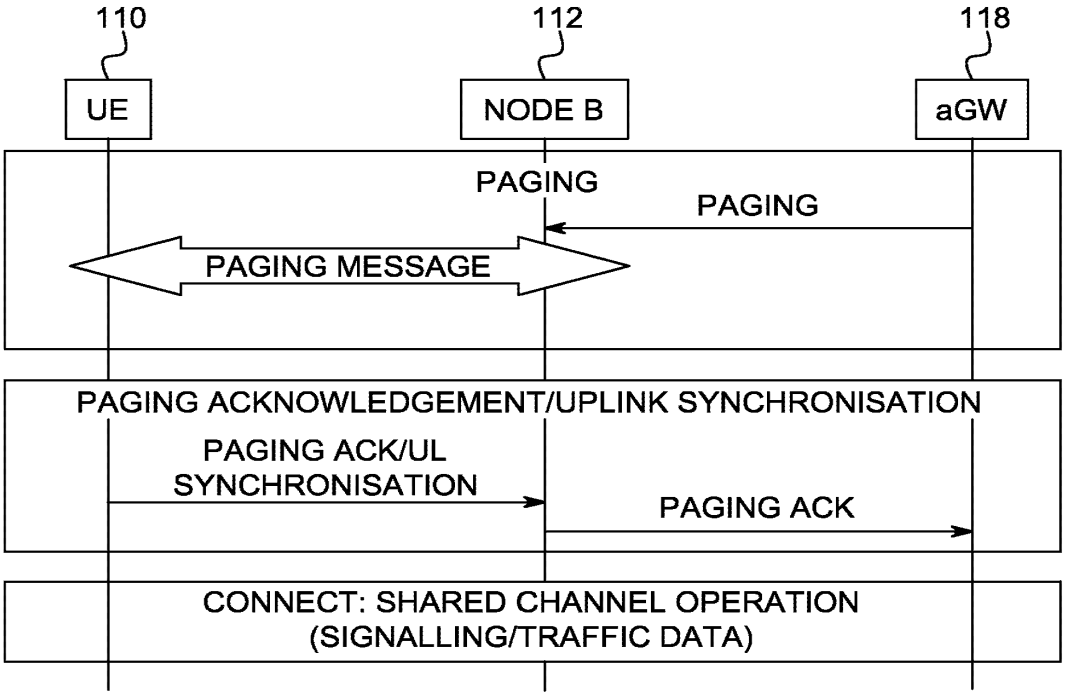


FIG. 3

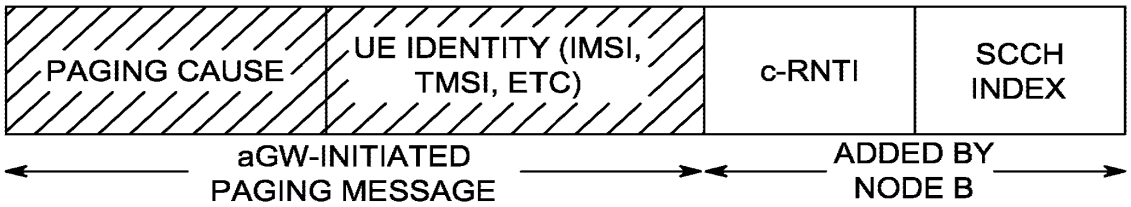


FIG. 4

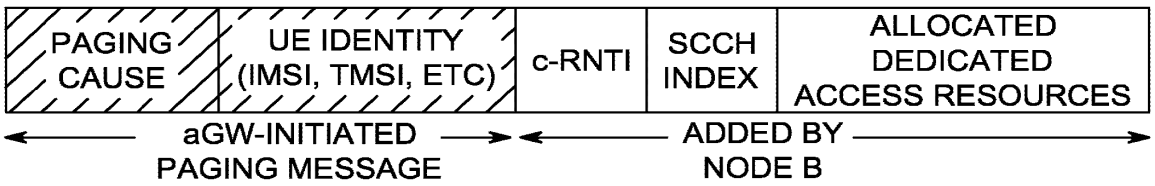


FIG. 5

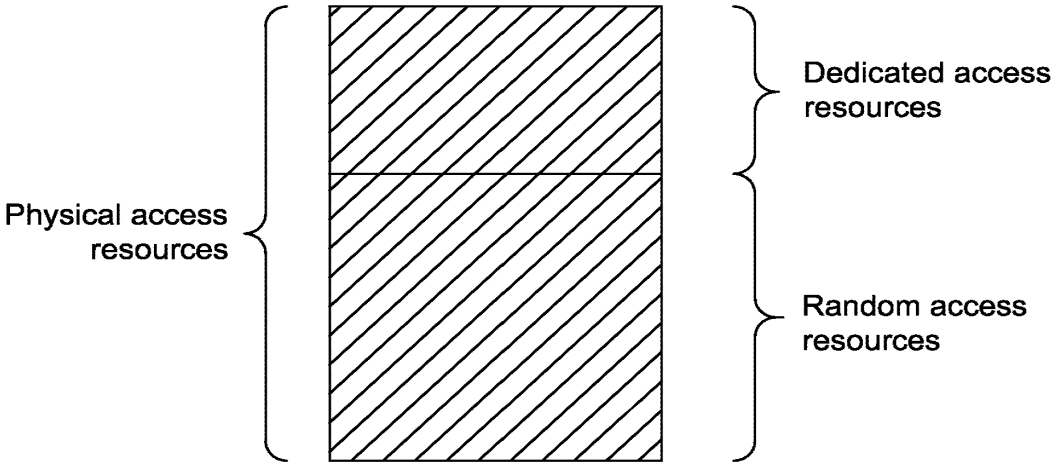

Physical access resources
Dedicated access resources
Random access resources

FIG. 6

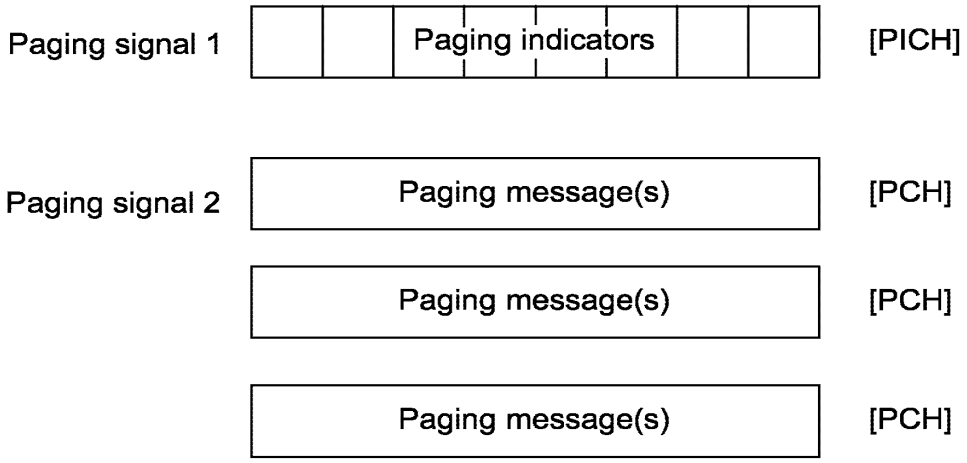

Paging signal 1
Paging indicators
[PICH]
Paging signal 2
Paging message(s)
[PCH]
Paging message(s)
[PCH]
Paging message(s)
[PCH]

FIG. 7

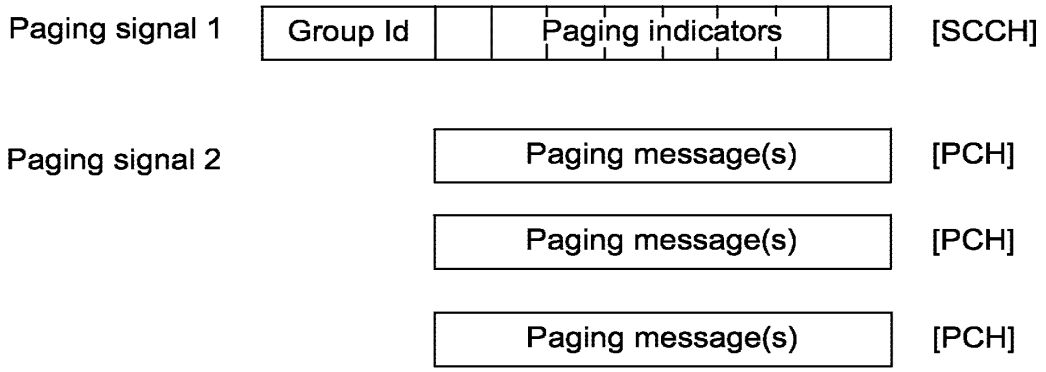


FIG. 8

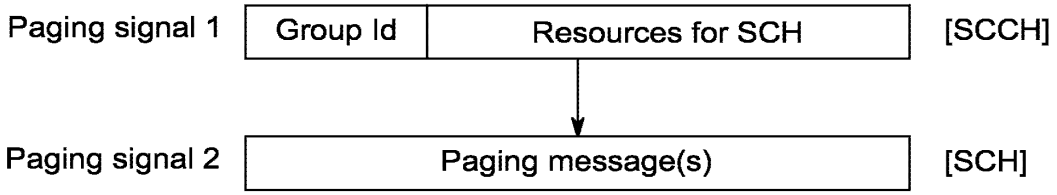


FIG. 9

c-RNTI (which is signalled in the paging message)	Signature sequence (for UL synchronisation)

FIG. 10

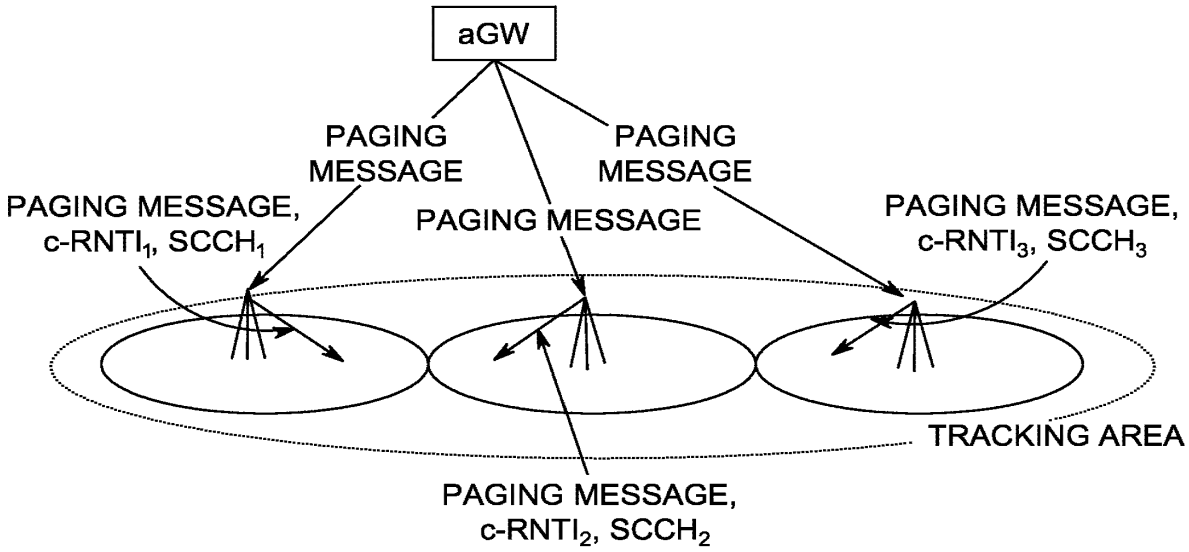

aGW
PAGING MESSAGE
PAGING MESSAGE
PAGING MESSAGE, c-RNTI1, SCCH1
PAGING MESSAGE
PAGING MESSAGE, c-RNTI3, SCCH3
TRACKING AREA
PAGING MESSAGE, c-RNTI2, SCCH2

FIG. 11

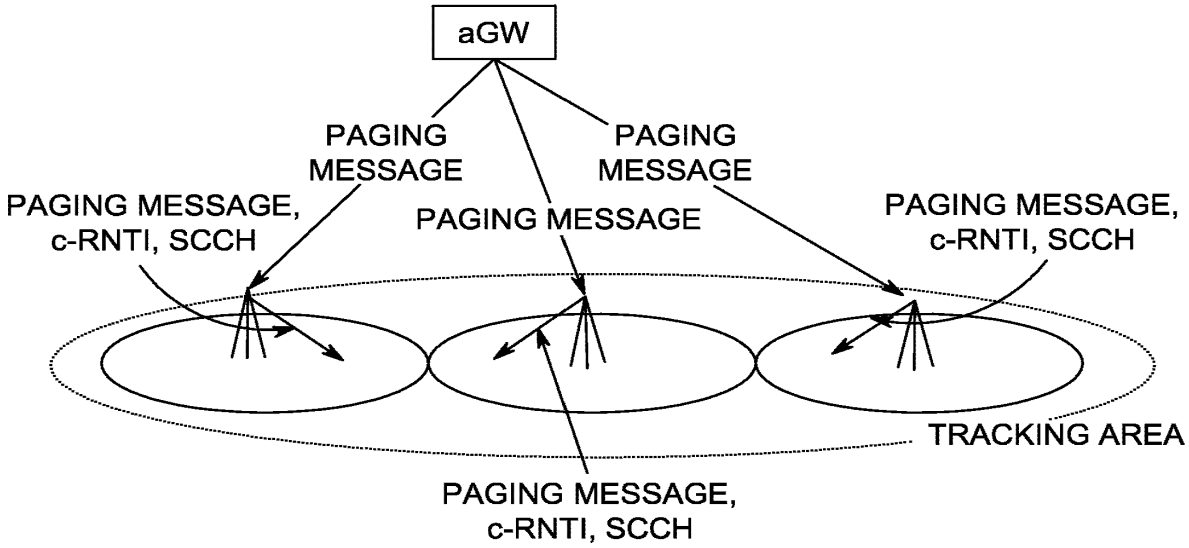

aGW
PAGING MESSAGE
PAGING MESSAGE
PAGING MESSAGE, c-RNTI, SCCH
PAGING MESSAGE
PAGING MESSAGE, c-RNTI, SCCH
TRACKING AREA
PAGING MESSAGE, c-RNTI, SCCH

FIG. 12

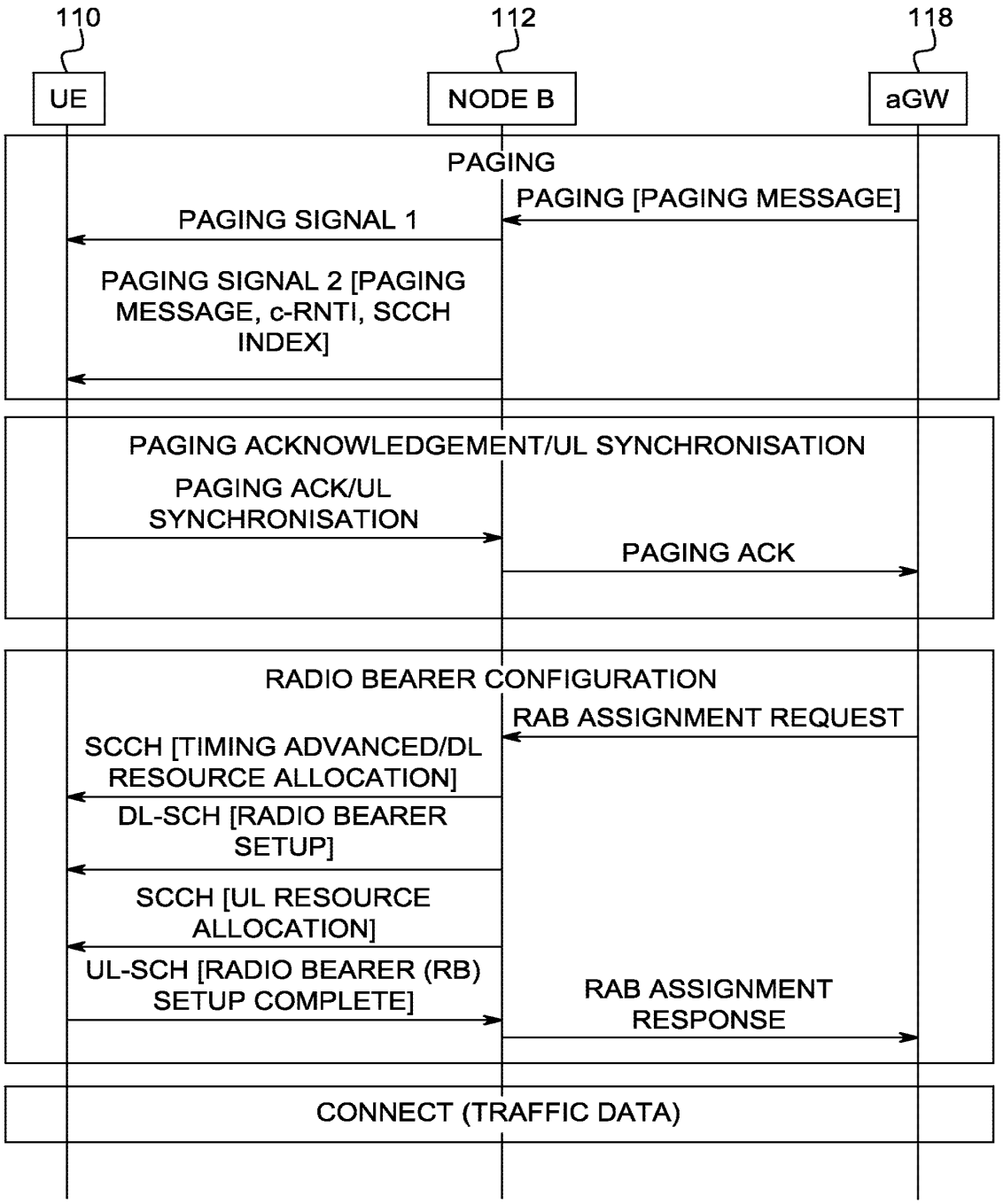

110
112
118
UE
NODE B
aGW
PAGING
PAGING [PAGING MESSAGE]
PAGING SIGNAL 1
PAGING SIGNAL 2 [PAGING MESSAGE, c-RNTI, SCCH INDEX]
PAGING ACKNOWLEDGEMENT/UL SYNCHRONISATION
PAGING ACK/UL SYNCHRONISATION
PAGING ACK
RADIO BEARER CONFIGURATION
RAB ASSIGNMENT REQUEST
SCCH [TIMING ADVANCED/DL RESOURCE ALLOCATION]
DL-SCH [RADIO BEARER SETUP]
SCCH [UL RESOURCE ALLOCATION]
UL-SCH [RADIO BEARER (RB) SETUP COMPLETE]
RAB ASSIGNMENT RESPONSE
CONNECT (TRAFFIC DATA)

FIG. 13

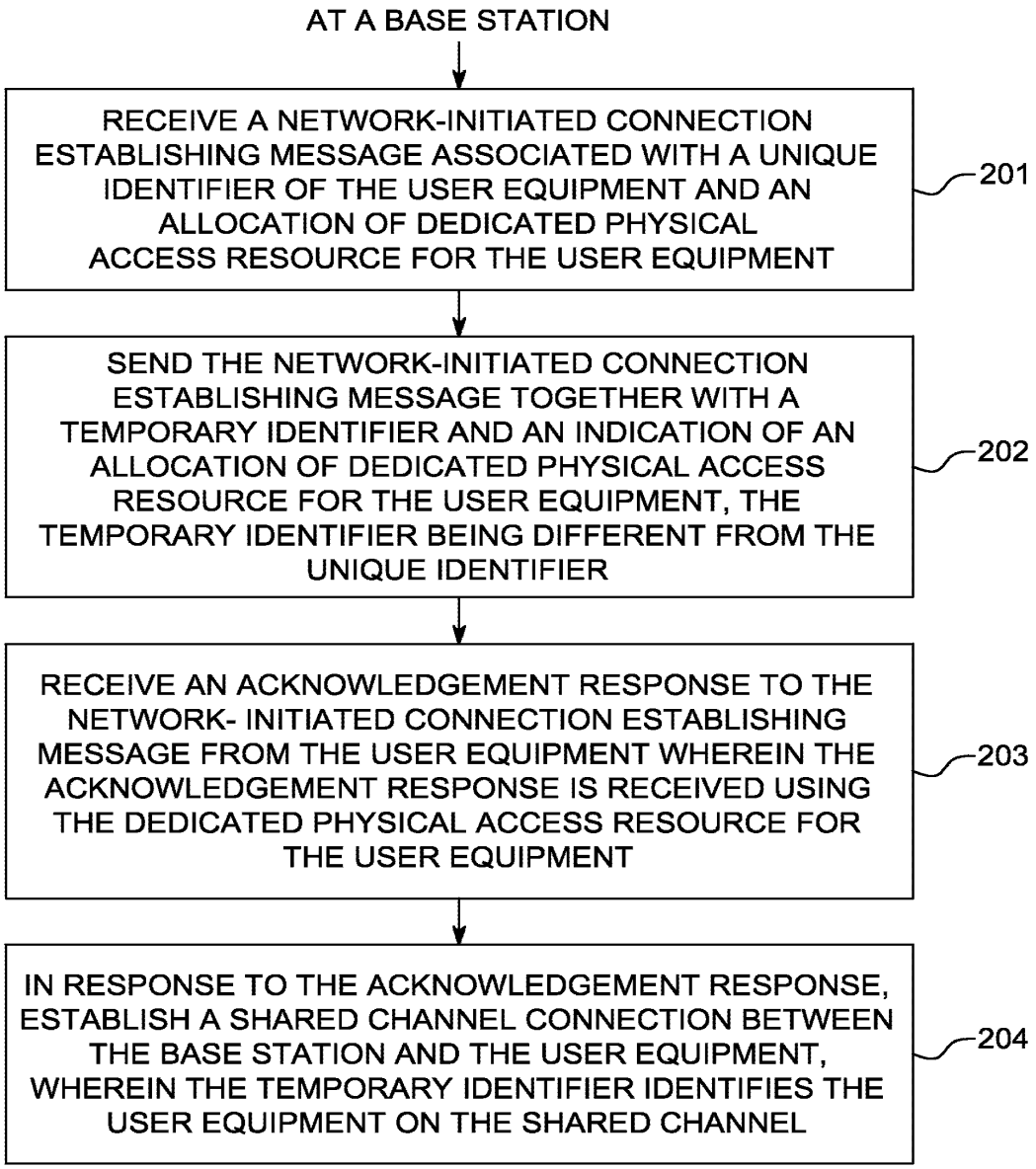

AT A BASE STATION
RECEIVE A NETWORK-INITIATED CONNECTION ESTABLISHING MESSAGE ASSOCIATED WITH A UNIQUE IDENTIFIER OF THE USER EQUIPMENT AND AN ALLOCATION OF DEDICATED PHYSICAL ACCESS RESOURCE FOR THE USER EQUIPMENT
201
SEND THE NETWORK-INITIATED CONNECTION ESTABLISHING MESSAGE TOGETHER WITH A TEMPORARY IDENTIFIER AND AN INDICATION OF AN ALLOCATION OF DEDICATED PHYSICAL ACCESS RESOURCE FOR THE USER EQUIPMENT, THE TEMPORARY IDENTIFIER BEING DIFFERENT FROM THE UNIQUE IDENTIFIER
202
RECEIVE AN ACKNOWLEDGEMENT RESPONSE TO THE NETWORK- INITIATED CONNECTION ESTABLISHING MESSAGE FROM THE USER EQUIPMENT WHEREIN THE ACKNOWLEDGEMENT RESPONSE IS RECEIVED USING THE DEDICATED PHYSICAL ACCESS RESOURCE FOR THE USER EQUIPMENT
203
IN RESPONSE TO THE ACKNOWLEDGEMENT RESPONSE, ESTABLISH A SHARED CHANNEL CONNECTION BETWEEN THE BASE STATION AND THE USER EQUIPMENT, WHEREIN THE TEMPORARY IDENTIFIER IDENTIFIES THE USER EQUIPMENT ON THE SHARED CHANNEL
204

FIG. 14

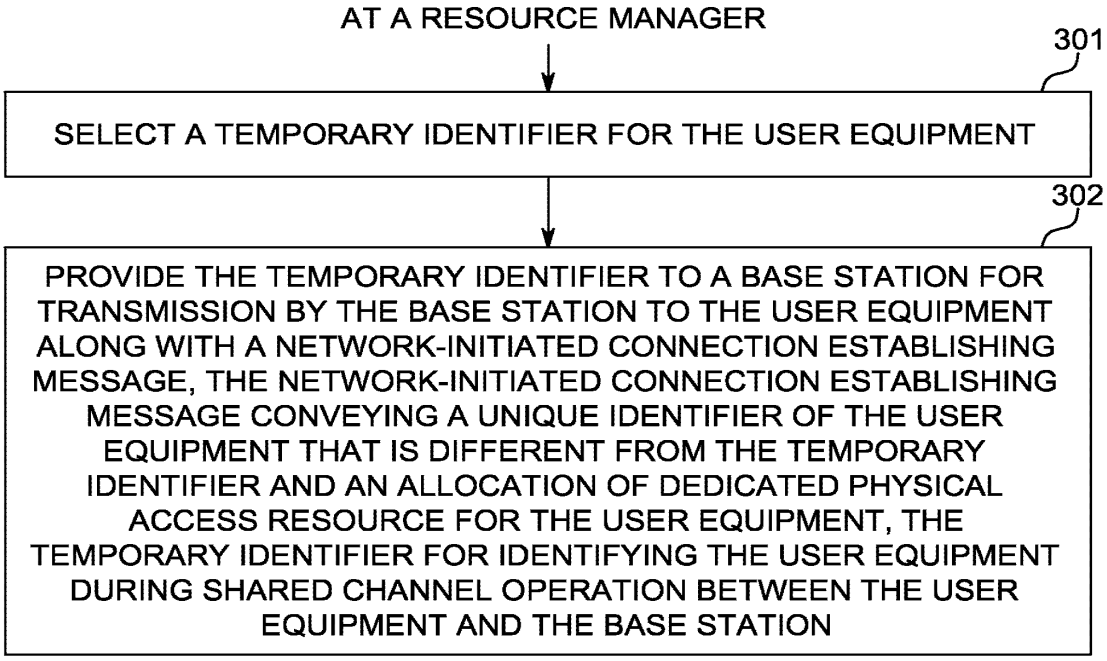

AT A RESOURCE MANAGER
301
SELECT A TEMPORARY IDENTIFIER FOR THE USER EQUIPMENT
302
PROVIDE THE TEMPORARY IDENTIFIER TO A BASE STATION FOR TRANSMISSION BY THE BASE STATION TO THE USER EQUIPMENT ALONG WITH A NETWORK-INITIATED CONNECTION ESTABLISHING MESSAGE, THE NETWORK-INITIATED CONNECTION ESTABLISHING MESSAGE CONVEYING A UNIQUE IDENTIFIER OF THE USER EQUIPMENT THAT IS DIFFERENT FROM THE TEMPORARY IDENTIFIER AND AN ALLOCATION OF DEDICATED PHYSICAL ACCESS RESOURCE FOR THE USER EQUIPMENT, THE TEMPORARY IDENTIFIER FOR IDENTIFYING THE USER EQUIPMENT DURING SHARED CHANNEL OPERATION BETWEEN THE USER EQUIPMENT AND THE BASE STATION

FIG. 15

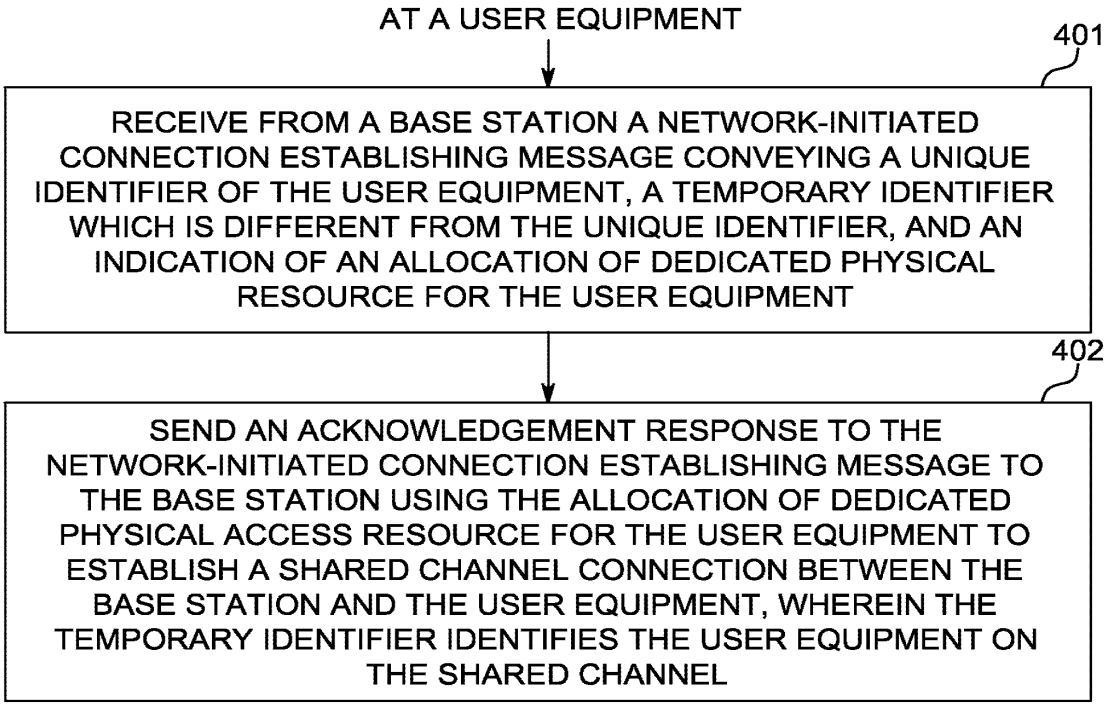

AT A USER EQUIPMENT
401
RECEIVE FROM A BASE STATION A NETWORK-INITIATED CONNECTION ESTABLISHING MESSAGE CONVEYING A UNIQUE IDENTIFIER OF THE USER EQUIPMENT, A TEMPORARY IDENTIFIER WHICH IS DIFFERENT FROM THE UNIQUE IDENTIFIER, AND AN INDICATION OF AN ALLOCATION OF DEDICATED PHYSICAL RESOURCE FOR THE USER EQUIPMENT
402
SEND AN ACKNOWLEDGEMENT RESPONSE TO THE NETWORK-INITIATED CONNECTION ESTABLISHING MESSAGE TO THE BASE STATION USING THE ALLOCATION OF DEDICATED PHYSICAL ACCESS RESOURCE FOR THE USER EQUIPMENT TO ESTABLISH A SHARED CHANNEL CONNECTION BETWEEN THE BASE STATION AND THE USER EQUIPMENT, WHEREIN THE TEMPORARY IDENTIFIER IDENTIFIES THE USER EQUIPMENT ON THE SHARED CHANNEL

FIG. 16

Electronic Acknowledgement Receipt

EFS ID:	14207275
Application Number:	11416865
International Application Number:	
Confirmation Number:	8530
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Customer Number:	3624
Filer:	Harry Vartanian/Angel Wolf
Filer Authorized By:	Harry Vartanian
Attorney Docket Number:	IPW2-USAP191682
Receipt Date:	12-NOV-2012
Filing Date:	02-MAY-2006
Time Stamp:	19:24:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		IPW2_USAP191682_Reply.PDF	145246 d5f3d222f1cbd36643ddb79bb80f23c16f0ee210	yes	21

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment After Final	1	1
	Claims	2	13
	Specification	14	14
	Abstract	15	16
	Drawings-only black and white line drawings	17	17
	Applicant Arguments/Remarks Made in an Amendment	18	21

Warnings:

Information:

2	Drawings-only black and white line drawings	IPW2_USAP191682_FormalDrawings.PDF	916754 ade0aceb852076170316f5c0ecc149b1610ee0e2	no	8

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<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.

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	11416865
	Filing Date	2006-05-02
	First Named Inventor	Chandrika K. Worrall
	Art Unit	2617
	Examiner Name	Patrick Nestor Edouard
	Attorney Docket Number	IPW2-USAP191682

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
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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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NON-PATENT LITERATURE DOCUMENTS			Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	11416865
	Filing Date	2006-05-02
	First Named Inventor	Chandrika K. Worrall
	Art Unit	2617
	Examiner Name	Patrick Nestor Edouard
	Attorney Docket Number	IPW2-USAP191682

	1	OFFICE ACTION, Japanese Patent Application No. 2009-508324, mailed January 4, 2012.	☐
	2	OFFICE ACTION, Korean Patent Application No. 200780021642.8, dated April 13, 2010.	☐
	3	OFFICE ACTION, Korean Patent Application No. 200780021642.8, dated August 12, 2011.	☐
	4	OFFICE ACTION, Korean Patent Application No. 200780021642.8, dated March 30, 2012.	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	11416865
	Filing Date	2006-05-02
	First Named Inventor	Chandrika K. Worrall
	Art Unit	2617
	Examiner Name	Patrick Nestor Edouard
	Attorney Docket Number	IPW2-USAP191682

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.

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

☒ None

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)	2012-08-01
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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The information provided by you in this form will be subject to the following routine uses:

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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:	13397807
Application Number:	11416865
International Application Number:	
Confirmation Number:	8530
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Customer Number:	3624
Filer:	John Porrazza/Carey Kulp
Filer Authorized By:	John Porrazza
Attorney Docket Number:	IPW2-USAP191682
Receipt Date:	01-AUG-2012
Filing Date:	02-MAY-2006
Time Stamp:	18:29:41
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Non Patent Literature	CN_OA_March2012.pdf	518244 db8a9e306871d2f5e4161c3bf15b26c10255a0c1	no	4

Warnings:

Information:

2	Non Patent Literature	CNOA_April_2010.pdf	1443964 dd1eeec673a34a2c3a7b447589f50f461cc8fa3a	no	10
Warnings:					
Information:					
3	Non Patent Literature	CNOA_AUG_2011.pdf	656164 ec4f8ffe361ea13e356807d29fc4d6fb60e4b7d5	no	5
Warnings:					
Information:					
4	Non Patent Literature	JPOA.pdf	370934 fe1697c5b4ce8d9f247aa45cc2d5bc6b4ad343a8	no	3
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	ids.pdf	778932 8eebe4cb7471d72eb7366f1cfb338d2c8ee3e38c	no	4
Warnings:					
Information:					

A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.

Total Files Size (in bytes):	3768238

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.

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
11/416,865	05/02/2006	Chandrika K. Worrall	9010-96635-US

CONFIRMATION NO. 8530

POWER OF ATTORNEY NOTICE

22242
FITCH EVEN TABIN & FLANNERY, LLP
120 SOUTH LASALLE STREET
SUITE 1600
CHICAGO, IL 60603-3406

OC000000055549306

Date Mailed: 07/26/2012

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/18/2012.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/kmoukdarath/

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

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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Address: COMMISSIONER FOR PATENTS
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/416,865	05/02/2006	Chandrika K. Worrall	9010-96635-US

CONFIRMATION NO. 8530

POA ACCEPTANCE LETTER

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

OC000000055549315

Date Mailed: 07/26/2012

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/18/2012.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/kmoukdarath/

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

PTO/SB/80 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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(b).

I hereby appoint:

[x] 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(b).

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

[x] 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.
Suite 300
Las Vegas, NV 89128

A copy of this form, together with a statement under 37 CFR 3.73(b) (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(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, 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	24 May 2012
Name	Jeremy Sanders	Telephone	/
Title	Authorized Person for Intellectual Ventures Holding 81 LLC		

DECLARATION REGARDING AUTHORITY TO SIGN ON BEHALF OF A LEGAL ENTITY
(37 C.F.R. 3.73(b)(2)(i))

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

Jeremy Sanders, Authorized Person for Intellectual Ventures Holding 81 LLC

24 May 2012
[date]

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Intellectual Ventures Holding 81 LLC

Application No./Patent No.: 11/416,865 Filed/Issue Date: May 2, 2006

Titled:
NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM

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 it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

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 therefore is attached.

OR

B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: CHANDRIKA K. WORRALL To: IPWIRELESS, INC.
The document was recorded in the United States Patent and Trademark Office at
Reel 018021, Frame 0200, or for which a copy thereof is attached.

2. From: IPWIRELESS, INC. To: WIRELESS TECHNOLOGY SOLUTIONS LLC
The document was recorded in the United States Patent and Trademark Office at
Reel 024305, Frame 0492, or for which a copy thereof is attached.

3. 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.

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

☒ As required by 37 CFR 3.73(b)(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.

/Jeremy Sanders/	May 24, 2012
Signature	Date
Jeremy Sanders	Authorized Person IVH81LLC
Printed or Typed Name	Title

Privacy Act Statement

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

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

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

STATEMENT UNDER 37 CFR 3.73(b) CONTINUED

Applicant/Patent Owner: Intellectual Ventures Holding 81 LLC

Application No./Patent No.: 11/416,865

Filed/Issue Date: May 2, 2006

Titled: NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM

4. **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** 0237

Electronic Acknowledgement Receipt

EFS ID:	13285365
Application Number:	11416865
International Application Number:	
Confirmation Number:	8530
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Customer Number:	22242
Filer:	Harry Vartanian
Filer Authorized By:	
Attorney Docket Number:	9010-96635-US
Receipt Date:	18-JUL-2012
Filing Date:	02-MAY-2006
Time Stamp:	21:02:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	IPW2_USAP191682_POA.PDF	911781 69cff9b09771e28471c033f443d31dfef1f4d8c3	no	1

Warnings:

Information:

2	Assignee showing of ownership per 37 CFR 3.73(b).	IPW2_USAP191682_3_73b_Authorization.PDF	208010 fc97659ff2f6d1a5020cec38c4160d94c6cfec36	no	1
Warnings:					
Information:					
3	Assignee showing of ownership per 37 CFR 3.73(b).	IPW2_USAP191682_3_73b_Statement.PDF	561665 ba299d302cd8c24f78906fc0403de6780dff9103	no	2
Warnings:					
Information:					
4	Assignee showing of ownership per 37 CFR 3.73(b).	IPW2_USAP191682_3_73b_Continued.PDF	65739 e4d28bea2fcf7b53939ab1c8c87532b367e65fee	no	1
Warnings:					
Information:					
			Total Files Size (in bytes):	1747195	

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.

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	11416865	Filing Date	2006-05-02	Docket Number (if applicable)	9147/96635 (06-011)	Art Unit	2617
First Named Inventor	Chandrika K. Worrall			Examiner Name	Aung T. Win		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☒ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to
Deposit Account No 061135

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Signature of Registered U.S. Patent Practitioner			
Signature	/Steven G. Parmelee/	Date (YYYY-MM-DD)	2011-08-08
Name	Steven G. Parmelee	Registration Number	28790

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. 11/416,865	)	***Confirmation No. 8530***
Filed: May 2, 2006	)	
Applicants: Chandrika K. Worrall	)	
Title: **NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM**	)	This Amendment B And Response was electronically filed on August 8, 2011 using EFS-Web.
Art Unit: 2617	)	
Examiner: Aung T. Win	)	
Attorney Docket: 9147-96635-US	)	
Customer No.: 22242	)	

Mail Stop AMENDMENT
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

AMENDMENT B AND RESPONSE

Sir:

In response to the Office Action mailed May 6, 2011 as entered in the above-captioned matter, Applicants respectfully submit the following amendment and response.

Amendments to the Specification begin on page 2 of this paper;

Amendments to the Drawings are specified at page 4 of this paper;

Amendments to the Claims are reflected in the listing of claims beginning on page 5 of this paper; and

Remarks begin on page 22 of this paper.

AMENDMENTS TO THE SPECIFICATION

At the conclusion of the Brief Description of the Drawings, add the following three new paragraphs/sentences:

[0035] FIG. 14 illustrates a flow diagram according to embodiments of the invention.

[0036] FIG. 15 illustrates a flow diagram according to embodiments of the invention.

[0037] FIG. 16 illustrates a flow diagram according to embodiments of the invention.

Between existing paragraphs 0072 and 00731 please insert the following three new paragraphs:

[0073] In accordance with the foregoing teachings, and referring to figure 14, a base station can be configured to receive (201) a network-initiated connection establishing message associated with a unique identifier of the user equipment and an allocation of dedicated physical access resource for the user equipment, send (202) the network-initiated connection establishing message together with a temporary identifier and an indication of an allocation of dedicated physical access resource for the user equipment, the temporary identifier being different from the unique identifier, receive (203) an acknowledgement response to the network-initiated connection establishing message from the user equipment wherein the acknowledgement response is received using the dedicated physical access resource for the user equipment, and in response to the acknowledgement response, establish (204) a shared channel connection between the base station and the user

1 As published.

equipment, wherein the temporary identifier identifies the user equipment on the shared channel.

[0074] Similarly, and referring to figure 15, a resource manager can be configured to select (301) a temporary identifier for the user equipment and then provide (302) the temporary identifier to a base station for transmission by the base station to the user equipment along with a network-initiated connection establishing message, the network-initiated connection establishing message conveying a unique identifier of the user equipment that is different from the temporary identifier and an allocation of dedicated physical access resource for the user equipment, the temporary identifier for identifying the user equipment during shared channel operation between the user equipment and the base station.

[0075] And as a further illustrative example in these regards, and referring now to figure 16, a user equipment can be configured to receive (401) from a base station a network-initiated connection establishing message conveying a unique identifier of the user equipment, a temporary identifier which is different from the unique identifier, and an indication of an allocation of dedicated physical resource for the user equipment and then send (402) an acknowledgement response to the network-initiated connection establishing message to the base station using the allocation of dedicated physical access resource for the user equipment to establish a shared channel connection between the base station and the user equipment, wherein the temporary identifier identifies the user equipment on the shared channel.

AMENDMENTS TO THE DRAWINGS

Please add three new sheets of drawings depicting, respectively, new figure 14, 15, and 16. These three new sheets appear at the conclusion of this document following the signature block.

AMENDMENTS TO THE CLAIMS

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

Listing of Claims:

1. (Currently amended) A base station for establishing a network-initiated connection with a user equipment over a radio interface in a cellular communication system, the base station comprising:

logic for deriving a network-initiated connection establishing message associated with a unique identifier of the user equipment and an allocation of dedicated physical access resource for the user equipment;

logic for sending the network-initiated connection establishing message together with a temporary identifier and an indication of the allocation of dedicated physical access resource for the user equipment ~~to at least one cell~~, the temporary identifier being different from the unique identifier;

logic for an acknowledgement response to the network-initiated connection establishing message from the user equipment wherein the acknowledgement response is received using the dedicated physical access resource for the user equipment ~~(UE) within the at least one cell~~; and

logic for establishing a shared channel connection between the base station and the user equipment ~~UE~~ in response to the acknowledgement response, wherein the temporary identifier identifies the user equipment ~~UE~~ on the shared channel.

2. (Previously presented) The base station of claim 1, wherein the logic for receiving the network-initiated connection establishing message is configured to receive the network-initiated connection establishing message from a core network.

3. (Currently amended) The base station of claim 1, comprising logic for assigning to the user equipment ~~UE~~ a temporary identifier from the base station to which it was last registered in response to the user equipment ~~UE~~ being in a dormant state.

4. (Currently amended) The base station of claim 1, wherein the logic for sending is configured to send at least one channel index to at least one shared control channel (SCCH) along with the network-initiated connection establishing message, the SCCH for communicating control information for the user equipment ~~UE~~ during shared channel operation.

5. (Currently amended) The base station of claim 1, comprising logic for signaling to the user equipment ~~UE~~ an indication of dedicated access resources to be used by the U user equipment ~~UE~~ E for an acknowledgement response to the network-initiated connection establishing message.

6. (Original) The base station of claim 5, wherein the dedicated access resources include a dedicated physical channel.

7. (Original) The base station of claim 5, wherein the dedicated access resources include a dedicated signal sequence to be used on a contention-based channel.

8. (Previously presented) The base station of claim 1, wherein the logic for receiving the acknowledgement response to the network-initiated connection establishing message is configured to receive the acknowledgement response to the network-initiated connection establishing message over a contention-based uplink channel.

9. (Currently amended) The base station of claim 2, further comprising logic for sending the acknowledgment response to the network-initiated connection establishing message to the core network to establish shared channel communications between the user equipment ~~UE~~ and the core network.

10. (Previously presented) The base station of claim 1, wherein the logic for sending is configured to send the network-initiated connection establishing message and the temporary identifier using a broadcast channel.

11. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific, the base station further comprising logic for selecting the temporary identifier at the base station.

12. (Original) The base station of claim 11, further comprising logic for selecting the SCCH at the base station.

13. (Currently amended) The base station of claim 1, wherein the logic for receiving the acknowledgement response to the network-initiated connection establishing message comprises logic for synchronizing communication with the user equipment ~~UE~~ based upon an uplink synchronization request from the user equipment ~~UE~~.

14. (Previously presented) The base station of claim 13, wherein the uplink synchronization request is part of an acknowledgement response to the network-initiated connection establishing message.

15. (Original) The base station of claim 2, wherein the temporary identifier is cell-specific, the base station further comprising logic for receiving the temporary identifier from the core network.

16. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific, the base station further comprising logic for receiving the temporary identifier from a resource manager outside the core network.

17. (Previously presented) The base station of claim 15, the base station further comprising logic for receiving the channel index from the core network.

18. (Original) The base station of claim 16, the base station further comprising logic for receiving the channel index from the resource manager.

19. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific.

20. (Original) The base station of claim 2, wherein the temporary identifier is common to a plurality of cells within a registration area, the base station further comprising logic for receiving the temporary identifier from the core network.

21. (Original) The base station of claim 1, wherein the temporary identifier is common to a plurality of cells within a registration area, the base station further comprising logic for receiving the temporary identifier from a resource manager.

22. (Original) The base station of claim 4, wherein the temporary identifier and the SCCH are cell-specific.

23. (Currently amended) The base station of claim 1, wherein the logic for sending comprises logic for:

sending at least one network-initiated connection establishing message indicator in a first physical channel, wherein each network-initiated connection establishing message indicator corresponds to at least one user equipment ~~UE~~; and

sending the network-initiated connection establishing message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one user equipment ~~UE~~.

24. (Previously presented) The base station of claim 23, wherein the first physical channel is a network-initiated connection establishing message indicator channel for carrying a plurality of network-initiated connection establishing message indicators, and the second physical channel is a network-initiated connection establishing message channel.

25. (Previously presented) The base station of claim 23, wherein the first physical channel is an SCCH channel, and the second physical channel is a network-initiated connection establishing message channel.

26. (Currently amended) The base station of claim 25, further comprising logic for sending in the SCCH a group identifier identifying a group of user equipments ~~UEs~~ to which network-initiated connection establishing messages are directed.

27. (Original) The base station of claim 23, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

28. (Currently amended) The base station of claim 27, further comprising logic for:

sending in the SCCH a group identifier identifying a group of user equipments ~~UEs~~ to which at least one network-initiated connection establishing message is directed; and

sending in the SCCH an indication of resources allocated to the group of user equipments ~~UEs~~ for receiving network-initiated connection establishing messages in the shared channel.

29. (Currently amended) A method for establishing a network-initiated connection between a user equipment and a base station over a radio interface in a cellular communication system, the method comprising, at a base station:

receiving a network-initiated connection establishing message associated with a unique identifier of the user equipment and an allocation of dedicated physical access resource for the user equipment;

sending the network-initiated connection establishing message together with a temporary identifier and an indication of an allocation of dedicated physical access resource for the user equipment ~~to at least one cell~~, the temporary identifier being different from the unique identifier;

receiving an acknowledgement response to the network-initiated connection establishing message from the user equipment ~~(UE)~~ ~~within the at least one cell~~ wherein the acknowledgement response is received using the dedicated physical access resource for the user equipment; and

in response to the acknowledgement response, establishing a shared channel connection between the base station and the user equipment ~~UE~~, wherein the temporary identifier identifies the user equipment ~~UE~~ on the shared channel.

30. (Previously presented) The method of claim 29, wherein receiving the network-initiated connection establishing message comprises receiving the network-initiated connection establishing message from a core network.

31. (Currently amended) The method of claim 29, wherein, in response to the user equipment ~~UE~~ being in a dormant state, the user equipment ~~UE~~ is assigned the same temporary identifier it had been assigned from the base station to which it was last registered.

32. (Currently amended) The method of claim 29, wherein sending further comprises sending at least one channel index to at least one shared control channel (SCCH) along with the network-initiated connection establishing message, the SCCH for communicating control information for the user equipment ~~UE~~ during shared channel operation.

33. (Currently amended) The method of claim 29, wherein sending the network-initiated connection establishing message comprises signaling to the user equipment ~~UE~~ an indication of dedicated access resources to be used by the user equipment ~~UE~~ for network-initiated connection establishing message acknowledgement.

34. (Currently amended) The method of claim 30, further comprising sending the acknowledgment response to the network-initiated connection establishing message to

the core network to establish shared channel communications between the user equipment ~~UE~~ and the core network.

35. (Original) The method of claim 29, wherein the temporary identifier is cell-specific, the method further comprising selecting the temporary identifier at the base station.

36. (Original) The method of claim 35, further comprising selecting the SCCH at the base station.

37. (Currently amended) The method of claim 29, further comprising synchronizing communications between the base station and the user equipment ~~UE~~ based upon an uplink synchronization request from the user equipment ~~UE~~.

38. (Original) The method of claim 30, wherein the temporary identifier is cell-specific, and the temporary identifier is selected by the core network that sent the paging message.

39. (Original) The method of claim 30, wherein the temporary identifier is common to a plurality of cells within a registration area, and is selected by the core network.

40. (Currently amended) The method of claim 29, wherein sending the network-initiated connection establishing message comprises:

sending at least one network-initiated connection establishing message indicator in a first physical channel, wherein each paging indicator corresponds to at least one user equipment ~~UE~~; and

sending the network-initiated connection establishing message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one user equipment ~~UE~~.

41. (Previously presented) The method of claim 40, wherein the first physical channel is a network-initiated connection establishing message indicator channel for carrying a plurality of network-initiated connection establishing message indicators, and the second physical channel is a network-initiated connection establishing message channel.

42. (Previously presented) The method of claim 40, wherein the first physical channel is an SCCH channel, and the second physical channel is a network-initiated connection establishing message channel.

43. (Currently amended) The method of claim 42, further comprising sending in the SCCH a group identifier identifying a group of user equipments ~~UEs~~ to which network-initiated connection establishing messages are directed.

44. (Original) The method of claim 40, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

45. (Currently amended) A resource manager for establishing a network-initiated connection between a user equipment ~~(UE)~~ and a base station over a radio interface in a cellular communication system, the resource manager comprising:

logic for selecting a temporary identifier for the user equipment ~~UE~~; and

logic for providing the temporary identifier to the base station for transmission by the base station to the user equipment ~~UE~~ along with a network-initiated connection establishing message, the network-initiated connection establishing message conveying a unique identifier of the user equipment ~~UE~~ that is different from the temporary identifier and an allocation of dedicated physical access resource for the user equipment, the temporary identifier for identifying the user equipment ~~UE~~ during shared channel operation between the user equipment ~~UE~~ and the base station.

46. (Previously presented) The resource manager of claim 45, wherein the network-initiated connection establishing message is provided to the base station by a core network.

47. (Previously presented) The resource manager of claim 45, wherein the resource manager is a radio resource manager outside a core network that provides the network-initiated connection establishing message to the base station.

48. (Currently amended) The resource manager of claim 45, further comprising logic for:

sending a network-initiated connection establishing message to at least one base station within a registration area, wherein the network-initiated connection establishing message includes the unique identifier;

receiving an acknowledgement response to the network-initiated connection establishing message from a user equipment ~~UE~~ associated with the unique identifier via a first base station to establish a shared channel connection between the first base station and the user equipment ~~UE~~.

49. (Previously presented) The resource manager of claim 48, wherein the resource manager is part of the core network that provides the network-initiated connection establishing message to the base station.

50. (Original) The resource manager of claim 49, wherein the resource manager is an access gateway.

51. (Currently amended) The resource manager of claim 45, further comprising logic for:

selecting a channel index to a shared control channel (SCCH); and

providing the channel index to the base station for transmission by the base station to the user equipment ~~UE~~ along with the network-initiated connection establishing message and the temporary identifier, the SCCH for communicating control information including the temporary identifier between the user equipment ~~UE~~ and the base station during shared channel operation.

52. (Original) The resource manager of claim 51, wherein the temporary identifier and the SCCH are cell-specific.

53. (Original) The resource manager of claim 51, wherein the temporary identifier and the SCCH are common to a plurality of cells within a registration area of the core network.

54. (Currently amended) A method for establishing a network-initiated connection between a user equipment ~~(UE)~~ and a base station over a radio interface in a cellular communication system, the method comprising, at a resource manager:

selecting a temporary identifier for the user equipment ~~UE~~; and

providing the temporary identifier to the base station for transmission by the base station to the user equipment ~~UE~~ along with a network-initiated connection establishing message, the network-initiated connection establishing message conveying a unique identifier of the user equipment ~~UE~~ that is different from the temporary identifier and an allocation of dedicated physical access resource for the user equipment, the temporary identifier for identifying the user equipment ~~UE~~ during shared channel operation between the user equipment ~~UE~~ and the base station.

55. (Previously presented) The method of claim 54, wherein the network-initiated connection establishing message is provided to the base station by a core network.

56. (Previously presented) The method of claim 54, wherein the resource manager is a radio resource manager outside a core network that provides the network-initiated connection establishing message to the base station.

57. (Currently amended) The method of claim 54, further comprising:

sending a network-initiated connection establishing message to at least one base station within a registration area, wherein the network-initiated connection establishing message includes the unique identifier; and

receiving an acknowledgement response to the network-initiated connection establishing message from a user equipment ~~UE~~ associated with the unique identifier via a

first base station to establish a shared channel connection between the first base station and the user equipment ~~UE~~.

58. (Previously presented) The method of claim 57, wherein the resource manager is part of the core network that provides the network-initiated connection establishing message to the base station.

59. (Currently amended) The method of claim 54, further comprising, at the resource manager:

selecting a channel index to a shared control channel (SCCH); and

providing the channel index to the base station for transmission by the base station to the user equipment ~~UE~~ along with the network-initiated connection establishing message and the temporary identifier, the SCCH for communicating control information including the temporary identifier between the user equipment ~~UE~~ and the base station during shared channel operation.

60. (Original) The method of claim 59, wherein the temporary identifier and the SCCH are cell-specific.

61. (Original) The method of claim 59, wherein the temporary identifier and the SCCH are common to a plurality of cells within a registration area of the core network.

62. (Currently amended) A user equipment ~~(UE)~~ for establishing a network-initiated connection with a base station over a radio interface in a cellular communication system, the user equipment ~~UE~~ comprising:

logic for receiving from the base station a network-initiated connection establishing message ~~and a temporary identifier, the network-initiated connection establishing message~~ conveying a unique identifier of the user equipment ~~UE~~, ~~the~~ a temporary identifier which is ~~being~~ different from the unique identifier, and an indication of an allocation of dedicated physical access resource for the user equipment ; and

logic for sending an acknowledgement response to the network-initiated connection establishing message to the base station using the allocation of dedicated physical access resource for the user equipment to establish a shared channel connection between the base station and the user equipment ~~UE~~, wherein the temporary identifier identifies the user equipment ~~UE~~ on the shared channel.

63. (Currently amended) The user equipment ~~UE~~ of claim 62, further comprising logic for communicating control information during shared channel operation using a channel index to at least one shared control channel (SCCH) received along with the network-initiated connection establishing message from the base station.

64. (Currently amended) The user equipment ~~UE~~ of claim 62, wherein the logic for receiving is configured to receive an indication of dedicated access resources from the base station, the user equipment ~~UE~~ further comprising logic for employing the dedicated access resources for acknowledgement of the network-initiated connection establishing message.

65. (Currently amended) The user equipment ~~UE~~ of claim 62, wherein the temporary identifier is cell-specific.

66. (Currently amended) The user equipment ~~UE~~ of claim 62, wherein the logic for sending the network-initiated connection establishing acknowledgement is configured to send an uplink synchronization request to the base station.

67. (Currently amended) The user equipment ~~UE~~ of claim 66, wherein the uplink synchronization request is part of an acknowledgement response to the network-initiated connection establishing message.

68. (Currently amended) The user equipment ~~UE~~ of claim 62, wherein the logic for receiving is configured to:

receive at least one network-initiated connection establishing message indicator in a first physical channel, wherein each network-initiated connection establishing message indicator corresponds to at least one user equipment ~~UE~~; and

receive the network-initiated connection establishing message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one user equipment ~~UE~~.

69. (Currently amended) The user equipment ~~UE~~ of claim 68, wherein the first physical channel is a network-initiated connection establishing message indicator channel for carrying a plurality of network-initiated connection establishing message indicators, and the second physical channel is a network-initiated connection establishing message channel.

70. (Currently amended) The user equipment ~~UE~~ of claim 68, wherein the first physical channel is an SCCH channel, and the second physical channel is a network-initiated connection establishing channel.

71. (Currently amended) The user equipment ~~UE~~ of claim 70, further comprising logic for receiving in the SCCH a group identifier identifying a group of user equipments ~~UEs~~ to which the user equipment ~~UE~~ belongs.

72. (Currently amended) The user equipment ~~UE~~ of claim 68, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

73. (Currently amended) The user equipment ~~UE~~ of claim 72, further comprising logic for:

receiving in the SCCH a group identifier identifying a group of user equipments ~~UEs~~ to which the user equipment ~~UE~~ belongs; and

receiving in the SCCH an indication of resources allocated to the group of UEs to which the UE belongs for receiving network-initiated connection establishing messages in the shared channel.

74. (Currently amended) A method for establishing a network-initiated connection with a base station over a radio interface in a cellular communication system, the method comprising, at a user equipment ~~UE~~:

receiving from the base station a network-initiated connection establishing message ~~and a temporary identifier, the network-initiated connection establishing message~~ conveying a unique identifier of the user equipment ~~UE~~, ~~the~~ a temporary identifier which is ~~being~~ different from the unique identifier, and an indication of an allocation of dedicated physical resource for the user equipment; and

sending an acknowledgement response to the network-initiated connection establishing message to the base station using the allocation of dedicated physical access resource for the user equipment to establish a shared channel connection between the base

station and the user equipment ~~UE~~, wherein the temporary identifier identifies the user equipment ~~UE~~ on the shared channel.

75. (Previously presented) The method of claim 74, comprising communicating control information during shared channel operation using a channel index to at least one shared control channel (SCCH) received along with the network-initiated connection establishing message from the base station.

76. (Previously presented) The method of claim 74, wherein receiving comprises receiving an indication of dedicated access resources from the base station, the method further comprising employing the dedicated access resources for acknowledgement of network-initiated connection establishing messages.

77. (Original) The method of claim 74, further comprising sending an uplink synchronization request to the base station.

78. (Currently amended) The method of claim 74, wherein receiving comprises:

receiving at least one network-initiated connection establishing message indicator in a first physical channel, wherein each network-initiated connection establishing message indicator corresponds to at least one user equipment ~~UE~~; and

receiving the network-initiated connection establishing message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one user equipment ~~UE~~.

79. (Previously presented) The method of claim 78, wherein the first physical channel is a network-initiated connection establishing message indicator channel for

carrying a plurality of network-initiated connection establishing message indicators, and the second physical channel is a network-initiated connection establishing message channel.

80. (Previously presented) The method of claim 78, wherein the first physical channel is an SCCH channel, and the second physical channel is a network-initiated connection establishing message channel.

81. (Currently amended) The method of claim 80, further comprising logic for receiving in the SCCH a group identifier identifying a group of user equipments ~~UEs~~ to which the user equipment ~~UE~~ belongs.

82. (Original) The method of claim 78, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

REMARKS

In the Office Communication mailed May 6, 2011 as entered in the above-captioned matter, the Examiner objected to the drawings under 37 CFR 1.83(a) and rejected Claims 1-82 under 35 U.S.C. 112, first paragraph. Claims 1, 29, 62, 74, 2, 30, 3, 31, 9, 34, 10, 4, 32, 63, 75, 5, 6, 33, 64, 76, 13, 14, 66, 67, 77, 45-50, and 54-58 were rejected under 35 U.S.C. 103(a) given 3GPP publications 3GPP ETSI TR 125931 V7.0.0 (2006-03) ("3GPP reference I") in view of 3GPP ETSI TS 144018 V6.16.0 (2006-01) ("3GPP reference II"). Claims 7 and 8 were rejected under 35 U.S.C. 103(a) given 3GPP reference I in view of 3GPP reference II and 3GPP TS 25.303 V3.12.0 (2002-06 ("3GPP reference III"). Claims 23-28, 40-48, 68-73, and78-82 were rejected under 35 U.S.C. 103(a) given 3GPP reference I in view of 3GPP reference II and further in view of prior art admitted in the background section of our disclosure. Claims 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, 12, 17, 18, 36, and 51-53 were rejected under 35 U.S.C. 103(a) given 3GPP reference I in view of 3GPP reference II and further in view of U.S. Patent Application Publication No. 20070218901 to Tenny ("Tenny"). We respectfully traverse these rejections and request reconsideration.

Objections to the drawings

The drawings were objected to under 37 CFR 1.83(a). In particular, the Examiner asserts that the connection establishment message signaling flows or sequences must be shown in the figures.

We have added, pursuant to this amendment, new figures 14 through 16. These figures are flow diagrams that track the flows described by method claims 29, 54, and 74 respectively. Accordingly, we respectfully observe that all flow/sequence features appearing in these claims now has a direct illustrative corollary in the figures, more than satisfying the limited requirements of 37 CFR 1.83(a).

These new figures simply reflect the features of the present claims and hence do not introduce new matter. As for the claim language newly added by this amendment, the feature

of the allocation of a dedicated physical access resource to be used by user equipment for the acknowledgment response is described at least at paragraph 0041 of the published application (paragraph 0039 in the application as filed). Accordingly, and again, these three new figures introduce no new matter.

Rejections under 35 U.S.C. 112

Claims 1-82 were rejected under 35 U.S.C. 112, first paragraph. In particular, the Examiner expresses concern that the disclosure lacks support for the claim limitation "network initiated connection establishing message and acknowledgement response message."

The expression "network-initiated connection establishing message" can be found throughout the specification. For example, see paragraphs 0005 and 0012 of the published application[2] which refer to the paging process using this "network-initiated connection establishing" language.

As for the "acknowledgement response message," there are again many references to this expression throughout the specification. See, for example, paragraph 0041 of the published application[3]. As described, this message is clearly sent as a response (and indeed this expression is referred to in paragraph 0041 as a "paging response").

We therefore respectfully submit that the expression in question is well supported by the specification.

Rejections under 35 U.S.C. 103

Claims 1, 29, 62, 74, 2, 30, 3, 31, 9, 34, 10, 4, 32, 63, 75, 5, 6, 33, 64, 76, 13, 14, 66, 67, 77, 45-50, and 54-58 were rejected under 35 U.S.C. 103(a) given 3GPP reference I in

2 Paragraphs 0003 and 0014 in the original application papers as filed.
3 Paragraph 0039 in the original application papers as filed.

view of 3GPP reference II. Claims 7 and 8 were rejected under 35 U.S.C. 103(a) given 3GPP reference I in view of 3GPP reference II and 3GPP reference III. Claims 23-28, 40-48, 68-73, and78-82 were rejected under 35 U.S.C. 103(a) given 3GPP reference I in view of 3GPP reference II and further in view of prior art admitted in the background section of our disclosure. Claims 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, 12, 17, 18, 36, and 51-53 were rejected under 35 U.S.C. 103(a) given 3GPP reference I in view of 3GPP reference II and further in view of Tenny.

The independent claims

The Examiner suggests that claim 1 represents an obvious combination of 3GPP reference I and 3GPP reference II.

First, for the record, the present Office Action seems to contradict the Examiner's conclusions set forth in a previous office action. To recount, in a response dated March 4, 2010 we explained that 3GPP reference I fails to disclose sending a temporary identifier together with a unique identifier. In the Office Action dated October 5, 2010 the Examiner acknowledged that this feature is indeed not disclosed in 3GPP reference I[4]. The Examiner then sought to rely on EP 0 544462 in these regards. In our corresponding response dated October 5, 2010 we explained how EP 0 544 462 also did not disclose the feature, and the Examiner seems to have accepted this as accurate as the Examiner is not maintaining this rejection based on EP 0 544 462.

In the present Office Action, however, the Examiner again seeks to rely on 3GPP reference I as disclosing the feature of sending both a temporary identifier and a unique identifier (see the paragraph that bridges pages 4 and 5 of the Office Action). In fact, however, as we have argued previously and as the Examiner has previously acknowledged, 3GPP reference I does not disclose such a feature.

4 *See* the middle paragraph on page 3 of the October 5 Office Action.

The Examiner presently seeks to rely on page 22 of 3GPP reference I as disclosing this particular limitation. The referred-to text, however, is exclusively concerned with *UE-initiated* connections and not *network-initiated* connections. Accordingly, the cited language fails to meet the requirements of the claim recitation at issue.[5]

Accordingly, we respectfully submit that "deriving a network-initiated connection establishing message associated with a unique identifier of the user equipment [and] sending the network-initiated connection establishing message together with a temporary identifier ... the temporary identifier being different from the unique identifier"[6] is a sufficient point of distinction to render our independent claims non-obvious in view of any combination of 3GPP reference I and 3GPP reference II.

This same requirement appears in one form or another in all of our independent claims.

Furthermore, in the interests of expedited prosecution we have now amended the independent claims to also now specify use of the allocation of a dedicated physical access resource for the user equipment when responding.[7] This limitation, too, is completely absent from the prior art references of record.

We respectfully submit that the independent claims are allowable over the references of record.

The dependent claims

The dependent claims are all ultimately dependent upon one of the independent claims shown above to be allowable. While we believe that other arguments are available to highlight the allowable subject matter presented in various ones of these dependent claims, we also believe that the comments set forth herein regarding allowability of the independent

5 For the record, we note that 3GPP reference II also contains nothing to meet this deficiency nor does the Examiner contend otherwise.
6 As appears, for the sake of example, in claim 1.
7 Support for this language can be found, for example, at paragraph 41 of the application as published (39 as originally filed) as well as in FIG. 5.

claims are sufficiently compelling to warrant present exclusion of such additional points for the sake of brevity and expedited consideration

Conclusion

There being no other objections to or rejections of the claims, the Applicants respectfully submit that claims 1-82 are allowable over the references of record and may be passed to allowance. If the Examiner should have any other points of concern, the Examiner is expressly invited to contact the undersigned by telephone to discuss those concerns and to seek an amicable resolution.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Dated: August 8, 2011

Steven G. Parmelee
Registration No. 28,790

120 South LaSalle Street, Suite 1600
Chicago, Illinois 60603-3406
Telephone (312) 577-7000
Facsimile (312) 577-7007

NEW SHEET

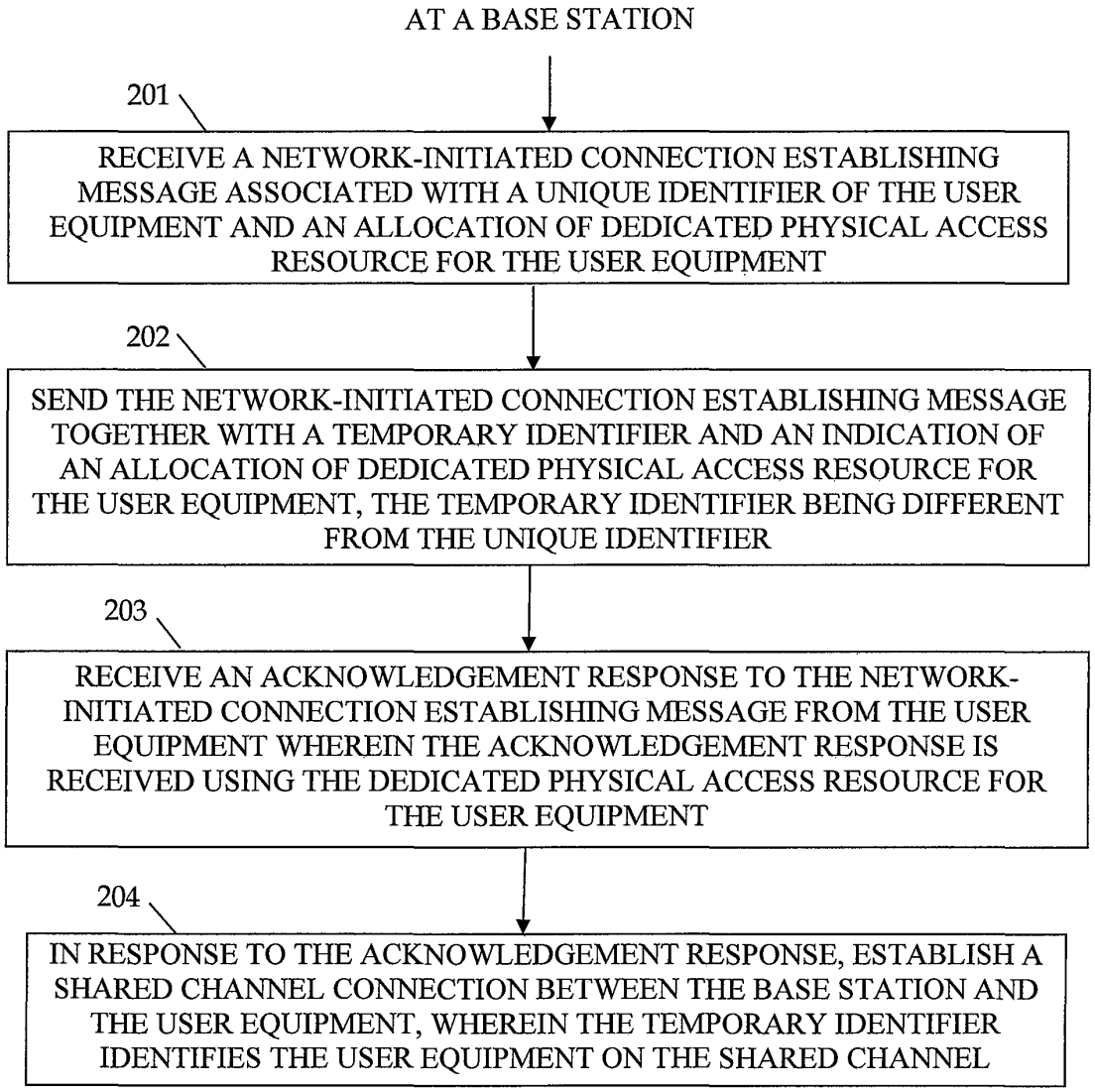

Figure 14

NEW SHEET

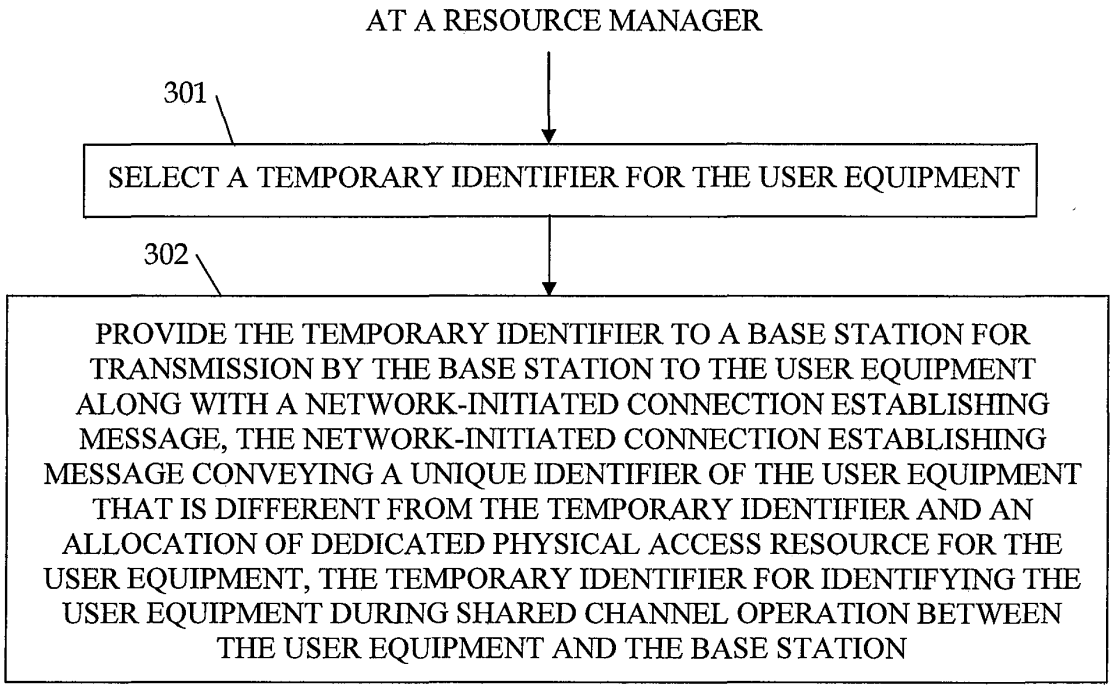

Figure 15

NEW SHEET

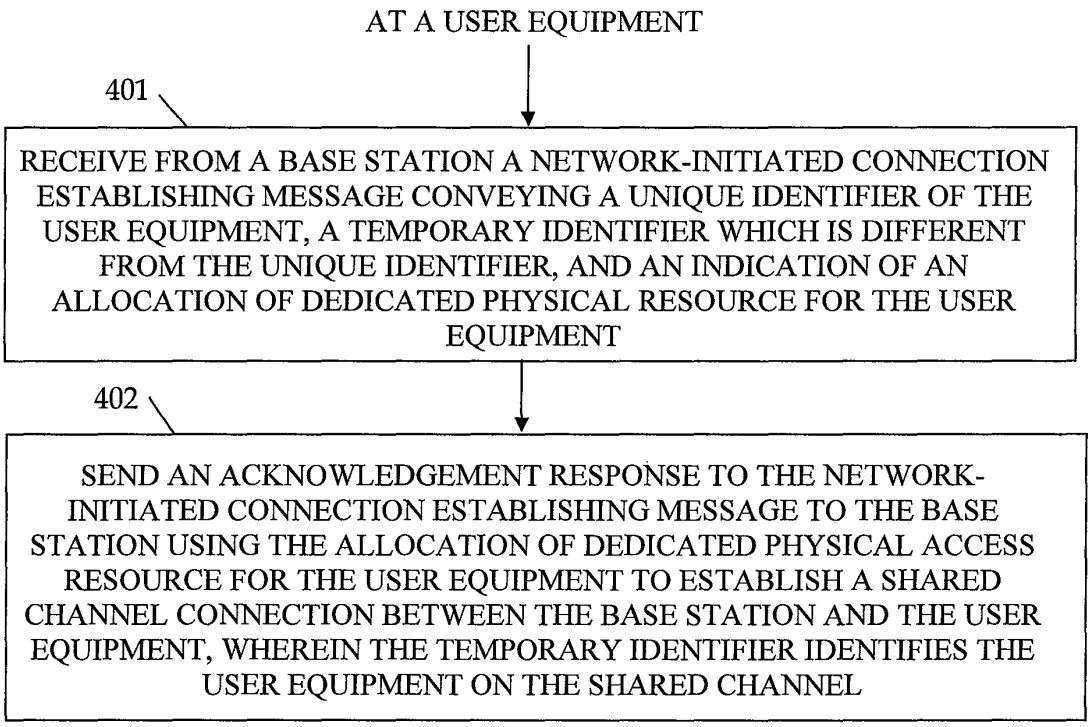

Figure 16

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. 11/416,865	)	***Confirmation No. 8530***
Filed: May 2, 2006	)	
Applicants: Chandrika K. Worrall	)	
Title: **NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM**	)	This Information Disclosure Statement Transmittal was electronically filed on August 8, 2011 using EFS-Web.
Art Unit: 2617	)	
Examiner: Aung T. Win	)	
Attorney Docket: 9147-96635-US	)	
Customer No.: 22242	)	

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

INFORMATION DISCLOSURE STATEMENT TRANSMITTAL

Sir:

Pursuant to the duty of disclosure under 37 C.F.R. § 1.56, and in accordance with MPEP § 601 and 37 C.F.R. §§ 1.97 and 1.98, Applicants and the undersigned attorney bring the information listed on Form PTO/SB/08a, filed concurrently herewith, to the attention of the Examiner.

The references cited in this Information Disclosure Statement were cited in an Office Action (Japanese Application No. 2009-508324) which issued on June 3, 2011, a copy of which is attached.

Pursuant to 37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be an admission that the information cited in this statement is, or is considered to be, prior art or is material to patentability as defined in 37 C.F.R. § 1.56(b).

The Commissioner is hereby authorized to charge any additional fees which may be required with respect to this communication, or credit any overpayment, to Deposit Account No. 06-1135.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Dated: August 8, 2011

Steven G. Parmelee
Registration No. 28,790

120 South LaSalle Street, Suite 1600
Chicago, Illinois 606033406
Telephone (312) 577-7000
Facsimile (312) 577-7007

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	11416865
	Filing Date	2006-05-02
	First Named Inventor	Worrall, Chandrika K.
	Art Unit	2617
	Examiner Name	Aung T. Win
	Attorney Docket Number	9147-96635-US

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
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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
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NON-PATENT LITERATURE DOCUMENTS			Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	11416865
	Filing Date	2006-05-02
	First Named Inventor	Worrall, Chandrika K.
	Art Unit	2617
	Examiner Name	Aung T. Win
	Attorney Docket Number	9147-96635-US

	1	English Summary of Office Action Dated June 3, 2011 from the Japanese Patent Office from Japanese Patent Application No. 2009-508324.	☐
	2	Vodafone Group, Modelling of the LTE RRC Active state, 3GPP TSG RAN WG2 #52, 3GPP, 27th April 2006, R2-060957, URL, http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_52/Documents/R2-060957.zip.	☐
	3	IPWireless, Initial Cell Access Procedure in LTE, 3GPP TSG RAN WG2 #51, 3GPP, 13th February 2006, R2-060380, URL, http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_51/Documents/R2-060380.zip.	☐
	4	3GPP, Physical channels and mapping of transport channels onto physical channels (TDD) (Release 7), 3GPP TS 25.221, 3GPP, March 2006, V7.0.0., p.84, URL, http://www.3gpp.org/ftp/Specs/archive/25_series/25.221/25221-700.zip.	☐
	5	Ericsson, Paging for E-UTRA, February 13-17, 2006, R1-060576; TSG-RAN WG1 #44.	☐

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	11416865
	Filing Date	2006-05-02
	First Named Inventor	Worrall, Chandrika K.
	Art Unit	2617
	Examiner Name	Aung T. Win
	Attorney Docket Number	9147-96635-US

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	/Steven G. Parmelee/	Date (YYYY-MM-DD)	2011-08-08
Name/Print	Steve G. Parmelee	Registration Number	28,790

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent 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 Patent Application Fee Transmittal

Application Number:	11416865
Filing Date:	02-May-2006
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Filer:	Steven Glen Parmelee/Helen Donegan
Attorney Docket Number:	9147-96635-US

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

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($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
			Total in USD ($)	**810**

Electronic Acknowledgement Receipt	
EFS ID:	10684333
Application Number:	11416865
International Application Number:	
Confirmation Number:	8530
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Customer Number:	22242
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	9147-96635-US
Receipt Date:	08-AUG-2011
Filing Date:	02-MAY-2006
Time Stamp:	12:26:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$810
RAM confirmation Number	8628
Deposit Account	061135
Authorized User	

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

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

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

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 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	Request for Continued Examination (RCE)	96635_RCE_Transmittal_08082011.pdf	697906 acacec473d7c31b30f9db5c121735b4bdac03f35	no	3
Warnings:					
Information:					
2		96635_Amendment_B_and_Response_1.PDF	1290433 1b55c93f760166dec4df33cce4171497236bcaad	yes	30

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment Submitted/Entered with Filing of CPA/RCE	1	1
Specification	2	3
Drawings-only black and white line drawings	4	4
Claims	5	21
Applicant Arguments/Remarks Made in an Amendment	22	27
Drawings-only black and white line drawings	28	30

Warnings:					
Information:					
3	Transmittal Letter	96635_IDS_Transmittal_08082011.pdf	99412 133ff4b70f43ca56e9c55380b76b4aab78cd2c48	no	2
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Form (SB08)	96635_PTO_Form_08082001.pdf	612538 e7e63beaf96e5d2fa4df5d3f7ca14d01373fa90c	no	4
Warnings:					
Information:					

A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.

5	Non Patent Literature	NPL1_08082011_1.PDF	227084 f86541eee88606ed51509121fcdf681fdf2c7b74	no	6
Warnings:					
Information:					
6	Non Patent Literature	NPL2_08082011_1.PDF	200461 78fb5b6c897d4f64b6e5f0fbfa06636ca8d6dd77	no	5
Warnings:					
Information:					
7	Non Patent Literature	NPL3_08082011_1.PDF	810070 59e54da1e3f339929ee47cebbdf94627a854ca2d	no	19
Warnings:					
Information:					
8	Non Patent Literature	NPL4_08082011_1.PDF	91254 704d7d317005317b02f143f7e42fba83a8f80286	no	3
Warnings:					
Information:					
9	Non Patent Literature	NPL5_08082011_1.PDF	74132 7847a21b88b377f331af477efff1499fa8363094	no	3
Warnings:					
Information:					
10	Fee Worksheet (SB06)	fee-info.pdf	30630 df4ee0060f79ee87be68b874d9979dffcff4039f	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	4133920	

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.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	
11/416,865	05/02/2006	☐ To be Mailed

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 08/08/2011

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 82	Minus	** 82	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 6	Minus	***6	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/ANTHONY WILLIAMS/

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/416,865	05/02/2006	Chandrika K. Worrall	9147-96635-US	8530

22242 7590 05/06/2011
FITCH EVEN TABIN & FLANNERY
120 SOUTH LASALLE STREET
SUITE 1600
CHICAGO, IL 60603-3406

EXAMINER
WIN, AUNG T

ART UNIT	PAPER NUMBER
2617	

MAIL DATE	DELIVERY MODE
05/06/2011	PAPER

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

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

Office Action Summary	Application No.	Applicant(s)	
	11/416,865	WORRALL, CHANDRIKA K.	
	Examiner	Art Unit	
	AUNG WIN	2617	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

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

Status

1)☒ Responsive to communication(s) filed on *05 April 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-82* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-82* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

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

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

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

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

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

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

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to newly amended claims filed 04/05/2011 have been considered but are moot in view of the new ground(s) of rejection.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "connection establishment message signaling flows or sequences comprising disclosed entities according to claims in accordance with different embodiments as claimed" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

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

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

Claims 1-82 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Examiner cannot find any support in the disclosure to Claims' limitation "network initiated connection establishing message and acknowledgement response message" as cited in the claims. Examiner requests the applicant specify the drawing, page, column or line number, which support the claim limitation. It appears to examiner that network initiated connection establishing message and acknowledgment response message are merely paging message for connection establishing and paging response message. Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 103

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

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

1. Claims 1, 29, 62, 74, 2, 30, 3, 31, 9, 34, 10, 4, 32, 63, 75, 5, 6, 33, 64, 76, 13, 14, 66, 67 & 77, 45-50, 54-58 are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications 3GPP ETSI TR 125 931 V7.0.0 (2006-03) herein after (3GPP reference I) in view of 3GPP ETSI TS 144 018 V6.16.0 (2006-01) herein after (3GPP reference II).

1.1 Regarding Claim 1, 3GPP reference I discloses a base station for establishing a network-initiated connection with a user equipment over a radio interface in a cellular communication system, the base station comprising:
logic for deriving network-initiated connection establishing message associated with a unique identifier of the user equipment [connection establishing Paging message from CN to node B comprising permanent UE identity for connection establishment: (Figures 5 & 6, page 22)] [(Paging procedures): pages 21-22];

logic for sending the network-initiated connection establishing message together with a temporary identifier to at least one cell, the temporary identifier being different form the unique identifier [node B sending paging message comprising temporary UE identity: (Figures 5 & 6, page 22)] [(Paging procedures): pages 21-22];
logic for establishing a shared channel connection between the base station and the UE [shared channel allocation to UE for communications connections establishment: (pages 91 & 92)]. It would have been obvious to one of ordinary skilled in the art that the temporary identifier identifies the UE on the shared channel as claimed because establishment of Radio Resource connection is based on initial UE identity [page 24] which is essentially temporary UE identity according to 3GPP standard.

3GPP reference I is silent on receiving an acknowledgement response to the network-initiated connection establishing message from the UE within the at least one cell. However, 3GPP reference II teaches that UE is configured to respond to connection establishing paging message according to 3GPP standard [paging response for Radio Resource connection: page 41].

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to modify the wireless system of 3GPP reference I as specified by 3GPP reference II so that base station receive the paging response message for connection establishment according to claim. One of ordinary skilled in the art at the time invention was made would have been motivated to implement the

wireless system according to the claim to implement the wireless system according to 3GPP specification.

1.2 Claim 29 is a method claim executed at a base station substantially close to base station of claim 1. Therefore, it would have been obvious to one of ordinary skilled in the art that the modified base station as stated above would teach the claim 29 method.

1.3 Claim 62 differs substantively from Claim 1 in that the former recites User Equipment claim for establishing a network-initiated connection between base station and UE, rather than base station for establishing the same network-initiated connection between base station and UE. Therefore, system as modified above in claim 1 would teach UE of claim 62.

1.4 Claim 74 is a method claim executed at UE substantially close to UE of claim 62. Therefore, it would have been obvious to one of ordinary skilled in the art that the modified UE as stated above would teach the claim 74 method.

1.5 As regards to Claim 45, 48 & 57, it would have been obvious to one of ordinary skilled in the art at the time invention was made would realize that modified method and system according to claim 1 would teach resource manager of claim 45 & 54 because claim 1, claim 45 & claim 54 establish network initiated communications based on same

UE identifiers. Because Core network as modified generates connection establishment paging message with UE identifiers as claimed, it would have been obvious to one of ordinary skilled in the art that modified system much be integrated with resource manager for selecting and providing UE temporary identifier to base station via connection establishment paging message.

1.6 Claim 54 is a method claim rejected for the same reason as stated above in claim 45 rejection because claim 54 method is substantially close to the method executed by apparatus claim 45.

1.7 As regards to claims 2, 30, 46 & 55, it would have been obvious to one of ordinary skilled in the art that modified method and system teaches claim 1 & 29, wherein the logic for receiving the network-initiated connection establishing message from a core network [3GPP reference I: page 22].

1.8 As regards to claims 9 & 34, it would have been obvious to one of ordinary skilled in the art that the modified method and network as stated above in claim 1 rejection would teach the base station of claim 2 & 30, further comprising logic for sending the acknowledgment response to the network-initiated connection establishing message to

the core network to establish shared channel communications between the UE and the core network [see claim 1 rejection in view of 3GPP reference II]

1.9 As regards to claim 10, it would have been obvious to one of ordinary skilled in the art that the modified method and network as stated above in claim 1 rejection would teach the base station of claim 10, wherein the logic for sending the network-initiated connection establishing message and the temporary identifier using a broadcast channel [network initiates the paging procedure for RR connection establishment by broadcasting a paging request message on appropriate paging channel: (page 39 of 3GPP reference II)].

1.10 As regards to claims 3 & 31, it would have been obvious to one of ordinary skilled in the art that the modified method and network supports dormant state therefore, it would teach the claims 1 & 29, comprising logic for assigning to the UE a temporary identifier from the base station to which it was last registered in response to the UE being in a dormant state as claimed because to one of ordinary skilled in the art at the time invention was made would realize that in dormant state, connection can be reactivated with connection information maintained at the base station without establishing the connection set up with core network again [also see idle vs dormant mode in applicant's background of invention].

1.11 As regards to claims 4, 32, 63 & 75, it would have been obvious to one of ordinary skilled in the art that the modified method and network as stated above in claim 1 rejection would teach the base station of claim 1, 29, 62, 74 and also teaches sending at least one channel index to at least one shared control channel along with the network initiated connection establishing message, the SCCH for communication control information for the UE during shared channel operation [paging message transmitted on CCCH comprises channels information needed for respective mobile stations as disclosed in paging request message content: (pages 162-165 of 3GPP reference II)].

1.12 As regards to claims 5, 6, 33, 64 & 76, it would have been obvious to one of ordinary skilled in the art at that modified method and system teaches according to claims 1, 29, 62, 74, further comprising logic for signaling to the UE an indication of dedicated access resources to be used by the UE for an acknowledgement response to the network-initiated connection establishing message according to claims 5, 33, 64 & 76 because reference II teaches that response message is transmitted on DCCH by the mobile station [page 165 of 3GPP reference II].

1.13 As regards to claims 13, 14, 66, 67 & 77, it would have been obvious to one of ordinary skilled in the art that modified method and system teaches according to claims 13, 14, 66, 67 & 77 because 3GPP reference I teaches uplink synchronization

communications as claimed [uplink synchronization: pages 24, 26, 32, 33, 34, 35, 50 & 96 of 3GPP reference I].

1.14 As regards to claim 47, 49, 50, 56 & 58 modified method and system teach according to claims 45, 54 & 57, but does not explicitly teach that resource manager is outside the core network that provides the network-initiated connection establishing message to the base station. However, implementing the resource manager outside the core network according to the claims would have been obvious matter of design choice since applicant has not disclose any particular purpose or advantages for having resource manager outside a core network rather that in the core network and therefore, it appears that the invention would perform equally well with regardless of where resource manager is located.

2. Claims 7 & 8 are rejected under 35 U.S.C. 103(a) as being obvious Claims 1, 29, 62, 74, 2, 30, 3, 31, 9, 34, 10, 4, 32, 63, 75, 5, 6, 33, 64, 76, 13, 14, 66, 67 & 77 are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications 3GPP ETSI TR 125 931 V7.0.0 (2006-03) herein after (3GPP reference I) in view of 3GPP ETSI TS 144 018 V6.16.0 (2006-01) herein after (3GPP reference II) and 3GPP TS 25.303 V3.12.0 (2002-06), herein after (3GPP reference III).

2.1 As regards to claims 7 & 8, modified method and system teach according to claim 1, but does not disclose contention based channel as claimed. 3GPP TS 25.303 teaches using a set of contention-based channels for communications transmission [contention-based channels: page 7]. Therefore it would have been obvious to one of ordinary skilled in the art at the time of invention of made to further modify to utilize contention based channels as taught by 3GPP TS 25.303 to modify according to claims 7 & 8. Utilizing contention based channels for transmissions would have been obvious matter of design choice and does not constitute patentably distinctions from prior art channel allocation and message transmission methods and system.

3. Claims 23-28, 40-48, 68-73 & 78-82 are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications 3GPP ETSI TR 125 931 V7.0.0 (2006-03) herein after (3GPP reference I) in view of 3GPP ETSI TS 144 018 V6.16.0 (2006-01) herein after (3GPP reference II), Further in view of prior art admitted in the background section of the applicant disclosure.

3.1 Regarding Claims 23-28, 40-48, 68-73 & 78-82, modified method and system teaches that connection establishment paging message can be sent to each individual UE or multiple UE as specified by paging message format [paging message format as specified in pages 162-165 of 3GPP reference II] [also see transmitting message targeted to a group of UE in two message assignment procedure: page 108 of 3GPP

reference II] but does not explicitly teach according to claims 23-28, 40-48, 68-73 & 78-82. However, applicant discloses that conventional paging procedure for connection establishment comprising transmitting messages via first and second channels [0011-0013]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to further modify the method and system according to conventional connection establishment signaling flow as disclosed by applicant to implement according to claims. One of ordinary skilled in the art at the time of invention of made to do this to establish communications with sleep mode UE.

4. Claims 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, 12, 17, 18, 36, 51-53 are rejected under 35 U.S.C. 103(a) as being obvious over Claims 1, 29, 62, 74, 2, 30, 3, 31, 9, 34, 10, 4, 32, 63, 75, 5, 6, 33, 64, 76, 13, 14, 66, 67 & 77 are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications 3GPP ETSI TR 125 931 V7.0.0 (2006-03) herein after (3GPP reference I) in view of 3GPP ETSI TS 144 018 V6.16.0 (2006-01) herein after (3GPP reference II), further in view of Tenny (US20070218901A1).

4.1 As regards to claims 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, 12, 17, 18, 36, 51-53, 59-61 it would have been obvious to one of ordinary skilled in the art at that modified method and system teaches according to claims 1, 2, 29, 45, 54, 59 but does not explicitly teach that the temporary UE identifier is cell-specific and signaling message

can be sent via SCCH. Tenny teaches UMTS network wherein temporary UE identifier is allocated as cell-specific temporary UE identifier [C-RNTI: 0024] and signaling messages can be sent via SCCH. Therefore, it would have been obvious to one of ordinary skilled in the art at the time invention was made to further modify the UMTS network and system to allocate cell-specific temporary UE ID and to communicate via SCCH channel as taught by Tenny to operate the network according to the claims. One of ordinary skilled in the art at the time invention was made would have been motivated to modify according to the claims for secured communications. It should be noted that allocating temporary identifier to UE at different network nodes according to claims would have been obvious matter of design choice since applicant has not disclose any particular purpose or advantages for selecting temporary identifier at one node rather than selecting at another network node and it appears that the invention would perform equally well with selecting temporary identifier at different network nodes.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AUNG WIN whose telephone number is (571)272-7549. The examiner can normally be reached on Monday-thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on 571-272-7603. 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.

/AUNG WIN/
Examiner, Art Unit 2617

/Patrick N. Edouard/
Supervisory Patent Examiner, Art Unit 2617

Notice of References Cited	Application/Control No. 11/416,865	Applicant(s)/Patent Under Reexamination WORRALL, CHANDRIKA K.	
	Examiner AUNG WIN	Art Unit 2617	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2007/0218901 A1	09-2007	Tenny, Nathan Edward	455/436
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

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

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

CLAIM		DATE								
Final	Original	05/04/2011								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
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	7	✓								
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	36	✓								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	**Art Unit**
	AUNG WIN	2617

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

CLAIM		DATE								
Final	Original	05/04/2011								
	37	✓								
	38	✓								
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	**Art Unit**
	AUNG WIN	2617

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

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

CLAIM		DATE								
Final	Original	05/04/2011								
	73	✓								
	74	✓								
	75	✓								
	76	✓								
	77	✓								
	78	✓								
	79	✓								
	80	✓								
	81	✓								
	82	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

SEARCHED			
Class	**Subclass**	**Date**	**Examiner**

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
updated search and google search	5/4/2011	atw

INTERFERENCE SEARCH			
Class	**Subclass**	**Date**	**Examiner**

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	11/416865 and (uplink adj synchro$9)	US-PGPUB; USPAT; EPO	OR	ON	2011/05/04 18:49
L3	1	11/416865 and indicator$4	US-PGPUB; USPAT; EPO	OR	ON	2011/05/04 19:28
L4	0	US20050041610A1	US-PGPUB; USPAT; EPO	OR	ON	2011/05/04 19:51
L5	2	"20050041610"	US-PGPUB; USPAT; EPO	OR	ON	2011/05/04 19:52
L6	121	(temporary adj2 (id ident $8)) and rnti and SCCH	US-PGPUB; USPAT; EPO	OR	ON	2011/05/04 20:46
L7	95	RRC and L6	US-PGPUB; USPAT; EPO	OR	ON	2011/05/04 20:46
L8	73	connection$1 and 7	US-PGPUB; USPAT; EPO	OR	ON	2011/05/04 20:46
L9	28	c$1rnti and 8	US-PGPUB; USPAT; EPO	OR	ON	2011/05/04 20:47
L10	1	11/673532 and c$rnti and SCCH	US-PGPUB; USPAT; EPO	OR	ON	2011/05/04 20:54
S1	38321	paging	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/12 11:36
S2	141717	acknowledgment ack acknowledg$7	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/12 11:36
S3	9588	S1 and S2	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/12 11:36
S4	65903	(sleep dormant slotted idle low$power (low adj power) non$active dose) adj (mode $1 state$1)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:36
S5	2641	S3 and S4	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:36

S6	1628	(mobile wireless radio).ab. and S5	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:37
S7	39617	scch sch ((shared common) adj2 channel$1)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:37
S8	621	S6 and S7	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:37
S9	534	S8 and (dedicated dcch dch)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:37
S10	513	S9 and (cell$1 location$1 zone$1 area$1)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:37
S11	513	S10 and ((indicat$4 or identif$7 or ID or identifier or identification$1 or identit $4))	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:38
S12	11822	PICH PCH (paging with (indicat$4 or identif$7 or ID or identifier or identification $1 or identit$4))	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:39
S13	300	S11 and S12	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:39
S14	965345	(cell$1 location$1 zone$1 area$1) with ((indicat$4 or identif$7 or ID or identifier or identification$1 or identit $4 or address$1))	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:40
S15	257	S13 and S14	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:40
S16	217	S15 and (register$3 registration$1)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:41
S17	16984	(C$1RNTI C-RNTI RNTI) (temporar$6 near3 ((indicat $4 or identif$7 or ID or identifier or identification$1 or identit$4)))	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 12:10
S18	102	S15 and S17	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 12:10

S19	496281	((user UE subscriber$1 mobile wireless WTRU WCD client CMD STA Station PCD terminal) near2 ((number$1 indicat$4 or identif$7 or ID or identifier or identification $1 or identit$4))) or (TMSI IMSI MSISDN)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 12:29
S20	101	S18 and S19	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 12:29
S21	94	S20 and (BCCH broadcast$4 poll$4)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 12:30
S22	79	S21 and (group$1 multi $1cast$4 multicast$4)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 12:31
S23	6156	(((user UE subscriber$1 mobile wireless WTRU WCD client CMD STA Station PCD terminal) near2 ((number$1 indicat$4 or identif$7 or ID or identifier or identification $1 or identit$4))) with temporary) or TMSI	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 15:51
S24	336	S23 same paging	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 15:51
S25	44	(C$1RNTI C-RNTI RNTI) and S24	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 15:52
S26	1	11/416865	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 10:46
S27	389	(paging same (response or (acknowledgment ack acknowledg$7))) and ((shared adj2 channel$1) or (SCH SCCH)) and (acknowledgment ack acknowledg$7)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:11
S28	256	(mobile wireless radio).ab. and S27	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:11
S29	131181	(channel$1 resource$1) with (assign$6 allocat$6)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:13
S30	226	S28 and S29	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:13

S31	63386	(channel$1 resource$1) near2 (shared common)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:16
S32	209	S30 and S31	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:16
S33	786585	(page paging near2 (response or (acknowledgment ack acknowledg$7)))	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:18
S34	145	S32 and S33	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:18
S35	136408	S33 with (user UE subscriber $1 mobile wireless WTRU WCD client CMD STA Station PCD terminal)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:19
S36	123	S34 and S35	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:19
S37	0	"2004008679"	USPAT	OR	OFF	2009/06/13 14:50
S38	0	"20040008679"	USPAT	OR	OFF	2009/06/13 14:50
S39	1	"20040008679"	US-PGPUB; USPAT	OR	OFF	2009/06/13 14:50
S40	16	paging.ti. and multimedia.ti. and broad$.ti.	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/13 14:54
S41	0	11/416865 and acknowl$6	US-PGPUB; USPAT; EPO	OR	ON	2011/05/04 15:15
S42	1	11/416865 and acknowle$6	US-PGPUB; USPAT; EPO	OR	ON	2011/05/04 15:15

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. 11/416,865	)	***Confirmation No. 8530***
Filed: May 2, 2006	)	
Applicants: Chandrika K. Worrall	)	
Title: **NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM**	)	This Amendment And Response was electronically filed on April 5, 2011 using EFS-Web.
Art Unit: 2617	)	
Examiner: Aung T. Win	)	
Attorney Docket: 9147-96635-US	)	
Customer No.: 22242	)	

Mail Stop AMENDMENT
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

AMENDMENT AND RESPONSE

Sir:

Applicants hereby petition under 37 CFR § 1.136(a) for a three-month extension of time in the above-captioned application, up to and including April 5, 2011, to make this reply timely.

In response to the Office Action mailed October 5, 2010 as entered in the above-captioned matter, the due date (taking the requested extension of time into account) for response being Tuesday, April 5, 2011, Applicants respectfully submit the following amendment and response.

Amendments to the Claims are reflected in the listing of claims beginning on page 2 of this paper; and

Remarks begin on page 19 of this paper.

AMENDMENTS TO THE CLAIMS

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

Listing of Claims:

1. (Currently amended) A base station for establishing a network-initiated connection with a user equipment over a radio interface in a cellular communication system, the base station comprising:

logic for deriving ~~receiving~~ a network-initiated connection establishing ~~paging~~ message associated with ~~comprising~~ a unique identifier of the user equipment;

logic for sending the network-initiated connection establishing ~~paging~~ message together with a temporary identifier to at least one cell, the temporary identifier being different from the unique identifier;

logic for receiving an ~~paging~~ acknowledgement response to the network-initiated connection establishing message from the user equipment (UE) within the at least one cell; and

logic for establishing a shared channel connection between the base station and the UE in response to the ~~paging~~ acknowledgement response, wherein the temporary identifier identifies the UE on the shared channel.

2. (Currently amended) The base station of claim 1, wherein the logic for receiving the network-initiated connection establishing ~~paging~~ message is configured to receive the network-initiated connection establishing ~~paging~~ message from a core network.

3. (Original) The base station of claim 1, comprising logic for assigning to the UE a temporary identifier from the base station to which it was last registered in response to the UE being in a dormant state.

4. (Currently amended) The base station of claim 1, wherein the logic for sending is configured to send at least one channel index to at least one shared control channel (SCCH) along with the network-initiated connection establishing ~~paging~~ message, the SCCH for communicating control information for the UE during shared channel operation.

5. (Currently amended) The base station of claim 1, comprising logic for signaling to the UE an indication of dedicated access resources to be used by the UE for an ~~paging~~ acknowledgement response to the network-initiated connection establishing message.

6. (Original) The base station of claim 5, wherein the dedicated access resources include a dedicated physical channel.

7. (Original) The base station of claim 5, wherein the dedicated access resources include a dedicated signal sequence to be used on a contention-based channel.

8. (Currently amended) The base station of claim 1, wherein the logic for receiving the ~~paging~~ acknowledgement response to the network-initiated connection establishing message is configured to receive the ~~paging~~ acknowledgement response to the network-initiated connection establishing message over a contention-based uplink channel.

9. (Currently amended) The base station of claim 2, further comprising logic for sending the ~~paging~~ acknowledgment response to the network-initiated connection establishing message to the core network to establish shared channel communications between the UE and the core network.

10. (Currently amended) The base station of claim 1, wherein the logic for sending is configured to send the network-initiated connection establishing ~~paging~~ message and the temporary identifier using a broadcast channel.

11. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific, the base station further comprising logic for selecting the temporary identifier at the base station.

12. (Original) The base station of claim 11, further comprising logic for selecting the SCCH at the base station.

13. (Currently amended) The base station of claim 1, wherein the logic for receiving the ~~paging~~ acknowledgement response to the network-initiated connection establishing message comprises logic for synchronizing communication with the UE based upon an uplink synchronization request from the UE.

14. (Currently amended) The base station of claim 13, wherein the uplink synchronization request is part of an ~~paging~~ acknowledgement response to the network-initiated connection establishing message.

15. (Original) The base station of claim 2, wherein the temporary identifier is cell-specific, the base station further comprising logic for receiving the temporary identifier from the core network.

16. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific, the base station further comprising logic for receiving the temporary identifier from a resource manager outside the core network.

17. (Previously presented) The base station of claim 15, the base station further comprising logic for receiving the channel index from the core network.

18. (Original) The base station of claim 16, the base station further comprising logic for receiving the channel index from the resource manager.

19. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific.

20. (Original) The base station of claim 2, wherein the temporary identifier is common to a plurality of cells within a registration area, the base station further comprising logic for receiving the temporary identifier from the core network.

21. (Original) The base station of claim 1, wherein the temporary identifier is common to a plurality of cells within a registration area, the base station further comprising logic for receiving the temporary identifier from a resource manager.

22. (Original) The base station of claim 4, wherein the temporary identifier and the SCCH are cell-specific.

23. (Currently amended) The base station of claim 1, wherein the logic for sending comprises logic for:

sending at least one network-initiated connection establishing message ~~paging~~ indicator in a first physical channel, wherein each network-initiated connection establishing message ~~paging~~ indicator corresponds to at least one UE; and

sending the network-initiated connection establishing ~~paging~~ message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

24. (Currently amended) The base station of claim 23, wherein the first physical channel is a network-initiated connection establishing message ~~paging~~ indicator channel for carrying a plurality of network-initiated connection establishing message ~~paging~~ indicators, and the second physical channel is a network-initiated connection establishing message ~~paging~~ channel.

25. (Currently amended) The base station of claim 23, wherein the first physical channel is an SCCH channel, and the second physical channel is a network-initiated connection establishing message ~~paging~~ channel.

26. (Currently amended) The base station of claim 25, further comprising logic for sending in the SCCH a group identifier identifying a group of UEs to which network-initiated connection establishing ~~paging~~ messages are directed.

27. (Original) The base station of claim 23, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

28. (Currently amended) The base station of claim 27, further comprising logic for:

sending in the SCCH a group identifier identifying a group of UEs to which at least one network-initiated connection establishing ~~paging~~ message is directed; and

sending in the SCCH an indication of resources allocated to the group of UEs for receiving network-initiated connection establishing ~~paging~~ messages in the shared channel.

29. (Currently amended) A method for establishing a network-initiated connection between a user equipment and a base station over a radio interface in a cellular communication system, the method comprising, at a base station:

receiving a ~~paging~~ network-initiated connection establishing message associated with ~~comprising~~ a unique identifier of the user equipment;

sending the network-initiated connection establishing ~~paging~~ message together with a temporary identifier to at least one cell, the temporary identifier being different from the unique identifier;

receiving an ~~paging~~ acknowledgement response to the network-initiated connection establishing message from the user equipment (UE) within the at least one cell; and

in response to the ~~paging~~ acknowledgement response, establishing a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

30. (Currently amended) The method of claim 29, wherein receiving the network-initiated connection establishing ~~paging~~ message comprises receiving the network-initiated connection establishing ~~paging~~ message from a core network.

31. (Original) The method of claim 29, wherein, in response to the UE being in a dormant state, the UE is assigned the same temporary identifier it had been assigned from the base station to which it was last registered.

32. (Currently amended) The method of claim 29, wherein sending further comprises sending at least one channel index to at least one shared control channel (SCCH) along with the network-initiated connection establishing ~~paging~~ message, the SCCH for communicating control information for the UE during shared channel operation.

33. (Currently amended) The method of claim 29, wherein sending the network-initiated connection establishing ~~paging~~ message comprises signaling to the UE an indication of dedicated access resources to be used by the UE for network-initiated connection establishing message ~~paging~~ acknowledgement.

34. (Currently amended) The method of claim 30, further comprising sending the ~~paging~~ acknowledgment response to the network-initiated connection establishing message to the core network to establish shared channel communications between the UE and the core network.

35. (Original) The method of claim 29, wherein the temporary identifier is cell-specific, the method further comprising selecting the temporary identifier at the base station.

36. (Original) The method of claim 35, further comprising selecting the SCCH at the base station.

37. (Original) The method of claim 29, further comprising synchronizing communications between the base station and the UE based upon an uplink synchronization request from the UE.

38. (Original) The method of claim 30, wherein the temporary identifier is cell-specific, and the temporary identifier is selected by the core network that sent the paging message.

39. (Original) The method of claim 30, wherein the temporary identifier is common to a plurality of cells within a registration area, and is selected by the core network.

40. (Currently amended) The method of claim 29, wherein sending the network-initiated connection establishing ~~paging~~ message comprises:

sending at least one network-initiated connection establishing message ~~paging~~ indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

sending the network-initiated connection establishing ~~paging~~ message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

41. (Currently amended) The method of claim 40, wherein the first physical channel is a network-initiated connection establishing message ~~paging~~ indicator channel for carrying a plurality of network-initiated connection establishing message ~~paging~~ indicators, and the second physical channel is a network-initiated connection establishing message ~~paging~~ channel.

42. (Currently amended) The method of claim 40, wherein the first physical channel is an SCCH channel, and the second physical channel is a network-initiated connection establishing message ~~paging~~ channel.

43. (Currently amended) The method of claim 42, further comprising sending in the SCCH a group identifier identifying a group of UEs to which network-initiated connection establishing ~~paging~~ messages are directed.

44. (Original) The method of claim 40, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

45. (Currently amended) A resource manager for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the resource manager comprising:

logic for selecting a temporary identifier for the UE; and

logic for providing the temporary identifier to the base station for transmission by the base station to the UE along with a network-initiated connection establishing ~~paging~~ message, the network-initiated connection establishing ~~paging~~ message conveying ~~comprising~~ a unique identifier of the UE that is different from the temporary identifier, the

temporary identifier for identifying the UE during shared channel operation between the UE and the base station.

46. (Currently amended) The resource manager of claim 45, wherein the network-initiated connection establishing ~~paging~~ message is provided to the base station by a core network.

47. (Currently amended) The resource manager of claim 45, wherein the resource manager is a radio resource manager outside a core network that provides the network-initiated connection establishing ~~paging~~ message to the base station.

48. (Currently amended) The resource manager of claim 45, further comprising logic for:

sending a network-initiated connection establishing ~~paging~~ message to at least one base station within a registration area, wherein the network-initiated connection establishing ~~paging~~ message includes the unique identifier;

receiving an ~~paging~~ acknowledgement response to the network-initiated connection establishing message from a UE associated with the unique identifier via a first base station to establish a shared channel connection between the first base station and the UE.

49. (Currently amended) The resource manager of claim 48, wherein the resource manager is part of the core network that provides the network-initiated connection establishing ~~paging~~ message to the base station.

50. (Original) The resource manager of claim 49, wherein the resource manager is an access gateway.

51. (Currently amended) The resource manager of claim 45, further comprising logic for:

selecting a channel index to a shared control channel (SCCH); and

providing the channel index to the base station for transmission by the base station to the UE along with the network-initiated connection establishing ~~paging~~ message and the temporary identifier, the SCCH for communicating control information including the temporary identifier between the UE and the base station during shared channel operation.

52. (Original) The resource manager of claim 51, wherein the temporary identifier and the SCCH are cell-specific.

53. (Original) The resource manager of claim 51, wherein the temporary identifier and the SCCH are common to a plurality of cells within a registration area of the core network.

54. (Currently amended) A method for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the method comprising, at a resource manager:

selecting a temporary identifier for the UE; and

providing the temporary identifier to the base station for transmission by the base station to the UE along with a network-initiated connection establishing ~~paging~~ message, the network-initiated connection establishing ~~paging~~ message conveying ~~comprising~~ a unique identifier of the UE that is different from the temporary identifier, the temporary identifier for identifying the UE during shared channel operation between the UE and the base station.

55. (Currently amended) The method of claim 54, wherein the network-initiated connection establishing ~~paging~~ message is provided to the base station by a core network.

56. (Currently amended) The method of claim 54, wherein the resource manager is a radio resource manager outside a core network that provides the network-initiated connection establishing ~~paging~~ message to the base station.

57. (Currently amended) The method of claim 54, further comprising:

sending a network-initiated connection establishing ~~paging~~ message to at least one base station within a registration area, wherein the network-initiated connection establishing ~~paging~~ message includes the unique identifier; and

receiving an ~~paging~~ acknowledgement response to the network-initiated connection establishing message from a UE associated with the unique identifier via a first base station to establish a shared channel connection between the first base station and the UE.

58. (Currently amended) The method of claim 57, wherein the resource manager is part of the core network that provides the network-initiated connection establishing ~~paging~~ message to the base station.

59. (Currently amended) The method of claim 54, further comprising, at the resource manager:

selecting a channel index to a shared control channel (SCCH); and

providing the channel index to the base station for transmission by the base station to the UE along with the network-initiated connection establishing ~~paging~~ message and the

temporary identifier, the SCCH for communicating control information including the temporary identifier between the UE and the base station during shared channel operation.

60. (Original) The method of claim 59, wherein the temporary identifier and the SCCH are cell-specific.

61. (Original) The method of claim 59, wherein the temporary identifier and the SCCH are common to a plurality of cells within a registration area of the core network.

62. (Currently amended) A user equipment (UE) for establishing a network-initiated connection with a base station over a radio interface in a cellular communication system, the UE comprising:

logic for receiving from the base station a network-initiated connection establishing ~~paging~~ message and ~~together with~~ a temporary identifier, the network-initiated connection establishing ~~paging~~ message conveying ~~comprising~~ a unique identifier of the UE, the temporary identifier being different from the unique identifier ; and

logic for sending an ~~paging~~ acknowledgement response to the network-initiated connection establishing message to the base station to establish a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

63. (Currently amended) The UE of claim 62, further comprising logic for communicating control information during shared channel operation using a channel index to at least one shared control channel (SCCH) received along with the network-initiated connection establishing ~~paging~~ message from the base station.

64. (Currently amended) The UE of claim 62, wherein the logic for receiving is configured to receive an indication of dedicated access resources from the base station, the UE further comprising logic for employing the dedicated access resources for ~~paging~~ acknowledgement of the network-initiated connection establishing message.

65. (Original) The UE of claim 62, wherein the temporary identifier is cell-specific.

66. (Currently amended) The UE of claim 62, wherein the logic for sending the network-initiated connection establishing ~~paging~~ acknowledgement is configured to send an uplink synchronization request to the base station.

67. (Currently amended) The UE of claim 66, wherein the uplink synchronization request is part of an ~~paging~~ acknowledgement response to the network-initiated connection establishing message.

68. (Currently amended) The UE of claim 62, wherein the logic for receiving is configured to:

receive at least one network-initiated connection establishing message ~~paging~~ indicator in a first physical channel, wherein each network-initiated connection establishing message ~~paging~~ indicator corresponds to at least one UE; and

receive the network-initiated connection establishing ~~paging~~ message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

69. (Currently amended) The UE of claim 68, wherein the first physical channel is a network-initiated connection establishing message ~~paging~~ indicator channel for carrying a plurality of network-initiated connection establishing message ~~paging~~ indicators, and the second physical channel is a network-initiated connection establishing message ~~paging~~ channel.

70. (Currently amended) The UE of claim 68, wherein the first physical channel is an SCCH channel, and the second physical channel is a network-initiated connection establishing ~~paging~~ channel.

71. (Original) The UE of claim 70, further comprising logic for receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs.

72. (Original) The UE of claim 68, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

73. (Currently amended) The UE of claim 72, further comprising logic for:

receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs; and

receiving in the SCCH an indication of resources allocated to the group of UEs to which the UE belongs for receiving network-initiated connection establishing ~~paging~~ messages in the shared channel.

74. (Currently amended) A method for establishing a network-initiated connection with a base station over a radio interface in a cellular communication system, the method comprising, at a UE:

receiving from the base station a network-initiated connection establishing ~~paging~~ message and ~~together with~~ a temporary identifier, the network-initiated connection establishing ~~paging~~ message conveying ~~comprising~~ a unique identifier of the UE, the temporary identifier being different from the unique identifier; and

sending an ~~paging~~ acknowledgement response to the network-initiated connection establishing message to the base station to establish a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

75. (Currently amended) The method of claim 74, comprising communicating control information during shared channel operation using a channel index to at least one shared control channel (SCCH) received along with the network-initiated connection establishing ~~paging~~ message from the base station.

76. (Currently amended) The method of claim 74, wherein receiving comprises receiving an indication of dedicated access resources from the base station, the method further comprising employing the dedicated access resources for ~~paging~~ acknowledgement of network-initiated connection establishing messages.

77. (Original) The method of claim 74, further comprising sending an uplink synchronization request to the base station.

78. (Currently amended) The method of claim 74, wherein receiving comprises:

receiving at least one network-initiated connection establishing message ~~paging~~ indicator in a first physical channel, wherein each network-initiated connection establishing message ~~paging~~ indicator corresponds to at least one UE; and

receiving the network-initiated connection establishing ~~paging~~ message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

79. (Currently amended) The method of claim 78, wherein the first physical channel is a network-initiated connection establishing message ~~paging~~ indicator channel for carrying a plurality of network-initiated connection establishing message ~~paging~~ indicators, and the second physical channel is a network-initiated connection establishing message ~~paging~~ channel.

80. (Currently amended) The method of claim 78, wherein the first physical channel is an SCCH channel, and the second physical channel is a network-initiated connection establishing message ~~paging~~ channel.

81. (Original) The method of claim 80, further comprising logic for receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs.

82. (Original) The method of claim 78, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

REMARKS

In the Office Communication mailed October 5, 2010, as entered in the above-captioned matter, the Examiner rejected claims 1, 29, 62, 74, 2, 30, 3, 31, 9, 34, 10, 4, 32, 63, 75, 5, 6, 33, 64,76, 13, 14, 66, 67 and 77 under 35 U.S.C. 103(a) given 3GPP publication 3GPP TR 25.931 V3.7.0 (2002-06) (" 3GPP publication") in view of George Edward Fry, Jr. (EU0544462A2) ("Fry") and further in view of Sinnarajah et al. (US20040008679A1) ("Sinnarajah"). Claims 7 and 8 were rejected under 35 U.S.C. 103(a) given the 3GPP publication in view of Fry and Sinnarajah and further in view of 3GPP publication 3GPP TS 25.303 V3.12.0 (2002-06) ("2nd 3GPP publication"). Claims 23-28, 40-48, 68-73 and 78-82 were rejected under 35 U.S.C. 103(a) given the 3GPP publication in view of Fry and Sinnarajah and further in view of prior art admitted in the background section of the applicant disclosure ("AAPA"). Claims 45, 54, 46, 55, 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, 12, 17, 18, and 36 were rejected under 35 U.S.C. 103(a) given the 3GPP publication in view of Fry and further in view of Lee et al. (US2005004161 OA1) ("Lee"). Claims 48-53 and 57-61 were rejected under 35 U.S.C. 103(a) given the 3GPP in view of Fry, Lee, and Sinnarajah. We respectfully traverse these rejections and request reconsideration.

Although we do not necessarily agree with the Examiner's characterization of these prior art references and the manner of applying these references to our claims, in the interests of concise prosecution we have nevertheless amended our claims to bring increased clarity to certain claim elements. The primary changes, and corresponding support in the specification, are noted as follows:

We have substituted "network-initiated connection establishing message" for "paging message." Our specification is replete with descriptions of the message as pertaining to "network-initiated connection establishment." See, for example, our paragraph

0007 (of the application as published) where it states, "This enables efficient paging in case of network-initiated connection establishment."

The basis for such a network-initiated connection establishing message being associated with a unique identifier for user equipment can be found, for example, in FIGS. 4 and 5 along with their corresponding text (see, for example, paragraph 0039 of our application as published).

In all cases we have introduced no new matter.

Rejections under 35 U.S.C. 103

Claims 1, 29, 62, 74, 2, 30, 3, 31, 9, 34, 10, 4, 32, 63, 75, 5, 6, 33, 64,76, 13, 14, 66, 67, and 77 were rejected under 35 U.S.C. 103(a) given the 3GPP publication in view of Fry and further in view of Sinnarajah. Of these, claims 1, 29, 62, and 74 are independent claims.

We have previously noted that a combination of the 3GPP publication with Sinnarajah does not lead to a base station that sends a network-initiated connection establishing message that conveys a unique identifier of a user equipment in addition to a different, temporary identifier that serves to identify the user equipment on a shared channel. This observation is based upon the fact that neither of these references discloses sending two different identifiers for the user equipment under any circumstances, let alone where one of the identifiers identifies the user equipment on a shared channel.

The Examiner now introduces Fry to overcome this deficiency that arises when one combines the 3GPP publication with Sinnarajah.

We respectfully observe, however, that Fry also fails to disclose a base station that sends two different identifiers for a user equipment, with one of those identifiers being used to identify the user equipment on a shared channel. Instead, Fry only discloses a base station that sends a paging message that comprises a single identifier for each user

equipment. The contents of Fry's Tables 1 and 2 (shown below) do not contradict this observation.

PAGING REQUEST TYPE 1 Message Format (BTS -> MS)			
INFORMATION ELEMENT	TYPE	LENGTH	VALUE
Protocol Discriminateur	MF	0.5	0x06
Transaction Identifier	MF	0.5	0x00
Message Type	MF	1	0x21
Page Mode	MF	1	varies
Mobile Identify	MV	1 - 9	varies
Mobile Identify	OV	2 - 10	varies

PAGING REQUEST TYPE 2 Message Format (BTS->MS)			
INFORMATION ELEMENT	TYPE	LENGTH	VALUE
Protocol Discriminator	MF	0.5	0x06
Transaction Identifier	MF	0.5	0x00
Message Type	MF	1	0x22
Page Mode	MF	1	varies
TMSI	MF	4	varies
TMSI	MF	4	varies
Mobile Identify	OV	2-10	varies

In particular, although these tables disclose sending multiple identifiers in a single message, this reflects a simple grouping together of paging requests for *multiple* user equipments. Accordingly, these tables depict different identifiers because these tables also correspond to a plurality of different user equipment. To put this another way, these tables do not disclose different identifiers for a same user equipment.

We also note that Fry discloses using either an IMSI identifier or a TMSI identifier (which is basically a temporary IMSI identifier) in a paging request. In particular, Fry will accommodate identifying some user equipment by their IMSI and some user equipment by their TMSI. Fry, in fact, directs considerable attention in these regards by describing a method of buffering paging messages in different stacks depending upon whether the paging messages are for TMSI-addressed user equipment or IMSI-addressed user equipment.[1]

Importantly, however, although Fry will accommodate using one identifier or the other, Fry never discloses sending a paging request that would use *both* of these identifiers for a single user equipment. Instead, Fry insists that one or the other be used but never both. See, for example:

1 See, for example, Fry and page 2, lines 35-38.

- Fry at page 3, lines 47-48: "each MS is identified by *one* of two types of identifiers; an . . . IMSI or . . . TMSI."[2]
- Fry at page 5, lines 4-5: "to determine if it is a TMSI *or* an IMSI intended for a TMSI *or* an IMSI identified MS (MS ID)."[3]
- Fry at page 5, lines 23-24" "the MSs may be identified by *either* their . . . IMSI or . . . TMSI."[4]

This same approach holds true throughout Fry's specification. See, for example, Fry's FIG. 5 (shown at the right) where Fry is careful to refer to "T *or* I" rather than "T *and* I."

PAGING REQUEST MESSAGE FORMATTING TABLE

NUMBER OF MS(s) TO PAGE	PAGING REQUEST MESSAGE TYPES[1]		
	TYPE 1	TYPE 2	TYPE 3
1	T or I	T	T
2	T or I	T	T
3		T or I	T
4			T

T=TEMPORARY MOBILE SUBSCRIBER IDENTITY (TMSI)
I=INTERNATIONAL MOBILE SUBSCRIBER IDENTITY (IMSI

We therefore respectfully submit that any combination of these three references, regardless of how obvious or unobvious those combinations might be, will fail to match the recitations of our claims 1, 29, 62, and 74 because, at the very least, these claims all specify a base station that sends a unique identifier for a user equipment along with a temporary identifier that is used to identify the user equipment on a shared channel.

Independent claims 45 and 54

Independent claims 45 and 54 were rejected under 35 U.S.C. 103(a) given the 3GPP publication in view of Fry and further in view of Lee. The 3GPP publication and Fry were discussed above.

2 Emphasis provided.
3 Emphasis provided.
4 Emphasis provided.

Lee describes various identifiers that may be utilized, but again, never suggests that more than one identifier (that identifiers a UE) be used in the manner we have claimed. See,

[**0021**] Specifically, the SGSN **18** provides "initial" UE **2** identification information, such as an intrinsic identifier or ID assigned to each UE, and the MBMS identification, or service ID information, of the specific service that the UE is joining. The RNC **10** stores the initial UE IDs of the UEs **2** joining the MBMS and thereby counts the number of RRC-connected UEs among a plurality of UEs joining the MBMS.

[**0022**] The initial UE ID enables the identification of a UE **2** regardless of its RRC connection status, thereby enabling identification of UEs by a core network **4** entity such as the MSC **14** or SGSN **18**. The initial UE ID may be an international mobile subscriber identity (IMSI) enabling a subscriber's identification worldwide, a temporary mobile subscriber identity (TMSI) allocated by the MSC **14** to a UE **2** having a CS connection for security of the IMSI, or a packet TMSI allocated by the SGSN **18** to a UE having a PS connection.

for example, Lee's paragraphs 0021 and 0022 as reproduced above for the convenience of the reader.

Accordingly, and much as before, no combination of these three references will match the recitations of these claims that require, for example, "logic for providing the temporary identifier to the base station for transmission by the base station to the UE along with a network-initiated connection establishing message, the network-initiated connection establishing message conveying a unique identifier of the UE that is different from the temporary identifier, the temporary identifier for identifying the UE during shared channel operation between the UE and the base station."[5]

Dependent claims 2-28, 30-44, 46-53, 55-61, 63-73, and 75-82

These claims are all ultimately dependent upon one of the independent claims shown above to be allowable. While we believe that other arguments are available to highlight the allowable subject matter presented in various ones of these dependent claims, we also believe that the comments set forth herein regarding allowability of the independent claims are sufficiently compelling to warrant present exclusion of such additional points for the sake of brevity and expedited consideration.

5 See claim 45.

Conclusion

There being no other objections to or rejections of the claims, the Applicants respectfully submit that claims 1-82 are allowable over the references of record and may be passed to allowance. If the Examiner should have any other points of concern, the Examiner is expressly invited to contact the undersigned by telephone to discuss those concerns and to seek an amicable resolution.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Dated: April 5, 2011

Steven G. Parmelee
Registration No. 28,790

120 South LaSalle Street, Suite 1600
Chicago, Illinois 60603-3406
Telephone (312) 577-7000
Facsimile (312) 577-7007

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Approved for use through 06/30/2010. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2009

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 245.00

Complete if Known	
Application Number	11/416,865
Filing Date	May 2, 2006
First Named Inventor	Chandrika K. Worrall
Examiner Name	Aung T. Win
Art Unit	2617
Attorney Docket No.	9147-96635-US

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☑ Deposit Account Deposit Account Number: 061135 Deposit Account Name: Fitch Even Tabin & Flanne

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

☑ Charge fee(s) indicated below
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☐ Credit any overpayments

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fees Paid ($)**
Utility	330	165	540	270	220	110	
Design	220	110	100	50	140	70	
Plant	220	110	330	165	170	85	
Reissue	330	165	540	270	650	325	
Provisional	220	110	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	**Fee ($)**	**Small Entity Fee ($)**
Each claim over 20 (including Reissues)	52	26
Each independent claim over 3 (including Reissues)	220	110
Multiple dependent claims	390	195

Total Claims _____ - 20 or HP = _____ x **Extra Claims** _____ **Fee ($)** _____ = **Fee Paid ($)** _____

HP = highest number of total claims paid for, if greater than 20.

Indep. Claims _____ - 3 or HP = _____ x **Extra Claims** _____ **Fee ($)** _____ = **Fee Paid ($)** _____

HP = highest number of independent claims paid for, if greater than 3.

Multiple Dependent Claims
Fee ($) _____ **Fee Paid ($)** _____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $270 ($135 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).

Total Sheets _____ - 100 = _____ / 50 = _____ (round **up** to a whole number) x **Fee ($)** _____ = **Fee Paid ($)** _____

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge): Difference in Extension Fees	245.00

SUBMITTED BY

Signature	/Steven G. Parmelee/	Registration No. (Attorney/Agent) 28,790	Telephone 312/577-7000
Name (Print/Type)	Steven G. Parmelee		Date April 5, 2011

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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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.
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:	11416865
Filing Date:	02-May-2006
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Filer:	Steven Glen Parmelee/Helen Donegan
Attorney Docket Number:	9147/96635 (06-0011)

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

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:				
Extension - 3 months with $0 paid	1253	1	1110	1110

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**1110**

Electronic Acknowledgement Receipt	
EFS ID:	9813760
Application Number:	11416865
International Application Number:	
Confirmation Number:	8530
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Customer Number:	22242
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	9147/96635 (06-0011)
Receipt Date:	05-APR-2011
Filing Date:	02-MAY-2006
Time Stamp:	16:02:32
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1110
RAM confirmation Number	2576
Deposit Account	061135
Authorized User	

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

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

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

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 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	Miscellaneous Incoming Letter	96635_NotificationThatSmallEntityStatusIsNoLongerClaimed_1.PDF	71155 53869ad791c1dc6988a11d31f804e7769a0cd6c9	no	2
Warnings:					
Information:					
2		96635_AMENDMENT_AND_RESPONSE.pdf	297503 4cfc5e60ffa838eed770689e727fbc6be9947a8f	yes	24

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	18
Applicant Arguments/Remarks Made in an Amendment	19	24

Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	96635_Fee_Transmittal.pdf	55545 b18e57ca733ef07df0c97f911fd58280834eef7	no	2
Warnings:					
Information:					
4	Fee Worksheet (PTO-875)	fee-info.pdf	30483 95e4e249c1e468860fd4588d6ad0c7dc569622ca	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	454686		

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. 11/416,865	)	***Confirmation No.*** 8530
Filed: MAY 2, 2006	)	
Applicants: Chandrika K. Worrall	)	This Notification was electronically filed on APRIL 5, 2011 using the USPTO's EFS-Web.
Title: **NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM**	)	
Art Unit: 2617	)	
Examiner: AUNG T. WIN	)	
Attorney Docket: 9147-96635-US	)	
Customer No.: 22242	)	

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

NOTIFICATION THAT SMALL ENTITY STATUS IS NO LONGER CLAIMED AND NOTIFICATION OF ERROR IN PAYMENT OF FEES AS A SMALL ENTITY UNDER 37 C.F.R. § 1.28(c)

Dear Sir:

Notification is hereby provided to the United States Patent and Trademark Office that small entity status established in the above-identified patent application is no longer claimed. Accordingly, Applicant respectfully requests a status change to Large Entity for the above-referenced application.

Pursuant to 37 C.F.R. § 1.28(c), Applicant respectfully submits that the status as a small entity was established in error but without deceptive intent.

Itemization of the Fee(s) Erroneously Paid as Small Entity

In accordance with 37 C.F.R. § 1.28(c)(2), the itemization of the deficiency payment is as follows:

Type of Fee Erroneously Paid and Date Fee Paid	Small Entity Fee Previously Paid	Current Large Entity Fee	Deficiency Owed
Two-month extension of time fee paid on November 23, 2009	$245.00	$490.00	$245.00
		Total Deficiency Owed	$245.00

Applicant requests that the total deficiency owed ($245.00) be charged to Deposit Account No. 06-1135.

Applicant also requests that the error in payment of fees as a small entity be excused upon payment of the deficiency between the amount paid and the amount due.

The Commissioner is authorized to charge any deficiency and/or additional fees required by this communication or credit any overpayment to Deposit Account No. 06-1135.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Date: April 5, 2011

Steven G. Parmelee
Registration No. 28,790

120 S. LaSalle Street, Suite 1600
Chicago, Illinois 60603-3406
Telephone: 312.577.7000
Facsimile: 312.577.7007

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	
11/416,865	05/02/2006	☐ To be Mailed

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 04/05/2011

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 82	Minus	** 82	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 6	Minus	***6	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/SHIRELL m. CARMICHAEL/

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/416,865	05/02/2006	Chandrika K. Worrall	9147/96635 (06-0011)	8530

22242 7590 10/05/2010
FITCH EVEN TABIN & FLANNERY
120 SOUTH LASALLE STREET
SUITE 1600
CHICAGO, IL 60603-3406

EXAMINER
WIN, AUNG T

ART UNIT	PAPER NUMBER
2617	

MAIL DATE	DELIVERY MODE
10/05/2010	PAPER

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

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

Office Action Summary	Application No.	Applicant(s)	
	11/416,865	WORRALL, CHANDRIKA K.	
	Examiner	**Art Unit**	
	AUNG WIN	2617	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

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

Status

1)☒ Responsive to communication(s) filed on *02 September 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-82* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-82* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

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

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

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

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

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

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

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/02/2010 has been entered.

Response to Arguments

Applicant's arguments with respect to amended claims filed 09/08/2010 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

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

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

1. Claims 1, 29, 62, 74, 2, 30, 3, 31, 9, 34, 10, 4, 32, 63, 75, 5, 6, 33, 64, 76, 13, 14, 66, 67 & 77 are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications 3GPP TR 25.931 V3.7.0 (2002-06) herein after 3GPP publication in view of

George Edward, Jr. (EU0544462A2)., further in view of Sinnarajah et al. (US20040008679A1).

1.1 Regarding Claim 1, 3GPP publication discloses a base station for establishing a network-initiated connection with a user equipment over a radio interface in a cellular communication system, the base station comprising: **logic for receiving a paging message comprising a unique identifier of the user equipment** [(Paging message from CN to base station comprising **permanent UE identity**): Figures 5 & 6, page 19]; logic for sending the paging message to at least one cell [(sending Type 1 or Type II message from base station to UE): Figure 5 & 6, page 19].

3GPP publication does not explicitly disclose type 1 or type II message include both permanent UE ID and temporary UE ID according to amended claim. George teaches that type I or type II message comprises two identifiers as claimed [Table 1 & 2]. Therefore it would have been obvious to one of ordinary skilled in the art at the time invention was made to include two claimed identifiers as taught by George to modify as claimed. It should be noted that paging utilizing two types of identifiers would have been an obvious of matter of design choice in identifying mobile stations accordingly.

Base station as modified does not explicitly disclose establishing a shared channel connection between the base station and the UE in response to paging acknowledgement from the user equipment (UE) as claimed but such claimed feature is expected to be implemented in the UTRAN, as disclosed in 3GPP publication.

Sinnarajah discloses base station comprising logic for receiving a paging acknowledgement from the user equipment (UE) within the cell; and logic for establishing a shared channel connection between the base station and the UE in response to the paging acknowledgement, wherein the temporary identifier identifies the UE on the shared channel [(establishing shared channel in response to paging response: 0090 & 0091) (based on **temporary identifier**: 0063)].

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to modify paging method and system of 3GPP publication as taught by Sinnarajah to establish shared channel communications in response to paging response and based on temporary UE identifier as disclosed in 3GPP publication to identify the UE on the shared channel. One of ordinary skilled in the art at the time of invention of made would have been motivated to do this for improved and effective communication service and system. It should be noted that paging users and assigning channels based on user paging response is well known to one of ordinary skilled in the art at the time invention of made.

1.2 Claim 29 is a method claim executed at a base station substantially close to base station of claim 1. Therefore, it would have been obvious to one of ordinary skilled in the art that the modified base station as stated above would teach the claim 29 method.

1.3 Claim 62 differs substantively from Claim 1 in that the former recites User Equipment claim for establishing a network-initiated connection between base station and UE, rather than base station for establishing the same network-initiated connection between base station and UE. Therefore, UE as modified above in claim 1 would teach UE of claim 62.

1.4 Claim 74 is a method claim executed at UE substantially close to UE of claim 62. Therefore, it would have been obvious to one of ordinary skilled in the art that the modified UE as stated above would teach the claim 74 method.

1.5 As regards to claims 2 & 30 modified method and system teaches claim 1 & 29, wherein the logic for receiving the paging message receives the paging message from a core network [3GPP publication: page 19].

1.6 As regards to claims 9 & 34, it would have been obvious to one of ordinary skilled in the art that the modified method and network as stated above in claim 1 rejection would teach the base station of claim 2, further comprising logic for sending the paging acknowledgment to the core network to establish shared channel communications between the UE and the core network [see claim 1 rejection in view of Sinnarajah et al.]

1.7 As regards to claim 10, it would have been obvious to one of ordinary skilled in the art that the modified method and network as stated above in claim 1 rejection would teach the base station of claim 10, wherein the logic for sending is operable to send the paging message using a broadcast channel because Sinnarajah teaches broadcast paging message [Sinnarajah: 0068].

1.8 As regards to claims 3 & 31, it would have been obvious to one of ordinary skilled in the art that the modified method and network supports dormant state therefore, it would teach the claims 1 & 29, comprising logic for assigning to the UE a temporary identifier from the base station to which it was last registered in response to the UE being in a dormant state as claimed since in dormant state, connection can be reactivated with connection information maintained at the base station without establishing the connection set up with core network again.

1.9 As regards to claims 4, 32, 63 & 75, 3GPP publication 3GPP publication discloses according to claims 1, 29, 62, 74 and also teaches base station is provided with temporary identifier and establishing shared channel communications between base station and UE via shared channel in response to paging message [see claim 1 rejections], but silent on provideing channel index to the base station as claimed. Sinnarajah teaches that base station can also be provided with channel assignment information as part of paging message [0098, 0099 & 0104]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to

modify the system and method as disclosed in 3GPP publication to provide shared channel assignment information as taught by Sinnarajah to implement the method and system according to claims 4, 32, 63 & 75. One of ordinary skilled in the art at the time of invention of made would have been motivated to do this to for efficient resource utilization.

1.10 As regards to claims 5, 6, 33, 64 & 76, it would have been obvious to one of ordinary skilled in the art at that modified method and system teaches according to claims 1, 29, 62, 74, further comprising logic for signaling to the UE an indication of dedicated access resources to be used by the UE for paging acknowledgement according to claims 5, 33, 64 & 76 because Sinnarajah teaches that UE can transmit information either on shared channel or dedicated channel [90 & 91]. Assigning dedicated resources for paging acknowledgement instead of using shared channel resources would have been obvious matter of design choice and does not constitute patentably distinctions from prior art channel allocation method for acknowledgement message transmission methods and system.

1.11 As regards to claims 13, 14, 66, 67 & 77, it would have been obvious to one of ordinary skilled in the art that modified method and system teaches according to claims 13, 14 because 3GPP publications teaches uplink synchronization communications as claimed [3GPP publication: page 14, 21, 23, 29, 30, 31, 32, 44 & 77]

2. Claims 7 & 8, are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications [3GPP TR 25.931 V3.7.0 (2002-06)] in view of George Edward, Jr. (EU0544462A2), further in view of Sinnarajah et al. (US20040008679A1) and 3GPP publications [3GPP TS 25.303 V3.12.0 (2002-06)].

2.1 As regards to claims 7 & 8, modified method and system teach according to claim 1, but do not disclose contention based channel as claimed. 3GPP TS 25.303 teaches using a set of contention-based channels for communications transmission [contention-based channels: page 7]. Therefore it would have been obvious to one of ordinary skilled in the art at the time of invention of made to further modify to utilize contention based channels as taught by 3GPP TS 25.303 to modify according to claims 7 & 8. Utilizing contention based channels for transmissions would have been obvious matter of design choice and does not constitute patentably distinctions from prior art channel allocation and message transmission methods and system.

3. Claims 23-28, 40-48, 68-73 & 78-82 are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications [3GPP TR 25.931 V3.7.0 (2002-06)] in view of George Edward, Jr. (EU0544462A2)., further in view of Sinnarajah et al. (US20040008679A1), Further in view of prior art admitted in the background section of the applicant disclosure.

3.1 Regarding Claims 23-28, 40-48, 68-73 & 78-82, modified method and system in view of Sinnarajah would teach group identifier for identifying group of UEs to which paging messages are directed and also assigning shared channels for communications, but does not explicitly teach second paging message to process according to the claims. According to applicant disclosure, such feature is well known conventional paging procedures for efficiently allocating the communication resources [0009-0013]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to further modify the method and system according to conventional paging procedure as disclosed by applicant to implement according to claims. One of ordinary skilled in the art at the time of invention of made to do this to efficiently allocate resources to a group of UEs.

4. Claims 45, 54, 46, 55, 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, 12, 17, 18, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over 3GPP publications 3GPP TR 25.931 V3.7.0 (2002-06) herein after 3GPP publication, in view of George Edward, Jr. (EU0544462A2), further in view of Lee et al. (US20050041610A1).

4.1 As regards to claims 45, 3GPP publication discloses Core network (CN: page 19) for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the Core network comprising: generating paging message with UE temporary identifier [page 19];

and providing the temporary identifier to the base station for transmission by the base station to the UE along with a paging message [page 19], the temporary identifier for identifying the UE during shared channel operation between the UE and the base station [(shared channel): page 74, page 75, Figure 45A]. Because Core network generates paging message with temporary identifier, it would have been obvious to one of ordinary skilled in the art that UMTS system much be integrated with resource manager as claimed in order for core network to generate paging message according to the UMTS system as disclosed in 3GPP publication.

3GPP publication does not explicitly disclose type 1 or type II message include both permanent UE ID and temporary UE ID according to amended claim. George teaches that type I or type II message comprises two identifiers as claimed [Table 1 & 2]. Therefore it would have been obvious to one of ordinary skilled in the art at the time invention was made to include two claimed identifiers as taught by George to modify as claimed. It should be noted that paging utilizing two types of identifiers would have been an obvious of matter of design choice in identifying mobile stations accordingly.

Lee discloses core network comprising resource manager i.e., core network entity which allocate temporary identifier for IE as claimed [0022 or 0084]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to modify core network entity of the network as disclosed in 3GPP publication as taught by Lee to implement the resource manager as claimed. One of ordinary skilled in the art at the time of invention of made would have to motivated to do this to enable the UE identification by core network entity for efficient communications.

4.2 Claim 54 is a method claim rejected for the same reason as stated above in claim 45 rejection because claim 54 method is substantially close to the method executed by apparatus claim 45.

4.3 As regards to claims 46 & 55, 3GPP publication discloses the resource manager of claim 45 & 54, wherein the paging message is provided to the base station by a core network [3GPP publication: page 19].

4.4 As regards to 47 & 56, The resource manager of claim 45, wherein the resource manager is a radio resource manager outside a core network that provides the paging message to the base station. As regards to claims 47 & 56, it would have been obvious to one of ordinary skilled in the art at that modified method and system in view of Lee would teach according to claims 45 & 54 wherein paging message is provided to the base station as stated above except that claims recites that resource manager is outside a core network. Further modifying the method and system for implement resource manage remotely from core network according to claims would have been obvious matter of design choice since applicant has not disclose any particular purpose or advantages for having resource manager outside a core network rather than in the core network and it appears that the invention would perform equally well with regardless of where resource manager is located.

4.5 As regards to claims 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, it would have been obvious to one of ordinary skilled in the art at that modified method and system in view of Lee would teach according to claims 1, 29, 62 & 74 wherein the temporary identifier is cell-specific [allocated by current serving MSC] except that claims recites that temporary identifier is selected or allocated at different network nodes. Further modifying the method and system for Selecting temporary identifier at different network nodes according to claims would have been obvious matter of design choice since applicant has not disclose any particular purpose or advantages for selecting temporary identifier at one node rather than selecting at another network node and it appears that the invention would perform equally well with selecting temporary identifier at different network nodes.

4.6 claims 12, 17, 18, 36 are also rejected for the same reason as stated above in claims 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65 rejections because modified method and system teaches using shared channels, SCCH as claimed.

5. Claims 48-53 & 57-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over 3GPP publications 3GPP TR 25.931 V3.7.0 (2002-06) herein after 3GPP publication in view of George Edward, Jr. (EU0544462A2), further in view of Lee et al. (US20050041610A1) and Sinnarajah et al. (US20040008679A1).

5.1 Regarding Claims 48 & 57, the network as modified discloses the resource manager of claims 45 & 54, further comprising logic for: sending a paging message to at least one base station within a registration area, wherein the paging message includes a UE identifier and establishing a shared channel connection between the base station and UE as stated above in Claims 45 & 54 rejections (also see claim 1 rejection) but does not explicitly disclose establishing a shared channel connection between the base station and the UE in response to paging acknowledgement from the user equipment (UE) as claimed but such claimed feature is expected to be implemented in the UTRAN, as disclosed in 3GPP publication. Sinnarajah discloses base station comprising logic for receiving a paging acknowledgement from the user equipment (UE) within the cell; and logic for establishing a shared channel connection between the base station and the UE in response to the paging acknowledgement, wherein the temporary identifier identifies the UE on the shared channel [(establishing shared channel in response to paging response: 0090 & 0091) (based on temporary identifier: 0063)].

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to further modify paging method and system as taught by Sinnarajah to establish shared channel communications in response to paging response and based on temporary UE identifier as disclosed in 3GPP publication to identify the UE on the shared channel. One of ordinary skilled in the art at the time of invention of made would have been motivated to do this for improved and effective communication service and system. It should be noted that shared/dedicated channel connection

establishment in response to acknowledgment is well known to one of ordinary skilled in the art and it would have been a matter of design choice for operators for different communications service types.

5.2 As regards to claims 49 & 58, it would have been obvious to one of ordinary skilled in the art that modified method and network would teach the resource manager of claim 48, wherein the resource manager is part of the core network that provides the paging message to the base station [see claim 48 rejections stated above].

5.3 As regards to claims 50, it would have been obvious to one of ordinary skilled in the art that modified method and network would teach the resource manager of claim 49, wherein the resource manager is an access gateway i.e., MSC (0022 of Lee et al. reference).

5.4 As regards to claims 51 & 59, 3GPP publication 3GPP publication discloses the resource manager of claims 45 & 54 and also teaches base station is provided with temporary identifier and establishing shared channel communications between base station and UE via shared channel in response to paging message [see claim 45 and claim 1 rejections], but silent on resource manager provides channel index to the base station as claimed. Sinnarajah teaches that base station can also be provided with

channel assignment information as part of paging message [0098, 0099 & 0104]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to modify the system and method as disclosed in 3GPP publication to provide shared channel assignment information as taught by Sinnarajah to implement the resource manager as claimed. One of ordinary skilled in the art at the time of invention of made would have been motivated to do this to for efficient resource utilization.

5.5 As regards to claims 52, 53, 60 & 61, it would have been obvious to one of ordinary skilled in the art at that modified method and system in view of Lee would teach that the temporary identifier is cell-specific and SCCH are common to a plurality of cells within a registration area of the core network because current serving MSC of core network assign temporary identifier and SCCH [see rejections stated above].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AUNG WIN whose telephone number is (571)272-7549. The examiner can normally be reached on Monday-thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on 571-272-7603. 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.

/AUNG WIN/
Examiner, Art Unit 2617
/Patrick N. Edouard/
Supervisory Patent Examiner, Art Unit 2617

Notice of References Cited	Application/Control No. 11/416,865	Applicant(s)/Patent Under Reexamination WORRALL, CHANDRIKA K.	
	Examiner AUNG WIN	Art Unit 2617	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
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	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N	EU0544462A2	02-1993	European	George Edward, Jr.	H04Q 7/04
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

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

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

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(71) Applicant : **AMERICAN TELEPHONE AND TELEGRAPH COMPANY**
32 Avenue of the Americas
New York, NY 10013-2412 (US)

(72) Inventor : **Fry, George Edward, Jr.**
11 Gregory Avenue
Morris Plains, New Jersey 07950 (US)

(74) Representative : **Buckley, Christopher Simon Thirsk et al**
AT & T (UK) LTD. 5 Mornington Road
Woodford Green, Essex IG8 OTU (GB)

(54) **Method and apparatus for bundling page request messages in a cellular radiotéléphone system.**

(57) Paging command messages received by a BTS, in a cellular radiotelephone system conforming to GSM regulations, are bundled at specific intervals into different types of paging request messages. These paging requests are bundled based on paging group and MS identifiers contained in the paging command message. These paging request messages are buffered for transmission to the MSs.

Paging request messages, in a specific embodiment of the invention, are asynchronously divided, for buffering, into two forms as governed by two types of MS identifications ; namely, TMSI (temporary mobile station identity) and IMSI (international mobile station identity) types. The bundles are formed from different compositions of these two identification types in order to maximize the buffering capacity.

The probability of dropping paging messages is reduced by augmenting the serial synchronous page bundling process with a parallel, primarily asynchronous bundling arrangement. The paging messages are entered into two paging stacks for each paging group. Paging requests are constructed when one stack becomes full.

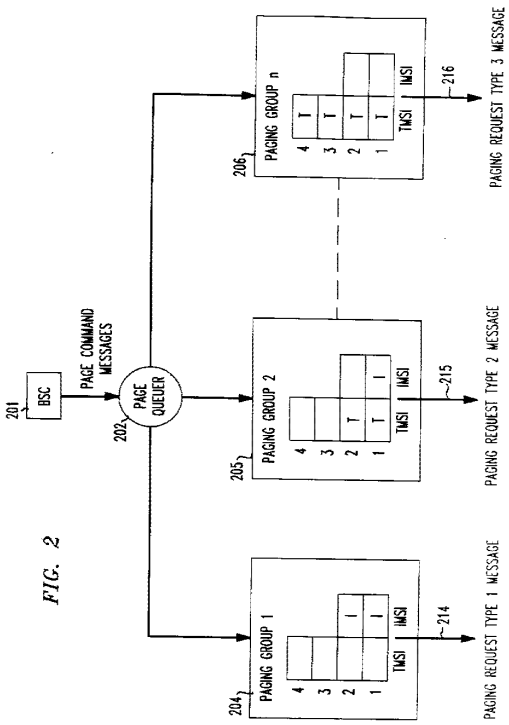

FIG. 2

EP 0 544 462 A2

Jouve, 18, rue Saint-Denis, 75001 PARIS

Field of the Invention

This invention relates to paging operations in a cellular radiotelephone system and, in particular, to a method and apparatus for enhancing capacity of a paging scheme conforming to GSM standards.

Background of the Invention

Availability of mobile stations (MS) to receive calls is determined by transmitting paging requests, a process whereby the paging request is sent by cell site equipment to all mobile stations within its service area either over a voice channel or a special set up channel. The dissemination of paging information is performed in correspondence to industry or government regulations or standards. TIA (Telephone Industry Association, a U.S. Standards body) and GSM (Groupe Speciale Mobile, a European Cellular Standard body) are typical organizations issuing standards controlling the operation of Cellular Radiotelephone Networks. A description of a GSM cellular radiotelephone system is provided in the document "General Description of a GSM PLMN (public land mobile network), and is available from the ETSI.

Issued GSM standards, for Europe, require that mobile stations (MS) be assigned to a paging group. Page requests for individual MSs of the same paging group are bundled together into one paging request message that is broadcast to all MSs in that paging group.

According to these GSM standards, page messages generated at a mobile switching center (MSC) are sent to a base station controller (BSC). The BSC produces a paging command message containing the ID of a single MS to be paged and sends it to a base transceiver station (BTS). The BTS queues the paging command messages received from the BSC and at specified intervals bundles them into a single paging request message. The paging request message is then transmitted to the MSs over the Air Interface.

The methodology chosen for queuing the paging command messages prior to the formation and transmission of the paging request messages has a significant impact on the operating efficiency of the paging operation. If the storage capacity of the base transceiver is exceeded, the overflow of excess paging command messages in the queue are dropped out of the cellular radiotelephone system and potential subscriber revenue may be lost. This may be somewhat alleviated by increasing the storage capacity, but this new increased storage capacity is again subject to the same overflow conditions.

This invention is a methodology for queuing paging command messages that reduces the probability of dropping paging command messages without increasing memory requirements.

Summary of the Invention

Storage for paging command messages is partitioned into paging buffers, one for each paging group. The GSM standards identify two types of MS IDs, Temporary Mobile Station Identification (TMSI) and International Mobile Station Identity (IMSI). Each paging group, in accord with the principles of the invention, maintains two paging stacks: one for IMSI MS IDs and one for TMSI MS IDs. The TMSI stack will hold up to four TMSI MS IDs while the IMSI stack will hold up to two IMSI MS IDs. MS IDs received within the paging command messages are queued according to their paging group and type of identification.

For each paging group the MS IDs that are queued in the BTS are bundled into different types of paging request messages in one of two processes: a synchronous process and an asynchronous process. In the synchronous process paging requests are constructed at specific intervals. The type of paging request message constructed is based on the number of MSs contained in the paging group's TMSI and IMSI paging stacks. In the asynchronous bundling process, the paging request messages are constructed when one of the paging group's paging stacks becomes full. This may happen before the paging interval has expired.

By dividing the paging command queue into separate paging groups and placing MS IDs only onto one of two paging stacks, memory requirements are limited by the number of paging groups supported by the system (81 in a GSM system). Each MS ID may occupy up to 10 bytes. Thus, the queuing methodology allows for 81 x ((4 x 10) + (2 x 10)) = 4860 bytes maximum. The asynchronous portion of the invention will execute when one of the paging stacks is full. Thus, there can only be three TMSI and one IMSI queued in a paging group at any one time. The next MS ID will cause a paging request message to be built and the full paging stack to be flushed. This limits memory requirements to 81 x ((3 x 10) + (1 x 10)) = 3240 bytes, or only 67% of the maximum. This feature of the invention reduces to 0 the probability that paging commands will be dropped due to overflow of paging memory.

In storing only the MS IDs on the paging stacks of the paging groups, a significant amount of preprocessing has taken place. The type of paging request message is known, via lookup table, indexed by the number of TMSI and IMSI MS IDs. The MS IDs themselves have been removed from the paging command messages.

The only remaining task is to put the MS IDs in their proper place within the paging request messages. Further, the asynchronous portion of the invention has assured that there is a minimum of paging request messages to construct at the time of execution of the synchronous portion. The efficiency of the synchronous portion of the invention is improved by the asynchronous part and this preprocessing of paging command messages.

Brief Description of the Drawing

In the drawing:

FIG. 1 is a schematic of a cellular radiotelephone system in which the invention may be applied;

FIG. 2 is a block schematic of a paging message processing arrangement according to the principles of the invention;

FIG. 3 is a block diagram of a base station control and transmission equipment in which the invention is applied;

FIG. 4 is a flow diagram of the control sequence in bundling the paging requests in the equipment of FIGS. 2 and 3; and

FIG. 5 is a table of illustrative bundling arrangements in the system of FIG. 2.

Detailed Description

The invention is concerned with a wireless telephone system in which a mobile telephone station is connected by radio signals to a land telephone network with conventional switched lines. A typical cellular radiotelephone system is shown in schematic form in FIG. 1. Individual mobile radiotelephones or subscriber stations (MS) 101 are connected, via radio airwave links 102, to a base station 103 which controls the radio setup and radio communication between the mobiles 101 and the base station 103. The base stations each include a base station transceiver (BTS) and a base station controller (BSC) as discussed here below.

A plurality of base stations 103, 104 and 105 are connected in turn, via trunks 106, 107 and 108, to a mobile switching center (MSC) 109 which provides switching facilities to interconnect the public switched telephone network 110 with the base station in a manner appropriate for communicating with the mobile 101.

In order to properly direct incoming calls to the correct mobile, the location of the mobile and the identity of its serving base station must be ascertained This is performed by a paging operation in which the individual base stations broadcast paging requests to all the mobiles within its broadcast range. These paging requests occur upon a demand for a telephone connection. The individual MSs respond to the paging requests that contain their identifiers announcing their identity and availability to receive incoming calls. This paging process is performed in accordance with the defined standards of the controlling regulatory authority of the local cellular radiotelephone system.

Under the provisions of the GSM Recommendations, all paging command messages are queued at the BTS and transmitted as a paging request within a single transmission period. To place these messages in a common queue is not desirable. The use of a common queue results in paging messages being dropped if the number of paging commands exceeds the size of the queue.

A method of bundling paging messages, embodying the principles of the invention, is shown in block process form in FIG. 2. A base station controller 201 receives downlink page messages from the MSC over a paging channel. These paging messages are forwarded to base station controllers (BSC) responsible for the MSs (i.e., those MSs which may be within the service area or cell of the base station). In the illustrative embodiment, the base station controller 201 manages base station transceivers (BTS) which may include the MSs to be paged in the range of coverage.

Base station controller 201 generates page command messages containing the ID of a single MS and sends them to each BTS. In the illustrative GSM system each MS is identified by one of two types of identifiers; an International Mobile Station Identity (IMSI) or a Temporary Mobile Station Identity (TMSI). The BSC 201 generates page command messages which are transmitted downlink to a page queuer 202 associated with a particular BTS associated with the MS to be paged. The page queuer 202 is functionally concerned with receiving page command messages; identifying their type (i.e., TMSI, IMSI) and forwarding them to available storage slots in one of the plurality of the page group storage bins 204, 205 and 206. Each page group storage bin has storage facilities for storing four TMSI paging commands and two IMSI paging commands. Each page group storage bin is operative to monitor the number of paging commands it is storing. When a page group storage bin becomes full, the asynchronous portion of the paging system requires a paging request message to be constructed from its contents. The synchronous feature of the paging system will, at intervals, construct paging request messages from the content of these page group storage bins that are not full, thereby ensuring that all paging commands are broadcast to the MSs within the paging interval.

In the illustrative arrangement of FIG. 2, the paging group storage bin 204 has two IMSI type paging commands from which it generates a type 2 paging request which is output on lead 214 to be coupled to a transceiver for broadcast transmission to the MSs. The page group storage bin 205 has two TMSI paging commands and one IMSI paging command stored therein. This is output on output lead 215 as a type 2 paging request message. Page group storage bin 206 with four TMSI paging commands generates a type 3 paging request message on output lead 216.

The processing arrangement, embodied in data processing equipment at the base station, and operative to perform the functional structuring of paging requests is shown in the block diagram of FIG. 3. A base station controller 301 (BSC) includes data processing components under the control of a core processor 302. Core processor 302 is coupled to a plurality of data processing cards 303 via a data bus 304. These data processing cards 303 are connected to a second data bus 305. A data processing card 306 connected to bus 305 is connected, via trunk 307, to receive paging commands from the MSC. A second data processing card 308 couples paging command messages from the bus 305 to a trunk line 309.

Paging command messages on trunk line 309 are applied to a data processing card 312 in the radio base station (RBS) 311. The RBS is under control of a core processor 313 which is connected to the data bus 315. A plurality of data cards 316 are connected to the data bus 315 and to a second data bus 317. A second plurality of data cards 318 interconnect the bus 315 to a second data bus 321. A data card 322 processes the data for airwave transmission and couples it, via a line 323, to an antenna 324 which broadcasts it to be received by an MS 325 to be paged.

In operation, the BSC 301 and the RBS 311 are stored data processors operating in response to a stored program which dictates its operations. The core processors 303 and 313 correspond to a control computer capable of storing the stored program and executing its commands to control the operations of the data processing cards included within the BSC and RBS, respectively. The BSC 301 is operative to handle incoming signaling and voice messages from the MSC and separate those control and voice signals to be transmitted to the RBS 311.

Data card 306 accepts voice and signaling messages and applies both messages to the bus 305. Voice messages are directed to the data card 308 for processing and application to the trunk 309. Signaling messages including paging messages are directed to the data cards 303 for processing under control of the core processor 302. These signaling messages are transmitted to the trunk 309, via the data card 308.

The voice and signaling messages processed by the BSC 301 are received by the data card 312 which distributes the messages to the bus 317. Voice messages are coupled by the bus 317 to the data cards 318 and, via bus 321, to data card 322 which processes these messages for radio transmission, via the trunk 323, and antenna 324 to the MS 325.

Signaling messages are coupled via the bus 317 to the data cards 316. Processing of these signaling messages is under control of the stored program of core processor 313 whose instructions are applied, via bus 315, to the data cards 316. The signaling messages including formatted paging requests are transmitted via the data card 322 to the trunk 323 and antenna 324 for broadcast to the MS 325.

The processing of the paging messages by the BSC converts the paging messages from the MSC into a paging command structural form. These paging commands are applied to the RBS 311 and parsed into the paging request messages having a structural form suitable for the MS being paged. This process is shown in detail by the flow control process shown in FIG. 4. This flow process is reflective of the stored instructions that convert the paging commands into the paging request that is transmitted to the MS.

The initial operation of the flow process designated in the block 401 is to wait for signaling input from the BSC. The subsequent decision block 402 designates an instruction to determine if the signal message is a paging command. If the signal message is not a paging command, the instruction flow proceeds to the decision block 407 whose designated instruction determines if a specified time interval has elapsed. This timing interval is provided by a master clock included in the BTS and is included for the purpose of forcing the transmission of paging requests in a timely manner. If the signal message is not a timer expiration, the process flow proceeds to block 408 whose designated instruction reports a bad input indicating that the received signal message was of an invalid type. Flow proceeds back to the block 401 where the instruction provided is to wait for further input from the BSC.

When the timer has expired, the process flow proceeds from the decision block 407 to the block 409 whose designated instruction is to retrieve all stored paging commands that have been grouped into storage areas to form the group paging requests. These paging commands are bundled together by the designated commands of block 410 and read out of the storage area as a particular type paging request for transmission as a group paging request to the MSs. The flow process proceeds to block 411 which clears the paging stacks of the paging groups and proceeds to determine in decision block 412 if there are more paging groups to be retrieved. In response to an affirmative answer, the flow process proceeds to the block 409 to repeat the proc-

ess flow, via blocks 410, 411 and 412. If there are no more paging groups to be processed, the flow proceeds to input block 401. The above sequence comprises the synchronous portion of the invention.

Upon determination, as per the instructions of decision block 402, that a paging command has been received, a paging command is evaluated in a subsequent decision block 403 to determine if it is a TMSI or an IMSI intended for a TMSI or an IMSI identified MS (MS ID), respectively. If the paging command is a TMSI command for a TMSI MS ID, the flow proceeds to block 413 whose designated instructions are to place the MS TMSI on a TMSI stack in a paging command storage area, such as shown symbolically in FIG. 2.

If the paging command is an IMSI MS ID the process flow passes through the decision block 404 whose designated instructions direct the process flow to the block 414 whose designated instructions are to place the MS IMSI on the IMSI stack in its paging command storage area, such as shown symbolically in FIG. 2.

The subsequent flow process from each of the two blocks 413 and 414 proceeds to the decision block 415 which is operative according to its designated instructions to determine if the paging stack just accessed by block 413 or 414 is full. If the stack is full, the flow process proceeds to block 416 whose instructions are to send a specified type message to the MSs. In doing so, the paging stack is cleared as per the designated instructions of block 417. The flow process proceeds to the input block 401. The above set of instructions comprise the asynchronous portion of the invention.

If the signal message contains neither IMSI or TMSI MS IDs the flow process proceeds through blocks 403 and 404 to block 405 which reports the no paging command signal message and returns the process flow to the input block 401.

As disclosed in describing the illustrative embodiment, varying combinations of TMSI MS ID messages and IMSI MS ID messages are combined into paging requests which enhance the efficiency of paging in a GSM mobile radiotelephone System.

A paging request Type 1 message is used to page up to two MSs. The MSs may be identified by either their International Mobile Station Identification (IMSI) or a Temporary Mobile Station Identity (TMSI) allocated by the network. Table 1 shows the format of the paging request type 1 message. The types of elements shown in the table are : mandatory fixed length (MF), mandatory variable length (MV), and optional variable length (OV).

PAGING REQUEST TYPE 1 Message Format (BTS -> MS)			
INFORMATION ELEMENT	**TYPE**	**LENGTH**	**VALUE**
Protocol Discriminateur	MF	0.5	0x06
Transaction Identifier	MF	0.5	0x00
Message Type	MF	1	0x21
Page Mode	MF	1	varies
Mobile Identify	MV	1 - 9	varies
Mobile Identify	OV	2 - 10	varies

Paging request type 2 messages are sent on the paging channel to two or three MSs to trigger a channel access. Two of the three MSs must be identified by TMSI to utilize this message. Table 2 shows the format of the paging request type message.

PAGING REQUEST TYPE 2 Message Format (BTS->MS)			
INFORMATION ELEMENT	TYPE	LENGTH	VALUE
Protocol Discriminator	MF	0.5	0x06
Transaction Identifier	MF	0.5	0x00
Message Type	MF	1	0x22
Page Mode	MF	1	varies
TMSI	MF	4	varies
TMSI	MF	4	varies
Mobile Identify	OV	2-10	varies

Paging request type 3 messages are sent on the paging channel to exactly four MSs to trigger a channel access. Each MS must be identified by a TMSI. MSs identified by IMSI may not be paged using paging request type 3 messages. Table 3 details this message format.

PAGING REQUEST TYPE 3 Message Format (BTS->MS)			
INFORMATION ELEMENT	TYPE	LENGTH	VALUE
Protocol Discriminator	MF	0.5	0x06
Transaction Identifier	MF	0.5	0x00
Message Type	MF	1	0x24
Page Mode	MF	1	varies
TMSI	MF	4	varies
TMSI	MF	4	varies
TMSI	MF	4	varies
TMSI	MF	4	varies

As described above, paging request type 1 messages allow for the bundling of up to two MSs identified by either TMSI or IMSI. Paging request Type 2 messages contain up three three MSs, at least two of which must be identified by TMSI. Paging request Type 3 messages contain up to four MSs, all of which must be identified by TMSI.

Another way to represent the choices of formatting paging request message is shown in the table shown in FIG. 5. The rows indicate the number of MSs to be paged according to their IMSI and the columns represent the number of MSs to page according to their TMSI. The envies in the table indicate the paging request message type to be used in paging the particular combination of IMSIs and TMSIs.

While a specific example of improving the efficiency of broadcasting paging requests has been disclosed, it is readily apparent that many variations thereon may be implemented by those skilled in the art without departing from the spirit and scope of the invention.

Claims

1. Apparatus for processing paging commands in a cellular radiotelephone system in which paging commands are of at least two types based upon MS IDs in the radiotelephone system, comprising:

   a base station (BS) (103,104,105) including;

   (a) a base station controller (BSC) (201) for generating paging command messages in a first and second type format suitable for the first and second MS IDs being paged; including;

(i) a connection (106,107,108) to a mobile switching center (MSC) (109) for receiving paging messages conforming to and to be addressed to first and second type MS IDs;
characterized by:
(ii) data processing circuitry (202) for queuing paging command messages into first and second data stacks of the paging command messages corresponding to predetermined numerical combinations of the first and second type MS IDs defining first, second and third paging request messages;
(iii) stored program control circuitry (204,205,206) included in the data processing circuitry for determining when a combination of stored paging commands in at least one of the first and second stacks represents a numerical combination defining one of the first second and third paging requests and for constructing a paging request from a predefined numerical combination of paging commands representing one of the first, second and third paging request format;
(b) a base station transceiver (BTS) (311) apparatus connected to the BSC and operative for serially transmitting paging requests to a mobile telephone station (MS) via radio airwave links.

2. Apparatus for processing paging commands in a cellular radiotelephone system, as claimed in claim 1;
wherein the data processing circuitry includes instructions to transmit a paging request to the BTS to be transmitted if the combination of paging commands includes,
two commands of two TMSI command types and IMSI command types.

3. Apparatus for processing paging commands in a cellular radiotelephone system, as claimed in claim 1;
wherein the data processing circuitry includes instructions to transmit a paging request to the BTS to be transmitted if the combination of paging commands includes,
three commands of two TMSI command types and one of a TMSI and IMSI command type.

4. Apparatus for processing paging commands in a cellular radiotelephone system, as claimed in claim 1;
wherein the data processing circuitry includes instructions to transmit a paging request to the BTS to be transmitted if the combination of paging commands includes,
four TMSI command types.

5. A method of processing paging messages in a cellular radio telephone system in which a form of paging messages is governed by types of identifiers used to identify mobile stations (MSs) served in the cellular system with at least two identifiers being used; comprising the steps of:
generating paging messages at a mobile switching center (MSC);
sending the paging command messages to a base station controller (BSC) which constructs a paging command message for each MS to be paged and forwarding it to a base station transceiver (BTS);
characterized by the steps of:
queuing the paging command messages at the BTS into paging request messages according to identifiers of MSs; by:
bundling the paging command messages into groups of paging command messages according to predefined numerical combinations of paging command messages associated with MSs of each identifier to form specified types of paging requests, and
serially transmitting the paging commands of groups of paging commands of complete types of paging requests as a group transmission.

6. A method of processing paging messages in a cellular radio telephone system as claimed in claim 5;
wherein at least two identifiers TMSI and IMSI are used to identify the MSs.

7. A method of processing paging messages in a cellular radio telephone system as claimed in claim 5;
wherein the paging requests are arranged into three groups including at least a first paging request group including at least a paging request for two MSs having the same identifier type.

8. A method of processing paging messages in a cellular radio telephone system as claimed in claim 5;
wherein the paging requests are arranged into three groups including at least a second paging request group including at least a paging request for three MSs with at least two MSs having a TMSI identifier.

9. A method of processing paging messages in a cellular radio telephone system as claimed in claim 5;
wherein the paging requests are arranged into three groups including at least a third paging request group including paging requests for four MSs having a TMSI identifier.

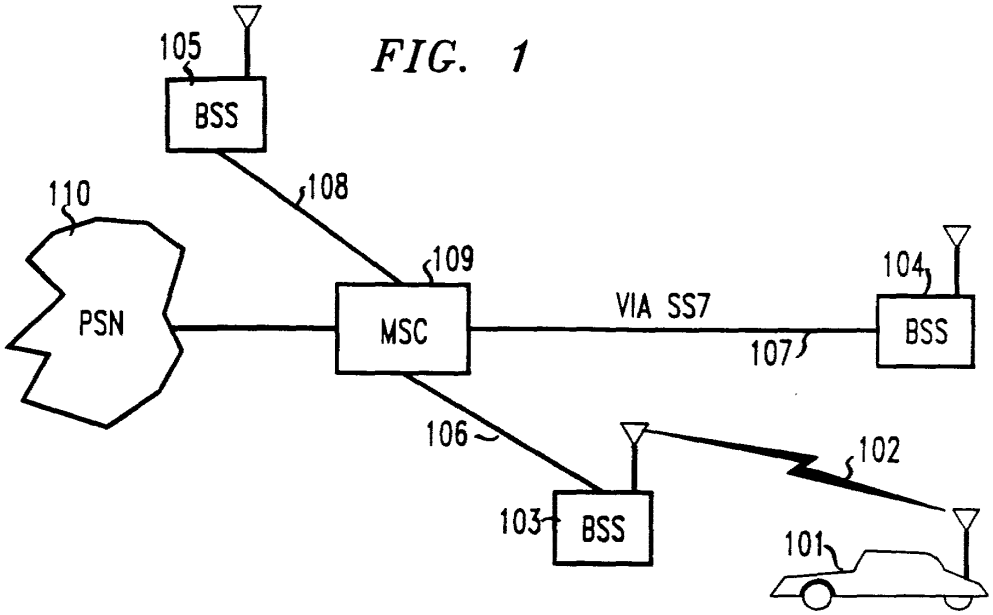

FIG. 1

FIG. 5

PAGING REQUEST MESSAGE FORMATTING TABLE

NUMBER OF MS(s) TO PAGE	PAGING REQUEST MESSAGE TYPES[1]		
	TYPE 1	TYPE 2	TYPE 3
1	T or I	T	T
2	T or I	T	T
3		T or I	T
4			T

T=TEMPORARY MOBILE SUBSCRIBER IDENTITY (TMSI)
I=INTERNATIONAL MOBILE SUBSCRIBER IDENTITY (IMSI

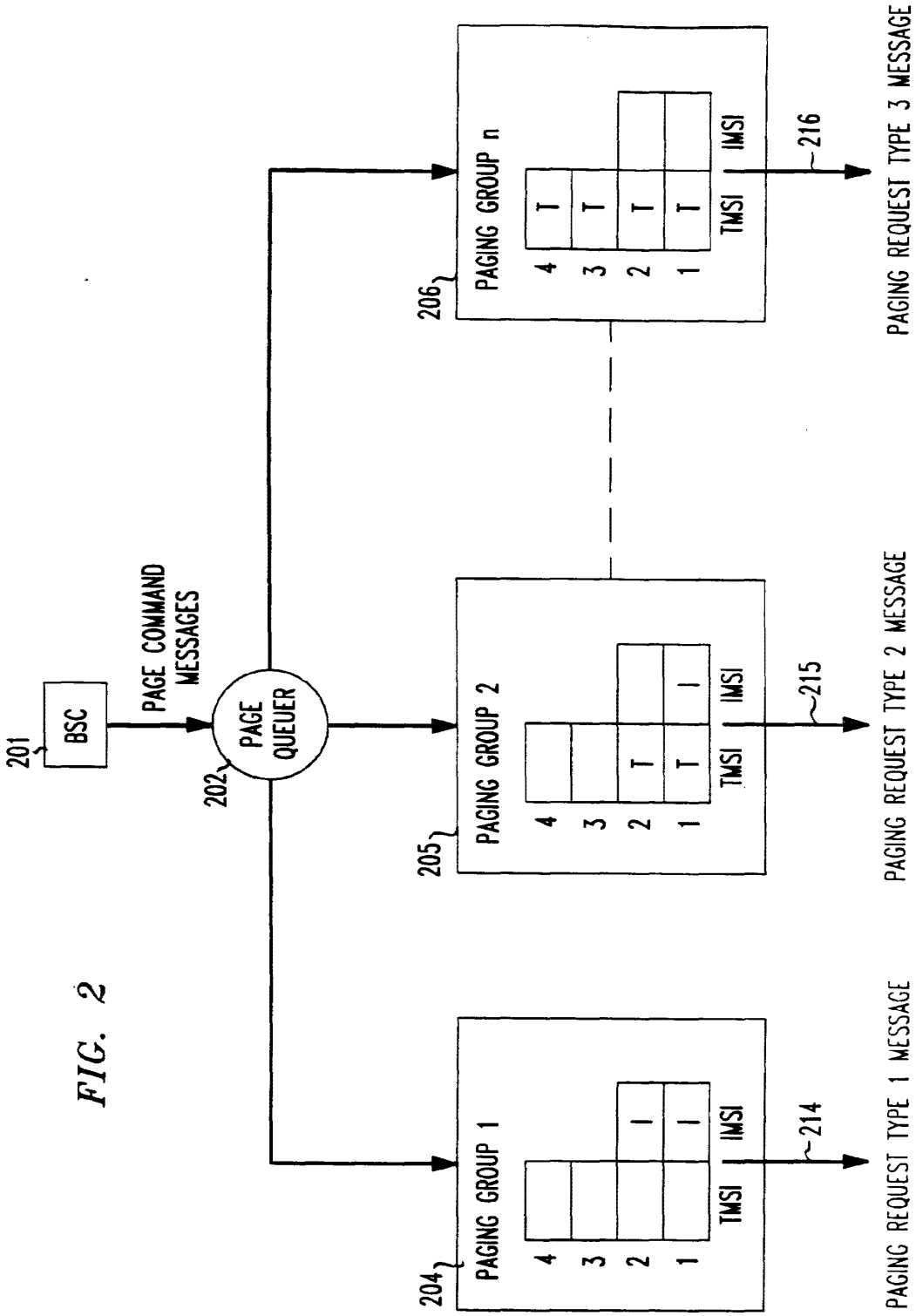
201
BSC
PAGE COMMAND MESSAGES
202
PAGE QUEUER
204
PAGING GROUP 1
4
3
2
1
TMSI
IMSI
214
PAGING REQUEST TYPE 1 MESSAGE
205
PAGING GROUP 2
T
T
T
T
I
I
215
PAGING REQUEST TYPE 2 MESSAGE
206
PAGING GROUP n
216
PAGING REQUEST TYPE 3 MESSAGE

FIG. 2

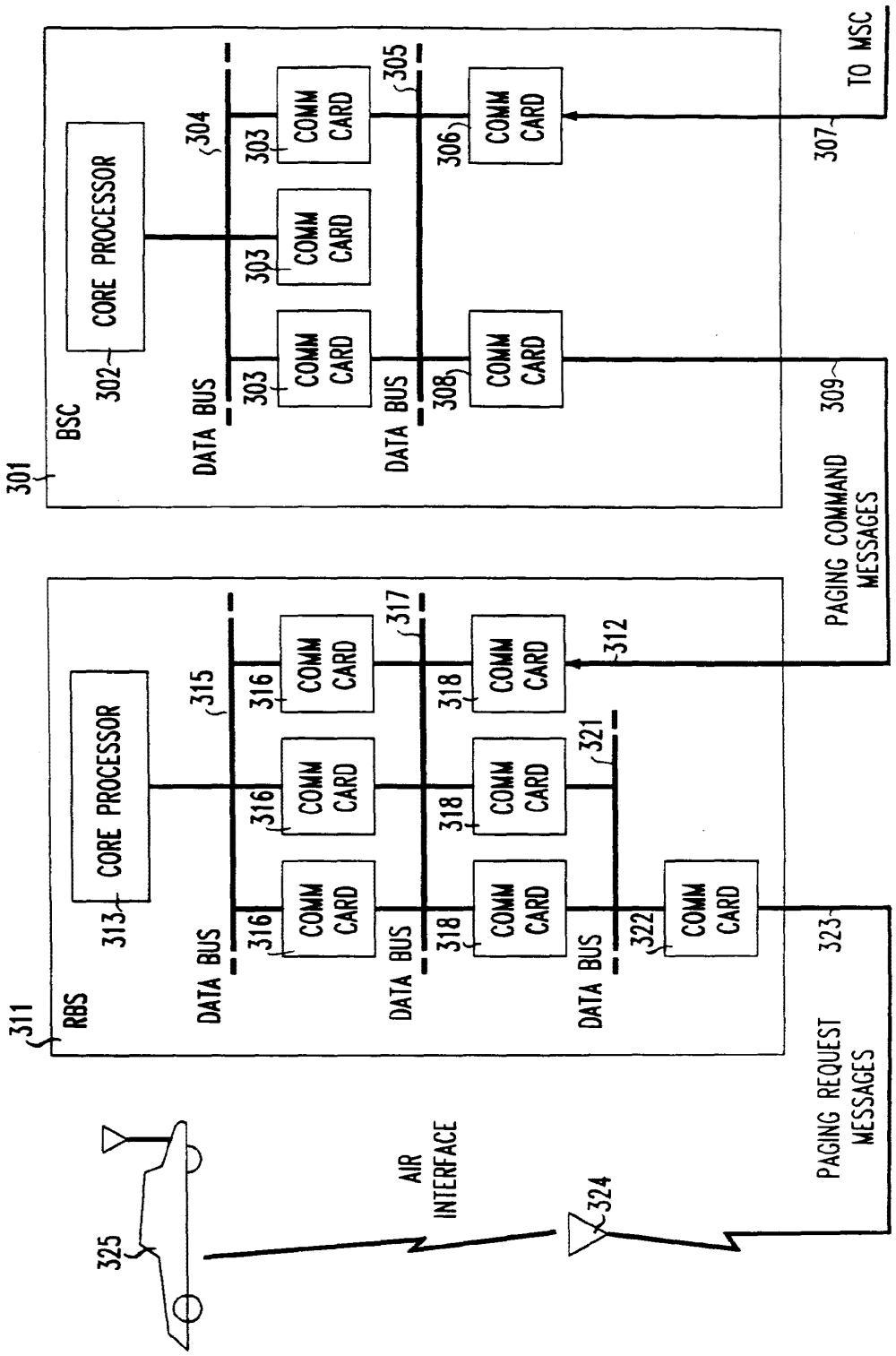
301
BSC
302
CORE PROCESSOR
304
DATA BUS
303
COMM CARD
305
306
307
TO MSC
308
309
PAGING COMMAND MESSAGES
311
RBS
313
315
316
317
318
312
321
322
323
PAGING REQUEST MESSAGES
325
AIR INTERFACE
324

FIG. 3

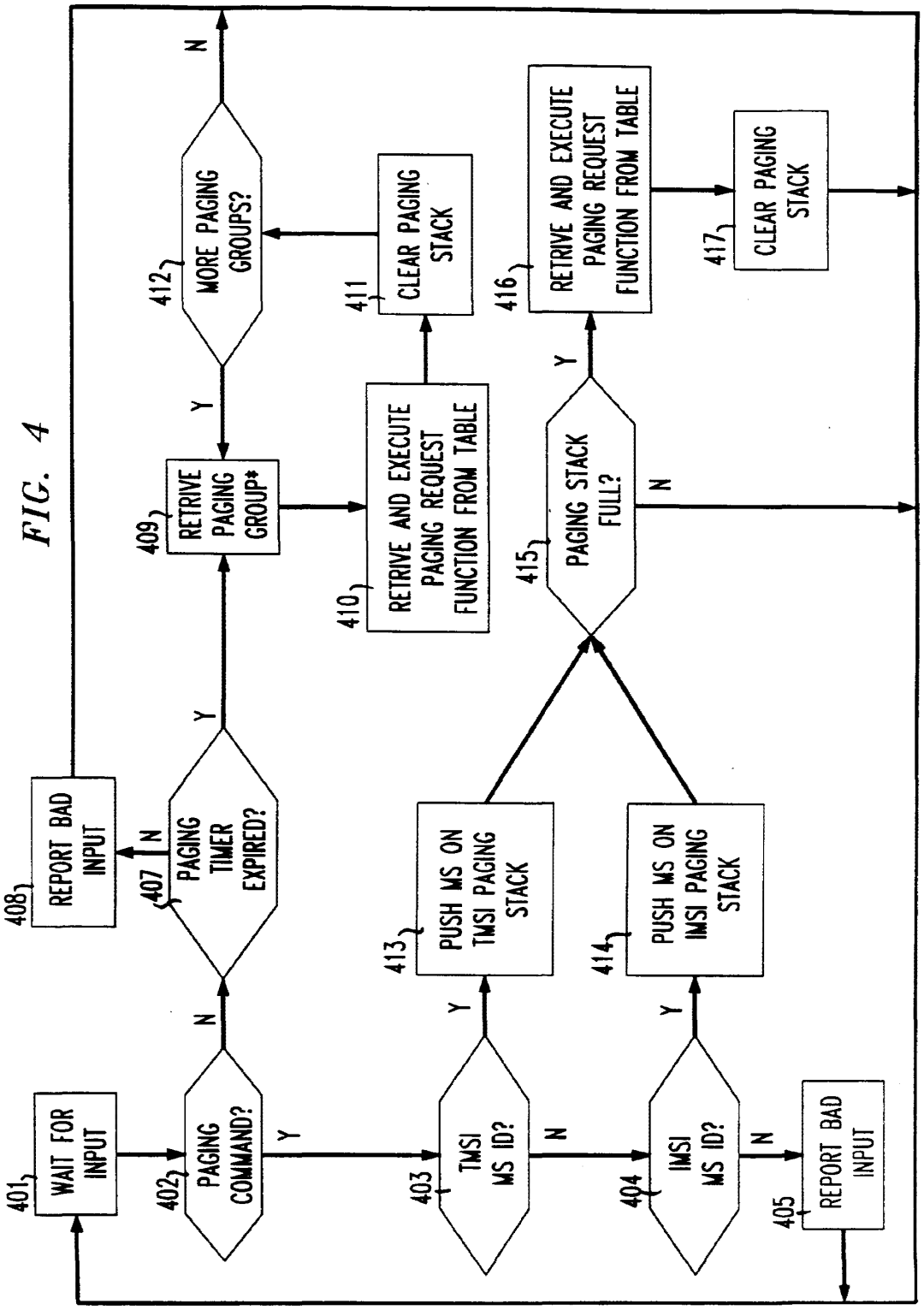
401
WAIT FOR INPUT
402
PAGING COMMAND?
N
Y
403
TMSI MS ID?
Y
N
404
IMSI MS ID?
Y
N
405
REPORT BAD INPUT
407
PAGING TIMER EXPIRED?
N
Y
408
REPORT BAD INPUT
409
RETRIVE PAGING GROUP*
410
RETRIVE AND EXECUTE PAGING REQUEST FUNCTION FROM TABLE
411
CLEAR PAGING STACK
412
MORE PAGING GROUPS?
Y
N
413
PUSH MS ON TMSI PAGING STACK
414
PUSH MS ON IMSI PAGING STACK
415
PAGING STACK FULL?
Y
N
416
RETRIVE AND EXECUTE PAGING REQUEST FUNCTION FROM TABLE
417
CLEAR PAGING STACK

FIG. 4

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	2	11/416864	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/29 22:50
L2	1	11/416865	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/29 22:50
L3	1	11/416865 and temporary	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/29 22:54
L4	0	11/416865 and temporary and unique	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/29 22:54
L5	1	11/416865 and (temporary with message)	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/29 22:55
L6	1	11/416865 and ((identifier id) with equipment)	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/29 22:56
L7	1	11/416865 and ((identifier id) with (UE equipment))	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/29 22:57
L8	1	11/416865 and ((((identifier id) with (UE equipment)) and IMSI) same paging)	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/29 22:59
L9	810	(((identifier identi$5 id) with (UE equipment)) TMSI IMSI) with paging	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/29 23:28
L10	78	(TMSI with IMSI with paging)	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/29 23:29
L11	78	9 and 10	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/29 23:29
L12	1	"20050002407"	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/30 00:16
L13	1	"20050002407" and paging	US-PGPUB; USPAT; EPO	OR	OFF	2010/09/30 00:16

9/30/2010 12:55:59 AM
C:\Documents and Settings\awin\My Documents\EAST\Workspaces\11416865.wsp

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

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

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

CLAIM		DATE								
Final	Original	09/30/2010								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
	11	✓								
	12	✓								
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	14	✓								
	15	✓								
	16	✓								
	17	✓								
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	31	✓								
	32	✓								
	33	✓								
	34	✓								
	35	✓								
	36	✓								

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

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

CLAIM		DATE								
Final	Original	09/30/2010								
	37	✓								
	38	✓								
	39	✓								
	40	✓								
	41	✓								
	42	✓								
	43	✓								
	44	✓								
	45	✓								
	46	✓								
	47	✓								
	48	✓								
	49	✓								
	50	✓								
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	52	✓								
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	61	✓								
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	66	✓								
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	68	✓								
	69	✓								
	70	✓								
	71	✓								
	72	✓								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

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

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

CLAIM		DATE								
Final	Original	09/30/2010								
	73	✓								
	74	✓								
	75	✓								
	76	✓								
	77	✓								
	78	✓								
	79	✓								
	80	✓								
	81	✓								
	82	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

SEARCHED			
Class	**Subclass**	**Date**	**Examiner**

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
updated search	9/30/2010	atw

INTERFERENCE SEARCH			
Class	**Subclass**	**Date**	**Examiner**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. 11/416,865	***Confirmation No. 8530***
Filed: May 2, 2006	
Applicants: Chandrika K. Worrall	
Title: **NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM**	This First Substitute Amendment And Response was electronically filed on September 8, 2010 using EFS-Web.
Art Unit: 2617	
Examiner: Aung T. Win	
Attorney Docket: 9147/96635 (06-0011) (SB6B4003US00)	
Customer No.: 22242	

Mail Stop AMENDMENT
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

FIRST SUBSTITUTE AMENDMENT AND RESPONSE

Sir:

In response to the Office Action mailed March 4, 2010 as entered in the above-captioned matter, the due date (taking the requested extension of time into account) for response being Tuesday, September 7, 2010, the first business day after Saturday, September 4, 2010, Applicants respectfully submit a Request For Continued Examination and the following amendment and response.

Amendments to the Claims reflected in the listing of claims beginning on page 2 of this paper; and

Remarks beginning on page 17 of this paper.

AMENDMENTS TO THE CLAIMS

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

Listing of Claims:

1. (Currently amended) A base station for establishing a network-initiated connection with a user equipment over a radio interface in a cellular communication system, the base station comprising:

logic for receiving a paging message comprising a unique identifier of the user equipment;

logic for sending the paging message ~~and~~ together with a temporary identifier to at least one cell, the temporary identifier being different from the unique identifier;

logic for receiving a paging acknowledgement from the user equipment (UE) within the at least one cell; and

logic for establishing a shared channel connection between the base station and the UE in response to the paging acknowledgement, wherein the temporary identifier identifies the UE on the shared channel.

2. (Previously presented) The base station of claim 1, wherein the logic for receiving the paging message is configured to receive the paging message from a core network.

3. (Original) The base station of claim 1, comprising logic for assigning to the UE a temporary identifier from the base station to which it was last registered in response to the UE being in a dormant state.

4. (Previously presented) The base station of claim 1, wherein the logic for sending is configured to send at least one channel index to at least one shared control channel (SCCH) along with the paging message, the SCCH for communicating control information for the UE during shared channel operation.

5. (Original) The base station of claim 1, comprising logic for signaling to the UE an indication of dedicated access resources to be used by the UE for paging acknowledgement.

6. (Original) The base station of claim 5, wherein the dedicated access resources include a dedicated physical channel.

7. (Original) The base station of claim 5, wherein the dedicated access resources include a dedicated signal sequence to be used on a contention-based channel.

8. (Currently amended) The base station of claim 1, wherein the logic for receiving the paging acknowledgement is configured to ~~for~~ receive the paging acknowledgement over a contention-based uplink channel.

9. (Original) The base station of claim 2, further comprising logic for sending the paging acknowledgment to the core network to establish shared channel communications between the UE and the core network.

10. (Currently amended) The base station of claim 1, wherein the logic for sending is configured to send the paging message <u>and the temporary identifier</u> using a broadcast channel.

11. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific, the base station further comprising logic for selecting the temporary identifier at the base station.

12. (Original) The base station of claim 11, further comprising logic for selecting the SCCH at the base station.

13. (Original) The base station of claim 1, wherein the logic for receiving the paging acknowledgement comprises logic for synchronizing communication with the UE based upon an uplink synchronization request from the UE.

14. (Original) The base station of claim 13, wherein the uplink synchronization request is part of a paging acknowledgement message.

15. (Original) The base station of claim 2, wherein the temporary identifier is cell-specific, the base station further comprising logic for receiving the temporary identifier from the core network.

16. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific, the base station further comprising logic for receiving the temporary identifier from a resource manager outside the core network.

17. (Currently amended) The base station of claim 15, the base station further comprising logic for receiving the channel index ~~is selected~~ from the core network.

18. (Original) The base station of claim 16, the base station further comprising logic for receiving the channel index from the resource manager.

19. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific.

20. (Original) The base station of claim 2, wherein the temporary identifier is common to a plurality of cells within a registration area, the base station further comprising logic for receiving the temporary identifier from the core network.

21. (Original) The base station of claim 1, wherein the temporary identifier is common to a plurality of cells within a registration area, the base station further comprising logic for receiving the temporary identifier from a resource manager.

22. (Original) The base station of claim 4, wherein the temporary identifier and the SCCH are cell-specific.

23. (Original) The base station of claim 1, wherein the logic for sending comprises logic for:

sending at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

sending the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

24. (Original) The base station of claim 23, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

25. (Original) The base station of claim 23, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

26. (Original) The base station of claim 25, further comprising logic for sending in the SCCH a group identifier identifying a group of UEs to which paging messages are directed.

27. (Original) The base station of claim 23, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

28. (Original) The base station of claim 27, further comprising logic for:

sending in the SCCH a group identifier identifying a group of UEs to which at least one paging message is directed; and

sending in the SCCH an indication of resources allocated to the group of UEs for receiving paging messages in the shared channel.

29. (Currently amended) A method for establishing a network-initiated connection between a user equipment and a base station over a radio interface in a cellular communication system, the method comprising, at a base station:

receiving a paging message <u>comprising a unique identifier of the user equipment</u>;

sending the paging message ~~and~~ <u>together with</u> a temporary identifier to at least one cell<u>, the temporary identifier being different from the unique identifier</u>;

receiving a paging acknowledgement from the user equipment (UE) within the at least one cell; and

in response to the paging acknowledgement, establishing a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

30. (Original) The method of claim 29, wherein receiving the paging message comprises receiving the paging message from a core network.

31. (Original) The method of claim 29, wherein, in response to the UE being in a dormant state, the UE is assigned the same temporary identifier it had been assigned from the base station to which it was last registered.

32. (Original) The method of claim 29, wherein sending further comprises sending at least one channel index to at least one shared control channel (SCCH) along with the paging message, the SCCH for communicating control information for the UE during shared channel operation.

33. (Original) The method of claim 29, wherein sending the paging message comprises signaling to the UE an indication of dedicated access resources to be used by the UE for paging acknowledgement.

34. (Original) The method of claim 30, further comprising sending the paging acknowledgment to the core network to establish shared channel communications between the UE and the core network.

35. (Original) The method of claim 29, wherein the temporary identifier is cell-specific, the method further comprising selecting the temporary identifier at the base station.

36. (Original) The method of claim 35, further comprising selecting the SCCH at the base station.

37. (Original) The method of claim 29, further comprising synchronizing communications between the base station and the UE based upon an uplink synchronization request from the UE.

38. (Original) The method of claim 30, wherein the temporary identifier is cell-specific, and the temporary identifier is selected by the core network that sent the paging message.

39. (Original) The method of claim 30, wherein the temporary identifier is common to a plurality of cells within a registration area, and is selected by the core network.

40. (Original) The method of claim 29, wherein sending the paging message comprises:

sending at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

sending the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

41. (Original) The method of claim 40, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

42. (Original) The method of claim 40, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

43. (Original) The method of claim 42, further comprising sending in the SCCH a group identifier identifying a group of UEs to which paging messages are directed.

44. (Original) The method of claim 40, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

45. (Currently amended) A resource manager for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the resource manager comprising:

logic for selecting a temporary identifier for the UE; and

logic for providing the temporary identifier to the base station for transmission by the base station to the UE along with a paging message, <u>the paging message comprising a unique identifier of the UE that is different from the temporary identifier,</u> the temporary identifier for identifying the UE during shared channel operation between the UE and the base station.

46. (Original) The resource manager of claim 45, wherein the paging message is provided to the base station by a core network.

47. (Original) The resource manager of claim 45, wherein the resource manager is a radio resource manager outside a core network that provides the paging message to the base station.

48. (Currently amended) The resource manager of claim 45, further comprising logic for:

sending a paging message to at least one base station within a registration area, wherein the paging message includes ~~a UE~~ the unique identifier;

receiving a paging acknowledgement from a UE associated with the ~~UE~~ unique identifier via a first base station to establish a shared channel connection between the first base station and the UE.

49. (Original) The resource manager of claim 48, wherein the resource manager is part of the core network that provides the paging message to the base station.

50. (Original) The resource manager of claim 49, wherein the resource manager is an access gateway.

51. (Original) The resource manager of claim 45, further comprising logic for:

selecting a channel index to a shared control channel (SCCH); and

providing the channel index to the base station for transmission by the base station to the UE along with the paging message and the temporary identifier, the SCCH for communicating control information including the temporary identifier between the UE and the base station during shared channel operation.

52. (Original) The resource manager of claim 51, wherein the temporary identifier and the SCCH are cell-specific.

53. (Original) The resource manager of claim 51, wherein the temporary identifier and the SCCH are common to a plurality of cells within a registration area of the core network.

54. (Currently amended) A method for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the method comprising, at a resource manager:

selecting a temporary identifier for the UE; and

providing the temporary identifier to the base station for transmission by the base station to the UE along with a paging message, <u>the paging message comprising a unique identifier of the UE that is different from the temporary identifier,</u> the temporary identifier for identifying the UE during shared channel operation between the UE and the base station.

55. (Original) The method of claim 54, wherein the paging message is provided to the base station by a core network.

56. (Original) The method of claim 54, wherein the resource manager is a radio resource manager outside a core network that provides the paging message to the base station.

57. (Currently amended) The method of claim 54, further comprising:

sending a paging message to at least one base station within a registration area, wherein the paging message includes ~~a UE~~ the unique identifier; and

receiving a paging acknowledgement from a UE associated with the ~~UE~~ unique identifier via a first base station to establish a shared channel connection between the first base station and the UE.

58. (Original) The method of claim 57, wherein the resource manager is part of the core network that provides the paging message to the base station.

59. (Original) The method of claim 54, further comprising, at the resource manager:

selecting a channel index to a shared control channel (SCCH); and

providing the channel index to the base station for transmission by the base station to the UE along with the paging message and the temporary identifier, the SCCH for communicating control information including the temporary identifier between the UE and the base station during shared channel operation.

60. (Original) The method of claim 59, wherein the temporary identifier and the SCCH are cell-specific.

61. (Original) The method of claim 59, wherein the temporary identifier and the SCCH are common to a plurality of cells within a registration area of the core network.

62. (Currently amended) A user equipment (UE) for establishing a network-initiated connection with a base station over a radio interface in a cellular communication system, the UE comprising:

logic for receiving from the base station a paging message ~~and~~ together with a temporary identifier, the paging message comprising a unique identifier of the UE, the temporary identifier being different from the unique identifier ; and

logic for sending a paging acknowledgement to the base station to establish a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

63. (Original) The UE of claim 62, further comprising logic for communicating control information during shared channel operation using a channel index to at least one shared control channel (SCCH) received along with the paging message from the base station.

64. (Previously presented) The UE of claim 62, wherein the logic for receiving is configured to receive an indication of dedicated access resources from the base station, the UE further comprising logic for employing the dedicated access resources for paging acknowledgement.

65. (Original) The UE of claim 62, wherein the temporary identifier is cell-specific.

66. (Previously presented) The UE of claim 62, wherein the logic for sending the paging acknowledgement is configured to send an uplink synchronization request to the base station.

67. (Original) The UE of claim 66, wherein the uplink synchronization request is part of a paging acknowledgement message.

68. (Previously presented) The UE of claim 62, wherein the logic for receiving is configured to:

receive at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

receive the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

69. (Original) The UE of claim 68, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

70. (Original) The UE of claim 68, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

71. (Original) The UE of claim 70, further comprising logic for receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs.

72. (Original) The UE of claim 68, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

73. (Original) The UE of claim 72, further comprising logic for:

receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs; and

receiving in the SCCH an indication of resources allocated to the group of UEs to which the UE belongs for receiving paging messages in the shared channel.

74. (Currently amended) A method for establishing a network-initiated connection with a base station over a radio interface in a cellular communication system, the ~~UE~~ method comprising, at a UE:

receiving from the base station a paging message ~~and~~ together with a temporary identifier, the paging message comprising a unique identifier of the UE, the temporary identifier being different from the unique identifier; and

sending a paging acknowledgement to the base station to establish a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

75. (Original) The method of claim 74, comprising communicating control information during shared channel operation using a channel index to at least one shared control channel (SCCH) received along with the paging message from the base station.

76. (Original) The method of claim 74, wherein receiving comprises receiving an indication of dedicated access resources from the base station, the method further comprising employing the dedicated access resources for paging acknowledgement.

77. (Original) The method of claim 74, further comprising sending an uplink synchronization request to the base station.

78. (Original) The method of claim 74, wherein receiving comprises:

receiving at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

receiving the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

79. (Original) The method of claim 78, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

80. (Original) The method of claim 78, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

81. (Original) The method of claim 80, further comprising logic for receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs.

82. (Original) The method of claim 78, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

REMARKS

In the Office Communication mailed March 4, 2010, as entered in the above-captioned matter, claims 1, 29, 62, 74, 2, 30, 3, 31 9, 34, 10, 4, 32, 63, 75, 5, 6, 33,64,76,13,14, 66, 67, and 77 were rejected under 35 U.S.C. 103(a) as being obvious over a first 3GPP publication (3GPP **TR** 25.931 V3.7.0 (2002-06)) ("first 3GPP publication") in view of Sinnarajah et al. (US20040008679A1) ("Sinnarajah").

Claims 7 and 8 were rejected under 35 U.S.C. 103(a) as being obvious over the first 3GPP publication in view of Sinnarajah and further in view of a second 3GPP publication (3GPP TS 25.303 V3.12.0 (2002-06)) ("second 3GPP publication").

Claims 23-28, 40-48, 68-73, and 78-82 were rejected under 35 U.S.C. 103(a) as being obvious over the first 3GPP publication in view of Sinnarajah and further in view of prior art admitted in the background section of our disclosure.

Claims 45, 54, 46, 55, 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, 12, 17, 18 and 36 were rejected under 35 U.S.C. 103(a) as being unpatentable over the first 3GPP publication in view of Lee et al. (US20050041610A1) ("Lee").

Claims 48-53 and 57-61 were rejected under 35 U.S.C. 103(a) as being unpatentable over the first 3GPP publication in view of Lee and further in view of Sinnarajah.

We respectfully traverse these rejections and request reconsideration.

Rejections under 35 U.S.C. §103

Claims 1, 29, 62, 74, 2, 30, 3, 31 9, 34, 10, 4, 32, 63, 75, 5, 6, 33,64,76,13,14, 66, 67, and 77 were rejected under 35 U.S.C. 103(a) as being obvious over the first 3GPP publication in view of Sinnarajah.

Independent claim 1

We have clarified Independent claim 1 by this amendment. The amended wording in claim 1 is contained in the following three lines of claim 1:

> "logic for receiving a paging message comprising a unique identifier of the user equipment;
>
> logic for sending the paging message together with a temporary identifier to at least one cell, the temporary identifier being different from the unique identifier;"[1]

These changes clarify that the base station sends, together, a unique identifier within a paging message *and* a temporary identifier, the temporary identifier being different from the unique identifier. These features are then usefully considered together with the following feature in the final lines of claim 1:

> "the temporary identifier identifies the UE on the shared channel."

These features in the aggregate describe a system that is very different from the arrangements described in the cited prior art.

The Sinnarajah reference

Sinnarajah teaches the setting up of a multicast[2] communication service.

The multicast transmission of Sinnarajah differs fundamentally from the present claims. Paragraph 0063 of Sinnerajah states that the network may broadcast a Temporary Mobile Station Identifier (TMSI) or an International Mobile Station Identifier (IMSI) when trying to locate a particular mobile station for a multicast transmission. Sinnerajah makes

1 Emphasis supplied.
2 *See* the expression "multicast content" in line 7 of 0091 of Sinnarajah.

no mention, however, of including a temporary identifier broadcast along with such an identifier.

Furthermore, paragraph 0116 of Sinnarajah shows that two communications from the base station need to be sent to each mobile station in order to assign a physical channel, on which the mobiles are to receive "multicast service." Looking at this in more detail, paragraph 0091 of Sinnarajah states that, after sending out a first communication:

> (i) "The access network waits for response from member subscriber stations ***before channel assignment.***" [Here the "member" is the member of a particular group.]
>
> (ii) ***"[T]he response allows the access network to decide,*** whether to assign a shared channel or a dedicated channel for the multicast content."[3]

These portions of Sinnarajah make clear that, in Sinnarajah:

(i) A broadcast message is sent out in order to determine a level of interest amongst a known group of subscribers for a multicast call. This message does not contain *both* a unique identifier and a temporary identifier; and

(ii) The access network is only in a position to decide which kind of channel to use to broadcast the "multicast content" when it has waited sufficiently long for responses from the members of the group, so it cannot assign a channel to any mobile subscriber prior to this point in time.

In contrast to Sinnarajah, the base station of claim 1 has logic for sending a temporary identifier together with a paging message with a unique identifier. Accordingly a sought UE is in possession of a temporary identifier much earlier than is the case with Sinnarajah. The mobile subscriber identifies itself on the shared channel using the temporary identifier, once the paging acknowledgment has been received.

---

3 Emphasis supplied.

The first 3GPP publication

Point 1.1 on page 4 of the final rejection compares the first 3GPP publication with former Claim 1, citing page 19 and figures 5 and 6 of the first 3GPP publication.

However, the first 3GPP publication describes a system that functions in accordance with the comments made about prior art systems in the "Description of the Related Art" section of the present application. In those regards, paragraph 0012 of our application points out that, in conventional systems:

> "...the connection establishment and cell update response to a paging message ***(network-initiated connection) follow the same procedures as when the connection establishment/ cell update is performed in response to a 'terminal initiated connection'***. In the latter case, the establishment cause is not known to the network until a connection request message is received by the mobile terminal. Therefore, the network can manage the connection setup ***only after receiving the initial connection request*** from the mobile terminal."[4]

Notably, the first 3GPP publication document states, in the sixth and seventh lines below its figure 5, that: "The UE detects page message from RNC1 (as example) and the procedure for NAS signalling connection establishment follows." It is clear that the NAS connection establishment procedure is *the same* in the first 3GPP publication, whether it is part of a connection set-up procedure *initiated by the UE*, or is part of a *network initiated* connection set-up procedure. See the first three lines on page 20, and figure 7, of the first 3GPP publication, where the same NAS signaling connection set-up procedure is shown whether it is for establishment requested "*by the terminal*" or "*stimulated by a paging from the CN* [core network]."

4 Emphasis supplied.

Point 1.1 on page 4 of the Office Action states that the first 3GPP publication has "logic for sending the paging message and a temporary UE identifier to at least one cell," and quotes Figures 5 and 6 and page 19 of the first 3GPP publication.

However, point 1 immediately below figure 5 on page 19 of the first 3GPP publication simply lists parameters that may be sent *from the CN* (Core Network) *to the RNC*. Amongst these parameters is a "*Temporary UE Identity*." The text under point 1, in the first three lines under figure 5, commences with the words "*CN initiates the paging...*" and refers to the two arrows at the upper right of figure 5 that are labeled "1 Paging." However, while points 2 and 3 under figure 5 on page 19 of the first 3GPP publication describe the paging, there is no mention here that the "Temporary UE Identity" is sent *together with* a unique identifier of the UE in the paging step as in amended Claim 1.

For the reasons given above, it is clear that both the Sinnarajah reference and the first 3GPP publication function very differently to the arrangement of amended Claim 1. Even if it were obvious to combine the teachings of these two prior art references, they would not result in a base station with the features of Claim 1.

Independent claims 29, 62 and 74

Independent claims 29, 62, and 74 were rejected on similar grounds to those used to reject claim 1. See point 1 on page 4 of the Office Action. Amended claims 29, 62, and 74 have been clarified in a similar manner to amended claim 1. Accordingly, we respectfully submit that the same points put forth above in favor of claim 1 are applicable to claims 29, 62 and 74.

Independent claims 45 and 54

Amended independent claims 45 and 54 include similar clarifications to those discussed above for claims 1, 29, 62, and 74.

In point 4 on page 10 of the Office Action, former claims 45 and 54 were rejected in view of a combination of the first 3GPP publication and Lee. Pages 74 and 75, and figure 45A of the first 3GPP publication were cited. Paragraphs 0022 and 0084 of Lee were cited.

Amended claims 45 and 54 are distinguished over pages 74 and 75, and figure 45A of the first 3GPP publication for the same reasons as given above for amended claim 1. Pages 74 and 75, and figure 45A of the first 3GPP publication do not disclose the features identified above as being the differences between the apparatus of claim 1 and the teaching of pages 19 and 20, and figures 5 and 6, of the first 3GPP publication.

Paragraph 0022 of Lee makes clear that the "UE ID" is one of an IMSI or a TMSI. There is no suggestion to provide a unique identifier along *with* a temporary identifier. Para 0084 makes clear that there is an RNC that may issue a temporary identifier. However, there is no suggestion to provide a unique identifier along with a temporary identifier. Paragraphs 0022 and 0084 of Lee do not disclose features that, either alone or together with the teaching of the first 3GPP publication, would render claims 45 or 54 obvious.

Dependent claims 2-28, 30-44, 46-53, 55-61, 63-73, and 75-82

These claims are ultimately dependent upon one of the independent claims, which have been shown above to be allowable. While the applicant believes that other arguments are available to highlight the allowable subject matter presented in various ones of these dependent claims, the applicant also believes that the comments set forth herein regarding allowability of the independent claims are sufficiently compelling to warrant present exclusion of such additional points for the sake of brevity and expedited consideration.

Conclusion

There being no other objections to or rejections of the claims, the Applicants respectfully submit that claims 1-82 are allowable over the references of record and may be passed to allowance.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Dated: September 8, 2010

Steven G. Parmelee
Registration No. 28,790

120 South LaSalle Street, Suite 1600
Chicago, Illinois 60603-3406
Telephone (312) 577-7000
Facsimile (312) 577-7007

Electronic Acknowledgement Receipt

EFS ID:	8377035
Application Number:	11416865
International Application Number:	
Confirmation Number:	8530
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Customer Number:	22242
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	9147/96635 (06-0011)
Receipt Date:	08-SEP-2010
Filing Date:	02-MAY-2006
Time Stamp:	16:48:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	96635_Response_to_NonCompliant_Amendment_1.PDF	33733 b315554d929f2c0b71aa6a7508705c95891a00c0	no	1

Warnings:

Information:

2		96635_First_Substitute_Amendment_and_Response_1.PDF	967926 2b400a52a0c329a96e4fc36071fda1e6d062213b	yes	23

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment Submitted/Entered with Filing of CPA/RCE	1	1
	Claims	2	16
	Applicant Arguments/Remarks Made in an Amendment	17	23

Warnings:

Information:

Total Files Size (in bytes):	1001659

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. 11/416,865	***Confirmation No. 8530***
Filed: May 2, 2006	
Applicants: Chandrika K. Worrall	
Title: **NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM**	This |Response to Non-Compliant Amendment was electronically filed on September 8, 2010 using EFS-Web.
Art Unit: 2617	
Examiner: Aung T. Win	
Attorney Docket: 9147/96635 (06-0011) (SB6B4003US00)	
Customer No.: 22242	

Mail Stop AMENDMENT
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

RESPONSE TO NON-COMPLIANT AMENDMENT

Sir:

In response to the Notice of Non-Compliant Amendment mailed September 7, 2010, which noted that the Amendment was unsigned, attached is the First Substitute Amendment and Response appropriately signed in regards to the above-captioned matter.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Dated: September 8, 2010

Steven G. Parmelee
Registration No. 28,790

120 South LaSalle Street, Suite 1600
Chicago, Illinois 60603-3406
Telephone (312) 577-7000
Facsimile (312) 577-7007

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	
11/416,865	05/02/2006	☒ To be Mailed

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 09/08/2010	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 82	Minus	** 82	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 6	Minus	***6	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/NICHELE PETERSON/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
U.S. Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

22242 e 09/07/2010

FITCH EVEN TABIN & FLANNERY
120 SOUTH LASALLE STREET
SUITE 1600
CHICAGO, IL 60603-3406

Paper No.

Application No.:	**11/416,865**	**Date Mailed:**	**09/07/2010**
First Named Inventor:	Worrall, Chandrika, K.	Examiner:	WIN, AUNG T
Attorney Docket No.:	9147/96635 (06-0011)	Art Unit:	2617
Confirmation No.:	8530	Filing Date:	05/02/2006

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

Commissioner for Patents

PTO-90c (Rev.08-06)

Notice of Non-Compliant Amendment (37 CFR 1.121)	Application No. 11/416,865	Applicant(s) WORRALL, CHANDRIKA K.	
		Art Unit 2600	

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

The amendment document filed on *02 September, 2010* is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121 or 1.4. In order for the amendment document to be compliant, correction of the following item(s) is required.

THE FOLLOWING MARKED (X) ITEM(S) CAUSE THE AMENDMENT DOCUMENT TO BE NON-COMPLIANT:

☐ 1. Amendments to the specification:
- ☐ A. Amended paragraph(s) do not include markings.
- ☐ B. New paragraph(s) should not be underlined.
- ☐ C. Other _____.

☐ 2. Abstract:
- ☐ A. Not presented on a separate sheet. 37 CFR 1.72.
- ☐ B. Other _____.

☐ 3. Amendments to the drawings:
- ☐ A. The drawings are not properly identified in the top margin as "Replacement Sheet," "New Sheet," or "Annotated Sheet" as required by 37 CFR 1.121(d).
- ☐ B. The practice of submitting proposed drawing correction has been eliminated. Replacement drawings showing amended figures, without markings, in compliance with 37 CFR 1.84 are required.
- ☐ C. Other _____.

☐ 4. Amendments to the claims:
- ☐ A. A complete listing of all of the claims is not present.
- ☐ B. The listing of claims does not include the text of all pending claims (including withdrawn claims)
- ☐ C. Each claim has not been provided with the proper status identifier, and as such, the individual status of each claim cannot be identified. Note: the status of every claim must be indicated after its claim number by using one of the following status identifiers: (Original), (Currently amended), (Canceled), (Previously presented), (New), (Not entered), (Withdrawn) and (Withdrawn-currently amended).
- ☐ D. The claims of this amendment paper have not been presented in ascending numerical order.
- ☐ E. Other: _____.

☒ 5. Other (e.g., the amendment is unsigned or not signed in accordance with 37 CFR 1.4): For further explanation of the amendment format required by 37 CFR 1.121, see MPEP § 714.

TIME PERIODS FOR FILING A REPLY TO THIS NOTICE:

1. Applicant is given **no new time period** if the non-compliant amendment is an after-final amendment or an amendment filed after allowance, or a drawing submission (only) If applicant wishes to resubmit the non-compliant after-final amendment with corrections, the **entire corrected amendment** must be resubmitted.

2. Applicant is given **one month**, or thirty (30) days, whichever is longer, from the mail date of this notice to supply the correction, if the non-compliant amendment is one of the following: a preliminary amendment, a non-final amendment (including a submission for a request for continued examination (RCE) under 37 CFR 1.114), a supplemental amendment filed within a suspension period under 37 CFR 1.103(a) or (c), and an amendment filed in response to a Quayle action. If any of above boxes 1 to 4 are checked, the correction required is only the corrected section of the non-compliant amendment in compliance with 37 CFR 1.121.

   Extensions of time are available under 37 CFR 1.136(a) only if the non-compliant amendment is a non-final amendment or an amendment filed in response to a *Quayle* action.
   Failure to timely respond to this notice will result in:
   Abandonment of the application if the non-compliant amendment is a non-final amendment or an amendment filed in response to a *Quayle* action; or
   Non-entry of the amendment if the non-compliant amendment is a preliminary amendment or supplemental amendment.

Legal Instruments Examiner (LIE), if applicable /NICHELE PETERSON/ Telephone No: (571)272-7273

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	
11/416,865	05/02/2006	☒ To be Mailed

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 09/02/2010

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 82	Minus	** 82	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 6	Minus	***6	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/NICHELE PETERSON/

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	11416865	Filing Date	2006-05-02	Docket Number (if applicable)	9147/96635 (06-011)	Art Unit	2617
First Named Inventor	Chandrika K. Worrall			Examiner Name	Aung T. Win		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to
Deposit Account No 061135

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
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Signature	/Steven G. Parmelee/	Date (YYYY-MM-DD)	2010-09-02
Name	Steven G. Parmelee	Registration Number	28790

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. 11/416,865	)	***Confirmation No. 8530***
Filed: May 2, 2006	)	
Applicants: Chandrika K. Worrall	)	
Title: **NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM**	)	This Amendment And Response was electronically filed on September 2, 2010 using EFS-Web.
Art Unit: 2617	)	
Examiner: Aung T. Win	)	
Attorney Docket: 9147/96635 (06-0011) (SB6B4003US00)	)	
Customer No.: 22242	)	

Mail Stop AMENDMENT
Commissioner for Patents
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Alexandria, Virginia 22313-1450

AMENDMENT AND RESPONSE

Sir:

Applicants hereby petition under 37 CFR § 1.136(a) for a three-month extension of time in the above-captioned application, up to and including September 7, 2010, to make this reply timely.

In response to the Office Action mailed March 4, 2010 as entered in the above-captioned matter, the due date for response being Tuesday, September 7, 2010, the first business day after Saturday, September 4, 2010, Applicants respectfully submit a Request For Continued Examination and the following amendment and response.

Amendments to the Specification beginning on page 2 of this paper;

Amendments to the Claims reflected in the listing of claims beginning on page 2 of this paper; and

Remarks beginning on page 17 of this paper.

AMENDMENTS TO THE CLAIMS

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

Listing of Claims:

1. (Currently amended) A base station for establishing a network-initiated connection with a user equipment over a radio interface in a cellular communication system, the base station comprising:

logic for receiving a paging message comprising a unique identifier of the user equipment;

logic for sending the paging message ~~and~~ together with a temporary identifier to at least one cell, the temporary identifier being different from the unique identifier;

logic for receiving a paging acknowledgement from the user equipment (UE) within the at least one cell; and

logic for establishing a shared channel connection between the base station and the UE in response to the paging acknowledgement, wherein the temporary identifier identifies the UE on the shared channel.

2. (Previously presented) The base station of claim 1, wherein the logic for receiving the paging message is configured to receive the paging message from a core network.

3. (Original) The base station of claim 1, comprising logic for assigning to the UE a temporary identifier from the base station to which it was last registered in response to the UE being in a dormant state.

4. (Previously presented) The base station of claim 1, wherein the logic for sending is configured to send at least one channel index to at least one shared control channel (SCCH) along with the paging message, the SCCH for communicating control information for the UE during shared channel operation.

5. (Original) The base station of claim 1, comprising logic for signaling to the UE an indication of dedicated access resources to be used by the UE for paging acknowledgement.

6. (Original) The base station of claim 5, wherein the dedicated access resources include a dedicated physical channel.

7. (Original) The base station of claim 5, wherein the dedicated access resources include a dedicated signal sequence to be used on a contention-based channel.

8. (Currently amended) The base station of claim 1, wherein the logic for receiving the paging acknowledgement is configured to ~~for~~ receive the paging acknowledgement over a contention-based uplink channel.

9. (Original) The base station of claim 2, further comprising logic for sending the paging acknowledgment to the core network to establish shared channel communications between the UE and the core network.

10. (Currently amended) The base station of claim 1, wherein the logic for sending is configured to send the paging message <u>and the temporary identifier</u> using a broadcast channel.

11. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific, the base station further comprising logic for selecting the temporary identifier at the base station.

12. (Original) The base station of claim 11, further comprising logic for selecting the SCCH at the base station.

13. (Original) The base station of claim 1, wherein the logic for receiving the paging acknowledgement comprises logic for synchronizing communication with the UE based upon an uplink synchronization request from the UE.

14. (Original) The base station of claim 13, wherein the uplink synchronization request is part of a paging acknowledgement message.

15. (Original) The base station of claim 2, wherein the temporary identifier is cell-specific, the base station further comprising logic for receiving the temporary identifier from the core network.

16. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific, the base station further comprising logic for receiving the temporary identifier from a resource manager outside the core network.

17. (Currently amended) The base station of claim 15, the base station further comprising logic for receiving the channel index ~~is selected~~ from the core network.

18. (Original) The base station of claim 16, the base station further comprising logic for receiving the channel index from the resource manager.

19. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific.

20. (Original) The base station of claim 2, wherein the temporary identifier is common to a plurality of cells within a registration area, the base station further comprising logic for receiving the temporary identifier from the core network.

21. (Original) The base station of claim 1, wherein the temporary identifier is common to a plurality of cells within a registration area, the base station further comprising logic for receiving the temporary identifier from a resource manager.

22. (Original) The base station of claim 4, wherein the temporary identifier and the SCCH are cell-specific.

23. (Original) The base station of claim 1, wherein the logic for sending comprises logic for:

sending at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

sending the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

24. (Original) The base station of claim 23, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

25. (Original) The base station of claim 23, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

26. (Original) The base station of claim 25, further comprising logic for sending in the SCCH a group identifier identifying a group of UEs to which paging messages are directed.

27. (Original) The base station of claim 23, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

28. (Original) The base station of claim 27, further comprising logic for:

sending in the SCCH a group identifier identifying a group of UEs to which at least one paging message is directed; and

sending in the SCCH an indication of resources allocated to the group of UEs for receiving paging messages in the shared channel.

29. (Currently amended) A method for establishing a network-initiated connection between a user equipment and a base station over a radio interface in a cellular communication system, the method comprising, at a base station:

receiving a paging message <u>comprising a unique identifier of the user equipment</u>;

sending the paging message ~~and~~ <u>together with</u> a temporary identifier to at least one cell<u>, the temporary identifier being different from the unique identifier</u>;

receiving a paging acknowledgement from the user equipment (UE) within the at least one cell; and

in response to the paging acknowledgement, establishing a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

30. (Original) The method of claim 29, wherein receiving the paging message comprises receiving the paging message from a core network.

31. (Original) The method of claim 29, wherein, in response to the UE being in a dormant state, the UE is assigned the same temporary identifier it had been assigned from the base station to which it was last registered.

32. (Original) The method of claim 29, wherein sending further comprises sending at least one channel index to at least one shared control channel (SCCH) along with the paging message, the SCCH for communicating control information for the UE during shared channel operation.

33. (Original) The method of claim 29, wherein sending the paging message comprises signaling to the UE an indication of dedicated access resources to be used by the UE for paging acknowledgement.

34. (Original) The method of claim 30, further comprising sending the paging acknowledgment to the core network to establish shared channel communications between the UE and the core network.

35. (Original) The method of claim 29, wherein the temporary identifier is cell-specific, the method further comprising selecting the temporary identifier at the base station.

36. (Original) The method of claim 35, further comprising selecting the SCCH at the base station.

37. (Original) The method of claim 29, further comprising synchronizing communications between the base station and the UE based upon an uplink synchronization request from the UE.

38. (Original) The method of claim 30, wherein the temporary identifier is cell-specific, and the temporary identifier is selected by the core network that sent the paging message.

39. (Original) The method of claim 30, wherein the temporary identifier is common to a plurality of cells within a registration area, and is selected by the core network.

40. (Original) The method of claim 29, wherein sending the paging message comprises:

sending at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

sending the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

41. (Original) The method of claim 40, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

42. (Original) The method of claim 40, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

43. (Original) The method of claim 42, further comprising sending in the SCCH a group identifier identifying a group of UEs to which paging messages are directed.

44. (Original) The method of claim 40, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

45. (Currently amended) A resource manager for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the resource manager comprising:

logic for selecting a temporary identifier for the UE; and

logic for providing the temporary identifier to the base station for transmission by the base station to the UE along with a paging message, <u>the paging message comprising a unique identifier of the UE that is different from the temporary identifier,</u> the temporary identifier for identifying the UE during shared channel operation between the UE and the base station.

46. (Original) The resource manager of claim 45, wherein the paging message is provided to the base station by a core network.

47. (Original) The resource manager of claim 45, wherein the resource manager is a radio resource manager outside a core network that provides the paging message to the base station.

48. (Currently amended) The resource manager of claim 45, further comprising logic for:

sending a paging message to at least one base station within a registration area, wherein the paging message includes ~~a UE~~ the unique identifier;

receiving a paging acknowledgement from a UE associated with the ~~UE~~ unique identifier via a first base station to establish a shared channel connection between the first base station and the UE.

49. (Original) The resource manager of claim 48, wherein the resource manager is part of the core network that provides the paging message to the base station.

50. (Original) The resource manager of claim 49, wherein the resource manager is an access gateway.

51. (Original) The resource manager of claim 45, further comprising logic for:

selecting a channel index to a shared control channel (SCCH); and

providing the channel index to the base station for transmission by the base station to the UE along with the paging message and the temporary identifier, the SCCH for communicating control information including the temporary identifier between the UE and the base station during shared channel operation.

52. (Original) The resource manager of claim 51, wherein the temporary identifier and the SCCH are cell-specific.

53. (Original) The resource manager of claim 51, wherein the temporary identifier and the SCCH are common to a plurality of cells within a registration area of the core network.

54. (Currently amended) A method for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the method comprising, at a resource manager:

selecting a temporary identifier for the UE; and

providing the temporary identifier to the base station for transmission by the base station to the UE along with a paging message, <u>the paging message comprising a unique identifier of the UE that is different from the temporary identifier,</u> the temporary identifier for identifying the UE during shared channel operation between the UE and the base station.

55. (Original) The method of claim 54, wherein the paging message is provided to the base station by a core network.

56. (Original) The method of claim 54, wherein the resource manager is a radio resource manager outside a core network that provides the paging message to the base station.

57. (Currently amended) The method of claim 54, further comprising:

sending a paging message to at least one base station within a registration area, wherein the paging message includes ~~a UE~~ the unique identifier; and

receiving a paging acknowledgement from a UE associated with the ~~UE~~ unique identifier via a first base station to establish a shared channel connection between the first base station and the UE.

58. (Original) The method of claim 57, wherein the resource manager is part of the core network that provides the paging message to the base station.

59. (Original) The method of claim 54, further comprising, at the resource manager:

selecting a channel index to a shared control channel (SCCH); and

providing the channel index to the base station for transmission by the base station to the UE along with the paging message and the temporary identifier, the SCCH for communicating control information including the temporary identifier between the UE and the base station during shared channel operation.

60. (Original) The method of claim 59, wherein the temporary identifier and the SCCH are cell-specific.

61. (Original) The method of claim 59, wherein the temporary identifier and the SCCH are common to a plurality of cells within a registration area of the core network.

62. (Currently amended) A user equipment (UE) for establishing a network-initiated connection with a base station over a radio interface in a cellular communication system, the UE comprising:

logic for receiving from the base station a paging message ~~and~~ together with a temporary identifier, the paging message comprising a unique identifier of the UE, the temporary identifier being different from the unique identifier ; and

logic for sending a paging acknowledgement to the base station to establish a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

63. (Original) The UE of claim 62, further comprising logic for communicating control information during shared channel operation using a channel index to at least one shared control channel (SCCH) received along with the paging message from the base station.

64. (Previously presented) The UE of claim 62, wherein the logic for receiving is configured to receive an indication of dedicated access resources from the base station, the UE further comprising logic for employing the dedicated access resources for paging acknowledgement.

65. (Original) The UE of claim 62, wherein the temporary identifier is cell-specific.

66. (Previously presented) The UE of claim 62, wherein the logic for sending the paging acknowledgement is configured to send an uplink synchronization request to the base station.

67. (Original) The UE of claim 66, wherein the uplink synchronization request is part of a paging acknowledgement message.

68. (Previously presented) The UE of claim 62, wherein the logic for receiving is configured to:

receive at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

receive the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

69. (Original) The UE of claim 68, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

70. (Original) The UE of claim 68, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

71. (Original) The UE of claim 70, further comprising logic for receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs.

72. (Original) The UE of claim 68, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

73. (Original) The UE of claim 72, further comprising logic for:

receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs; and

receiving in the SCCH an indication of resources allocated to the group of UEs to which the UE belongs for receiving paging messages in the shared channel.

74. (Currently amended) A method for establishing a network-initiated connection with a base station over a radio interface in a cellular communication system, the ~~UE~~ method comprising, at a UE:

receiving from the base station a paging message ~~and~~ together with a temporary identifier, the paging message comprising a unique identifier of the UE, the temporary identifier being different from the unique identifier; and

sending a paging acknowledgement to the base station to establish a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

75. (Original) The method of claim 74, comprising communicating control information during shared channel operation using a channel index to at least one shared control channel (SCCH) received along with the paging message from the base station.

76. (Original) The method of claim 74, wherein receiving comprises receiving an indication of dedicated access resources from the base station, the method further comprising employing the dedicated access resources for paging acknowledgement.

77. (Original) The method of claim 74, further comprising sending an uplink synchronization request to the base station.

78. (Original) The method of claim 74, wherein receiving comprises:

receiving at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

receiving the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

79. (Original) The method of claim 78, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

80. (Original) The method of claim 78, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

81. (Original) The method of claim 80, further comprising logic for receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs.

82. (Original) The method of claim 78, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

REMARKS

In the Office Communication mailed March 4, 2010, as entered in the above-captioned matter, claims 1, 29, 62, 74, 2, 30, 3, 31 9, 34, 10, 4, 32, 63, 75, 5, 6, 33,64,76,13,14, 66, 67, and 77 were rejected under 35 U.S.C. 103(a) as being obvious over a first 3GPP publication (3GPP **TR** 25.931 V3.7.0 (2002-06)) ("first 3GPP publication") in view of Sinnarajah et al. (US20040008679A1) ("Sinnarajah").

Claims 7 and 8 were rejected under 35 U.S.C. 103(a) as being obvious over the first 3GPP publication in view of Sinnarajah and further in view of a second 3GPP publication (3GPP TS 25.303 V3.12.0 (2002-06)) ("second 3GPP publication").

Claims 23-28, 40-48, 68-73, and 78-82 were rejected under 35 U.S.C. 103(a) as being obvious over the first 3GPP publication in view of Sinnarajah and further in view of prior art admitted in the background section of our disclosure.

Claims 45, 54, 46, 55, 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, 12, 17, 18 and 36 were rejected under 35 U.S.C. 103(a) as being unpatentable over the first 3GPP publication in view of Lee et al. (US20050041610A1) ("Lee").

Claims 48-53 and 57-61 were rejected under 35 U.S.C. 103(a) as being unpatentable over the first 3GPP publication in view of Lee and further in view of Sinnarajah.

We respectfully traverse these rejections and request reconsideration.

Rejections under 35 U.S.C. §103

Claims 1, 29, 62, 74, 2, 30, 3, 31 9, 34, 10, 4, 32, 63, 75, 5, 6, 33,64,76,13,14, 66, 67, and 77 were rejected under 35 U.S.C. 103(a) as being obvious over the first 3GPP publication in view of Sinnarajah.

Independent claim 1

We have clarified Independent claim 1 by this amendment. The amended wording in claim 1 is contained in the following three lines of claim 1:

> ”logic for receiving a paging message comprising a unique identifier of the user equipment;
>
> logic for sending the paging message together with a temporary identifier to at least one cell, the temporary identifier being different from the unique identifier;”[1]

These changes clarify that the base station sends, together, a unique identifier within a paging message *and* a temporary identifier, the temporary identifier being different from the unique identifier. These features are then usefully considered together with the following feature in the final lines of claim 1:

> ”the temporary identifier identifies the UE on the shared channel.”

These features in the aggregate describe a system that is very different from the arrangements described in the cited prior art.

The Sinnarajah reference

Sinnarajah teaches the setting up of a multicast[2] communication service.

The multicast transmission of Sinnarajah differs fundamentally from the present claims. Paragraph 0063 of Sinnerajah states that the network may broadcast a Temporary Mobile Station Identifier (TMSI) or an International Mobile Station Identifier (IMSI) when trying to locate a particular mobile station for a multicast transmission. Sinnerajah makes

1 Emphasis supplied.
2 *See* the expression “multicast content” in line 7 of 0091 of Sinnarajah.

no mention, however, of including a temporary identifier broadcast along with such an identifier.

Furthermore, paragraph 0116 of Sinnarajah shows that two communications from the base station need to be sent to each mobile station in order to assign a physical channel, on which the mobiles are to receive "multicast service." Looking at this in more detail, paragraph 0091 of Sinnarajah states that, after sending out a first communication:

> (i) "The access network waits for response from member subscriber stations ***before channel assignment.***" [Here the "member" is the member of a particular group.]
>
> (ii) "***[T]he response allows the access network to decide,*** whether to assign a shared channel or a dedicated channel for the multicast content."[3]

These portions of Sinnarajah make clear that, in Sinnarajah:

(i) A broadcast message is sent out in order to determine a level of interest amongst a known group of subscribers for a multicast call. This message does not contain *both* a unique identifier and a temporary identifier; and

(ii) The access network is only in a position to decide which kind of channel to use to broadcast the "multicast content" when it has waited sufficiently long for responses from the members of the group, so it cannot assign a channel to any mobile subscriber prior to this point in time.

In contrast to Sinnarajah, the base station of claim 1 has logic for sending a temporary identifier together with a paging message with a unique identifier. Accordingly a sought UE is in possession of a temporary identifier much earlier than is the case with Sinnarajah. The mobile subscriber identifies itself on the shared channel using the temporary identifier, once the paging acknowledgment has been received.

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3 Emphasis supplied.

The first 3GPP publication

Point 1.1 on page 4 of the final rejection compares the first 3GPP publication with former Claim 1, citing page 19 and figures 5 and 6 of the first 3GPP publication.

However, the first 3GPP publication describes a system that functions in accordance with the comments made about prior art systems in the "Description of the Related Art" section of the present application. In those regards, paragraph 0012 of our application points out that, in conventional systems:

> "...the connection establishment and cell update response to a paging message ***(network-initiated connection) follow the same procedures as when the connection establishment/ cell update is performed in response to a 'terminal initiated connection'***. In the latter case, the establishment cause is not known to the network until a connection request message is received by the mobile terminal. Therefore, the network can manage the connection setup ***only after receiving the initial connection request*** from the mobile terminal."[4]

Notably, the first 3GPP publication document states, in the sixth and seventh lines below its figure 5, that: "The UE detects page message from RNC1 (as example) and the procedure for NAS signalling connection establishment follows." It is clear that the NAS connection establishment procedure is *the same* in the first 3GPP publication, whether it is part of a connection set-up procedure *initiated by the UE*, or is part of a *network initiated* connection set-up procedure. See the first three lines on page 20, and figure 7, of the first 3GPP publication, where the same NAS signaling connection set-up procedure is shown whether it is for establishment requested "*by the terminal*" or "*stimulated by a paging from the CN* [core network]."

4 Emphasis supplied.

Point 1.1 on page 4 of the Office Action states that the first 3GPP publication has "logic for sending the paging message and a temporary UE identifier to at least one cell," and quotes Figures 5 and 6 and page 19 of the first 3GPP publication.

However, point 1 immediately below figure 5 on page 19 of the first 3GPP publication simply lists parameters that may be sent *from the CN* (Core Network) *to the RNC*. Amongst these parameters is a "*Temporary UE Identity*." The text under point 1, in the first three lines under figure 5, commences with the words "*CN initiates the paging…*" and refers to the two arrows at the upper right of figure 5 that are labeled "1 Paging." However, while points 2 and 3 under figure 5 on page 19 of the first 3GPP publication describe the paging, there is no mention here that the "Temporary UE Identity" is sent *together with* a unique identifier of the UE in the paging step as in amended Claim 1.

For the reasons given above, it is clear that both the Sinnarajah reference and the first 3GPP publication function very differently to the arrangement of amended Claim 1. Even if it were obvious to combine the teachings of these two prior art references, they would not result in a base station with the features of Claim 1.

Independent claims 29, 62 and 74

Independent claims 29, 62, and 74 were rejected on similar grounds to those used to reject claim 1. See point 1 on page 4 of the Office Action. Amended claims 29, 62, and 74 have been clarified in a similar manner to amended claim 1. Accordingly, we respectfully submit that the same points put forth above in favor of claim 1 are applicable to claims 29, 62 and 74.

Independent claims 45 and 54

Amended independent claims 45 and 54 include similar clarifications to those discussed above for claims 1, 29, 62, and 74.

In point 4 on page 10 of the Office Action, former claims 45 and 54 were rejected in view of a combination of the first 3GPP publication and Lee. Pages 74 and 75, and figure 45A of the first 3GPP publication were cited. Paragraphs 0022 and 0084 of Lee were cited.

Amended claims 45 and 54 are distinguished over pages 74 and 75, and figure 45A of the first 3GPP publication for the same reasons as given above for amended claim 1. Pages 74 and 75, and figure 45A of the first 3GPP publication do not disclose the features identified above as being the differences between the apparatus of claim 1 and the teaching of pages 19 and 20, and figures 5 and 6, of the first 3GPP publication.

Paragraph 0022 of Lee makes clear that the "UE ID" is one of an IMSI or a TMSI. There is no suggestion to provide a unique identifier along *with* a temporary identifier. Para 0084 makes clear that there is an RNC that may issue a temporary identifier. However, there is no suggestion to provide a unique identifier along with a temporary identifier. Paragraphs 0022 and 0084 of Lee do not disclose features that, either alone or together with the teaching of the first 3GPP publication, would render claims 45 or 54 obvious.

Dependent claims 2-28, 30-44, 46-53, 55-61, 63-73, and 75-82

These claims are ultimately dependent upon one of the independent claims, which have been shown above to be allowable. While the applicant believes that other arguments are available to highlight the allowable subject matter presented in various ones of these dependent claims, the applicant also believes that the comments set forth herein regarding allowability of the independent claims are sufficiently compelling to warrant present exclusion of such additional points for the sake of brevity and expedited consideration.

Conclusion

There being no other objections to or rejections of the claims, the Applicants respectfully submit that claims 1-82 are allowable over the references of record and may be passed to allowance.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Dated: September 2, 2010

Steven G. Parmelee
Registration No. 28,790

120 South LaSalle Street, Suite 1600
Chicago, Illinois 60603-3406
Telephone (312) 577-7000
Facsimile (312) 577-7007

Electronic Patent Application Fee Transmittal

Application Number:	11416865
Filing Date:	02-May-2006
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Filer:	Steven Glen Parmelee/Helen Donegan
Attorney Docket Number:	9147/96635 (06-0011)

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
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Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 3 months with $0 paid	1253	1	1110	1110

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
		Total in USD ($)		**1920**

Electronic Acknowledgement Receipt	
EFS ID:	8344368
Application Number:	11416865
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Confirmation Number:	8530
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Customer Number:	22242
Filer:	Steven Glen Parmelee/Helen Donegan
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Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	96635_RCE_Transmittal.pdf	697443 bad9077cc0cc17e0dc98ecf0819732ec9e858246	no	3
Warnings:					
Information:					
2		96635_AMENDMENT_AND_RESPONSE.pdf	166224 3c425856e2ba88d5047b68af360e69f85459b2ad	yes	23

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment Submitted/Entered with Filing of CPA/RCE	1	1
Claims	2	16
Amendment After Final	17	23

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	32549 d2cb60c2f1932673d33da8cd71408b2f0e8b460a	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	896216		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/416,865	05/02/2006	Chandrika K. Worrall	9010/96635 (06-0011)	8530

22242 7590 03/04/2010
FITCH EVEN TABIN & FLANNERY
120 SOUTH LASALLE STREET
SUITE 1600
CHICAGO, IL 60603-3406

EXAMINER
WIN, AUNG T

ART UNIT	PAPER NUMBER
2617	

MAIL DATE	DELIVERY MODE
03/04/2010	PAPER

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

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

Office Action Summary	Application No.	Applicant(s)	
	11/416,865	WORRALL, CHANDRIKA K.	
	Examiner	**Art Unit**	
	AUNG WIN	2617	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

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

Status

1)☒ Responsive to communication(s) filed on *23 November 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-82* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-82* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

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

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

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

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

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

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

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 11/23/2009 have been fully considered but they are not persuasive.

As regards that claims, Applicant argues that modified method and apparatus does not teach according to the claims because applied references alone or in combination do not teach the claimed invention according to the independent claims for the following reasons.

Claimed invention requires

(i) Base station amends or affixes temporary identifier to received paging message;

(ii) Claimed temporary identifier is for example, c-RNTI;

(ii) The claimed invention does not require two messaging sequences for UE shared channel assignment as stated in applicant's remarks. Examiner respectfully disagrees.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., claimed invention (i) (ii) & (iii) as stated above) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). During patent examination, the claims are given the broadest reasonable interpretation consistent with the specification. See In re Morris,

127 F.3d 1048, 44 USPQ2d 1023 (Fed. Cir. 1997). See MPEP § 2111 - § 2116.01 for case law pertinent to claim analysis. Therefore, applicant's arguments are not persuasive.

As regards to the claims, Applicant also argues that applied references alone or in combination do not teach the claimed limitation “the temporary identifier identifies the UE on the shared channel”, because Sinnarajah et al. does not teach the temporary identifier that identifies the UE on the assigned shared channel. Examiner disagrees. Sinnarajah et al. teaches that access network waits for response from subscribers before shared channel assignment in order to determine whether subscribers are interested in communications and the response allows the access network to determine whether to assigne a shared channel for the multicast content [0091]. Sinnarajah et al. also teaches that temporary mobile station identifier (TMSI) is used for individually addressing a subscriber [0063]. Therefore, it would have been obvious to one of ordinary skilled in the art that temporary identifier address can be used to identify the UE on the shared channel as claimed. Therefore, applicant’s arguments are not persuasive. It would have been obvious to one of ordinary skilled in the art the identifier that uniquely identifying each serving UE must be used in order to provide any type of communications service over any type of assigned channel.

Claim Rejections - 35 USC § 103

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

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

1. Claims 1, 29, 62, 74, 2, 30, 3, 31, 9, 34, 10, 4, 32, 63, 75, 5, 6, 33, 64, 76, 13, 14, 66, 67 & 77 are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications 3GPP TR 25.931 V3.7.0 (2002-06) herein after 3GPP publication in view of Sinnarajah et al. (US20040008679A1).

1.1 Regarding Claim 1, 3GPP publication discloses a base station for establishing a network-initiated connection with a user equipment over a radio interface in a cellular communication system, the base station comprising: logic for receiving a paging message [(Paging message from CN to base station): Figures 5 & 6, page 19]; logic for sending the paging message and a temporary UE identifier to at least one cell [(sending Type 1 or Type II message comprising temporary identifier from base station to UE): Figure 5 & 6, page 19]. 3GPP publication disclose general signaling procedure in UTRAN so does not explicitly disclose establishing a shared channel connection between the base station and the UE in response to paging acknowledgement from the user equipment (UE) as claimed but such claimed feature is expected to be implemented in the UTRAN, as disclosed in 3GPP publication. Sinnarajah discloses

base station comprising logic for receiving a paging acknowledgement from the user equipment (UE) within the cell; and logic for establishing a shared channel connection between the base station and the UE in response to the paging acknowledgement, wherein the temporary identifier identifies the UE on the shared channel [(establishing shared channel in response to paging response: 0090 & 0091) (based on temporary identifier: 0063)].

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to modify paging method and system of 3GPP publication as taught by Sinnarajah to establish shared channel communications in response to paging response and based on temporary UE identifier as disclosed in 3GPP publication to identify the UE on the shared channel. One of ordinary skilled in the art at the time of invention of made would have been motivated to do this for improved and effective communication service and system. It should be noted that paging users and assigning channels based on user paging response is well known to one of ordinary skilled in the art at the time invention of made.

1.2 Claim 29 is a method claim executed at a base station substantially close to base station of claim 1. Therefore, it would have been obvious to one of ordinary skilled in the art that the modified base station as stated above would teach the claim 29 method.

1.3 Claim 62 differs substantively from Claim 1 in that the former recites User Equipment claim for establishing a network-initiated connection between base station

and UE, rather than base station for establishing the same network-initiated connection between base station and UE. Therefore, UE as modified above in claim 1 would teach UE of claim 62.

1.4 Claim 74 is a method claim executed at UE substantially close to UE of claim 62. Therefore, it would have been obvious to one of ordinary skilled in the art that the modified UE as stated above would teach the claim 74 method.

1.5 As regards to claims 2 & 30 modified method and system teaches claim 1 & 29, wherein the logic for receiving the paging message receives the paging message from a core network [3GPP publication: page 19].

1.6 As regards to claims 9 & 34, it would have been obvious to one of ordinary skilled in the art that the modified method and network as stated above in claim 1 rejection would teach the base station of claim 2, further comprising logic for sending the paging acknowledgment to the core network to establish shared channel communications between the UE and the core network [see claim 1 rejection in view of Sinnarajah et al.]

1.7 As regards to claim 10, it would have been obvious to one of ordinary skilled in the art that the modified method and network as stated above in claim 1 rejection would teach the base station of claim 10, wherein the logic for sending is operable to send the

paging message using a broadcast channel because Sinnarajah teaches broadcast paging message [Sinnarajah: 0068].

1.8 As regards to claims 3 & 31, it would have been obvious to one of ordinary skilled in the art that the modified method and network supports dormant state therefore, it would teach the claims 1 & 29, comprising logic for assigning to the UE a temporary identifier from the base station to which it was last registered in response to the UE being in a dormant state as claimed since in dormant state, connection can be reactivated with connection information maintained at the base station without establishing the connection set up with core network again.

1.9 As regards to claims 4, 32, 63 & 75, 3GPP publication 3GPP publication discloses according to claims 1, 29, 62, 74 and also teaches base station is provided with temporary identifier and establishing shared channel communications between base station and UE via shared channel in response to paging message [see claim 1 rejections], but silent on provideing channel index to the base station as claimed. Sinnarajah teaches that base station can also be provided with channel assignment information as part of paging message [0098, 0099 & 0104]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to modify the system and method as disclosed in 3GPP publication to provide shared channel assignment information as taught by Sinnarajah to implement the method and system according to claims 4, 32, 63 & 75. One of ordinary skilled in the art at the time

of invention of made would have been motivated to do this to for efficient resource utilization.

1.10 As regards to claims 5, 6, 33, 64 & 76, it would have been obvious to one of ordinary skilled in the art at that modified method and system teaches according to claims 1, 29, 62, 74, further comprising logic for signaling to the UE an indication of dedicated access resources to be used by the UE for paging acknowledgement according to claims 5, 33, 64 & 76 because Sinnarajah teaches that UE can transmit information either on shared channel or dedicated channel [90 & 91]. Assigning dedicated resources for paging acknowledgement instead of using shared channel resources would have been obvious matter of design choice and does not constitute patentably distinctions from prior art channel allocation method for acknowledgement message transmission methods and system.

1.11 As regards to claims 13, 14, 66, 67 & 77, it would have been obvious to one of ordinary skilled in the art that modified method and system teaches according to claims 13, 14 because 3GPP publications teaches uplink synchronization communications as claimed [3GPP publication: page 14, 21, 23, 29, 30, 31, 32, 44 & 77]

2. Claims 7 & 8, are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications [3GPP TR 25.931 V3.7.0 (2002-06)] in view of Sinnarajah et al.

(US20040008679A1), further in view of 3GPP publications [3GPP TS 25.303 V3.12.0 (2002-06)].

2.1 As regards to claims 7 & 8, modified method and system teach according to claim 1, but do not disclose contention based channel as claimed. 3GPP TS 25.303 teaches using a set of contention-based channels for communications transmission [contention-based channels: page 7]. Therefore it would have been obvious to one of ordinary skilled in the art at the time of invention of made to further modify to utilize contention based channels as taught by 3GPP TS 25.303 to modify according to claims 7 & 8. Utilizing contention based channels for transmissions would have been obvious matter of design choice and does not constitute patentably distinctions from prior art channel allocation and message transmission methods and system.

3. Claims 23-28, 40-48, 68-73 & 78-82 are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications [3GPP TR 25.931 V3.7.0 (2002-06)] in view of Sinnarajah et al. (US20040008679A1), over prior art admitted in the background section of the applicant disclosure.

3.1 Regarding Claims 23-28, 40-48, 68-73 & 78-82, modified method and system in view of Sinnarajah would teach group identifier for identifying group of UEs to which paging messages are directed and also assigning shared channels for communications, but does not explicitly teach second paging message to process according to the

claims. According to applicant disclosure, such feature is well known conventional paging procedures for efficiently allocating the communication resources [0009-0013]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to further modify the method and system according to conventional paging procedure as disclosed by applicant to implement according to claims. One of ordinary skilled in the art at the time of invention of made to do this to efficiently allocate resources to a group of UEs.

4. Claims 45, 54, 46, 55, 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, 12, 17, 18, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over 3GPP publications 3GPP TR 25.931 V3.7.0 (2002-06) herein after 3GPP publication in view of Lee et al. (US20050041610A1).

4.1 As regards to claims 45, 3GPP publication discloses Core network (CN: page 19) for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the Core network comprising: generating paging message with UE temporary identifier [page 19]; and providing the temporary identifier to the base station for transmission by the base station to the UE along with a paging message [page 19], the temporary identifier for identifying the UE during shared channel operation between the UE and the base station [(shared channel): page 74, page 75, Figure 45A]. Because Core network

generates paging message with temporary identifier, it would have been obvious to one of ordinary skilled in the art that UMTS system much be integrated with resource manager as claimed in order for core network to generate paging message according to the UMTS system as disclosed in 3GPP publication. Lee discloses core network comprising resource manager i.e., core network entity which allocate temporary identifier for IE as claimed [0022 or 0084]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to modify core network entity of the network as disclosed in 3GPP publication as taught by Lee to implement the resource manager as claimed. One of ordinary skilled in the art at the time of invention of made would have to motivated to do this to enable the UE identification by core network entity for efficient communications.

4.2 Claim 54 is a method claim rejected for the same reason as stated above in claim 45 rejection because claim 54 method is substantially close to the method executed by apparatus claim 45.

4.3 As regards to claims 46 & 55, 3GPP publication discloses the resource manager of claim 45 & 54, wherein the paging message is provided to the base station by a core network [3GPP publication: page 19].

4.4 As regards to 47 & 56, The resource manager of claim 45, wherein the resource manager is a radio resource manager outside a core network that provides the paging message to the base station. As regards to claims 47 & 56, it would have been obvious to one of ordinary skilled in the art at that modified method and system in view of Lee would teach according to claims 45 & 54 wherein paging message is provided to the base station as stated above except that claims recites that resource manager is outside a core network. Further modifying the method and system for implement resource manage remotely from core network according to claims would have been obvious matter of design choice since applicant has not disclose any particular purpose or advantages for having resource manager outside a core network rather than in the core network and it appears that the invention would perform equally well with regardless of where resource manager is located.

4.5 As regards to claims 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, it would have been obvious to one of ordinary skilled in the art at that modified method and system in view of Lee would teach according to claims 1, 29, 62 & 74 wherein the temporary identifier is cell-specific [allocated by current serving MSC] except that claims recites that temporary identifier is selected or allocated at different network nodes. Further modifying the method and system for Selecting temporary identifier at different network nodes according to claims would have been obvious matter of design choice since applicant has not disclose any particular purpose or advantages for selecting temporary identifier at one node rather than selecting at another network node and it appears that

the invention would perform equally well with selecting temporary identifier at different network nodes.

4.6 claims 12, 17, 18, 36 are also rejected for the same reason as stated above in claims 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65 rejections because modified method and system teaches using shared channels, SCCH as claimed.

5. Claims 48-53 & 57-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over 3GPP publications 3GPP TR 25.931 V3.7.0 (2002-06) herein after 3GPP publication in view of Lee et al. (US20050041610A1), further in view of Sinnarajah et al. (US20040008679A1).

5.1 Regarding Claims 48 & 57, the network as modified discloses the resource manager of claims 45 & 54, further comprising logic for: sending a paging message to at least one base station within a registration area, wherein the paging message includes a UE identifier and establishing a shared channel connection between the base station and UE as stated above in Claims 45 & 54 rejections (also see claim 1 rejection) but does not explicitly disclose establishing a shared channel connection between the base station and the UE in response to paging acknowledgement from the user equipment (UE) as claimed but such claimed feature is expected to be implemented in the UTRAN, as disclosed in 3GPP publication. Sinnarajah discloses base station comprising logic

for receiving a paging acknowledgement from the user equipment (UE) within the cell; and logic for establishing a shared channel connection between the base station and the UE in response to the paging acknowledgement, wherein the temporary identifier identifies the UE on the shared channel [(establishing shared channel in response to paging response: 0090 & 0091) (based on temporary identifier: 0063)].

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to further modify paging method and system as taught by Sinnarajah to establish shared channel communications in response to paging response and based on temporary UE identifier as disclosed in 3GPP publication to identify the UE on the shared channel. One of ordinary skilled in the art at the time of invention of made would have been motivated to do this for improved and effective communication service and system. It should be noted that shared/dedicated channel connection establishment in response to acknowledgment is well known to one of ordinary skilled in the art and it would have been a matter of design choice for operators for different communications service types.

5.2 As regards to claims 49 & 58, it would have been obvious to one of ordinary skilled in the art that modified method and network would teach the resource manager of claim 48, wherein the resource manager is part of the core network that provides the paging message to the base station [see claim 48 rejections stated above].

5.3 As regards to claims 50, it would have been obvious to one of ordinary skilled in the art that modified method and network would teach the resource manager of claim 49, wherein the resource manager is an access gateway i.e., MSC (0022 of Lee et al. reference).

5.4 As regards to claims 51 & 59, 3GPP publication 3GPP publication discloses the resource manager of claims 45 & 54 and also teaches base station is provided with temporary identifier and establishing shared channel communications between base station and UE via shared channel in response to paging message [see claim 45 and claim 1 rejections], but silent on resource manager provides channel index to the base station as claimed. Sinnarajah teaches that base station can also be provided with channel assignment information as part of paging message [0098, 0099 & 0104]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to modify the system and method as disclosed in 3GPP publication to provide shared channel assignment information as taught by Sinnarajah to implement the resource manager as claimed. One of ordinary skilled in the art at the time of invention of made would have been motivated to do this to for efficient resource utilization.

5.5 As regards to claims 52, 53, 60 & 61, it would have been obvious to one of ordinary skilled in the art at that modified method and system in view of Lee would teach

that the temporary identifier is cell-specific and SCCH are common to a plurality of cells within a registration area of the core network because current serving MSC of core network assign temporary identifier and SCCH [see rejections stated above].

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AUNG WIN whose telephone number is (571)272-7549. The examiner can normally be reached on Monday-thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on 571-272-7603. 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.

/AUNG WIN/
Examiner, Art Unit 2617
/Patrick N. Edouard/

Supervisory Patent Examiner, Art Unit 2617

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

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

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

CLAIM		DATE								
Final	Original	02/26/2010								
	1	✓								
	2	✓								
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	5	✓								
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

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

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

CLAIM		DATE								
Final	Original	02/26/2010								
	37	✓								
	38	✓								
	39	✓								
	40	✓								
	41	✓								
	42	✓								
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	68	✓								
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	70	✓								
	71	✓								
	72	✓								

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
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CLAIM		DATE								
Final	Original	02/26/2010								
	73	✓								
	74	✓								
	75	✓								
	76	✓								
	77	✓								
	78	✓								
	79	✓								
	80	✓								
	81	✓								
	82	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

SEARCHED			
Class	**Subclass**	**Date**	**Examiner**

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
responded to arguments.	2/26/2010	atw

INTERFERENCE SEARCH			
Class	**Subclass**	**Date**	**Examiner**

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/416,865	05/02/2006	Chandrika K. Worrall	

CONFIRMATION NO. 8530

POA ACCEPTANCE LETTER

22242
FITCH EVEN TABIN & FLANNERY
120 SOUTH LASALLE STREET
SUITE 1600
CHICAGO, IL 60603-3406

OC000000038976146

Date Mailed: 11/30/2009

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/19/2009.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/hsarwari/

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	11/416,865	***Confirmation No. 8530***
Filed:	May 2, 2006	
Applicants:	Chandrika K. Worrall	
Title:	**NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM**	This Amendment And Response was electronically filed on November 23, 2009 using EFS-Web.
Art Unit:	2617	
Examiner:	Aung T. Win	
Attorney Docket:	9010/96635 (06-0011)	
Customer No.:	22242	

Mail Stop AMENDMENT
Commissioner for Patents
P. O. Box 1450
Alexandria, Virginia 22313-1450

AMENDMENT AND RESPONSE

Sir:

Applicants hereby petition under 37 CFR § 1.136(a) for a two-month extension of time in the above-captioned application, up to and including November 23, 2009 to make this reply timely, the due date for response being Monday, November 23, 2009, the first business day after Saturday/Sunday, November 22, 2009.

In response to the Office Action mailed June 22, 2009, please amend the above-identified patent application as follows:

Amendments to the Claims being reflected in the listing of claims beginning on page 2 of this paper; and

Remarks beginning on page 15 of this paper.

AMENDMENTS TO THE CLAIMS

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

Listing of Claims:

1. (Original) A base station for establishing a network-initiated connection with a user equipment over a radio interface in a cellular communication system, the base station comprising:

logic for receiving a paging message;

logic for sending the paging message and a temporary identifier to at least one cell;

logic for receiving a paging acknowledgement from the user equipment (UE) within the at least one cell; and

logic for establishing a shared channel connection between the base station and the UE in response to the paging acknowledgement, wherein the temporary identifier identifies the UE on the shared channel.

2. (Currently amended) The base station of claim 1, wherein the logic for receiving the paging message is configured ~~operable~~ to receive the paging message from a core network.

3. (Original) The base station of claim 1, comprising logic for assigning to the UE a temporary identifier from the base station to which it was last registered in response to the UE being in a dormant state.

4. (Currently amended) The base station of claim 1, wherein the logic for sending is configured ~~operable~~ to send at least one channel index to at least one shared control channel (SCCH) along with the paging message, the SCCH for communicating control information for the UE during shared channel operation.

5. (Original) The base station of claim 1, comprising logic for signaling to the UE an indication of dedicated access resources to be used by the UE for paging acknowledgement.

6. (Original) The base station of claim 5, wherein the dedicated access resources include a dedicated physical channel.

7. (Original) The base station of claim 5, wherein the dedicated access resources include a dedicated signal sequence to be used on a contention-based channel.

8. (Currently amended) The base station of claim 1, wherein the logic for receiving the paging acknowledgement is configured ~~operable~~ to for receive the paging acknowledgement over a contention-based uplink channel.

9. (Original) The base station of claim 2, further comprising logic for sending the paging acknowledgment to the core network to establish shared channel communications between the UE and the core network.

10. (Currently amended) The base station of claim 1, wherein the logic for sending is configured ~~operable~~ to send the paging message using a broadcast channel.

11. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific, the base station further comprising logic for selecting the temporary identifier at the base station.

12. (Original) The base station of claim 11, further comprising logic for selecting the SCCH at the base station.

13. (Original) The base station of claim 1, wherein the logic for receiving the paging acknowledgement comprises logic for synchronizing communication with the UE based upon an uplink synchronization request from the UE.

14. (Original) The base station of claim 13, wherein the uplink synchronization request is part of a paging acknowledgement message.

15. (Original) The base station of claim 2, wherein the temporary identifier is cell-specific, the base station further comprising logic for receiving the temporary identifier from the core network.

16. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific, the base station further comprising logic for receiving the temporary identifier from a resource manager outside the core network.

17. (Original) The base station of claim 15, the base station further comprising logic for receiving the channel index is selected from the core network.

18. (Original) The base station of claim 16, the base station further comprising logic for receiving the channel index from the resource manager.

19. (Original) The base station of claim 1, wherein the temporary identifier is cell-specific.

20. (Original) The base station of claim 2, wherein the temporary identifier is common to a plurality of cells within a registration area, the base station further comprising logic for receiving the temporary identifier from the core network.

21. (Original) The base station of claim 1, wherein the temporary identifier is common to a plurality of cells within a registration area, the base station further comprising logic for receiving the temporary identifier from a resource manager.

22. (Original) The base station of claim 4, wherein the temporary identifier and the SCCH are cell-specific.

23. (Original) The base station of claim 1, wherein the logic for sending comprises logic for:

sending at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

sending the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

24. (Original) The base station of claim 23, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

25. (Original) The base station of claim 23, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

26. (Original) The base station of claim 25, further comprising logic for sending in the SCCH a group identifier identifying a group of UEs to which paging messages are directed.

27. (Original) The base station of claim 23, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

28. (Original) The base station of claim 27, further comprising logic for:

sending in the SCCH a group identifier identifying a group of UEs to which at least one paging message is directed; and

sending in the SCCH an indication of resources allocated to the group of UEs for receiving paging messages in the shared channel.

29. (Original) A method for establishing a network-initiated connection between a user equipment and a base station over a radio interface in a cellular communication system, the method comprising, at a base station:

receiving a paging message;

sending the paging message and a temporary identifier to at least one cell;

receiving a paging acknowledgement from the user equipment (UE) within the at least one cell; and

in response to the paging acknowledgement, establishing a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

30. (Original) The method of claim 29, wherein receiving the paging message comprises receiving the paging message from a core network.

31. (Original) The method of claim 29, wherein, in response to the UE being in a dormant state, the UE is assigned the same temporary identifier it had been assigned from the base station to which it was last registered.

32. (Original) The method of claim 29, wherein sending further comprises sending at least one channel index to at least one shared control channel (SCCH) along with the paging

message, the SCCH for communicating control information for the UE during shared channel operation.

33. (Original) The method of claim 29, wherein sending the paging message comprises signaling to the UE an indication of dedicated access resources to be used by the UE for paging acknowledgement.

34. (Original) The method of claim 30, further comprising sending the paging acknowledgment to the core network to establish shared channel communications between the UE and the core network.

35. (Original) The method of claim 29, wherein the temporary identifier is cell-specific, the method further comprising selecting the temporary identifier at the base station.

36. (Original) The method of claim 35, further comprising selecting the SCCH at the base station.

37. (Original) The method of claim 29, further comprising synchronizing communications between the base station and the UE based upon an uplink synchronization request from the UE.

38. (Original) The method of claim 30, wherein the temporary identifier is cell-specific, and the temporary identifier is selected by the core network that sent the paging message.

39. (Original) The method of claim 30, wherein the temporary identifier is common to a plurality of cells within a registration area, and is selected by the core network.

40. (Original) The method of claim 29, wherein sending the paging message comprises:

sending at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

sending the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

41. (Original) The method of claim 40, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

42. (Original) The method of claim 40, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

43. (Original) The method of claim 42, further comprising sending in the SCCH a group identifier identifying a group of UEs to which paging messages are directed.

44. (Original) The method of claim 40, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

45. (Original) A resource manager for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the resource manager comprising:

logic for selecting a temporary identifier for the UE; and

logic for providing the temporary identifier to the base station for transmission by the base station to the UE along with a paging message, the temporary identifier for identifying the UE during shared channel operation between the UE and the base station.

46. (Original) The resource manager of claim 45, wherein the paging message is provided to the base station by a core network.

47. (Original) The resource manager of claim 45, wherein the resource manager is a radio resource manager outside a core network that provides the paging message to the base station.

48. (Original) The resource manager of claim 45, further comprising logic for:

sending a paging message to at least one base station within a registration area, wherein the paging message includes a UE identifier;

receiving a paging acknowledgement from a UE associated with the UE identifier via a first base station to establish a shared channel connection between the first base station and the UE.

49. (Original) The resource manager of claim 48, wherein the resource manager is part of the core network that provides the paging message to the base station.

50. (Original) The resource manager of claim 49, wherein the resource manager is an access gateway.

51. (Original) The resource manager of claim 45, further comprising logic for:

selecting a channel index to a shared control channel (SCCH); and

providing the channel index to the base station for transmission by the base station to the UE along with the paging message and the temporary identifier, the SCCH for communicating control information including the temporary identifier between the UE and the base station during shared channel operation.

52. (Original) The resource manager of claim 51, wherein the temporary identifier and the SCCH are cell-specific.

53. (Original) The resource manager of claim 51, wherein the temporary identifier and the SCCH are common to a plurality of cells within a registration area of the core network.

54. (Original) A method for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the method comprising, at a resource manager:

selecting a temporary identifier for the UE; and

providing the temporary identifier to the base station for transmission by the base station to the UE along with a paging message, the temporary identifier for identifying the UE during shared channel operation between the UE and the base station.

55. (Original) The method of claim 54, wherein the paging message is provided to the base station by a core network.

56. (Original) The method of claim 54, wherein the resource manager is a radio resource manager outside a core network that provides the paging message to the base station.

57. (Original) The method of claim 54, further comprising:

sending a paging message to at least one base station within a registration area, wherein the paging message includes a UE identifier; and

receiving a paging acknowledgement from a UE associated with the UE identifier via a first base station to establish a shared channel connection between the first base station and the UE.

58. (Original) The method of claim 57, wherein the resource manager is part of the core network that provides the paging message to the base station.

59. (Original) The method of claim 54, further comprising, at the resource manager:

selecting a channel index to a shared control channel (SCCH); and

providing the channel index to the base station for transmission by the base station to the UE along with the paging message and the temporary identifier, the SCCH for communicating control information including the temporary identifier between the UE and the base station during shared channel operation.

60. (Original) The method of claim 59, wherein the temporary identifier and the SCCH are cell-specific.

61. (Original) The method of claim 59, wherein the temporary identifier and the SCCH are common to a plurality of cells within a registration area of the core network.

62. (Original) A user equipment (UE) for establishing a network-initiated connection with a base station over a radio interface in a cellular communication system, the UE comprising:

logic for receiving from the base station a paging message and a temporary identifier; and

logic for sending a paging acknowledgement to the base station to establish a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

63. (Original) The UE of claim 62, further comprising logic for communicating control information during shared channel operation using a channel index to at least one shared control channel (SCCH) received along with the paging message from the base station.

64. (Currently amended) The UE of claim 62, wherein the logic for receiving is configured ~~operable~~ to receive an indication of dedicated access resources from the base station, the UE further comprising logic for employing the dedicated access resources for paging acknowledgement.

65. (Original) The UE of claim 62, wherein the temporary identifier is cell-specific.

66. (Currently amended) The UE of claim 62, wherein the logic for sending the paging acknowledgement is configured ~~operable~~ to send an uplink synchronization request to the base station.

67. (Original) The UE of claim 66, wherein the uplink synchronization request is part of a paging acknowledgement message.

68. (Currently amended) The UE of claim 62, wherein the logic for receiving is configured ~~operable~~ to:

receive at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

receive the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

69. (Original) The UE of claim 68, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

70. (Original) The UE of claim 68, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

71. (Original) The UE of claim 70, further comprising logic for receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs.

72. (Original) The UE of claim 68, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

73. (Original) The UE of claim 72, further comprising logic for:

receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs; and

receiving in the SCCH an indication of resources allocated to the group of UEs to which the UE belongs for receiving paging messages in the shared channel.

74. (Original) A method for establishing a network-initiated connection with a base station over a radio interface in a cellular communication system, the UE comprising, at a UE:

receiving from the base station a paging message and a temporary identifier; and

sending a paging acknowledgement to the base station to establish a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

75. (Original) The method of claim 74, comprising communicating control information during shared channel operation using a channel index to at least one shared control channel (SCCH) received along with the paging message from the base station.

76. (Original) The method of claim 74, wherein receiving comprises receiving an indication of dedicated access resources from the base station, the method further comprising employing the dedicated access resources for paging acknowledgement.

77. (Original) The method of claim 74, further comprising sending an uplink synchronization request to the base station.

78. (Original) The method of claim 74, wherein receiving comprises:

receiving at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

receiving the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

79. (Original) The method of claim 78, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

80. (Original) The method of claim 78, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

81. (Original) The method of claim 80, further comprising logic for receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs.

82. (Original) The method of claim 78, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

REMARKS

In the Office Communication mailed June 22, 2009 as entered in the above-captioned matter, claim 2, 4, 8, 10, 64, 66, and 68 were rejected under 35 U.S.C. §112, second paragraph . Claims 1-6, 74, 29-34, 9, 10, 75-77, 62-64, 13, 14, 66, and 67 were rejected under 35 U.S.C. 103(a) as being obvious over first 3GPP publications (3GPP **TR** 25.931 V3.7.0 (2002-06)) ("first 3GPP publication") in view of Sinnarajah et al. (US20040008679A1) ("Sinnarajah"). Claims 7 and 8, were rejected under 35 U.S.C. 103(a) as being obvious over the first 3GPP publication in view of Sinnarajah and further in view of second 3GPP publications (3GPP TS 25.303 V3.12.0 (2002-06)) ("second 3GPP publication"). Claims 23-28, 40-48, 68-73 and 78-82 were rejected under 35 U.S.C. 103(a) as being obvious over the first 3GPP publication in view of Sinnarajah and further in view of prior art admitted in the background section of our disclosure. Claims 45, 54, 46, 55, 11, 15-22, 35, 38, 39, 65, 12, and 36 were rejected under 35 U.S.C. 103(a) as being unpatentable over the first 3GPP publication in view of Lee et al. (US2005004161 OA1) ("Lee"). Claims 48-53 and 57-61 were rejected under 35 U.S.C. 103(a) as being unpatentable over the first 3GPP publication in view of Lee and further in view of Sinnarajah. We respectfully traverse these rejections and request reconsideration.

Rejections under 35 U.S.C. §112

Claims 2, 4, 8, 10, 64, 66, and 68 were rejected under 35 U.S.C. §112, second paragraph. In particular, the Examiner expressed concerns regarding the word "operable." Though we do not necessarily agree with the Examiner's concern, in the interests of expediency we have amended each of these claims by substituting the word "configured" for "operable" in each instance. We therefore respectfully submit that this rejection has been traversed and that the claims are in suitable condition to support further examination and allowance.

Rejections under 35 U.S.C. §103

Claims 1-6, 74, 29-34, 9, 10, 75-77, 62-64, 13, 14, 66, and 67 were rejected under 35 U.S.C. 103(a) as being obvious over the first 3GPP publications in view of Sinnarajah. Claims 7 and 8, were rejected under 35 U.S.C. 103(a) as being obvious over the first 3GPP publication in view of Sinnarajah and further in view of the second 3GPP publication. Claims 23-28, 40-48, 68-73 and 78-82 were rejected under 35 U.S.C. 103(a) as being obvious over the first 3GPP publication in view of Sinnarajah and further in view of prior art admitted in the background section of our disclosure. Claims 45, 54, 46, 55, 11, 15-22, 35, 38, 39, 65, 12, and 36 were rejected under 35 U.S.C. 103(a) as being unpatentable over the first 3GPP publication in view of Lee. Claims 48-53 and 57-61 were rejected under 35 U.S.C. 103(a) as being unpatentable over the first 3GPP publication in view of Lee and further in view of Sinnarajah.

Independent claim 1

The first 3GPP publication

The 3GPP prior art describes a system in which the following sequence of four events occurs:

1. When the Core Network needs to contact a UE, the Core Network sends a paging message to many base stations. The core network only knows that the sought UE is located somewhere in a tracking area/routine area. That area may encompass a very large number of base stations. The paging message includes information identifying the sought UE. The information may be, for example, the international mobile subscriber identity (IMSI) or temporary mobile subscriber identity (TMSI). This information is unique to the UE within the entire tracking area/routine area.

2. Each base station forwards the paging message that it receives from the Core Network to the cell(s) that it covers. These base stations do not amend the paging message and merely pass the paging message on in the form in which it was provided.

3. The sought UE recognizes that the paging message is intended for that UE, because the paging message contains the identifying information (i.e., the TMSI or IMSI) for that UE which the Core Network included in the paging message in the first instance.

4. When the sought UE receives the paging message, the UE then must register with the base station from which the paging message was sent. The UE does this by sending a paging acknowledge signal to the base station.

As acknowledged in point 1.1 of the Office Action, these teachings do not explicitly disclose establishing a shared channel connection between the base station and the UE in response to the base station receiving a paging acknowledgment signal from the sought UE. This, however, is not the only point of differentiation between these teachings and our claims.

First, we note that even if an extension of the teachings of the 3GPP prior art were to result in the assignment of a shared channel in response to receipt of the paging acknowledgment signal, the resulting arrangement would still not meet the limitations of our claims. In particular, we respectfully note that once the base station received a paging acknowledgment from the sought UE, the base station would then still have to contact the UE a *second* time and to assign a temporary identifier to the UE. This sequence of two messages from the base station is a time-consuming arrangement and represents more in the way of the problem rather than the solution we are seeking.

Importantly in these regards, the cited materials provide no suggestion that a TMSI (as provided in the prior art paging message) be used as a temporary identifier for such a call or other communication on a shared channel. Furthermore, we respectfully observe that the UE would not wish to use the TMSI as a temporary identifier for a call or other communication on a shared channel. This is for at least two reasons. Firstly, there is a security risk, which is the risk that the mobile could be tracked by unauthorized persons. Secondly, the TMSI is a 32 bit number. Accordingly, repeated use of the TMSI as an identifier would involve the transmission of unnecessarily amounts of data, e.g. if the TMSI were used throughout a call or other communication.

To conclude this particular point, the second communication from the base station to the sought UE is essential in the 3GPP prior art, even if the 3GPP prior art were somehow extended to

include the assignment of a shared channel. The need for this second communication is not eliminated by the UE using the IMSI or the TMSI received with the paging signal as a temporary identifier for the subsequent call or other communication for at least the reasons noted.

Importantly, with the 3GPP arrangement described above, after receiving the paging message the UE essentially goes through the same registration process as if it were itself initiating a call to the network. See paragraph [0012] of the description of the present application. The 3GPP document recognizes no opportunity for quicker call set up for a "network initiated connection" than a "terminal initiated connection."

Comparing the teaching of 3GPP materials to the recitations of claim 1, it is clear that the 3GPP prior art does not:

(i) Explicitly teach the establishment of a shared channel connection between the base station and the UE in response to a paging acknowledgement; or

(ii) Teach using a temporary identifier sent with the paging signal, as the identification of the UE on the shared channel.

Our claimed approach will accommodate a paging signal as sent by the Core Network to be received by each of many base stations. Each base station can then affix to the paging signal a further signal, which may be specific to the cell, before broadcasting the combined signal. Importantly, each base station affixes to the paging signal a temporary identifier that it knows to be free, and which the UE can use immediately on a shared channel. The temporary identifier can be, for example, a cell-specific radio network temporary identity (c-RNTI).

So when the sought UE receives a paging message with that UE's unique identifier, e.g. the TMSI, it also receives the temporary identifier that it is to use on the shared channel. When the sought UE sends the paging acknowledgment signal back to the base station from which it received the paging signal, it <u>already</u> knows the temporary identifier that it is to use on a shared channel. This obviates the need, present in the 3GPP prior art, for a second communication from the base station where the sought UE is located, informing the sought UE of a temporary identifier.

One advantage of our approach may therefore be that a UE can be located and assigned to a traffic channel more rapidly than would be possible with the 3GPP prior art arrangement. A further advantage of the invention may arise from the fact that a new temporary identifier will be assigned to the UE if it moves to a new cell during a call. This makes illicit tracking of the UE more difficult than any system in which the UE uses the IMSI or TMSI throughout a call. In such a system, the IMSI or TMSI is the same throughout the whole tracking area covered by the Core Network, which might cover an entire US state. If the 3GPP prior art were to use the IMSI or TMSI as a temporary identifier, then this would facilitate illicit tracking, even when the UE moved into a new cell of the Core Network`s tracking area.

The Sinnarajah reference

Sinnarajah teaches the setting up of a multicast communication service. Multicast communication is a very different field of technology from that of the present invention.

Paragraph [0091] of Sinnarajah describes the set-up of a multicast transmission from a network to a set of subscribers. The set comprises some or all of the members of a predefined group. Paragraph [0091] states that

(i) "*The access network waits for response from member subscriber stations before channel assignment.*" Here the "member" is the member of a particular group. The members of the group are the target of the multicast transmission.

(ii) "*[T]he response allows the access network to decide, whether to assign a shared channel or a dedicated channel for the multicast content.*" Although this section uses the phrase "shared channel" for one of the options, the channel is actually functioning as what is normally referred to as a "common" channel. On this channel, all the "member subscriber stations" will listen to the same content.

The multicast transmission of Sinnarajah differs fundamentally from the present invention. With Sinnarajah, the initial signal from the network seeks out interested members from a particular group. With Sinnarajah, the list of members of the group is already known to the network. Any

member interested in listening in to a particular multicast transmission normally needs only to send the group identifier *Group_IDx* back to the network.

Paragraph [0116] and figure 10 of Sinnarajah show how subscriber stations are contacted for a multicast transmission. Lines t3 and t4 on figure 10 show two mobiles sending the group identifier *Group_IDx* back to the base station.

Paragraph [0116] also shows that two communications from the base station need to be sent to each mobile in order to assign a physical channel, on which the mobiles are to receive "multicast service."

Paragraph [0063] of Sinnerajah, cited in the Office Action, simply adds to the above that the network may broadcast the TMSI or IMSI when trying to locate a particular mobile station for a multicast transmission. By broadcasting the TMSI or IMSI, this embodiment is matching the broadcast of the TMSI or IMSI that is carried out in the 3GPP prior art document discussed above. In Sinnerajah, even if the TMSI or IMSI were sent back to the base station on the reverse access channel, it would then not be used during a communication on a shared channel, as specified in our claim 1.

In conclusion, Sinnerajah:

(i) Teaches set up of a multicast service;

(ii) Uses a common channel for members of a pre-defined group of mobile stations to receive multicast service; and

(iii) Normally relies on a mobile station to transmit its group identifier Group_IDx as part of the set up of the multicast service, and does not then go on to use a temporary identifier during communication on a shared channel.

Combining these 3GPP and Sinnerajah teachings

We further contend that it would not be obvious to combine the first 3GPP publication and Sinnerajah, because Sinnerajah is concerned with multicast communication systems.

Furthermore, neither 3GPP nor Sinnerajah teaches the provision of a temporary identifier that is supplied with a paging signal and which is then used to identify the UE during a subsequent communication on a shared channel. Accordingly, no combination of these two references, regardless of how obvious or unobvious that combination might be, will yield the recitations of claim 1.

Independent claims 29, 45, 54, 62 and 74

Independent claims 29, 62, and 74 were rejected on similar grounds. These claims have limitations similar to those of claim 1. Accordingly, we respectfully submit that the same points put forth above in favor of claim 1 are applicable here as well. We will not repeat those points for the sake of brevity.

Independent claim 45 includes similar limitations to those discussed above and was rejected in view of the aforementioned combination of the first 3GPP publication with Sinnarajah as further combined with the contents of the applicant's own background section. As noted above, the first two references fail to disclose the use of a temporary identifier that is combined with a paging message and which then serves to identify the UE when the UE and the base station subsequently establish a shared channel connection. The background section of our application does not remedy this deficiency. Accordingly, we respectfully observe that no combination of these three references will yield the recitations of independent claim 45.

Independent claim 54 was rejected in view of a combination of the first 3GPP publication with Lee. Once again, this claim includes limitations similar to those noted above. And again we observe that the first 3GPP publication fails to disclose providing a temporary identifier along with a paging message that is then used by the UE to identify itself during shared channel operation with a base station. This functionality and series of events is unrelated to Lee's temporary identifier. Accordingly, a combination of the first 3GPP publication with Lee fails to meet the recitations of claim 54.

Dependent claims 2-28, 30-44, 46-53, 55-61, 63-74, and 75-82

These claims are ultimately dependent upon one of the independent claims, which have been shown above to be allowable. While the applicant believes that other arguments are available to highlight the allowable subject matter presented in various ones of these dependent claims, the applicant also believes that the comments set forth herein regarding allowability of the independent claims are sufficiently compelling to warrant present exclusion of such additional points for the sake of brevity and expedited consideration.

CONCLUSION

There being no other objections to or rejections of the claims, the Applicants respectfully submit that claims 1-82 are allowable over the references of record and may be passed to allowance. The Commissioner is hereby authorized to charge any additional fees which may be required with respect to this communication, or credit any overpayment, to Deposit Account No. 06-1135.

Respectfully submitted,

FITCH, EVEN, TABIN & FLANNERY

Dated: November 23, 2009

Steven G. Parmelee
Registration No. 28,790

120 South LaSalle Street, Suite 1600
Chicago, Illinois 60603-3406
Telephone (312) 577-7000
Facsimile (312) 577-7007

Electronic Patent Application Fee Transmittal

Application Number:	11416865
Filing Date:	02-May-2006
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Filer:	Steven Glen Parmelee/Helen Donegan
Attorney Docket Number:	

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

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:				
Extension - 2 months with $0 paid	2252	1	245	245

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**245**

Electronic Acknowledgement Receipt	
EFS ID:	6503222
Application Number:	11416865
International Application Number:	
Confirmation Number:	8530
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Customer Number:	20872
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	
Receipt Date:	23-NOV-2009
Filing Date:	02-MAY-2006
Time Stamp:	11:26:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$245
RAM confirmation Number	7750
Deposit Account	061135
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 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		96635_Amendment_and_Response.pdf	167839 6914a3d1720317241352f6e173cad872390a5006	yes	22

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	14
Applicant Arguments/Remarks Made in an Amendment	15	22

Warnings:

Information:

2	Fee Worksheet (PTO-875)	fee-info.pdf	30075 14d76b810fa8c147c55e41fb64d638a26bee2d36	no	2

Warnings:

Information:

Total Files Size (in bytes):	197914

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.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	
11/416,865	05/02/2006	☐ To be Mailed

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			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 $250 ($125 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			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 11/23/2009

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 82	Minus	** 82	= 0	X $ =		OR	X $52=	0
Independent (37 CFR 1.16(h))	* 6	Minus	***6	= 0	X $ =		OR	X $220=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT

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

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/MARQUITA D. JONES/

PTO/SB/80 (01-06)
Approved for use through 12/31/2008. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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(b).

I hereby appoint:

[X] Practitioners associated with the Customer Number: 22242

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(b).

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

[X] The address associated with Customer Number: 22242

OR

[ ] Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:
IPWireless, Inc.
90 New Montgomery Street, Suite 315
San Francisco, California 94105

A copy of this form, together with a statement under 37 CFR 3.73(b) (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(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, 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	7/10/09
Name	ALAN EDWARD JONES	Telephone	+441249800114
Title	EXECUTIVE VICE PRESIDENT		

PTO/SB/96 (10-07)
Approved for use through 10/31/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Chandrika K. Worrall

Application No./Patent No.: 11/416,865 Filed/Issue Date: May 2, 2006

Entitled: Network-Initiated Communication Establishment in a Cellular System

IPWireless, Inc., a Corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. [✓] the assignee of the entire right, title, and interest; or

2. [ ] an assignee of less than the entire right, title and interest
(The extent (by percentage) of its ownership interest is_____ %)

in the patent application/patent identified above by virtue of either:

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 018021, Frame 0200, or for which a copy thereof is attached.

OR

B. [ ] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

[ ] Additional documents in the chain of title are listed on a supplemental sheet.

[ ] As required by 37 CFR 3.73(b)(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.

_____	November 19, 2009
Signature	Date
Stéven G. Parmelee	312/577-7000
Printed or Typed Name	Telephone Number
Attorney for Applicant	
Title	

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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	11/416,865	**CONFIRMATION NO. 8530**
Inventor:	Chandrika K. Worrall	This Change in Entity Status was electronically filed using the U.S. Patent and Trademark Office's EFS Web
Filed:	May 2, 2006	
For:	**NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM**	
TC/A.U.:	2617	
Examiner:	Aung T. Win	
Docket No.:	9010/96635 (06-0011)	
Customer No.:	22242	

ASSERTION OF SMALL ENTITY STATUS

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

Dear Sir:

In accordance with 37 C.F.R. §1.28(b), written notification is hereby provided to the U.S. Patent and Trademark Office of the assertion of small entity status in the above-identified patent. The Assignee of the present patent is a small entity under 37 C.F.R. §1.27(a)(3) and hereby requests that the patent show said small entity status.

Respectfully requested,

FITCH, EVEN, TABIN & FLANNERY

By: _____
Steven G. Parmelee
Registration No. 28,790

Date: 11/19/2009

120 South LaSalle Street, Suite 1600
Chicago, Illinois 60603-4277
Telephone: (312) 577-7000

Electronic Acknowledgement Receipt

EFS ID:	6488671
Application Number:	11416865
International Application Number:	
Confirmation Number:	8530
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Customer Number:	20872
Filer:	Steven Glen Parmelee/Helen Donegan
Filer Authorized By:	Steven Glen Parmelee
Attorney Docket Number:	
Receipt Date:	19-NOV-2009
Filing Date:	02-MAY-2006
Time Stamp:	16:00:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	96635_Power_of_Attorney_1.PDF	269493 d1249d60e1612aa271edebdc6c99fa27002b61f6	no	3

Warnings:

Information:

2	Miscellaneous Incoming Letter	96635_Assertion_of_Small_Entity_Status_1.PDF	32025 08fc1cb3fdd30b78e4903e55a90af414072a2c7e	no	1
Warnings:					
Information:					
			Total Files Size (in bytes):	301518	

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.

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
11/416,865	05/02/2006	Chandrika K. Worrall	

CONFIRMATION NO. 8530

POWER OF ATTORNEY NOTICE

20872
MORRISON & FOERSTER LLP
425 MARKET STREET
SAN FRANCISCO, CA 94105-2482

OC000000037997135

Date Mailed: 09/28/2009

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/01/2009.

- The withdrawal as attorney in this application has been accepted. Future correspondence will be mailed to the new address of record. 37 CFR 1.33.

/atkelley/

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

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

MORRISON & FOERSTER LLP
425 MARKET STREET
SAN FRANCISCO, CA 94105-2482

COPY MAILED
SEP 28 2009
OFFICE OF PETITIONS

In re Application of	:	
Chandrika K. Worrall	:	DECISION ON PETITION
Application No. 11/416,865	:	TO WITHDRAW
Filed: May 2, 2006	:	FROM RECORD
Attorney Docket No. 562492006900	:	

This is a decision on the Request to Withdraw as attorney or agent of record under 37 C.F.R. § 1.36(b), filed September 1, 2009.

The request is **APPROVED**.

A grantable request to withdraw as attorney/agent of record must be signed by every attorney/agent seeking to withdraw or contain a clear indication that one attorney is signing on behalf of another/others. The Office will require the practitioner(s) to certify that he, she or they have: (1) given reasonable notice to the client, prior to the expiration of the reply period, which the practitioner(s) intends to withdraw from employment; (2) delivered to the client or a duly authorized representative of the client all papers and property (including funds) to which the client is entitled; and (3) notified the client of any replies that may be due and the time frame within which the client must respond, pursuant to 37 CFR 10.40 (c).

The request was signed by Robert A. Saltzberg, on behalf of all practitioners of record who are associated with Customer Number 20872.

All attorneys/agents associated with the Customer Number 20872 have been withdrawn. Applicant is reminded that there is no attorney of record at this time.

The correspondence address however, of record remains unchanged.

There is an outstanding Office action mailed June 22, 2009 that requires a reply from the applicant.

Telephone inquires concerning this decision should be directed to the undersigned at (571) 272-6059. All other inquires concerning either the examination or status of the application should be directed to the Technology Center.

Alicia Kelley
Petitions Examiner
Office of Petitions

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
11/416,865	05/02/2006	Chandrika K. Worrall	

CONFIRMATION NO. 8530

POWER OF ATTORNEY NOTICE

20872
MORRISON & FOERSTER LLP
425 MARKET STREET
SAN FRANCISCO, CA 94105-2482

OC000000037997135

Date Mailed: 09/28/2009

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/01/2009.

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/atkelley/

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

PTO/SB/21 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	3

Application Number	11/416,865
Filing Date	May 2, 2006
First Named Inventor	Chandrika K. WORRALL
Art Unit	2617
Examiner Name	A. Win
Attorney Docket Number	562492006900

ENCLOSURES (*Check all that apply*)

- [ ] Fee Transmittal Form
  - [ ] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
  - [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (please Identify below):

1. Request for Withdrawal as Attorney or Agent and Change of Correspondence Address - 2 pages

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	MORRISON & FOERSTER LLP (Customer Number 20872)		
Signature	Robert Saltzberg		
Printed name	Robert A. Saltzberg		
Date	August 27, 2009	Reg. No.	36,910

sf-2724884

PTO/SB/83 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS		
	Application Number	11/416,865
	Filing Date	May 2, 2006
	First Named Inventor	Chandrika K. WORRALL
	Art Unit	2617
	Examiner Name	A. Win
	Attorney Docket Number	562492006900

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

Please withdraw me as attorney or agent for the above identified patent application, and

- [ ] all the practitioners of record;
- [ ] the practitioners (with registration numbers) of record listed on the attached paper(s); or
- [x] the practitioners of record associated with Customer Number: 20872

NOTE: The immediately preceding box should only be marked when the practitioners were appointed using the listed Customer Number.

The reason(s) for this request are those described in 37 CFR:

[ ] 10.40(b)(1)	[ ] 10.40(b)(2)	[ ] 10.40(b)(3)	[x] 10.40(b)(4)
[ ] 10.40(c)(1)(i)	[ ] 10.40(c)(1)(ii)	[ ] 10.40(c)(1)(iii)	[ ] 10.40(c)(1)(iv)
[ ] 10.40(c)(1)(v)	[ ] 10.40(c)(1)(vi)	[ ] 10.40(c)(2)	[ ] 10.40(c)(3)
[ ] 10.40(c)(4)	[ ] 10.40(c)(5)	[ ] 10.40(c)(6) Please explain below:	

Certifications

Check each box below that is factually correct. WARNING: If a box is left unchecked, the request will likely not be approved.

1. [x] I/We have given reasonable notice to the client, prior to the expiration of the response period, that the practitioner(s) intend to withdraw from employment.

2. [x] I/We have delivered to the client or a duly authorized representative of the client all papers and property (including funds) to which the client is entitled.

3. [x] I/We have notified the client of any responses that may be due and the time frame within which the client must respond.

Please provide an explanation, if necessary:

The practitioners have been discharged by the assignee/client. The assignee/client has requested transfer.

sf-2724886

REQUEST FOR WITHDRAWAL AS ATTORNEY OR AGENT AND CHANGE OF CORRESPONDENCE ADDRESS

Complete the following section only when the correspondence address will change. *Changes of address will only be accepted to an inventor or an assignee that has properly made itself of record pursuant to 37 CFR 3.71.*

Change the correspondence address and direct all future correspondence to:

A. ☐ The address of the inventor or assignee associated with Customer Number: _____

OR

B. ☐ Inventor or Assignee Name			
Address			
City	State	Zip	Country
Telephone		Email	

I am authorized to sign on behalf of myself and all withdrawing practitioners.

Signature	Robert Saltzberg		
Name	Robert A. Saltzberg	Registration No.	36,910
Address	Morrison & Foerster LLP 425 Market Street		
City	San Francisco	State CA	Zip 94105-2482 Country US
Date	August 27, 2009	Telephone No.	(415) 268-6428

NOTE: ***Withdrawal is effective when approved rather than when received.***

sf-2724886

Electronic Acknowledgement Receipt

EFS ID:	5997259
Application Number:	11416865
International Application Number:	
Confirmation Number:	8530
Title of Invention:	Network-initiated communication establishment in a cellular system
First Named Inventor/Applicant Name:	Chandrika K. Worrall
Customer Number:	20872
Filer:	Robert A. Saltzberg/Lindsay Seydel
Filer Authorized By:	Robert A. Saltzberg
Attorney Docket Number:	562492006900
Receipt Date:	01-SEP-2009
Filing Date:	02-MAY-2006
Time Stamp:	19:24:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Miscellaneous Incoming Letter	562492006900_trans.pdf	52447 a6d6a6a1c31905bffe66372ef98051c138fe636e	no	1

Warnings:

Information:

2	Power of Attorney	562492006900_req.pdf	93761 6924ef8b3b3b01f96dd1e7f6f1c04f869e94b43b	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	146208	

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.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/416,865	05/02/2006	Chandrika K. Worrall	562492006900	8530

20872 7590 06/22/2009
MORRISON & FOERSTER LLP
425 MARKET STREET
SAN FRANCISCO, CA 94105-2482

EXAMINER
WIN, AUNG T

ART UNIT	PAPER NUMBER
2617	

MAIL DATE	DELIVERY MODE
06/22/2009	PAPER

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

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

Office Action Summary	Application No.	Applicant(s)	
	11/416,865	WORRALL, CHANDRIKA K.	
	Examiner	Art Unit	
	AUNG WIN	2617	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

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

Status

1)☒ Responsive to communication(s) filed on *02 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-82* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-82* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

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

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

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

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

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

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

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

Claims 2, 4, 8, 10, 64, 66 & 68 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims recites "operable to" which renders the claim indefinite because “operable to” is typical of claim limitation, which may not distinguish over the prior art. It has been held that the recitation that an element such as “operable to” “adapted to” performing a function is not a positive limitation but only requires the ability to so perform.

Claim Rejections - 35 USC § 103

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

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

1. Claims 1, 29, 62, 74, 2, 30, 3, 31, 9, 34, 10, 4, 32, 63, 75, 5, 6, 33, 64, 76, 13, 14, 66, 67 & 77 are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications 3GPP TR 25.931 V3.7.0 (2002-06) herein after 3GPP publication in view of Sinnarajah et al. (US20040008679A1).

1.1 Regarding Claim 1, 3GPP publication discloses a base station for establishing a network-initiated connection with a user equipment over a radio interface in a cellular communication system, the base station comprising: logic for receiving a paging message [(Paging message from CN to base station): Figures 5 & 6, page 19]; logic for sending the paging message and a temporary UE identifier to at least one cell [(sending Type 1 or Type II message comprising temporary identifier from base station to UE): Figure 5 & 6, page 19]. 3GPP publication disclose general signaling procedure in UTRAN so does not explicitly disclose establishing a shared channel connection between the base station and the UE in response to paging acknowledgement from the user equipment (UE) as claimed but such claimed feature is expected to be implemented in the UTRAN, as disclosed in 3GPP publication. Sinnarajah discloses base station comprising logic for receiving a paging acknowledgement from the user equipment (UE) within the cell; and logic for establishing a shared channel connection between the base station and the UE in response to the paging acknowledgement, wherein the temporary identifier identifies the UE on the shared channel [(establishing shared channel in response to paging response: 0090 & 0091) (based on temporary identifier: 0063)].

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to modify paging method and system of 3GPP publication as taught by Sinnarajah to establish shared channel communications in response to paging response and based on temporary UE identifier as disclosed in 3GPP publication to identify the UE on the shared channel. One of ordinary skilled in the art at the time of

invention of made would have been motivated to do this for improved and effective communication service and system. It should be noted that shared/dedicated channel connection establishment in response to acknowledgment is well known to one of ordinary skilled in the art and it would have been a matter of design choice for operators for different communications service types.

1.2 Claim 29 is a method claim executed at a base station substantially close to base station of claim 1. Therefore, it would have been obvious to one of ordinary skilled in the art that the modified base station as stated above would teach the claim 29 method.

1.3 Claim 62 differs substantively from Claim 1 in that the former recites User Equipment claim for establishing a network-initiated connection between base station and UE, rather than base station for establishing the same network-initiated connection between base station and UE. Therefore, UE as modified above in claim 1 would teach UE of claim 62.

1.4 Claim 74 is a method claim executed at UE substantially close to UE of claim 62. Therefore, it would have been obvious to one of ordinary skilled in the art that the modified UE as stated above would teach the claim 74 method.

1.5 As regards to claims 2 & 30 modified method and system teaches claim 1 & 29, wherein the logic for receiving the paging message receives the paging message from a core network [3GPP publication: page 19].

1.6 As regards to claims 9 & 34, it would have been obvious to one of ordinary skilled in the art that the modified method and network as stated above in claim 1 rejection would teach the base station of claim 2, further comprising logic for sending the paging acknowledgment to the core network to establish shared channel communications between the UE and the core network [see claim 1 rejection in view of Sinnarajah et al.]

1.7 As regards to claim 10, it would have been obvious to one of ordinary skilled in the art that the modified method and network as stated above in claim 1 rejection would teach the base station of claim 10, wherein the logic for sending is operable to send the paging message using a broadcast channel because Sinnarajah teaches broadcast paging message [Sinnarajah: 0068].

1.8 As regards to claims 3 & 31, it would have been obvious to one of ordinary skilled in the art that the modified method and network supports dormant state therefore, it would teach the claims 1 & 29, comprising logic for assigning to the UE a temporary identifier from the base station to which it was last registered in response to the UE being in a dormant state as claimed since in dormant state, connection can be

reactivated with connection information maintained at the base station without establishing the connection set up with core network again.

1.9 As regards to claims 4, 32, 63 & 75, 3GPP publication 3GPP publication discloses according to claims 1, 29, 62, 74 and also teaches base station is provided with temporary identifier and establishing shared channel communications between base station and UE via shared channel in response to paging message [see claim 1 rejections], but silent on provideing channel index to the base station as claimed. Sinnarajah teaches that base station can also be provided with channel assignment information as part of paging message [0098, 0099 & 0104]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to modify the system and method as disclosed in 3GPP publication to provide shared channel assignment information as taught by Sinnarajah to implement the method and system according to claims 4, 32, 63 & 75. One of ordinary skilled in the art at the time of invention of made would have been motivated to do this to for efficient resource utilization.

1.10 As regards to claims 5, 6, 33, 64 & 76, it would have been obvious to one of ordinary skilled in the art at that modified method and system teaches according to claims 1, 29, 62, 74, further comprising logic for signaling to the UE an indication of dedicated access resources to be used by the UE for paging acknowledgement according to claims 5, 33, 64 & 76 because Sinnarajah teaches that UE can transmit

information either on shared channel or dedicated channel [90 & 91]. Assigning dedicated resources for paging acknowledgement instead of using shared channel resources would have been obvious matter of design choice and does not constitute patentably distinctions from prior art channel allocation method for acknowledgement message transmission methods and system.

1.11 As regards to claims 13, 14, 66, 67 & 77, it would have been obvious to one of ordinary skilled in the art that modified method and system teaches according to claims 13, 14 because 3GPP publications teaches uplink synchronization communications as claimed [3GPP publication: page 14, 21, 23, 29, 30, 31, 32, 44 & 77]

2. Claims 7 & 8, are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications [3GPP TR 25.931 V3.7.0 (2002-06)] in view of Sinnarajah et al. (US20040008679A1), further in view of 3GPP publications [3GPP TS 25.303 V3.12.0 (2002-06)].

2.1 As regards to claims 7 & 8, modified method and system teach according to claim 1, but do not disclose contention based channel as claimed. 3GPP TS 25.303 teaches using a set of contention-based channels for communications transmission [contention-based channels: page 7]. Therefore it would have been obvious to one of ordinary skilled in the art at the time of invention of made to further modify to utilize

contention based channels as taught by 3GPP TS 25.303 to modify according to claims 7 & 8. Utilizing contention based channels for transmissions would have been obvious matter of design choice and does not constitute patentably distinctions from prior art channel allocation and message transmission methods and system.

3. Claims 23-28, 40-48, 68-73 & 78-82 are rejected under 35 U.S.C. 103(a) as being obvious over 3GPP publications [3GPP TR 25.931 V3.7.0 (2002-06)] in view of Sinnarajah et al. (US20040008679A1), over prior art admitted in the background section of the applicant disclosure.

3.1 Regarding Claims 23-28, 40-48, 68-73 & 78-82, modified method and system in view of Sinnarajah would teach group identifier for identifying group of UEs to which paging messages are directed and also assigning shared channels for communications, but does not explicitly teach second paging message to process according to the claims. According to applicant disclosure, such feature is well known conventional paging procedures for efficiently allocating the communication resources [0009-0013]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to further modify the method and system according to conventional paging procedure as disclosed by applicant to implement according to claims. One of ordinary skilled in the art at the time of invention of made to do this to efficiently allocate resources to a group of UEs.

4. Claims 45, 54, 46, 55, 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, 12, 17, 18, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over 3GPP publications 3GPP TR 25.931 V3.7.0 (2002-06) herein after 3GPP publication in view of Lee et al. (US20050041610A1).

4.1 As regards to claims 45, 3GPP publication discloses Core network (CN: page 19) for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the Core network comprising: generating paging message with UE temporary identifier [page 19]; and providing the temporary identifier to the base station for transmission by the base station to the UE along with a paging message [page 19], the temporary identifier for identifying the UE during shared channel operation between the UE and the base station [(shared channel): page 74, page 75, Figure 45A]. Because Core network generates paging message with temporary identifier, it would have been obvious to one of ordinary skilled in the art that UMTS system much be integrated with resource manager as claimed in order for core network to generate paging message according to the UMTS system as disclosed in 3GPP publication. Lee discloses core network comprising resource manager i.e., core network entity which allocate temporary identifier for IE as claimed [0022 or 0084]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to modify core network entity of the network as disclosed in 3GPP publication as taught by Lee to implement the resource manager as claimed. One of ordinary skilled in the art at the time of

invention of made would have to motivated to do this to enable the UE identification by core network entity for efficient communications.

4.2 Claim 54 is a method claim rejected for the same reason as stated above in claim 45 rejection because claim 54 method is substantially close to the method executed by apparatus claim 45.

4.3 As regards to claims 46 & 55, 3GPP publication discloses the resource manager of claim 45 & 54, wherein the paging message is provided to the base station by a core network [3GPP publication: page 19].

4.4 As regards to 47 & 56, The resource manager of claim 45, wherein the resource manager is a radio resource manager outside a core network that provides the paging message to the base station. As regards to claims 47 & 56, it would have been obvious to one of ordinary skilled in the art at that modified method and system in view of Lee would teach according to claims 45 & 54 wherein paging message is provided to the base station as stated above except that claims recites that resource manager is outside a core network. Further modifying the method and system for implement resource manage remotely from core network according to claims would have been obvious matter of design choice since applicant has not disclose any particular purpose

or advantages for having resource manager outside a core network rather than in the core network and it appears that the invention would perform equally well with regardless of where resource manager is located.

4.5 As regards to claims 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65, it would have been obvious to one of ordinary skilled in the art at that modified method and system in view of Lee would teach according to claims 1, 29, 62 & 74 wherein the temporary identifier is cell-specific [allocated by current serving MSC] except that claims recites that temporary identifier is selected or allocated at different network nodes. Further modifying the method and system for Selecting temporary identifier at different network nodes according to claims would have been obvious matter of design choice since applicant has not disclose any particular purpose or advantages for selecting temporary identifier at one node rather than selecting at another network node and it appears that the invention would perform equally well with selecting temporary identifier at different network nodes.

4.6 claims 12, 17, 18, 36 are also rejected for the same reason as stated above in claims 11, 15, 16, 19, 20, 21, 22, 35, 38, 39, 65 rejections because modified method and system teaches using shared channels, SCCH as claimed.

5. Claims 48-53 & 57-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over 3GPP publications 3GPP TR 25.931 V3.7.0 (2002-06) herein after 3GPP publication in view of Lee et al. (US20050041610A1), further in view of Sinnarajah et al. (US20040008679A1).

5.1 Regarding Claims 48 & 57, the network as modified discloses the resource manager of claims 45 & 54, further comprising logic for: sending a paging message to at least one base station within a registration area, wherein the paging message includes a UE identifier and establishing a shared channel connection between the base station and UE as stated above in Claims 45 & 54 rejections (also see claim 1 rejection) but does not explicitly disclose establishing a shared channel connection between the base station and the UE in response to paging acknowledgement from the user equipment (UE) as claimed but such claimed feature is expected to be implemented in the UTRAN, as disclosed in 3GPP publication. Sinnarajah discloses base station comprising logic for receiving a paging acknowledgement from the user equipment (UE) within the cell; and logic for establishing a shared channel connection between the base station and the UE in response to the paging acknowledgement, wherein the temporary identifier identifies the UE on the shared channel [(establishing shared channel in response to paging response: 0090 & 0091) (based on temporary identifier: 0063)].

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to further modify paging method and system as taught by Sinnarajah to establish shared channel communications in response to paging response

and based on temporary UE identifier as disclosed in 3GPP publication to identify the UE on the shared channel. One of ordinary skilled in the art at the time of invention of made would have been motivated to do this for improved and effective communication service and system. It should be noted that shared/dedicated channel connection establishment in response to acknowledgment is well known to one of ordinary skilled in the art and it would have been a matter of design choice for operators for different communications service types.

5.2 As regards to claims 49 & 58, it would have been obvious to one of ordinary skilled in the art that modified method and network would teach the resource manager of claim 48, wherein the resource manager is part of the core network that provides the paging message to the base station [see claim 48 rejections stated above].

5.3 As regards to claims 50, it would have been obvious to one of ordinary skilled in the art that modified method and network would teach the resource manager of claim 49, wherein the resource manager is an access gateway i.e., MSC (0022 of Lee et al. reference).

5.4 As regards to claims 51 & 59, 3GPP publication 3GPP publication discloses the resource manager of claims 45 & 54 and also teaches base station is provided with

temporary identifier and establishing shared channel communications between base station and UE via shared channel in response to paging message [see claim 45 and claim 1 rejections], but silent on resource manager provides channel index to the base station as claimed. Sinnarajah teaches that base station can also be provided with channel assignment information as part of paging message [0098, 0099 & 0104]. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of invention of made to modify the system and method as disclosed in 3GPP publication to provide shared channel assignment information as taught by Sinnarajah to implement the resource manager as claimed. One of ordinary skilled in the art at the time of invention of made would have been motivated to do this to for efficient resource utilization.

5.5 As regards to claims 52, 53, 60 & 61, it would have been obvious to one of ordinary skilled in the art at that modified method and system in view of Lee would teach that the temporary identifier is cell-specific and SCCH are common to a plurality of cells within a registration area of the core network because current serving MSC of core network assign temporary identifier and SCCH [see rejections stated above].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AUNG WIN whose telephone number is (571)272-7549. The examiner can normally be reached on Monday-thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on 571-272-7603. 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.

/AUNG WIN/
Examiner, Art Unit 2617
/Patrick N. Edouard/
Supervisory Patent Examiner, Art Unit 2617

Notice of References Cited	Application/Control No. 11/416,865	Applicant(s)/Patent Under Reexamination WORRALL, CHANDRIKA K.	
	Examiner AUNG WIN	Art Unit 2617	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2004/0008679 A1	01-2004	Sinnarajah et al.	370/390
*	B	US-2005/0041610 A1	02-2005	Lee et al.	370/312
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	3GPP UTRAN Functions, Examples on Signaling Procedures, 06/2002, 3GPP TR 25.931 V3.7.0 (2002-06)
	V	3GPP Interlayer procedures in Connected Mode, 06/2002, 3GPP TS 25.303 V3.12.0 (2002-06)
	W	
	X	

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11416865	WORRALL, CHANDRIKA K.
	Examiner	**Art Unit**
	AUNG WIN	2617

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

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

CLAIM		DATE								
Final	Original	06/14/2009								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
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	27	✓								
	28	✓								
	29	✓								
	30	✓								
	31	✓								
	32	✓								
	33	✓								
	34	✓								
	35	✓								
	36	✓								

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CLAIM		DATE								
Final	Original	06/14/2009								
	37	✓								
	38	✓								
	39	✓								
	40	✓								
	41	✓								
	42	✓								
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	68	✓								
	69	✓								
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	72	✓								

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CLAIM		DATE								
Final	Original	06/14/2009								
	73	✓								
	74	✓								
	75	✓								
	76	✓								
	77	✓								
	78	✓								
	79	✓								
	80	✓								
	81	✓								
	82	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
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SEARCHED			
Class	**Subclass**	**Date**	**Examiner**

SEARCH NOTES		
Search Notes	**Date**	**Examiner**
searched in keywords and google NPL search	6/12/2009	atw

INTERFERENCE SEARCH			
Class	**Subclass**	**Date**	**Examiner**

ALTERNATIVE TO PTO/SB/08A/B (04/07)

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	1	of	1

Complete if Known	
Application Number	11/416,865
Filing Date	May 2, 2006
First Named Inventor	Chandrika K. WORRALL
Art Unit	2617
Examiner Name	Not Yet Assigned
Attorney Docket Number	562492006900

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

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*EXAMINER: Initial if information considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.W./

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	1.	"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Multimedia Broadcast/Multicast Service (MBMS); Architecture and functional description (Release 6)," (September 2004). 3GPP:Valbonne, France, TS 23.246 v6.4.0:1-42.	
	2.	Radio Electronics.com. "UMTS/WCDMA tutorial [1]- a tutorial about the 3G Wideband CDMA, WCDMA, or UMTS cellular telecommunications system," located at <http://www.radio-electronics.com/info/cellulartelecomms/umts/umts_wcdma_tutorial.php> visited on June 29, 2007. (3 pages).	
	3.	Radio Electronics.com. "UMTS/WCDMA tutorial [2]- the basic system architecture including the User Equipment - UE -, the Radio Network Subsystem, and the Core Network," located at <http://www.radio-electronics.com/info/cellulartelecomms/umts/umts_wcdma_architecture.php> visited on June 29, 2007. (3 pages).	
	4.	Radio Electronics.com. "UMTS/WCDMA tutorial [3]- the air interface, frequencies, spreading and power control used within UMTS or Wideband CDMA, WCDMA, cellular telecommunications system," located at <http://www.radio-electronics.com/info/cellulartelecomms/umts/umts_wcdma_radio.php> visited on June 29, 2007. (4 pages).	
	5.	Radio Electronics.com. "UMTS/WCDMA tutorial [4]- the frames slots and channels used within UMTS or Wideband CDMA, WCDMA, cellular telecommunications system," located at <http://www.radio-electronics.com/info/cellulartelecomms/umts/umts_wcdma_channels.php> visited on June 29, 2007. (4 pages).	
	6.	Radio Electronics.com. "UMTS/WCDMA tutorial [5]- packet data, speech coding and handover used within UMTS or Wideband CDMA cellular telecommunication system," located at <http://www.radio-electronics.com/info/cellulartelecomms/umts/umts_wcdma_coding_handover.php> visited on June 29, 2007. (3 pages).	

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Examiner Signature	/Aung Win/	Date Considered	06/12/2009

sf-2347045

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First Named Inventor	Chandrika K. WORRALL
Art Unit	2617
Examiner Name	Not Yet Assigned
Attorney Docket Number	562492006900

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	1.	US-6,876,636-B2	04-05-2005	Sinnarajah et al.	

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Examiner Initials*	Cite No.[1]	Foreign Patent Document: Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	2.	EP-1465444-A2	10-06-2004	Samsung Electronics Co., Ltd.		
	3.	EP-1631016-A2	03-01-2006	Siemens Mobile Communications		

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	4.	"Universal Mobile Telecommunications System (UMTS);Multimedia Broadcast/Multicast Service (MBMS; Architecture and Functional Description (3GPP TS 23.246 version 6.8.0 Release 6),"September 2005). ETSI TS 123 246 v6.8.0:1-49.	
	5.	International Search Report and Written Opinion mailed August 13, 2007, for PCT/EP2007/054161 filed April 27, 2007, 14 pages.	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /A.W./

Examiner Signature	/Aung Win/	Date Considered	06/12/2009

sf- 2384524

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	38321	paging	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/12 11:36
S2	141717	acknowledgment ack acknowledg$7	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/12 11:36
S3	9588	S1 and S2	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/12 11:36
S4	65903	(sleep dormant slotted idle low$power (low adj power) non$active dose) adj (mode$1 state$1)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:36
S5	2641	S3 and S4	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:36
S6	1628	(mobile wireless radio). ab. and S5	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:37
S7	39617	scch sch ((shared common) adj2 channel $1)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:37
S8	621	S6 and S7	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:37
S9	534	S8 and (dedicated dcch dch)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:37
S10	513	S9 and (cell$1 location$1 zone$1 area$1)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:37
S11	513	S10 and ((indicat$4 or identif$7 or ID or identifier or identification $1 or identit$4))	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:38

S12	11822	PICH PCH (paging with (indicat$4 or identif$7 or ID or identifier or identification$1 or identit $4))	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:39
S13	300	S11 and S12	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:39
S14	965345	(cell$1 location$1 zone$1 area$1) with ((indicat$4 or identif$7 or ID or identifier or identification $1 or identit$4 or address $1))	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:40
S15	257	S13 and S14	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:40
S16	217	S15 and (register$3 registration$1)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 11:41
S17	16984	(C$1RNTI C-RNTI RNTI) (temporar$6 near3 ((indicat$4 or identif$7 or ID or identifier or identification$1 or identit $4)))	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 12:10
S18	102	S15 and S17	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 12:10
S19	496281	((user UE subscriber$1 mobile wireless WTRU WCD client CMD STA Station PCD terminal) near2 ((number$1 indicat $4 or identif$7 or ID or identifier or identification $1 or identit$4))) or (TMSI IMSI MSISDN)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 12:29
S20	101	S18 and S19	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 12:29
S21	94	S20 and (BCCH broadcast $4 poll$4)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 12:30

S22	79	S21 and (group$1 multi $1cast$4 multicast$4)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 12:31
S23	6156	(((user UE subscriber$1 mobile wireless WTRU WCD client CMD STA Station PCD terminal) near2 ((number$1 indicat $4 or identif$7 or ID or identifier or identification $1 or identit$4))) with temporary) or TMSI	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 15:51
S24	336	S23 same paging	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 15:51
S25	44	(C$1RNTI C-RNTI RNTI) and S24	US-PGPUB; USPAT; EPO	OR	ON	2009/06/12 15:52
S26	1	11/416865	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 10:46
S27	389	(paging same (response or (acknowledgment ack acknowledg$7))) and ((shared adj2 channel$1) or (SCH SCCH)) and (acknowledgment ack acknowledg$7)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:11
S28	256	(mobile wireless radio). ab. and S27	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:11
S29	131181	(channel$1 resource$1) with (assign$6 allocat$6)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:13
S30	226	S28 and S29	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:13
S31	63386	(channel$1 resource$1) near2 (shared common)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:16

S32	209	S30 and S31	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:16
S33	786585	(page paging near2 (response or (acknowledgment ack acknowledg$7)))	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:18
S34	145	S32 and S33	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:18
S35	136408	S33 with (user UE subscriber$1 mobile wireless WTRU WCD client CMD STA Station PCD terminal)	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:19
S36	123	S34 and S35	US-PGPUB; USPAT; EPO	OR	ON	2009/06/13 14:19
S37	0	"2004008679"	USPAT	OR	OFF	2009/06/13 14:50
S38	0	"20040008679"	USPAT	OR	OFF	2009/06/13 14:50
S39	1	"20040008679"	US-PGPUB; USPAT	OR	OFF	2009/06/13 14:50
S40	16	paging.ti. and multimedia.ti. and broad$.ti.	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/13 14:54
S41	14	"6731932"	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 08:43
S42	8	S41 and temp$7	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 08:43
S43	1537	temporary and VLR and (gateway SGSN GGSN)	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 08:46
S44	94	temporary with (((visit$7 adj location$1) VLR) with (gateway SGSN GGSN))	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 08:47

S45	1716	temporary with (((visit$7 adj location$1) VLR) or (gateway SGSN GGSN))	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 08:47
S46	78	S44 and (UTRAN UMTS (core adj network))	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 08:48
S47	506	temporary with (assign$5 allocat$4) with (((visit$7 adj location$1) VLR) or (gateway SGSN GGSN))	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 08:53
S48	231	S47 and (UTRAN UMTS (core adj network))	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 08:53
S49	19	RNTI and S48	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 08:54
S50	212	S48 not S49	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 08:58
S51	0	11/217692 and (temp$6 same (core adj network))	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 09:19
S52	2	11/217692 and (temp$6 and (core adj network))	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 09:20
S53	3	10/924093 and temp$6	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 09:29
S56	222	RNC with temp$6	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 09:31
S57	2	11/217692 and ((core adj network) UMTS UTRAN)	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 09:31
S58	202	S56 and ((core adj network) UMTS UTRAN)	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 09:31

S59	33	((visit$7 adj location$1) VLR) and (MSC gateway SGSN GGSN) and S58	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 09:32
S60	20136	(allocat$5 assign$7) with temp$6	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 09:32
S61	13	S59 and S60	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 09:32
S62	6	10/192428 and dedicated	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 10:10
S63	6	10/192428 and broadcast	US-PGPUB; USPAT; EPO	OR	OFF	2009/06/14 10:35

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APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/416,865	05/02/2006	Chandrika K. Worrall	562492006900

CONFIRMATION NO. 8530

20872
MORRISON & FOERSTER LLP
425 MARKET STREET
SAN FRANCISCO, CA94105-2482

Title: Network-initiated communication establishment in a cellular system

Publication No. US-2007-0259675-A1
Publication Date: 11/08/2007

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 Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, 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 http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Pre-Grant Publication Division, 703-605-4283

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	2.	EP-1465444-A2	10-06-2004	Samsung Electronics Co., Ltd.		
	3.	EP-1631016-A2	03-01-2006	Siemens Mobile Communications		

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Examiner Signature		Date Considered	

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Appln No. 11/416,865
Docket No. 562492006900

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 465 444 A2

(12) EUROPEAN PATENT APPLICATION

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(51) Int Cl.7: H04Q 7/24

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(71) Applicant: Samsung Electronics Co., Ltd.
Suwon-city, Gyeonggi-do (KR)

(72) Inventors:
- Hwang, Sung-Oh c/o Samsung Elec. Co., Ltd.
Suwon-si Gyeonggi-do (KR)
- Lee, Kook-Heul c/o Samsung Elec. Co., Ltd.
Suwon-si Gyeonggi-do (KR)
- Choi, Sung-Ho c/o Samsung Elec. Co., Ltd.
Suwon-si Gyeonggi-do (KR)

(74) Representative: Grünecker, Kinkeldey,
Stockmair & Schwanhäusser Anwaltssozietät
Maximilianstrasse 58
80538 München (DE)

(54) Paging system and method for providing a multimedia broadcast/multicast service

(57) A paging system and method for use in a multimedia/broadcast multicast service (MBMS). The paging system checks a paging indicator channel of a UE (User Equipment), and determines whether there is a paging signal associated with a broadcast service. If the paging signal associated with the broadcast service is detected, the paging system recognizes the channel information indicative of the paging fact, checks paging information included in an ID for differentiating between the broadcast service and other broadcast services and a paging response indicator adapted to determine a transmission channel scheme of the broadcast service, establishes a radio link, and receives control information using the radio link. The base station controller adapted to manage a cell including the UE transmits MBMS transmission scheme information to the UE in advance using the paging information, resulting in maximum use efficiency of RRC (Radio Resource Controller) resources.

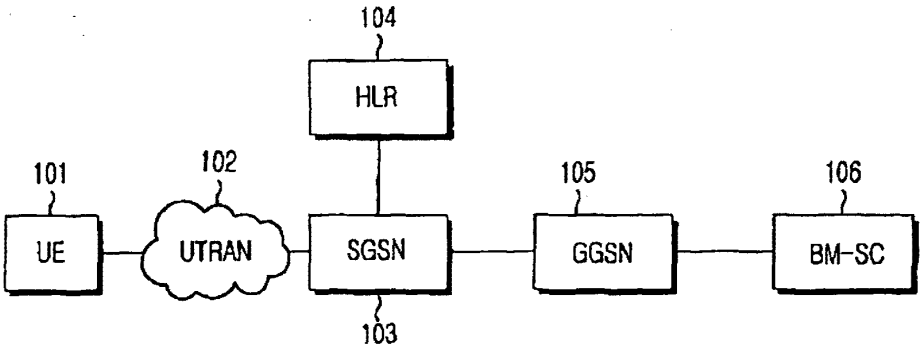

FIG.1

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates generally to a mobile communication system, and more particularly to a paging system and method for use in mobile communication system providing an MBMS (Multimedia Broadcast/Multicast Service).

2. Description of the Related Art

[0002] With the increasing development of communication technologies, a conventional CDMA (Code Division Multiplex Access) mobile communication system has rapidly evolved to a multicast multimedia communication system capable of transferring a large amount of data, e.g., voice data, packet data, and a circuit data. As a result, a Broadcast/Multicast Service system capable of multicasting a service from a single data source to a plurality of UEs (User Equipments) to support multicast multimedia communication has been developed. The Broadcast/Multicast Service is classified into a CBS (Cell Broadcast Service) functioning as a message-based service and an MBMS (Multimedia Broadcast/ Multicast Service) for providing multimedia data, e.g., real-time video and audio data, still images, text, etc.

[0003] Fig. 1 is a block diagram illustrating a network configuration for providing the MBMS service in a mobile communication system. Referring to Fig. 1, the network system for providing the MBMS service includes a UE 101 for receiving the MBMS service, a UTRAN (Universal Mobile Telecommunications System (UMTS) Radio Access Network) 102, an SGSN (Serving General Packet Radio Service (GPRS) Support Node) 103 included in a CN (Core Network), an HLR (Home Location Register) 104, a GGSN (Gateway GPRS Support Node) 105, a BM-SC (Broadcast/Multicast-service Center) 106.

[0004] The UE 101 is connected to the UTRAN 102 to perform a call control process, supports both CS (Circuit Service) and PS (Packet Service), and includes hardware and software modules for receiving the MBMS data. The UTRAN 102 includes a Node B (not shown), and an RNC (Radio Network Controller) (not shown). The UTRAN 102 performs a protocol conversion process, such that it can transmit RF (Radio Frequency) data or control messages having been received from the UE 101 via an air interface to the CN using a GTP (GPRS Tunneling Protocol). In this case, the GPRS is a packet data service performed in the UMTS network. The SGSN 103 is a network node for managing subscriber and position information of the UE 101.The SGSN 103 is connected to the HLR 104, such that it can manage the subscriber and position information.

[0005] The HLR 104 stores subscriber information of a packet domain and routing information. It should be noted that the HLR 104 can also be included in another PLMN (Public Land Mobile Network) because of the roaming capability of the UE 101. The GGSN 105 is a termination end of the GTP in the UMTS network, such that it can interwork with the Internet, a PDN (Packet Domain Network) or other PLMNs, etc. The GGSN 105 is connected to the BM-SC 106, The GGSN 105 receives MBMS streams from the BM-SC 106, and transmits the received MBMS streams to the SGSN 103. The SGSN 103 is included in the CN, and connects the UTRAN 102 to the CN. The SGSN 103, having received the MBMS streams from the GGSN 105, controls MBMS-associated services of subscribers, i.e., UEs, who wish to receive the MBMS. In order to control the MBMS-associated services, the SGSN 103 manages data associated with individual MBMS service charges, and selectively transmits MBMS service data to a specific RNC. The SGSN 103 configures/manages an SGSN service context in association with the MBMS service, and re-transmits the MBMS streams to the RNC. The service context used for the MBMS is called an MBMS context, which indicates the set of control information elements needed to provide a prescribed MBMS. The RNC controls a plurality of Node Bs, selects a specific Node B where a UE requesting the MBMS exists from its own Node Bs, and transmits MBMS data to the selected Node B. Additionally, the RNC controls a radio channel established to provide the MBMS, configures an RNC service context associated with the MBMS upon receiving the MBMS streams from the SGSN 103, and manages the configured RNC service context.

[0006] The RNC and the SGSN 103 manage service-associated information for every MBMS, and define the service-associated information managed for every MBMS as the MBMS context. In this case, there is a variety of information in the MBMS context, for example, name information, i.e., IDs, of UEs requesting the MBMS, information indicative of a service area where the UEs exist, and QoS information needed to provide the MBMS.

[0007] Basic information associated with the MBMS must be transmitted to UEs in order to provide the UEs with a prescribed MBMS. If the UEs, having received the basic information associated with the MBMS, wish to receive the prescribed MBMS, name information of the UEs must be transmitted to the network. Upon receipt of the name information of the UEs requesting the prescribed MBMS, the network must call or page the UEs and then establish a radio bearer used for providing the MBMS. If the radio bearer has been established with the UEs, the prescribed MBMS can be provided to the UEs via the setup radio bearer. However, if the MBMS is terminated, this MBMS termination state must be recognized by all the UEs, and all the UEs must release all resources having been allocated to implement the MBMS, such that a normal MBMS is made available.

[0008] In this case, a transmission scheme for transmitting the MBMS is determined to be either a PTP (Point to Point) scheme or a PTM (Point to Multipoint) scheme. The PTP scheme transmits MBMS data desired by individual UEs over a dedicated channel. The PTM scheme provides the same MBMS data to the UEs over a common channel.

[0009] A method for transmitting MBMS control information, i.e., information of a channel over which the MBMS data will be transmitted, to UEs requesting the MBMS is differently applied to a PTP-based MBMS and a PTM-based MBMS. [n this case, the channel information includes logical channel information, transport channel information, physical channel information, etc. More specifically, in providing the MBMS according to the PTP scheme, all the UEs to which the MBMS data will be transmitted receive the MBMS data over different channels. The RNC assigns a DCCH (Dedicated Control CHannel) to individual UEs, and transmits control information of a channel over which the MBMS data will be transmitted over the DCCH. Therefore, an RRC (Radio Resource Control) connection is required to transmit the MBMS control information over the DCCH.

[0010] Alternatively, in providing the MBMS data according to the PTM scheme, all the UEs to which the MBMS data will be transmitted receive the MBMS data using one or more channels in common. In the PTM scheme, there is no need to separately receive a variety of channel information associated with the MBMS. That is, the PTM scheme enables the UEs requesting the MBMS data to receive the MBMS channel information over a common control channel denoted as an MCCH (MBMS Control CHannel). In receiving the MBMS channel information over the MCCH, there is no need for the UEs to establish the RRC connection. That is, if the UEs can receive the MBMS channel information over the MCCH, system complexity is greatly reduced and wireless resources are effectively used.

[0011] Accordingly, a call control procedure for transmitting and receiving the MBMS control messages in the case of using a predetermined MBMS is needed. Additionally, there is a need for a call control procedure for transmitting MBMS data using the PTP and PTM schemes in consideration of the number of UEs requesting the MBMS.

SUMMARY OF THE INVENTION

[0012] Therefore, the present invention has been designed in view of the above and other problems, and it is an object of the present invention to provide a paging method for use in a mobile communication system providing an MBMS.

[0013] It is another object of the present invention to provide a paging method differently applied to transmission methods of a mobile communication system providing an MBMS.

[0014] It is yet another object of the present invention to provide a paging method differently applied to PTP-based or PTM-based MBMS schemes for use in a mobile communication system providing an MBMS.

[0015] In accordance with one aspect of the present invention, the above and other objects can be accomplished by a method for receiving control information of a specific broadcast service at UE(User Equipment) in a mobile communication system including at least one UE, a plurality of cells containing the at least one UE, and a RNC(Radio Network Controller) for managing at least one of the plurality of cells and providing other broadcast services via the plurality of cells, comprising the steps of: a) checking a paging indicator channels of the at least one UE, and determining whether a paging signal associated with the broadcast service ; b) if the paging signal associated with the broadcast service is detected, receiving the paging signal; c) identifying paging information including ID (MBMS Identifier) information allocated to differentiate between the specific broadcast service and the other broadcast services and a paging response indicator for determining a transmission channel scheme associated with the specific broadcast service; and

d) based on the paging response indicator, establishing a connection set-up between the at least one UE and the RNC.

[0016] In accordance with another aspect of the present invention, there is provided a mobile communication system including at least one UE (User Equipment), a plurality of cells containing the at least one UE, and a RNC(Radio Network Controller) for managing at least one cell and providing broadcast services via the plurality of cells comprising a method for transmitting control information of a predetermined broadcast service at RNC(Radio Network Controller), comprising the steps of: a) transmitting paging information over a paging signal including ID (MBMS Identifier) information for differentiating between the predetermined broadcast service and other broadcast services and a paging response indicator for determining a transmission channel associated with the predetermined broadcast service over a predetermined channel for indicating that the at least one UE has been paged; b) recognizing a number of the at least one UE included in the plurality of cells based on receiving a response message from the at least one UE according to the paging response indicator; and c) determining a transmission channel scheme associated with the predetermined broadcast service based on the number of the UEs in the cell; d) transmitting the predetermined broadcast service to the at least one UE according to the determined transmission channel scheme.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The above and other objects, features, and advantages of the present invention will be more clearly understood from the following detailed description taken

in conjunction with the accompanying drawings, in which:

Fig. 1 is a block diagram illustrating a network configuration for providing an MBMS in a mobile communication system;

Fig. 2 is a view illustrating an MBMS paging information configuration in accordance with a preferred embodiment of the present invention;

Fig. 3 is a conceptual diagram illustrating a channel signal transmission procedure when UE paging is performed in accordance with a preferred embodiment of the present invention;

Fig. 4 is a flow chart illustrating a UE operation procedure in accordance with a preferred embodiment of the present invention;

Fig. 5 is a conceptual diagram illustrating a channel signal transmission procedure when UE paging is performed in accordance with another preferred embodiment of the present invention; and

Fig. 6 is a flow chart illustrating a UE operation procedure in accordance with another preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] Preferred embodiments of the present invention will be described in detail herein below with reference to the annexed drawings. In the drawings, the same or similar elements are denoted by the same reference numerals even though they are used in different drawings. Additionally, in the following description of the present invention, a detailed description of known functions and configurations incorporated herein will be omitted when it may make the subject matter of the present invention rather unclear.

[0019] The present invention discloses a paging method for controlling a network such as a UTRAN (UMTS Terrestrial Radio Access Network) to minimize power consumption of a UE (User Equipment) in a mobile communication system providing an MBMS (Multimedia Broadcast/Multicast Service). It is assumed that predetermined UEs, i.e., UE#1~UE#k, requesting a predetermined MBMS are positioned in the same cell. It is also assumed that there is no limitation in the number of UEs that may be located within a cell. It is also assumed that all the UEs acquire a variety of information by receiving a BCH (Broadcast CHannel) for transmitting an SIB (System Information Block), for example, information of a PICH for transmitting a paging indicator of the predetermined MBMS, MBMS paging information, and information of an MCCH (MBMS Control CHannel) for transmitting control information of an MBMS transmission channel.

[0020] The UEs, having requested the predetermined MBMS, receive PICH data at a predetermined time using PICH information associated with the MBMS. Thereafter, the UEs check the PICH information associated with the MBMS, and determine whether there is a paging indicator associated with the requested MBMS. If it is determined that the paging indicator is detected, the UEs each receive a paging information check command via the channel information. A detailed description of the aforementioned operation will hereinafter be described with reference to Fig. 2.

[0021] Fig. 2 is a view illustrating an MBMS paging information configuration in accordance with a preferred embodiment of the present invention. Referring to Fig. 2, if the UEs having received the PICH information associated with the predetermined MBMS determine that a paging indicator exists, the UEs then check paging information of MBMS data transmitted over either a paging channel having MBMS paging information or a dedicated paging channel used for the MBMS. The MBMS paging information includes a TMGI (Temporary Multicast Group Identity) 250 and a paging response indicator 251. The TMGI 250 is a temporary ID (IDentifier) indicative of a corresponding MBMS, and its length may be determined to be a predetermined value. The paging response indicator 251 indicates an indicator associated with the MBMS paging response, and its length may be determined to be a predetermined value of more than 1 bit.

More specifically, it is determined whether each UE indicates a TMGI (Temporary Multicast Group Identity) associated with its desired MBMS, and it is also determined whether there is a need for each UE to answer an MBMS paging signal caused by the TMGI. When the UEs each check a response indicator associated with the MBMS paging signal and thereby determine the response indicator to be an ON state, the UEs transmit a paging response for the MBMS. Therefore, the UEs each request an MBMS paging response message.

[0022] For example, it is assumed that a first UE denoted by UE#1 (not shown) checks a TMGI of its desired MBMS. It is also assumed that a response to the MBMS paging request, having been transmitted over the UTRAN and CN, is required because a response indicator associated with an MBMS paging request is determined to be an ON state. Furthermore, it is also assumed that a second UE denoted by UE#2 (not shown) is in the same condition as the first UE UE#1. The first and second UEs UE#1 and UE#2 transmit the RRC connection request message to an RNC (Radio Network Controller) over the MBMS paging response procedure. Based on the number of UEs requesting the MBMS, the RNC (not shown), having received the MBMS paging response messages, determines whether the MBMS will be executed using the PTP scheme or the PTM scheme. More specifically, the RNC receives paging response messages from the UEs, and determines whether the MBMS is performed using the PTP or PTM scheme. In this case, the number of UEs is determined to be a predetermined value, determined by an experimental method, or may be determined to be different

values according to a variety of systems.

[0023] Prior to describing a first preferred embodiment of the present invention, it should be noted that the following description uses the MBMS paging information comprising the TMGI for indicating MBMS ID information of a predetermined MBMS and the paging response indicator as illustrated in Fig. 2. The MBMS paging information will be transmitted to corresponding UEs that have requested the MBMS over the MCCH.

[0024] Fig. 3 is a conceptual diagram illustrating a channel signal transmission procedure when UE paging is performed in accordance with a preferred embodiment of the present invention. Referring to Fig. 3, a method for transmitting the MBMS control information to a UE requesting a predetermined MBMS may be determined to be either a PICH reception process for the MBMS and a PCH confirmation process (i.e., an MBMS paging information confirmation process), or an MCCH confirmation process (i.e., an MBMS paging information confirmation process) and an MBMS control information reception process (i.e., a reception process over either an MCCH or a DCCH).

[0025] In this case, the RNC performs a time division process of the MBMS paging information on the same MCCH as in the MBMS control information matched with the MBMS paging information. Alternatively, the RNC may also transmit the MBMS paging information over different MCCHs. The RNC multiplexes two MCCHs using the same transport channel, and thereby simultaneously transmits the MBMS paging information over the two MCCHs, because the 3GPP specification supports IDs for identifying different MCCHs, i.e., logical channels, such that a specific UE receiving the MCCHs can also identify the MCCHs. In other words, the MBMS control information and the MBMS paging information are time-division-transmitted over the same MCCH, or are transmitted over different MCCHs, such that the UE receiving the aforementioned information can decrease complexity of its reception module.

[0026] The reference number 300 of Fig. 3 indicates a PICH transmission, a first UE UE#1 checks a PICH at a time 301, a second UE UE#2 checks the PICH at a time 302, and a UE UE#k checks the PICH at a time 303, such that it checks a paging indicator for indicating the presence of the requested MBMS paging information. The reference number 315 indicates the MBMS paging information, and is denoted by "MBMS paging information transmission on PCH" in Fig. 3. The first UE UE#1 receives the MBMS paging information over the PCCH at a time 311, the second UE UE#2 receives the MBMS paging information over the PCCH at a time 312, and a UE#k receives the MBMS paging information over the PCCH at a time 313. For example, UE#1 and UE#2 check the MBMS paging information, and assume that the MBMS paging response indicator is in an ON state , which indicates that the UEs must transmit a response. UE#k check the paging information at the time 313, and assume that the MBMS paging response indicator is in an OFF state. Therefore, the UE#1 and UE#2 transmit the MBMS paging response messages to the RNC, and the RNC, having received the MBMS paging response messages, determines whether the MBMS is carried out according to the PTP scheme or the PTM scheme.

[0027] The reference number 320 indicates a method for transmitting control information matched with the MBMS over the MCCH, which is denoted by "MBMS control information transmission" in Fig. 3. More specifically, reference number 320 indicates a specific case in which the MBMS matched with the MBMS control information is transmitted using the PTM scheme because the number of UEs that transmitted the MBMS paging response messages is higher than a predetermined reference value. In this case, reference number 323 indicates that the MBMS control information is equal to the other reference number 324.

[0028] Referring to Fig. 3, reference number 350 indicates a specific case where the MBMS control information is transmitted over a DCCH, reference number 353 indicates MBMS control information transmitted to UE#1, and reference number 354 indicates MBMS control information transmitted to the second UE#2The reference number 350 indicates a specific case in which the MBMS data is transmitted using the PTP scheme. DCCH information is transmitted over a FACH (Forward Access Channel) or DCH, because the RNC has determined that the number of UEs receiving the MBMS data is suitable for the PTP transmission scheme at a corresponding transmission time contained in the process 315. In this case, the MBMS control information is transmitted over the DCCH.

[0029] Additionally, Fig. 3 illustrates a specific case in which the MBMS paging information and the MBMS control information are transmitted over the same MCCH according to a time division scheme 330. More specifically, reference number 330 identifies a specific case in which the MBMS paging information is transmitted over the MCCH. The MBMS paging information and the MBMS control information are transmitted several times at different time intervals, and the MBMS paging information includes a TMGI and an MBMS paging response indicator. The MBMS control information includes a TMGI and information of a channel over which MBMS data matched with the MBMS control information is to be transmitted. The MBMS control information can be transmitted over the same MCCH, because the UTRAN and the CN attach IDs to individual information pieces and then transmit the information pieces having the IDs, thereby enabling the UE to identify the IDs. Individual contents of the IDs may be determined to be predetermined values, or may also be transmitted over an SIB (System Information Block) through which the MBMS information is transmitted. A time period of the MBMS paging information and a time period of the MBMS control information may use predetermined values, respectively, or may also be transmitted to the SIB used for the MBMS information transmission.

[0030] The reference number 331 indicates MBMS paging information to be received in UE#1. The MBMS paging information identified by 331 indicates an RRC message including a TMGI associated with the MBMS data requested by UE#1 and the MBMS paging response indicator. In this case, it is assumed that the MBMS paging response indicator is in an ON response state. The reference number 332 indicates MBMS paging information to be received in UE#2, and includes a TMGI associated with the MBMS and an MBMS paging response indicator in the same manner as in the aforementioned MBMS paging information. Therefore, UE#1 and UE#2 transmit the MBMS paging response messages to the RNC. The RNC, having received the MBMS paging response messages, determines whether the MBMS data will be transmitted using the PTP scheme or the PTM scheme.

[0031] Reference number 333 indicates MBMS paging information to be received in UE#k, and assumes that MBMS data requested by UE#k is to be transmitted using the PTM scheme at a specific time at which UE#k receives the MBMS paging information. Therefore, UE#k receives the MBMS paging information including both an ID of the MBMS requested by UE#k and an MBMS paging response indicator indicating that there is no need to answer the MBMS paging request.

[0032] Reference number 334 indicates a specific time at which information of a channel over which the MBMS data requested by the UEs of Fig. 3 is to be transmitted. In this case, MBMS control information is transmitted several times to enable all the UEs where the MBMS data is to be transmitted to receive the channel information. Reference number 336 has the same configuration and contents as in reference number 334.

[0033] The reference number 335 indicates MBMS paging information for UE#1, and its contents are the same as reference number 333.

[0034] Further, Fig. 3 illustrates a specific case in which the MBMS paging information and the MBMS control information are transmitted over the same transport channel whereas they are transmitted over different MCCHs. Information of the MCCHs can be transmitted over the FACH at reference number 340.

[0035] Reference number 341 indicates MBMS paging information to be received in UE#1. The MBMS paging information denoted by reference number 341 indicates an RRC message composed of an ID associated with MBMS data requested by UE#1 and an MBMS paging response indicator. In this case, it is assumed that the MBMS paging response indicator is in an ON response state.

[0036] Reference number 342 indicates MBMS paging information to be received in UE#2, and its configuration and contents are equal to those of the MBMS paging information of the reference number 341. MBMS transmission formats requested by UE#1 and UE#2 have not been determined yet at individual transmission times of the MBMS paging information 341 and 342, such that only the MBMS paging information is transmitted at the transmission times.

[0037] Reference number 343 indicates a specific case in which the MBMS paging information for UE#k and the MBMS control information are transmitted. Reference number 344 indicates a specific case in which the MBMS paging information and the MBMS control information are transmitted over the same transport channel whereas they are transmitted over different MCCHs. In this case, UE#k can receive the MBMS paging information and the MBMS control information at the same time. However, when using a plurality of MBMSs, the MBMS paging information may not be matched with the MBMS control information. In this case, the UE can determine whether a TMGI ID of the MBMS paging information is matched with that of the MBMS control information.

[0038] When the MBMS control information and the MBMS paging information are transmitted over different MCCHs even though they are not shown in Fig. 3, they can use different transport channels, and such different transport channel information can be transmitted over the same channel or different physical channels.

[0039] Fig. 4 is a flow chart illustrating a UE operation procedure in accordance with a preferred embodiment of the present invention. Referring to Fig. 4, the UE receives BCH information, and receives information of a channel for transmitting the MBMS control information, i.e., information of a channel over which the MBMS paging information is transmitted, a parameter associated with a reception interval of the MBMS control information, and other information associated with the remaining channels other than the above channel, such that the UE can recognize system information at step 401.

[0040] The UE checks whether there is an MBMS paging indicator transmitted via some part of the MBMS data of the PICH at step 402. If it is determined that the MBMS paging indicator is set to an ON value at step 402, i.e., if it is determined that there is an MBMS paging signal, the UE receives MCCH or PCH information having the MBMS paging information at step 403. However, if it is determined that the MBMS paging indicator is not set to the ON vale at step 402, the UE enters an idle state to reduce an amount of power consumption. A representative example for transmitting the MBMS paging information over the MCCH will hereinafter be described for illustrative purposes.

[0041] The UE receives the MCCH information, such that it can check the MBMS paging information composed of the TMGI value and the MBMS paging response indicator value at step 404. The MBMS paging information is time-division-processed with the MBMS control information so that it can be transmitted over a single MCCH, and can also be transmitted over different MCCHs in the same manner as illustrated in Fig. 3.

[0042] The UE determines whether the MBMS paging response indicator confirmed at step 404 is set to an ON value at step 405. If it is determined that the MBMS pag-

ing response indicator is set to the ON value at step 405, this means that the MBMS paging response is required, and the UE proceeds to step 406. However, if it is determined that the MBMS paging response indicator is not set to the ON value at step 405, the UE proceeds to step 420.

[0043] At step 406, the UE attempts to establish the RRC connection to receive the MBMS control information. More specifically, the UE performs a physical layer operation for acquiring an RACH usage qualification using a physical channel procedure prescribed in the 3GPP standard, such that it can transmit a control message to the RNC. If the UE acquires the RACH usage qualification at step 407, it transmits an RRC connection request message using the acquired RACH usage qualification at step 409.

[0044] Upon receiving the MBMS paging response messages from individual UEs, the RNC determines a transmission scheme of a channel capable of transmitting the MBMS control information according to the number of UEs having transmitted the response messages, and transmits the control information according to the determined scheme.

[0045] The UE determines whether the MBMS channel information is transmitted over the DCCH at step 410. In this case, because the UE receives the MBMS channel information over the DCCH, a channel for transmitting the channel information is determined by the PTP scheme because the number of UEs having attempted to establish the RRC connection is less than a predetermined threshold value. Therefore, the UE receives the MBMS channel information and the MBMS control information over the DCCH, and is ready to receive the MBMS data.

[0046] However, if it is determined that the UE does not receive the MBMS channel information over the DCCH at step 410, the UE determines whether it receives the MBMS control information over the MCCH adapted to receive the MBMS paging information at step 411. If the UE has received the MBMS channel information over the MCCH, it means that a channel for transmitting the channel information is determined by the PTM scheme because the number of UEs having attempted to establish the RRC connection of a corresponding cell is higher than the predetermined threshold value. In other words, the MBMS paging information and the MBMS control information are received over the MCCH.

[0047] If the UE does not receive its desired MBMS control information at step 411, it determines whether a reception time of the MBMS control information of the step 401 elapses at step 412. If the reception value for the MBMs control information does not elapse at step 412, the UE proceeds to step 413, and continues to receive the MCCH information on the basis of the information acquired at step 401. and the UE may perform step 411 several times.

[0048] If the reception time for the MBMS control information is longer than a predetermined reception time at step 412, the UE returns to step 402, such that it rechecks the MBMS paging indicator at step 402. In this case, the UE returns to step 402 in order to prevent battery charge from being excessively consumed on the assumption that the UE continues to receive the MCCH even though it cannot correctly receive the MBMS control information due to either a problem of radio channel environments or a timing problem. As a result, the UE can prevent the UE battery charge from being reduced and can also prevent unnecessary operations from being generated.

[0049] The reception time for the MBMS control information may also be determined to be a UE implementation value even though it is not illustrated in Fig. 4. If the UE fails to acquire the RACH usage qualification at step 407, it determines whether a current time reaches a specific time at which the MBMS paging response indicator must be checked at step 408. Provided that a transmission scheme of the MBMS data requested by the UE is determined to be the PTM scheme while the RRC continuously fails to establish the RRC connection trial at step 406, the UE is designed to continuously perform unnecessary trials, such that the operation of step 408 is required to solve such unnecessary trials of the UE. Therefore, if the UE determines that a current time reaches a specific time at which the UE must check the MBMS paging response indicator at step 408, it returns to step 405. Otherwise, if the UE determines that the current time does not reach the specific time at which the UE must check the MBMS paging response indicator at step 408, it returns to step 406. An interval value indicative of the checkup time of the MBMS paging response indicator may be determined to be a predetermined value, which may be transmitted by the SIB for transmitting MBMS system information to the BCH, by the RNC. Also, the interval value may also be implemented by the UE.

[0050] Fig. 5 is a conceptual diagram illustrating a channel signal transmission procedure when UE paging is performed in accordance with another preferred embodiment of the present invention. Referring to Fig. 5, a method for transmitting the MBMS control information to a UE requesting a predetermined MBMS may include a PICH reception process, a PCH confirmation process, i.e., an MBMS paging information confirmation process, and an MBMS control information reception process, i. e., a reception process over an MCCH or DCCH.

[0051] Reference number 500 indicates a PICH signal transmission procedure. Reference number 510 indicates an MBMS paging information transmission procedure using the PCH, and is denoted by "MBMS paging information transmission on PCH". Reference numbers 520 and 530 each transmit the MBMS control information transmission procedures, and are each denoted by "MBMS control information transmission".

[0052] Individual times 501~504 at which UEs UE#1~UE#N are indicated in the PICH transmission

procedure 500 indicate specific times at which the UEs UE#1~UE#N check an MBMS PI (Paging Indicator) to receive the MBMS data. In this case, the MBMS PI uses a specific part corresponding to a PICH's MBMS.

[0053] Reference number 510 indicates an MBMS paging information transmission procedure over a PCH, and is denoted by "MBMS paging information transmission PCH". The MBMS paging information includes a TMGI of a desired MBMS of UE#1~UE#N and an MBMS paging response indicator having a predetermined bit length. In this case, UE#1 receives the MBMS paging information transmitted over the PCCH at the time 511, UE#2 receives the MBMS paging information transmitted over the PCCH at the time 512, UE#k receives the MBMS paging information transmitted over the PCCH at the time 513, and UE#N receives the MBMS paging information transmitted over the PCCH at the time 514. In this case, UE#1 and UE#2 check the paging information, and assume that the MBMS paging response indicator requires a response message. In this case, the RNC for transmitting the MBMS paging information sets a transmission scheme of the MBMS matched with the MBMS paging information to the PTM scheme at individual times 513 and 514 indicative of MBMS paging information reception times of UE#k and UE#N, such that it is assumed that the MBMS paging response indicators of the UEs UE#k and UE#N are in an OFF state. Therefore, UE#k and UE#N recognize IDs of the MBMS matched with the MBMS paging information at the MBMS paging information reception time, and at the same time recognize a specific indicator indicating that there is no need to answer the MBMS paging information. UE#k and UE#N do not transmit a response message to the MBMS paging information according to the MBMS paging information response indicator, namely, they do not transmit the RRC connection request message. As a result, the number of unnecessary message transmissions is reduced.

[0054] Reference number 520 indicates a specific case in which control information matched with the MBMS is transmitted over the MCCH, and is denoted by "MBMS control information transmission". As illustrated in the MBMS control information transmission procedure 520, UE#k and UE#N and the remaining UEs UE#1 and UE#2 each transmitting a response message to the MBMS paging information can receive information of a channel over which the MBMS data requested by the UEs UE#1~UE#N is transmitted over the MCCH. The MBMS control information of step 523 is to the same as the MBMS control information of step 524, and the MBMS control information elements 523 and 524 are repeatedly transmitted to enable all the UEs requesting the MBMS matched with the MBMS control information to listen to the control information.

[0055] Reference number 530 indicates a specific case in which the control information matched with the MBMS is transmitted over the DCCH. The reference number 533 indicates MBMS control information transmitted to UE#1. The reference number 534 indicates MBMS control information transmitted to UE#2. In this case, UE#1 and UE#2, which have transmitted a response signal to the MBMS paging information, i.e., the RRC connection request message, at step 510, receive the MBMS control information over the DCCH according to the PTP scheme.

[0056] In other words, if the RNC determines a PTP transmission scheme, a corresponding UE receives MBMS channel information over the DCCH. If the RNC determines a PTM transmission scheme, a corresponding UE receives such MBMS channel information over the MCCH.

[0057] In this case, after UE#1 and UE#2 transmit the RRC connection messages, two methods may be used to determine whether the MBMS channel information requested by UEs UE#1 and UE#2 is received over the MCCH or DCCH.

[0058] In accordance with the first method, when there is no response to the RRC connection messages transferred from the UEs even though a predetermined period of time elapses, a corresponding UE receives BCH information to recognize the MCCH, and receives the MBMS channel information transmitted over the MCCH upon receiving information of a physical channel used for MCCH transmission.

[0059] In accordance with the second method, when the MBMS channel information using the DCCH is not received in the MBMS-associated information using the BCH during a predetermined period of time in association with UEs, having transmitted the MBMS paging response messages, a corresponding UE checks the MBMS paging information re-transmitted over the PCH. More specifically, the corresponding UE checks a paging response indicator of the PCH's MBMS paging information, and thereby acquires MBMS channel information upon receiving the MCCH channel information from the BCH.

[0060] The MBMS channel information is transmitted with the MBMS ID, i.e., a TMGI. Therefore, it is determined that the MBMS channel information is required by the UEs using the TMGI value.

Fig. 6 is a flow chart illustrating a UE operation procedure in accordance with another preferred embodiment of the present invention. Referring to Fig. 6, the UE receives BCH information, and recognizes a variety of information, for example, information of a channel used for transmitting the MBMS control information, PCH information, PICH information, and other system-associated information, at step 601. The UE receives the PICH information associated with the MBMS, and checks the MBMS paging indicator value at step 602.If the MBMS paging indicator is set to an ON state at step 602, i.e., if there is an MBMS paging reception command at step 602, the UE receives PCH information associated with the MBMS at step 603. However, if the MBMS paging indicator is set to an OFF state, the UE enters an idle state to reduce power consumption.

[0061] The UE receives the PCH information, and checks MBMS paging information transmitted over the PCH, i.e., the TMGI value and the MBMS paging response indicator value at step 604. If it is determined that the MBMS paging response indicator of step 604 is set to the ON state at step 605, i.e., if the MBMS paging response is required, the UE proceeds to step 606. However, if it is determined that the MBMS paging response indicator of step 604 is not set to the ON state at step 605, the UE proceeds to step 620.

[0062] When the UE proceeds to step 620, this indicates that the MBMS requested by the UE is transmitted using the PTM scheme. Therefore, upon receiving information of a physical channel, over which the MCCH information acquired from the step 601 will be transmitted, the UE receives information of an MCCH over which the requested MBMS control information is transmitted at step 620.

[0063] If the MBMS paging response indicator confirmed at step 605 is determined to be the ON state, the UE transmits a paging response message at step 606. More specifically, the UE controls the RNC to perform a physical layer operation for acquiring an RACH acquisition qualification (also called an RACH usage qualification) according to a predetermined physical channel procedure prescribed in the 3GPP standard. The UE, having successfully acquired the RACH usage qualification at step 607, transmits the RRC connection request message using the acquired RACH information at step 609. In this case, the RNC, having received the paging response messages from the UEs, determines whether the MBMS data will be transmitted using the PTP scheme or the PTM scheme, and transmits the MBMS control information over either the DCCH or the MCCH according to the determination result. The UE receives the MBMS control information over the DCCH or MCCH according to the determined MBMS transmission scheme determined by the RNC at step 610.

[0064] If the UE fails to acquire the RACH usage qualification at step 607, it determines whether a current time reaches a prescribed time at which the MBMS paging response indicator must be checked at step 608. Provided that a transmission scheme of the MBMS data requested by the UE is determined to be the PTM scheme while the RRC continuously fails to establish the RRC connection trial at step 606, the UE is designed to continuously perform unnecessary trials, such that the operation of step 608 is required to solve such unnecessary trials of the UE. Therefore, if the UE determines that a current time reaches a specific time at which the UE must check the MBMS paging response indicator at step 608, the returns to step 605, such that it re-checks the MBMS paging response indicator value from among a variety of received MBMS paging information of the PCH.

[0065] If the UE determines that the current time does not reach the specific time at which the UE must check the MBMS paging response indicator at step 608, it returns to step 606, such that it re-transmits the paging response message according to the MBMS paging response indicator having the ON-state value at step 606. In this case, an interval value indicative of the checkup time of the MBMS paging response indicator may be determined to be a predetermined value, which may be transmitted by the SIB for transmitting MBMS system information to the BCH, by the RNC. Also, the interval value may be implemented by the UE.

[0066] As is apparent from the above description, the present invention controls a base station controller to transmit MBMS paging information including an ID of an MBMS requested by a UE and a paging response indicator used to determine an MBMS transmission scheme, such that it can prevent unnecessary RRC connection messages from being transmitted to a destination. More specifically, the base station controller pre-transmits information indicative of the MBMS transmission scheme to the UE using the paging information, resulting in maximum use efficiency of RRC resources.

[0067] Although the preferred embodiments of the present invention have been disclosed for illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the present invention as disclosed in the accompanying claims.

Claims

1. A method for receiving control information of a specific broadcast service at UE(User Equipment) in a mobile communication system including at least one UE, a plurality of cells containing the at least one UE, and a RNC(Radio Network Controller) for managing at least one of the plurality of cells and providing other broadcast services via the plurality of cells, comprising the steps of:

   a) checking individual paging indicator channels of the at least one UE, and determining whether a paging signal associated with the broadcast service ;
   b) if the paging signal associated with the broadcast service is detected, receiving the paging signal;
   c) identifying paging information including ID (MBMS Identifier) information allocated to differentiate between the specific broadcast service and the other broadcast services and a paging response indicator for determining a transmission channel scheme associated with the specific broadcast service; and
   d) based on the paging response indicator, establishing a connection set-up between the at least one UE and the RNC.

2. The method as set forth in claim 1, wherein the at least one UE transmits a radio link control connection request message to the RNC when the paging response indicator associated with the broadcast service is set to an ON value.

3. The method as set forth in claim 1, wherein the RNC receives response messages from the at least one UE, depending on the paging response indicator, and establishes a DCCH (Dedicated Control Channel) connection mode when a number of that at least one UE that transmitted the response messages is less than a predetermined value.

4. The method as set forth in claim 1, wherein the RNC receives the response messages, and establishes an MCCH (Multimedia Broadcasting/Multicast Service (MBMS) Control CHannel) connection mode when a number of the at least one UE that transmitted the response messages is higher than a predetermined value.

5. A method for transmitting control information of a predetermined broadcast service at RNC(Radio Network Controller) in a mobile communication system including at least one UE (User Equipment), a plurality of cells containing the at least one UE, and the base station controller for managing at least one cell and providing broadcast services via the plurality of cells, comprising the steps of:

   a) transmitting paging information over a paging signal including ID (MBMS Identifier) information for differentiating between the predetermined broadcast service and other broadcast services and a paging response indicator for determining a transmission channel associated with the predetermined broadcast service over a predetermined channel for indicating that the at least one UE has been paged;
   b) recognizing a number of the at least one UE included in the plurality of cells based on receiving a response message from the at least one UE according to the paging response indicator; and
   c) determining a transmission channel scheme associated with the predetermined broadcast service based on the number of the UEs in the cell;
   d) transmitting the predetermined broadcast service to the at least one UE according to the determined transmission channel scheme.

6. The method as set forth in claim 5, wherein the UEs determine a radio link control connection request message to be a response message of the paging response indicator when the paging response indicator associated with the broadcast service is set to an ON value, and transmit the determined RRC message to the RNC.

7. The method as set forth in claim 5, wherein the RNC receives the response message from the at least one UE upon receiving the paging response indicator, and establishes a DCCH (Dedicated Control Channel) connection mode when a number of the at least one UE that transmitted the response messages is less than a predetermined value.

8. The method as set forth in claim 5, wherein the RNC receives the response messages, and establishes an MCCH (Multimedia Broadcasting/Multicast Service (MBMS) Control CHannel) connection mode when a number of the at least one UE that transmitted the response messages is higher than a predetermined value.

9. The method as set forth in claim 5, wherein the RNC time-division-processes the paging information associated with the predetermined broadcast service and the control information associated with the predetermined broadcast service, and transmits the time-division results to the at least one UE over an MCCH (Multimedia Broadcasting/Multicast Service (MBMS) Control CHannel).

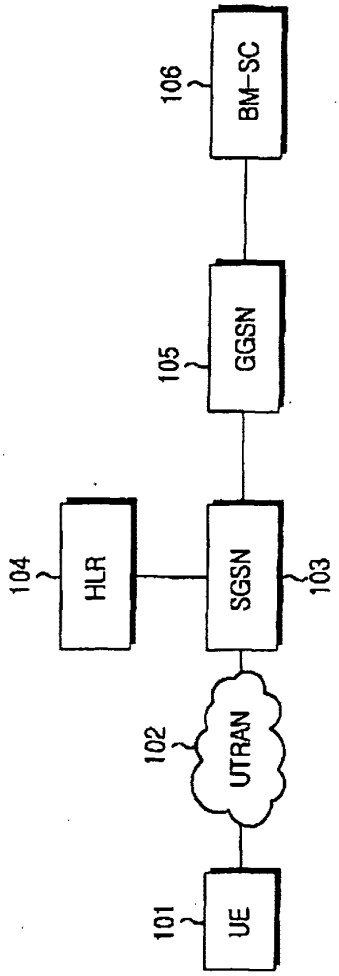

FIG. 1

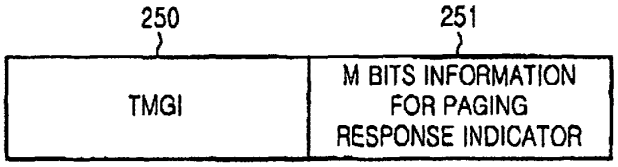
250
251
TMGI
M BITS INFORMATION
FOR PAGING
RESPONSE INDICATOR

FIG.2

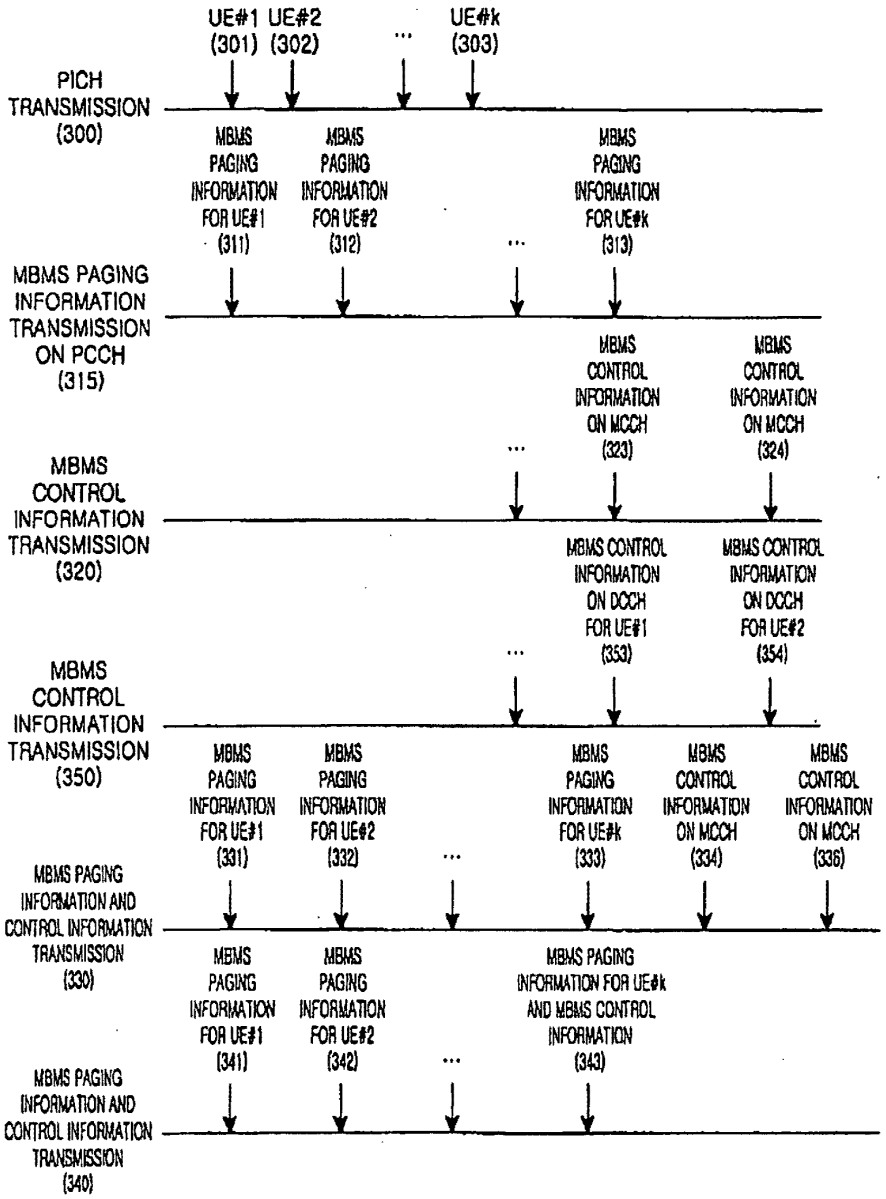
UE#1 (301)
UE#2 (302)
...
UE#k (303)
PICH TRANSMISSION (300)
MBMS PAGING INFORMATION FOR UE#1 (311)
MBMS PAGING INFORMATION FOR UE#2 (312)
...
MBMS PAGING INFORMATION FOR UE#k (313)
MBMS PAGING INFORMATION TRANSMISSION ON PCCH (315)
MBMS CONTROL INFORMATION ON MCCH (323)
MBMS CONTROL INFORMATION ON MCCH (324)
MBMS CONTROL INFORMATION TRANSMISSION (320)
MBMS CONTROL INFORMATION ON DCCH FOR UE#1 (353)
MBMS CONTROL INFORMATION ON DCCH FOR UE#2 (354)
MBMS CONTROL INFORMATION TRANSMISSION (350)
MBMS PAGING INFORMATION FOR UE#1 (331)
MBMS PAGING INFORMATION FOR UE#2 (332)
MBMS PAGING INFORMATION FOR UE#k (333)
MBMS CONTROL INFORMATION ON MCCH (334)
MBMS CONTROL INFORMATION ON MCCH (336)
MBMS PAGING INFORMATION AND CONTROL INFORMATION TRANSMISSION (330)
MBMS PAGING INFORMATION FOR UE#1 (341)
MBMS PAGING INFORMATION FOR UE#2 (342)
MBMS PAGING INFORMATION FOR UE#k AND MBMS CONTROL INFORMATION (343)
MBMS PAGING INFORMATION AND CONTROL INFORMATION TRANSMISSION (340)

FIG.3

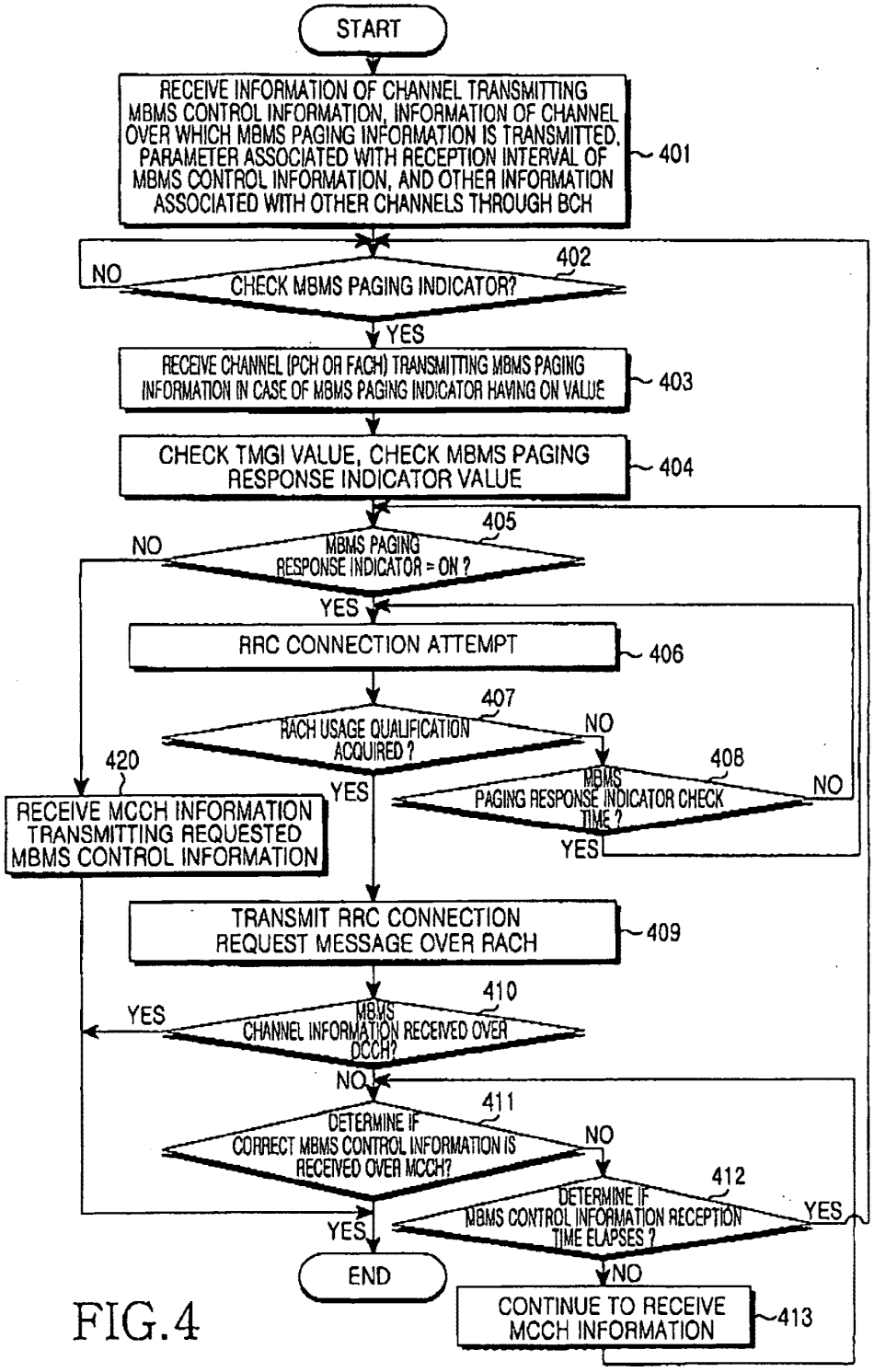
START
RECEIVE INFORMATION OF CHANNEL TRANSMITTING MBMS CONTROL INFORMATION, INFORMATION OF CHANNEL OVER WHICH MBMS PAGING INFORMATION IS TRANSMITTED, PARAMETER ASSOCIATED WITH RECEPTION INTERVAL OF MBMS CONTROL INFORMATION, AND OTHER INFORMATION ASSOCIATED WITH OTHER CHANNELS THROUGH BCH
401
402
CHECK MBMS PAGING INDICATOR?
NO
YES
RECEIVE CHANNEL (PCH OR FACH) TRANSMITTING MBMS PAGING INFORMATION IN CASE OF MBMS PAGING INDICATOR HAVING ON VALUE
403
CHECK TMGI VALUE, CHECK MBMS PAGING RESPONSE INDICATOR VALUE
404
405
MBMS PAGING RESPONSE INDICATOR = ON ?
NO
YES
RRC CONNECTION ATTEMPT
406
407
RACH USAGE QUALIFICATION ACQUIRED ?
NO
YES
408
MBMS PAGING RESPONSE INDICATOR CHECK TIME ?
NO
YES
420
RECEIVE MCCH INFORMATION TRANSMITTING REQUESTED MBMS CONTROL INFORMATION
TRANSMIT RRC CONNECTION REQUEST MESSAGE OVER RACH
409
410
MBMS CHANNEL INFORMATION RECEIVED OVER DCCH?
YES
NO
411
DETERMINE IF CORRECT MBMS CONTROL INFORMATION IS RECEIVED OVER MCCH?
NO
YES
412
DETERMINE IF MBMS CONTROL INFORMATION RECEPTION TIME ELAPSES ?
YES
NO
END
CONTINUE TO RECEIVE MCCH INFORMATION
413

FIG.4

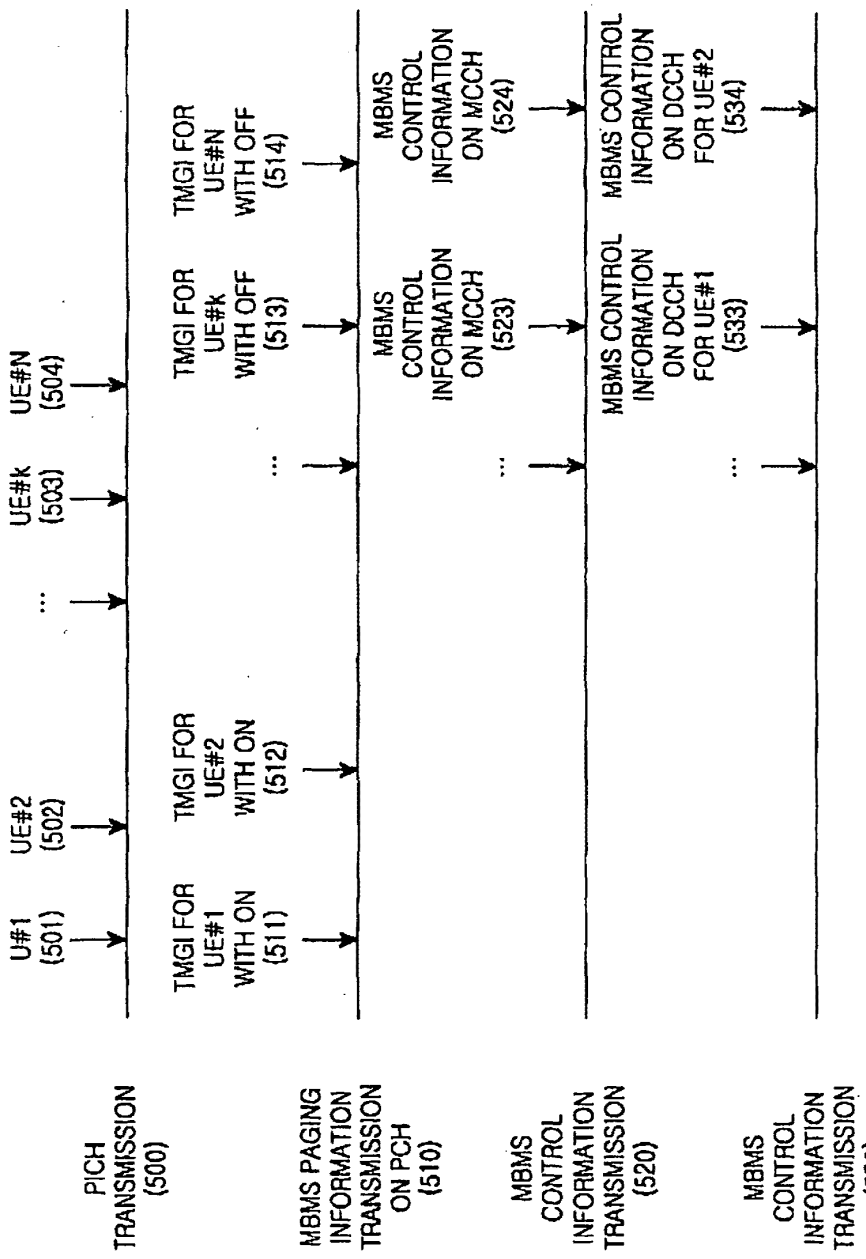
PICH TRANSMISSION (500)
U#1 (501)
UE#2 (502)
...
UE#k (503)
UE#N (504)
MBMS PAGING INFORMATION TRANSMISSION ON PCH (510)
TMGI FOR UE#1 WITH ON (511)
TMGI FOR UE#2 WITH ON (512)
...
TMGI FOR UE#k WITH OFF (513)
TMGI FOR UE#N WITH OFF (514)
MBMS CONTROL INFORMATION TRANSMISSION (520)
MBMS CONTROL INFORMATION ON MCCH (523)
MBMS CONTROL INFORMATION ON MCCH (524)
MBMS CONTROL INFORMATION TRANSMISSION (530)
MBMS CONTROL INFORMATION ON DCCH FOR UE#1 (533)
MBMS CONTROL INFORMATION ON DCCH FOR UE#2 (534)

FIG.5

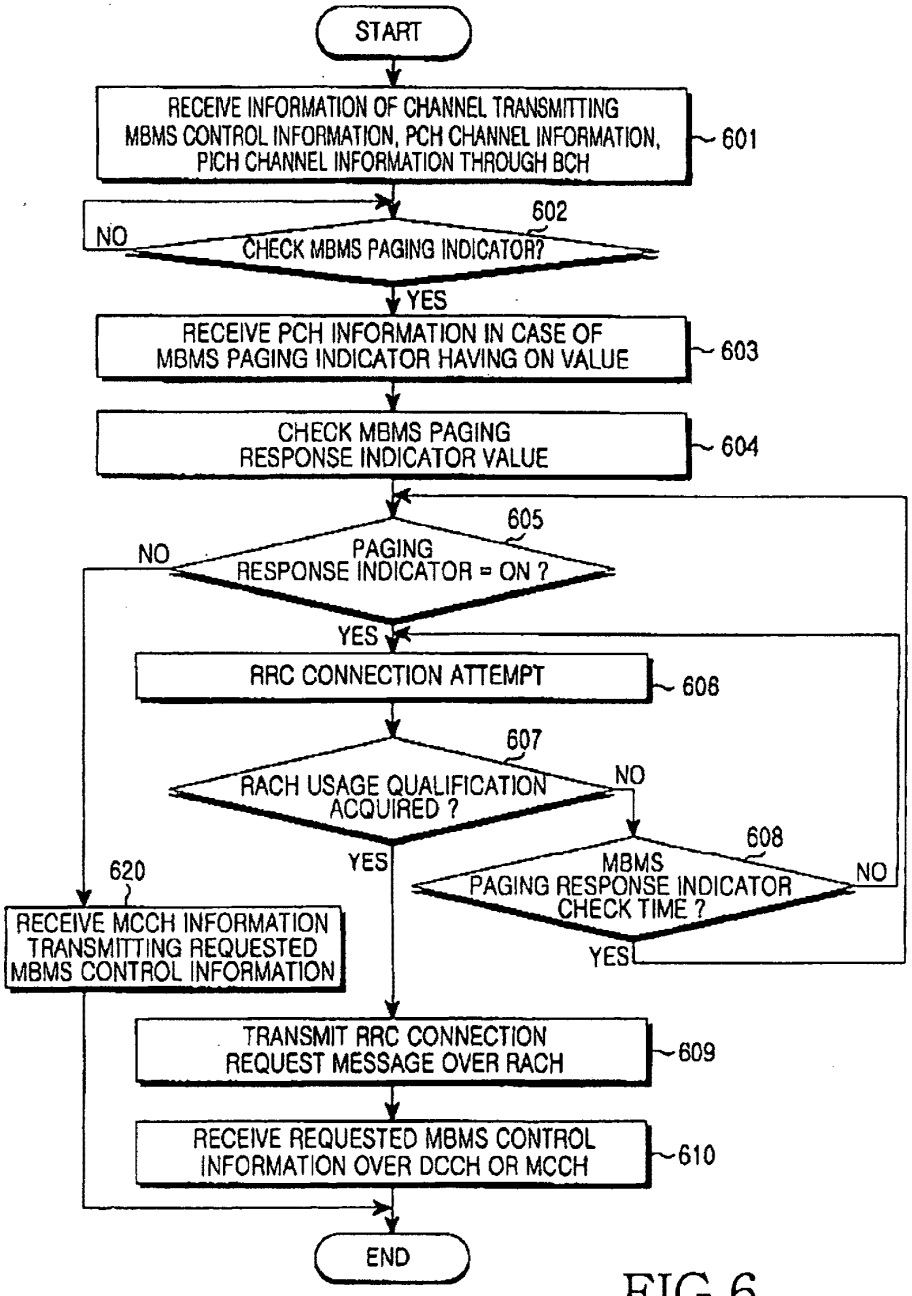
START
RECEIVE INFORMATION OF CHANNEL TRANSMITTING MBMS CONTROL INFORMATION, PCH CHANNEL INFORMATION, PICH CHANNEL INFORMATION THROUGH BCH
601
602
NO
CHECK MBMS PAGING INDICATOR?
YES
RECEIVE PCH INFORMATION IN CASE OF MBMS PAGING INDICATOR HAVING ON VALUE
603
CHECK MBMS PAGING RESPONSE INDICATOR VALUE
604
605
NO
PAGING RESPONSE INDICATOR = ON ?
YES
RRC CONNECTION ATTEMPT
606
607
RACH USAGE QUALIFICATION ACQUIRED ?
NO
YES
608
MBMS PAGING RESPONSE INDICATOR CHECK TIME ?
NO
YES
620
RECEIVE MCCH INFORMATION TRANSMITTING REQUESTED MBMS CONTROL INFORMATION
TRANSMIT RRC CONNECTION REQUEST MESSAGE OVER RACH
609
RECEIVE REQUESTED MBMS CONTROL INFORMATION OVER DCCH OR MCCH
610
END

FIG.6

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(71) Applicant: Siemens Mobile Communications S.p.A.
20126 Milano (IT)

(72) Inventors:
- Fumagalli, Sergio
20069 Vaprio D'Adda (IT)
- Morini, Massimilliano
27040 Castelleto (IT)

(54) Method to hold on a RCC connection inside a third generation Radio Access Network when the UE capability doesn't match with the DCH reconfiguration state

(57) A method is described to hold on RRC connections established between a Radio Network Controller (RNC) belonging to a third generation PLMN and some former *Type a* and *Type b* User Equipments (UEs) which do not support at least one Uplink/Downlink (UL/DL) downgraded bitrate among the ones normally triggered by the RNC during a reconfiguration of the Dedicated Channel (DCH) state. These former UEs are of the following types:

Type a : AMR + PS0/0kbps not supported and AMR + PS8/8kbps not supported;
Type b: AMR + PS0/0kbps supported and AMR + PS8/8kbps not supported.

These old *Type a* and *Type b* are detectable among the other UEs because of it is possible associate to each one of them a respective unique subset of radio access capability parameters with assigned values. The two unique subset are acting as characteristic signatures. During an initial step (F0) the two subset are stored by the network into the system configuration database. In order to avoid drop of a connection due to unacceptable DCH reconfiguration is triggered, the UTRAN reads (F4) the radio access capability parameter combinations and values contained in the *RRC CONNECTION SETUP COMPLETE* message from a connected UE under reconfiguration. Then it compares (F4) the readings with the two stored subset in order to detect the presence of *Type a* or *Type b* UE in case a stored subset is included in the read combinations and values. Once either *Type a* or *Type b* UE is detected, UTRAN inhibits (F5, F6) the triggering of a DCH state reconfiguration towards an UL/DL downgraded bitrate which is not supported by the detected type of former UE (fig.6).

RRC Connection hold on procedure during DCH reconfiguration

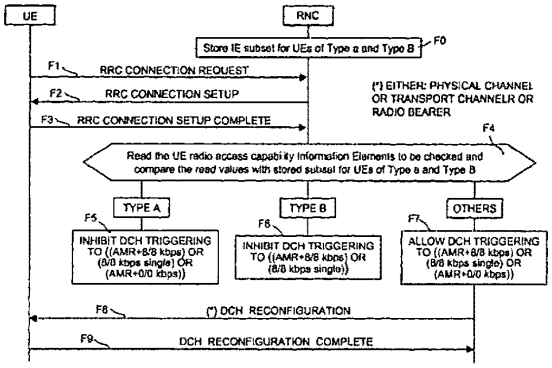

FIG. 6

EP 1 631 016 A1

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to the field of mobile radio communications networks and more precisely to a method to hold on a RRC (Radio Resource Control) connection inside a third generation PLMN (Public Land Mobile Network) when the UE (User Equipment) capability doesn't match with the DCH (Dedicated Channel) reconfiguration state. Without limitation, the invention is applicable in 3rd generation 3GPP (3rd Generation Partnership Project) PLMNs and in any UMTS (Universal Mobile Telecommunications System) networks with RRC protocol connections similar to the 3GPP standard ones. Depending on the adopted standard, either Frequency Division Duplexing (FDD) or Time Division Duplexing (TDD) are possible. Non-limiting 3GPP system suitable to accommodate the invention are for example the following:

- WCDMA (Wideband Code Division Multiple Access) UTRA-FDD (Universal Terrestrial Radio Access) 3.84 Mcps (Mega chips);
- 3GPP UTRA-TDD 3.84 Mcps;
- 3GPP UTRA-TDD 1.28 Mcps; and
- TD-SCDMA (Time Division - Synchronous CDMA) 1.28 Mcps standardised by CWTS committee (Chinese Wireless Telecommunication Standards).

BACKGROUND TO THE INVENTION

[0002] 3GPP group issued a complete set of continuously updated Technical Specifications (TS) for the standardisation of the UMTS network. With particular reference to the present invention the following two are pointed out:

- **TS 25.331** V3.a.0 (Release 1999) titled: "Radio Resource Control (RRC) Protocol Specification"; and
- **TS 25.926** V3.2.0 (Release 1999) titled: "UE Radio Access Capabilities".

[0003] **Figures 1a, 1b,** and **1c** show as many simplified message sequence charts in accordance with **TS 25.331** which allow to introduce the technical problem arising with the prior art. **Fig.1a** (see fig.8.1.3-1) represents a RRC Connection Establishment procedure in the specific case of acceptance of the RRC connection by the network. With reference to **fig.1a** and section 8.1.3 titled "Initiation", the UE shall initiate the procedure when upper layers in the UE request the establishment of a signalling connection and the UE is in idle mode (no RRC connection exists). Upon initiation of the procedure, the UE shall performs some operations specified in the paragraph 8.1.3.2, then it sends a *RRC CONNECTION REQUEST* message to the UTRAN. The message content includes the initialisation value of the following variable: *ESTABLISHMENT_CAUSE, INITIAL_UE_IDENTITY, PROTOCOL_ERROR _INDICATOR.* Upon receiving the RRC *CONNECTION REQUEST* message, UTRAN accepts the request and sends to the UE an *RRC CONNECTION SETUP* message including a predefined or default radio configuration or alternatively the complete set of RB (Radio Bearer), TrCH (Transparent Channel), and PhyCH (Physical Channel) information elements to be used. Upon reception of the *RRC CONNECTION SETUP* message, the UE shall performs the operations listed in the paragraph 8.1.3.6, then it sends an *RRC CONNECTION SETUP COMPLETE* message to the UTRAN including the information mentioned in the paragraph 8.1.3.6. Among other things the UE shall:

- retrieve its UTRA UE radio access capability information elements from variable UE_CAPABILITY_REQUESTED; and then
- include this in IE (Information Element) "UE radio access capability" and IE "UE radio access capability extension", provided this IE is included in variable UE_CAPABILITY_REQUESTED;
- retrieve its inter-RAT-specific UE radio access capability information elements from variable UE_CAPABILITY_REQUESTED; and then
- include this in IE "UE system specific capability".

[0004] Concerned to the UE radio access capabilities and their usage, **TS 25.926** includes some interesting resuming tables. The following tables are provided:

- Table 5.2.1.1: UE radio access capability parameter combinations, parameters common for UL (Uplink) and DL (Downlink).
- Table 5.2.2.1: UE radio access capability parameter combinations, DL parameters.
- Table 5.2.3.1: UE radio access capability parameter combinations, UL parameters.

- Table 6.1: Reference RABs.
- Table 6.2: Example mappings between capability combinations and RAB combinations.

In all the above Tables the UE Radio Access capability parameters are grouped for classes of the UE bitrate; the following classes are foreseen: 32, 64, 128, 384, 768, and 2048 kbps. The main exemplary capability parameters in Table 5.2.1.1 are: PDCP (Packet Data Convergence Protocol) parameters; RLC (Radio Link Control) parameters (e.g.: Total RLC AM buffer size (kBytes) and Maximum number of AM (Acknowledge Mode) entities; Multi-mode related parameters (e.g.: Support of UTRA FDD/TDD); Multi-RAT (Radio Access Technology) related parameters (e.g.: Support of GSM, Support of multicarrier); Location Services (LCS) related parameters (e.g.: Standalone location method(s) supported); RF parameters for FDD (e.g.: UE power class, Tx/Rx frequency separation); RF parameters for TDD (e.g.. Radio frequency bands, Chip rate capability, UE power class). The main exemplary capability parameters in Table 5.2.2.1 and 5.2.3.1 are: RLC channel parameters, Physical channel parameters (FDD), and Physical channel parameters (TDD). The RAB characteristics and mapping to DCH in Table 6.1 are grouped from letter A to G by the following Quality of Service (QoS) classes: Conversational speech, Streaming max. 57.6 kbps, Interactive/Background max. 32 to 2048 kbps.

[0005] Once the RRC connection is established as said for the interaction scheme of **fig.1a**, due to various causes, the need could arise to change one or more parameters specified for one or more original connections. For example, in order to satisfy incoming requests of resources by the UEs during peaks of data traffic, the UTRAN might downgrade the quality of some connections. The same behaviour might be enforced by UTRAN in order to increase the probability of accepting a call assignment request by the UE. Downgrade the quality is performed by reconfiguring the connection towards lower bitrates. For this aim UTRAN may initially reconfigure the DCH state to a bitrate of 8 kbps both in uplink an downlink channel, then the bitrate may be zeroed but the resources kept reserved for a given time. Operatively, the Radio Network Controller (RNC) triggers the reconfiguration to DCH state at 8/8 kbps and to DCH state at 0/0 kbps, with all mobiles types; as a matter of fact, in that case, RNC does not take into account information about UE capabilities. In this situation the mobile not able to manage the DCH state at 8/8 kbps and the DCH state at 0/0 kbps will drop the connection. On the other hand the UE is not tied by 3GPP specifications to comply with 8/8 kbps and 0/0 kbps because said specifications only declare the maximum bitrate the UE shall comply with. Presently some former UEs exist which don't bear those downgraded DCH states. These special UEs certainly comply with one or more of the standardized maximum bitrates grouped as previously said, so that they enter the initial RRC connected mode, but in case of successive reconfiguration towards said downgraded DCH states the connection is dropped. The drawback is further complicated by the fact that at the present state of 3GPP specifications the minimum bitrates are not mandatory, as instead the highest ones, and those special UEs are not immediately detectable by means of specifically related Identifiers.

[0006] **Fig.1b** and **1c**, show the Physical channel reconfiguration procedure in either normal flow or failure case. Other than Physical channel, the reconfiguration procedure may concerns Transport Channel or Radio Bearer, indifferently. For the aim of the invention all the reconfiguration opportunities are referred to DCH (Dedicated Channel), remembering that DCCH (Dedicated Control Channel) and, if configured, DTCH (Dedicated Traffic Channel) are available in the CELL_DCH state. Besides, the UE and UTRAN shall select the signalling radio bearers for RRC messages using RLC-TM (Transparent Mode), RLC-UM (Unacknowledged Mode) or RLC-AM (Acknowledged Mode) on the DCCH and CCCH (Common Control Channel) available in the CELL_DCH state.

[0007] With reference to **fig.1b** (see TS 25.331: figure 8.2.2.-9) the simplified message sequence chart is started by a *PHYSICAL CHANNEL RECONFIGURATION* message directed from UTRAN to the UE. This message is used by UTRAN to assign, replace or release a set of physical channels used by an UE. According to paragraph 10.2.22, the content of this message includes the new Information Elements the UE shall agree with. In particular, a reconfiguration towards downgraded AMR (Adaptive MultiRate) of 8/8 kbps and 0/0 kbps are set up. When the physical channel reconfiguration has been done the UE sends to the UTRAN the message *PHYSICAL CHANNEL RECONFIGURATION COMPLETE* according to paragraph 10.2.23. The good end of the reconfiguration procedure clearly means that the involved UEs are able to manage the DCH AMR state at 8/8 kbps and 0/0 kbps.

[0008] With reference to **fig.1c** (see TS 25.331: figure 8.2.2.-10) the simplified message sequence chart is started as in the preceding figure and the *PHYSICAL CHANNEL RECONFIGURATION* message content is set in the same manner. Contrarily to the case of the preceding figure, in this case some old UEs are present in RRC connected mode inside the Service Area which don't bear one or both the downgraded DCH states. These special UEs are of the following types:

Type a: AMR + PS0/0kbps not supported and AMR + PS8/8kbps not supported;
Type b: AMR + PS0/0kbps supported and AMR + PS8/8kbps not supported.

[0009] Sign "+" means that the UE is delivering a double service, namely: normal Adaptive Multirate Voice call service contemporarily to a packet service; for example, for Web browsing during voice call (opportunity offered by the only UMTS technology). PS8/8kbps means that the Packet Service is delivered at 8 kbps in UL/DL. PS0/0kbps means that

the resources for Packet Service are still set up before a given time is elapsed but no data transfer is accepted.

[0010] Because of in the case of **fig.1c** the configuration given by UTRAN is unacceptable, these special UEs send back a *PHYSICAL CHANNEL RECONFIGURATION FAILURE* message whose content is set according to paragraph 10.2.24. Due to reconfiguration failure said UEs will drop the respective connections. In such a case just the opposite result with respect to the original aim of extending the probability of accepting new call assignment requests is obtained.

OBJECT OF THE INVENTION

[0011] The main object of the present invention is that to overcome the drawbacks of the prior art and indicate a method able to hold on a RRC connection inside a third generation PLMN when the UE capability doesn't match with the DCH reconfiguration state.

SUMMARY AND ADVANTAGES OF THE INVENTION

[0012] The invention achieves said object by providing a method to hold on an RRC connection inside a third generation PLMN, as disclosed in the claims.

[0013] According to the method of the invention, the inventors have realized that some former UEs catalogued as Type a and Type b in the introductory part are detectable among the other UEs by the examination of the UE radio access capability parameter combinations included in the content of the *RRC CONNECTION SETUP COMPLETE* message from the UE. The checked parameters concern: RLC capability, Transport channel capability, and Physical channel capability. The two subset of UE radio access capability Information Elements characteristic of Type a and Type b UEs, are similar to signatures among all the foreseeable IE combinations and values. All UEs except for Type a and Type b shall have radio access capability IE combinations and values different from the two signatures.

[0014] Operatively, UTRAN stores the two IE signatures relevant to Type a and Type UEs in the system configuration database. UTRAN, before downgrading the DCH state, compares the UE radio access capability parameter combinations included in the content of the *RRC CONNECTION SETUP COMPLETE* message from the UE with the stored IE signatures. Whether a coincidence is detected, UTRAN does not allocate the downgraded DCH state relevant to the detected signature. In this situation the UE not able to manage the downgraded DCH state at 8/8 kbps (either for single data service or plus AMR voice call) or the preceding downgraded state plus DCH state at 0/0 kbps, will not drop the connection. Whether a coincidence is not detected UTRAN freely allocates the downgraded DCH states.

[0015] The advantage of the invention is to make UTRAN aware on the existence of said former types of UEs, so as to regulate its behaviour in order to avoid drops of the RRC connections during the attempt to face traffic peaks or increase the probability of accepting a call assignment request. The method of the invention is completely transparent to the UEs so that their firmware is unchanged.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The features of the present invention which are considered to be novel are set forth with particularity in the appended claims. The invention and its advantages may be understood with reference to the following detailed description of an embodiment thereof taken in conjunction with the accompanying drawings given for purely non-limiting explanatory purposes and wherein:

- **figures 1a, 1b**, and **1c** shows three simplified message sequence charts relevant to RRC connection/reconfiguration in accordance with **TS 25.331;**
- **fig.2** shows an example of UMTS network Service Area;
- **fig.3** shows a functional block representation of the UMTS system;
- **fig.4** shows the general protocol model of UTRAN specification;
- **fig.5** shows the Radio Interface protocol model of UTRAN specification;
- **fig.6** shows a hybrid representation (message sequence charts including a flow chart) of the method according to the present invention.

DETAILED DESCRIPTION OF AN EMBODIMENT OF THE INVENTION

[0017] With reference to **fig.2** we see a partial UMTS network deployed on a territory subdivided into contiguous service cells, each corresponding to the radio coverage area of a fixed base station, conventionally named Node B, placed at the centre or in corner position. Each Node B is connected via radio with a plurality of UEs. A cluster of contiguous fixed base stations is physically connected to a RNC, in its turn connected to the Core Network CN. The latter is schematically represented by a block SGSN / MSC (Serving GPRS Support Node / Message Switching Centre)

for indicating either packet switching or circuit switching capability. The Core Network CN is shared between UMTS and the existing GSM (Global System for Mobile communications). The following interfaces are defined: Iu interface between the core network and RNCs; Iub interface between RNC and controlled Nodes B; and Uu on-air interface between Node B and the UEs in the covered cell. The UMTS network is subdivided into contiguous service areas, each including several cells. Mobile terminals in idle state are traceable into a service area by paging messages broadcast from the bases stations.

[0018] With reference to **fig.3**, the UMTS system includes the Core Network CN, (see TS 23.002) connected to the mobile UEs through the interposed UTRAN (see TS 25.401). UTRAN includes a plurality of Node B blocks and the respective RNC controllers, and all the involved interfaces. Each UE includes a Mobile Equipment (ME) with a respective USIM card (UMTS Subscriber Identity Module). Inside the UTRAN the upper RNC is a SRNC (Serving RNC) connected to the Core Network CN by means of a first Iu(CS) Circuits Switched (CS) interface and a second Iu(PS) Packet Switched (PS) interface. The RNC placed below is a DRNC (Drift RNC) connected to the SRNC by means of an internal Iur interface. Each RNC controlling cells is named CRNC and is interfaced to the other type of RNCs through the Iur interface. The UTRAN and the served UEs constitute a Radio Network Subsystem (RNS) disclosed in TS 23.110. The core network CN includes a CIRCUIT SWITCHED part and a PACKET SWITCHED part. The first one is connected to the PSTN (Public Switched Telephone Network) while the second one is connected to the IP (Internet Protocol) network. The circuit switched part includes the MSC / VLR (Visitor Location Register) network elements which together allow wandering of users inside the territory covered by the network. The packet switched part includes two network elements known as SGSN (Serving GPRS Support Node) and GGSN (Gateway GPRS Support Node). The first one is interfaced to the MSC / VLR and to the HLR (Home Location Register) to catch location information of the UEs in the packet switched domain. The SRNC is interfaced to the MSC/VLR block through the Iu(CS) interface and to the SGSN node through the Iu(PS) interface. The SGSN node is further interfaced to the GGSN node through the Gn interface. The GGSN node is further interfaced to the IP network through the Gi interface.

[0019] As the operation is concerned, on the Uu radio interface the transmissions are based on the CDMA technique. The CDMA technique implies that multiple signals can be transmitted in the same time interval and in the same frequency band, but separated in the code domain. Depending on the adopted standard, the CDMA transmissions can be further based on TDMA (Time Division Multiple Access) technique. The TDMA technique implies that each frame is subdivided in a fixed number of timeslots, each of them conveys one or more CDMA bursts, and different timeslots of the frame can be assigned to different users or alternatively to pilots or signalling channels.

[0020] **Fig.4** shows diagrammatically the general protocol architecture of the signalling used in the UMTS network. For this aim the network is subdivided into the UE, UTRAN and CN parts delimited by the Uu and Iu interfaces (but also Iur and Iub). An Access Stratum with a superimposed Non-Access Stratum (NAS) are lie down on the depicted architecture. The Access Stratum includes the Iur / Iub protocols defined in TS 25.42x / TS 25.43x, the Iu protocols defined in TS 25.41x, and the Radio protocols defined in TS 25.2xx and 25.3xx. User data and control information are exchanged between the CN and the UEs using the Radio protocols and the Iu protocols of the Access Stratum. These protocols contain mechanisms for transfer NAS message transparently, i.e. the so-called Direct Transfer (DT) procedures. The NAS stratum includes higher levels protocols to handle control aspects, such as: Connection Management (CM), Mobility Management (MM), GPRS Mobility Management (GMM), Session Management (SM), Short Message Service (SMS), etc.

[0021] **Fig.5** shows the general architecture of the Radio Interface Protocols according to TS 25.301. With reference to **fig.5**, starting from the bottom of the protocol stack we see the following superimposed layers: Physical Layer (Level 1), MAC (Medium Access Control at Level 2), and RLC (Level 2) entering both the Control Plane and User Plane. Superimposed to the RLC layer, the Control Plane includes the RRC protocol al Level 3, while the User Plane includes PDCP (Packet Data Convergence Protocol) and BMC (Broadcast / Multicast Control) protocols both at Level 2. Some control lines depart from RRC block to reach all the existing blocks. Two-way transport Channels exist between Physical Layer and MAC layer. Two-way Logical Channels exist between MAC and RLC layers. Other logical channels exist between RRC, PDCP, BMC and the RLC layer.

[0022] The Physical Layer of Um interface is described in the TS 25.2xx series. The UTRA FDD and TDD modes could be used for physical transmission. The Physical layer offers information transfer to MAC and higher sub-layers via Transport Channels mapped on Physical Channels characterised by frequency and code in the UTRAN FDD mode and by frequency, code, and timeslot in the UTRAN TDD mode. Main Transport Channels are: Random Access Channel (RACH), Forward Access Channel (FACH), Broadcast Channel (BCH), Paging Channel (PCH), Dedicated Cannel (DCH). Other important Layer 1 functions are: Encoding / De-coding, Interleaving / De-interleaving, Forward Error Correction (FEC), Rate matching, Spreading / De-spreading, QPSK Modulation / De-modulation, RF processing, Closed Loop Power Control, Error Detection, Measurement of power and quality parameters of the reception signal, etc.

[0023] The MAC protocol is described in TS 25.321. It is responsible for e.g.: mapping of Logical Channel to Transport Channel and vice versa; switching between Common and Dedicated Transport Channel on RRC (Radio Resource Control) decision; selection of Transport Format for each Transport Channel; ciphering of RT data; UE identification on Common Transport Channels, etc.

[0024] The RLC protocol is described in TS 25.322. It is responsible for e.g.: Segmentation / Re-Assembly the higher layer PDUs (Protocol Data Unit) into/from smaller RLC Payload Units (PU); transfer of user data in Acknowledged / Unacknowledged mode; Flow Control to provide different Quality of Service (QoS) levels; Backward Error Correction (BEC) for NRT data; Ciphering for RT data, etc.

[0025] The PDCP protocol is described in TS 25.323. It is used only in the User Plane for Packet Switched (PS) domain services. The central PDCP function is (de-) compression of redundant network PDU control information. This may include TCP/IP header (de-) compression.

[0026] The BMC protocol is described in TS 25.324. It is existing only in the User Plane for e.g.: providing broadcast or multicast transmission service on the radio interface for common user data in transparent or unacknowledged mode; storage and scheduling of BMC messages such as SMS messages for transmission to the UEs.

[0027] The RRC is described in **TS 25.331.** The exchange of control data between the UE and UTRAN is handled via RRC. Important RRC functions are:

- Broadcasting of NAS System Information (SI) provided by the Core Network as well as cell specific AS system information. The information are normally repeated on a regular basis. RRC is responsible for scheduling, segmentation and repetition of the information.
- Paging & Notification. RRC is responsible to page or notify certain UEs.
- Handling of Radio Bearer. RRC layer is able to establish, reconfigure and release Radio Bearer in the User Plane.
- Handling of Radio Resources. RRC handles the assignment, reconfiguration and release of radio resources (e.g.: Codes, CPCH (Common Packet Channel)) channels needed for the RRC connection.
- RRC Connection Mobility functions. This function is used to keep track of the location while the UE is connected with UTRAN. It performs the evaluation, decision and execution of Hard and Soft handovers, performs Cell URA (User Registration Area) update, and any more.
- UE measurement reporting & control. RRC controls the UE measurement, i.e. what to measure, when to measure and when to report. It performs also the reporting of the measurements from the UE to the S-RNC.
- Quality of Service control, to ensure that the requested QoS for the Radio Bearers can be met.
- Outer Loop Power Control, i.e. to control the setting of the Closed Loop Power Control target.
- Control of Ciphering, to provide procedures for setting of ciphering between the UE and the S-RNC.

[0028] Two basic modes of RRC connectivity are existing: "RRC Idle" and "RRC Connected". In the RRC Idle mode no UE location information are stored in UTRAN (UE identified by NAS identifier, e.g.: IMSI, TMSI, P-TMSI). No exchange of signalling information is possible because an RRC connection shall be established before. Exit the RRC Idle mode can only be initiated by the UE with a request for an RRC connection. The transition can be triggered by the network with a paging message.

[0029] In the RRC connected mode UTRAN stores UE location information and assigns an RNTI (Radio Network Temporary Identity) to the UE. A signalling connection between the UE and UTRAN exists. Four different States exist in the RRC Connected mode:

- Cell_DCH: a DCH is allocated to the UE and the UE location is known in the S-RNC on cell of active level. Handovers are used to track the movement of the UE. The S-RNC can decide to change from Cell_DCH to Cell_FACH state due to low activity.
- Cell_FACH: no dedicated resources are allocated to the UE. Common channel (FACH, RACH, CPCH) are used for transmitting signalling messages and small amounts of user data. The UE location is known at cell level. If there is higher load, a transition to Cell_DCH is performed. If there is no activity, a transit to Cell_PCH (Paging Channel) is possible.
- Cell_PCH: the UE is still known at cell level. Cell Updates are performed but the UEs can only be reached via Paging. Discontinuous Reception (DRX) is activated.
- URA_PCH: the UE is known at URA level. Only URA updates are performed to reduce the Uu signalling load.

[0030] Now some RRC Control Plane procedures are summarized. The exemplary procedures are: RRC Connection

Setup, RRC Connection Release, and Paging, remembering that the Physical Channel Reconfiguration procedure for either normal flow or failure have been already described with reference to **fig.1b** and **fig.1c.** The description of the RRC Connection Setup (Establishment) procedure integrates the arguments introduced with reference to **fig.1a.**

[0031] RRC Connection Setup: an RRC Connection is necessary for the exchange of signalling information between the UE and RNC. It is always requested by the UE with an *RRC Connection Request* message on the RACH channel. This message directly includes a unique UE identity and the Establishment Cause (e.g.: Originating Call, Terminating Call, Emergency Call, Detach, SMS). The RNC allocates either Dedicated or Common Channel (DCH or CCH) resources to the UE with the *RRC Connection Setup* message on a FACH channel. So the UE turns over to the CELL_DCH or CELL_FACH state. The UE request can be rejected using the *RRC Connection Reject* message. The UE may be directed to another UTRA carrier or system. In case of receiving the RRC *Connection Setup* message the UE acknowledges with an *RRC Connection Setup Complete* message.

[0032] RRC Connection Release: the UE RRC Connection, including the signalling link and all radio bearers, is released with the *RRC Connection Release* message from the RNC. It is acknowledged by the UE with *RRC Connection Release Complete.* The UE turns back from Cell_DCH or Cell_FACH state to the RRC Idle Mode.

[0033] Paging is an RRC message transmitted from RNC to the selected UEs in a cell for the following reasons:

- The UE is in RRC Idle Mode and there is a Mobile Terminating Call (MTC) or Session Setup for the UE. The Core Network requests the RNC to page the UE.
- The UE is in RRC Connected Mode Cell_PCH or URA_PCH Mode. For e.g. DL packet data transmission it should change to Cell_FACH Mode.
- System information have been updated. The RNC sends a paging message to all the UEs in the cell with the new information.

[0034] The RRC block of **fig.5** at the RNC side is specialized to carry out the RRC connection hold on procedure of the present invention represented in **fig.6**. With reference to **fig.6**, the procedure is developed by means of exchanging signalling messages between UEs and the RNC inside the UTRAN. The procedure begins with step **F0** executed during an UTRAN initialization phase. During step **F0** the RNC stores in the system database two subset of Radio Access Capability Information Elements concerning: RLC capability, Transport channel capability, and Physical channel capability which are needed to discriminate UEs of *Type a* and *Type b* among other UEs. With reference to **TS 25.331** (10.3.3.42) the following subset is stored for *Type a* UEs characterized by *AMR + 0/0kbps not supported and AMR + 8/8kbps not supported*:

Capability Group Name	Information Element (IE)	IE value
RLC Capability (10.3.3.34)	Total_RLC_AM_Buffer_Size	10 kBytes
Transport Channel Capability (10.3.3.40)	UL_Transport_CH_Capability / Turbo_(De-) coding_Supported	2560 bits
Physical Channel Capability (10.3.3.25)	UL_Phys_CH_Capability / Support_of_PCPCH (Physical Common Packet Channel)	TRUE (boolean)

IE value	Semantics description
Total_RLC_AM_Buffer_Size (10.3.3.34)	Total receiving and transmitting RLC Acknowledge Mode buffer and MAC reordering buffer capability in kBytes.
UL_Transport_CH_Capability / Turbo_(De-) coding_Supported	Maximum sum of number of bits of all turbo coded transport blocks transmitted uplink at an arbitrary time instant.

Turbo codes are well known in the art, they were introduced by the article of Berrou et al. (1993), titled: "Near Shannon Limit Error-Correcting Coding and Decoding: Turbo Codes"; *Proc. IEEE Int. Conf. Commun.*, pp. 1064-1070, May, Geneva, Switzerland.

The following subset is stored for UEs of *Type b* characterized by *AMR + 0/0kbps not supported and AMR + 8/8kbps not supported*:

Capability Group Name	Information Element (IE)	IE value
RLC Capability (10.3.3.34)	Total_RLC_AM_Buffer_Size	10 kBytes
Transport Channel Capability (10.3.3.40)	UL_Transport_CH_Capability / Turbo_(De-)coding_Supported	2560 bits
Physical Channel Capability (10.3.3.25)	UL_Phys_CH_Capability / Support of PCPCH	FALSE (boolean)

Starting from the UEs in RRC Idle state, the first three steps **F1, F2,** and **F3** correspond to the ones of **fig.1a** for driving the UE in RRC Connected state and setting up the DCH channel. During these steps only UE maximum bitrate information are exchanged. In the successive step **F4** the RNC reads the content of *RRC CONNECTION SETUP COMPLETE* message in order to acquire all the UE radio access capability Information Elements at the respective values. Then it compares the readings with the two subset stored during step **F0** in order to detected the presence of *Type a* or *Type b* UE, in case a respective stored subset is included in the readings. In case the readings are not matching the stored subset the type of UE is classified as *others.* Depending on the type of UE, the RNC performs different actions in the successive steps **F5**, or **F6**, or **F7.** In case step **F5** is entered the RNC inhibits DCH triggering to ((AMR+8/8 kbps) OR (8/8 kbps single) OR (AMR+0/0 kbps)). If step **F6** is entered, the RNC inhibits DCH triggering to ((AMR+8/8 kbps) OR (8/8 kbps single)) but it may assign AMR+PSO/0kbps. If step F7 is entered, the RNC allows DCH triggering to ((AMR+8/8 kbps) OR (8/8 kbps single) OR (AMR+0/0 kbps)). After the execution of the step **F7** the RNC sends in the successive step **F8** a *DCH RECONFIGURATION* message to the UE compliant with the previous step. The UE responds with a *DCH RECONFIGURATION COMPLETE* message stating the good end of the reconfiguration procedure. In any case the RRC connection is held on either with the original setting of the DCH channel, in the case of inhibition step **F5** or **F6**, or with different setting in the case of step **F7**.

Claims

1. Method to hold on Radio Resource Control (RRC) connections established (F1, F2, F3) between a Radio Network Controller (S-RNC) belonging to a third generation PLMN and some former types (TYPE A, TYPE B) of controlled mobile User Equipments (UE) which do not support at least one Uplink/Downlink downgraded bitrate normally triggered by the network (UTRAN) during reconfiguration (F7) state of a Dedicated Channel, called DCH, **characterized in that**: the network performs the steps of:

   - storing (F0) in a system configuration database for each different type of former UE an associated subset of radio access capability parameters and respective assigned values, each subset being unique among all the radio access capability parameter combinations and values assumed by other UEs;
   - reading (F4) the radio access capability parameter combinations and values contained in a *RRC CONNECTION SETUP COMPLETE* message from a connected UE and comparing (F4) the readings with all the stored subset, in order to detect the presence of a former type of UE (TYPE A, TYPE B) in case a stored subset is included in the read combinations and values;
   - inhibiting (F5, F6) the triggering of a DCH state reconfiguration towards an UL/DL downgraded bitrate which is not supported by the detected type of former UE (TYPE A, TYPE B).

2. The method of claim 1, **characterized in that** said unique combinations of radio access capability parameters and values include RLC capability, Transport channel capability, and Physical channel capability.

3. The method of claim 2, **characterized in that** the UE belonging to a first former type (TYPE A) do not support both:

   - Adaptive Multirate voice call service plus contemporary Packet service at 0 kbps in Uplink and Downlink ; and
   - Adaptive Multirate voice call service plus contemporary Packet service at 8 kbps in Uplink and Downlink.

4. The method of claim 3, **characterized in that** the stored subset associated to the UE of said first former type (TYPE A) includes the following parameters and values:

Capability Group Name	Information Element IE	IE value
RLC Capability	Total_RLC_AM_Buffer_Size	10 kBytes
Transport Channel Capability	UL_Transport_CH_Capability / Turbo_(De-)coding_Supported	2560 bits
Physical Channel Capability	UL_Phys_CH_Capability / Support of PCPCH	TRUE (boolean)

5. The method of claim 3, **characterized in that** upon an UE belonging to said first former type (TYPE A) is detected, the triggering of a DCH state reconfiguration towards either:

- Adaptive Multirate voice call service plus contemporary Packet service at 0 kbps in Uplink and Downlink; OR
- Adaptive Multirate voice call service plus contemporary Packet service at 8 kbps in Uplink and Downlink; OR
- Single Packet service at 8 kbps in Uplink and Downlink; is inhibited (F5) by the network.

6. The method of claim 2, **characterized in that** the UE belonging to a second former type (TYPE B):

- support Adaptive Multirate voice call service plus contemporary Packet service at 0 kbps in Uplink and Downlink; and
- do not support Adaptive Multirate voice call service plus contemporary Packet service at 8 kbps in Uplink and Downlink.

7. The method of claim 6, **characterized in that** the stored subset associated to the UEs of said second former type (TYPE B) includes the following parameters and values:

Capability Group Name	Information Element	IE value
RLC Capability	Total_RLC_AM_Burfer_Size	10 kBytes
Transport Channel Capability	UL_Transport_CH Capability / Turbo_(De-)coding_Supported	2560 bits
Physical Channel Capability	UL_Phys_CH_Capability / Support of PCPCH	FALSE (boolean)

8. The method of claim 6, **characterized in that** upon an UE belonging to said second former type (TYPE B) is detected, the triggering of a DCH state reconfiguration towards either:

- Adaptive Multirate voice call service plus contemporary Packet service at 8 kbps in Uplink and Downlink; OR
- Single Packet service at 8 kbps in Uplink and Downlink; is inhibited (F6) by the network.

9. The method of claim 1, **characterized in that** in case the presence of a former type UE (TYPE A, TYPE B) is not detected, the network triggers (F7) a reconfiguration state of the Dedicated Channel with a downgraded UL/DL bitrate which is not supported by said UEs of former type (TYPE A, TYPE B).

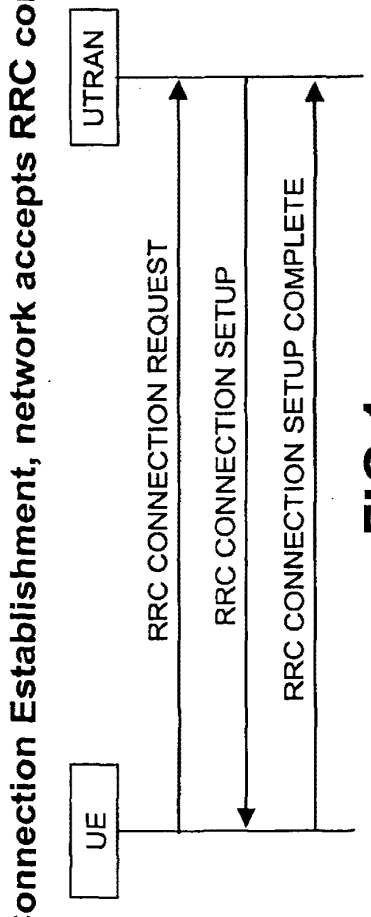

FIG.1a (3GPP TS 25.331 - Figure 8.1.3-1)

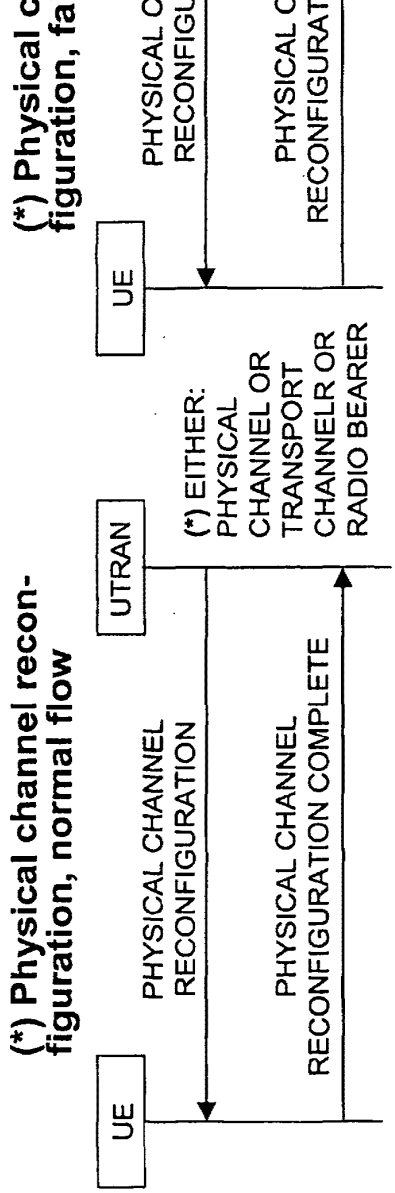

FIG.1b (3GPP TS 25.331 - Figure 8.2.2-9)

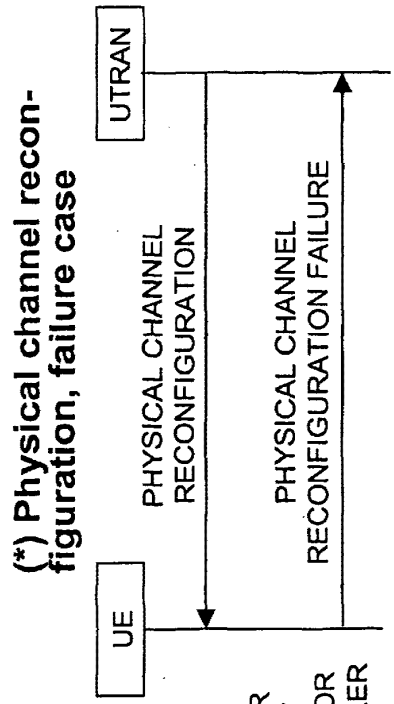

FIG.1c (3GPP TS 25.331 - Figure 8.2.2-10)

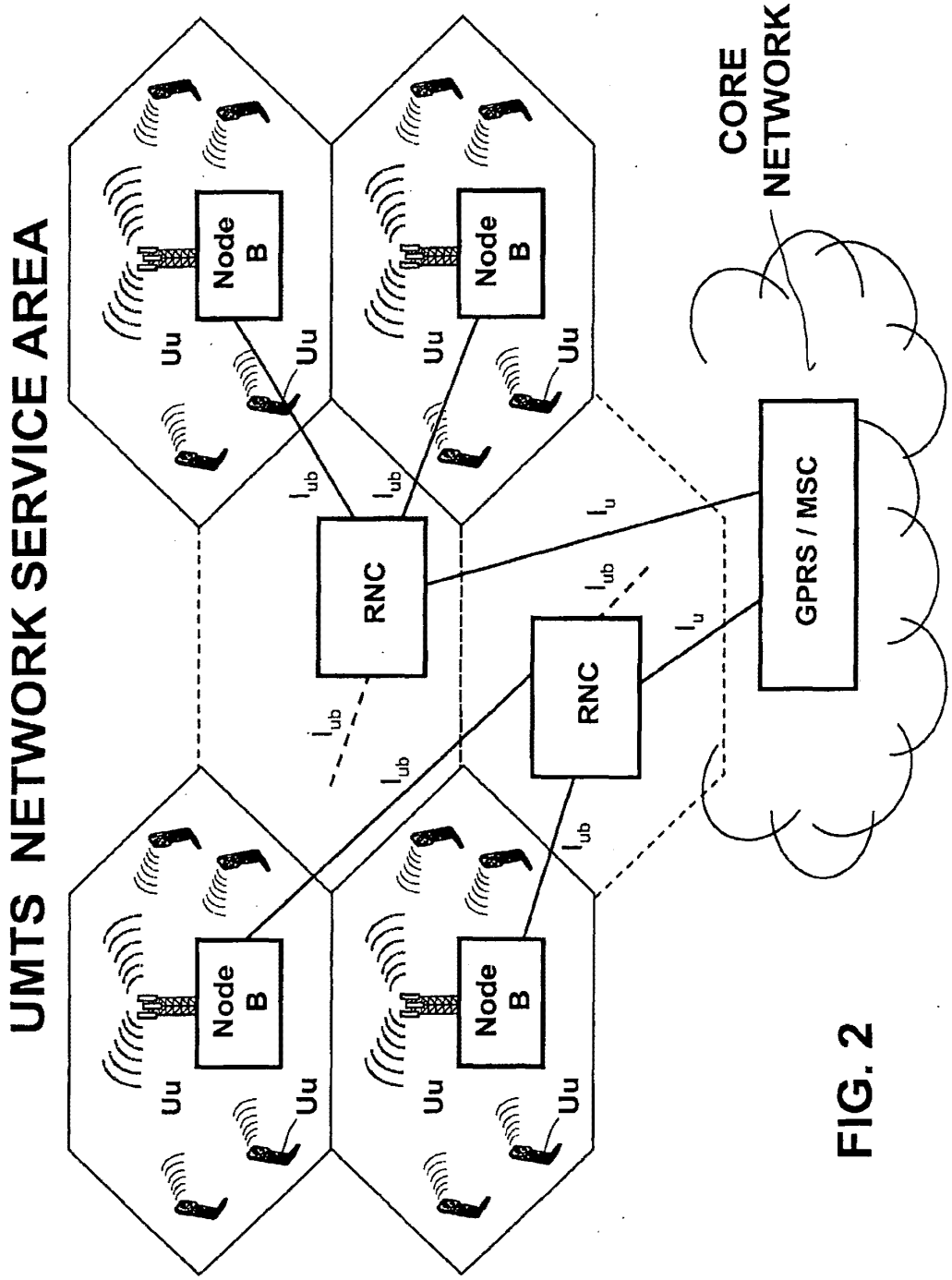
UMTS NETWORK SERVICE AREA
Node B
Node B
Node B
Node B
Uu
Uu
Uu
Uu
Uu
Uu
Uu
Uu
I_{ub}
I_{ub}
I_{ub}
I_{ub}
I_{ub}
I_{ub}
I_u
I_u
RNC
RNC
GPRS / MSC
CORE NETWORK

FIG. 2

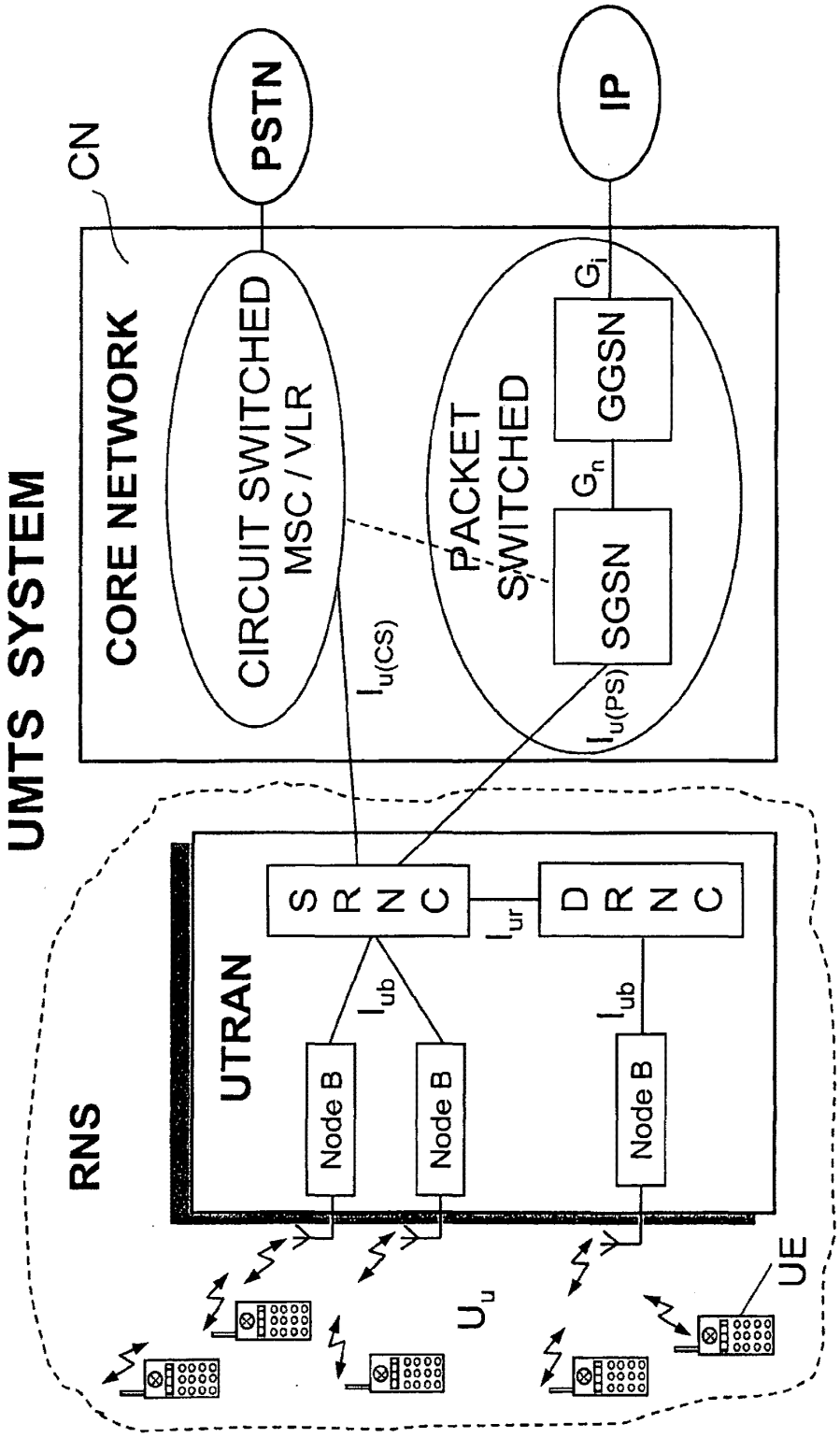
UMTS SYSTEM
CN
CORE NETWORK
CIRCUIT SWITCHED
MSC / VLR
PSTN
PACKET
SWITCHED
SGSN
GGSN
IP
G_n
G_i
$I_{u(CS)}$
$I_{u(PS)}$
RNS
UTRAN
S R N C
D R N C
I_{ur}
I_{ub}
I_{ub}
Node B
Node B
Node B
U_u
UE

FIG. 3

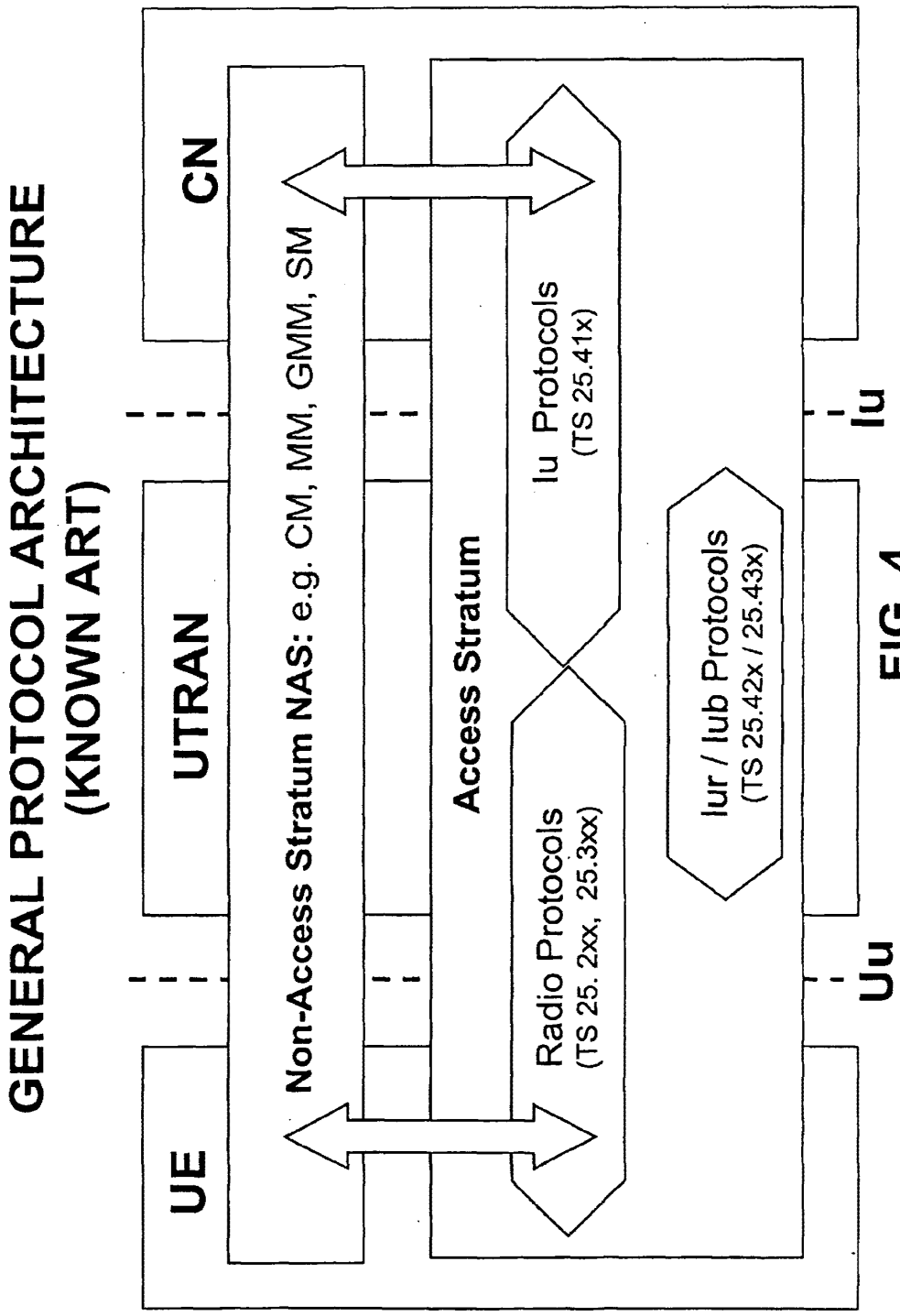
GENERAL PROTOCOL ARCHITECTURE
(KNOWN ART)
UE
UTRAN
CN
Non-Access Stratum NAS: e.g. CM, MM, GMM, SM
Access Stratum
Radio Protocols
(TS 25. 2xx, 25.3xx)
Iu Protocols
(TS 25.41x)
Iur / Iub Protocols
(TS 25.42x / 25.43x)
Uu
Iu

FIG. 4

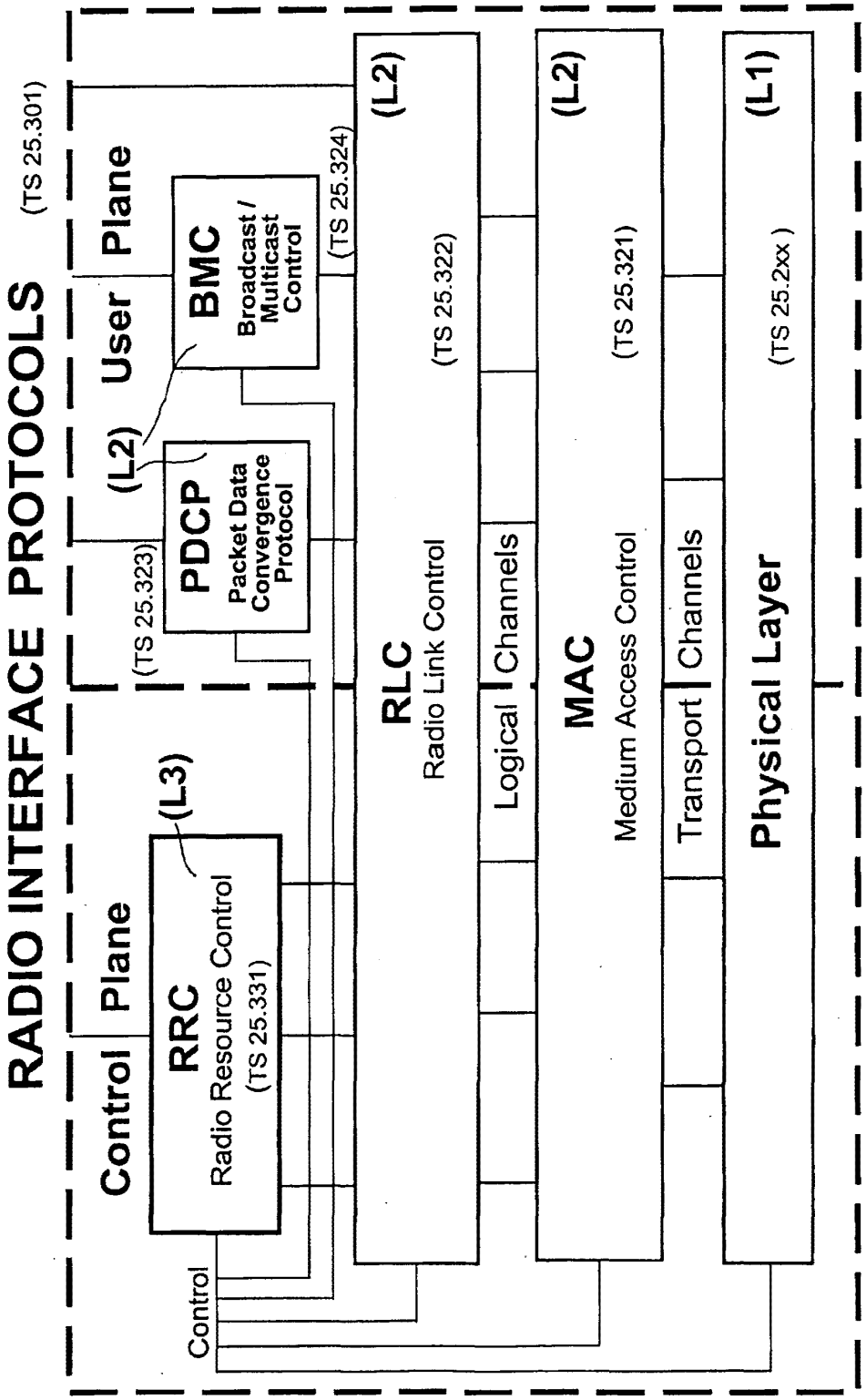
RADIO INTERFACE PROTOCOLS
(TS 25.301)
Control Plane
User Plane
(L3)
RRC
Radio Resource Control
(TS 25.331)
(L2)
PDCP
Packet Data Convergence Protocol
(TS 25.323)
BMC
Broadcast / Multicast Control
(TS 25.324)
Control
(L2)
RLC
Radio Link Control
(TS 25.322)
Logical Channels
(L2)
MAC
Medium Access Control
(TS 25.321)
Transport Channels
(L1)
Physical Layer
(TS 25.2xx)

FIG. 5

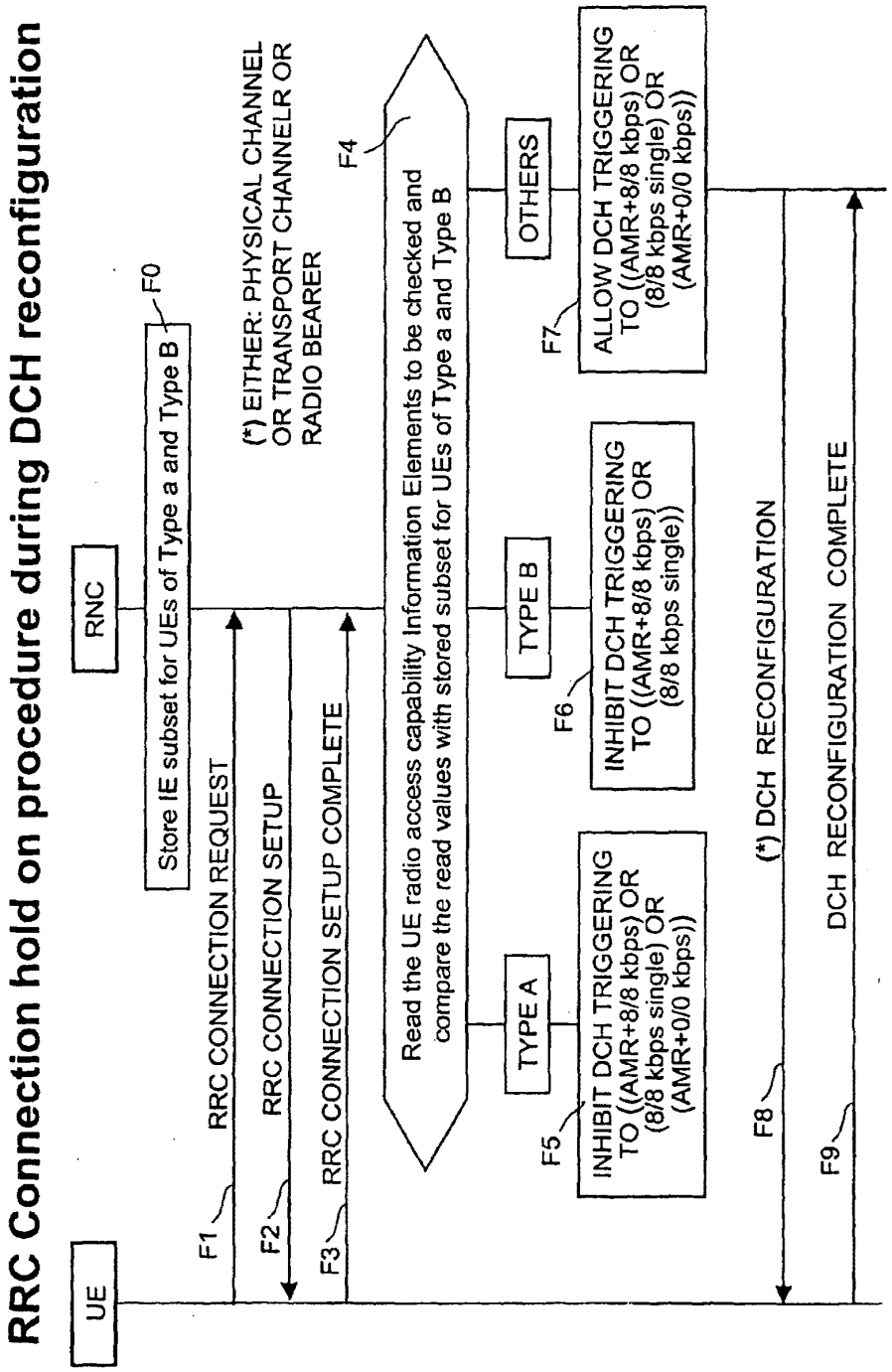
RRC Connection hold on procedure during DCH reconfiguration
UE
RNC
F0
Store IE subset for UEs of Type a and Type B
F1
RRC CONNECTION REQUEST
F2
RRC CONNECTION SETUP
F3
RRC CONNECTION SETUP COMPLETE
(*) EITHER: PHYSICAL CHANNEL OR TRANSPORT CHANNELR OR RADIO BEARER
F4
Read the UE radio access capability Information Elements to be checked and compare the read values with stored subset for UEs of Type a and Type B
TYPE A
TYPE B
OTHERS
F5
INHIBIT DCH TRIGGERING TO ((AMR+8/8 kbps) OR (8/8 kbps single) OR (AMR+0/0 kbps))
F6
INHIBIT DCH TRIGGERING TO ((AMR+8/8 kbps) OR (8/8 kbps single))
F7
ALLOW DCH TRIGGERING TO ((AMR+8/8 kbps) OR (8/8 kbps single) OR (AMR+0/0 kbps))
F8
(*) DCH RECONFIGURATION
F9
DCH RECONFIGURATION COMPLETE

FIG. 6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 42 5636

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	EP 1 307 009 A (LUCENT TECHNOLOGIES INC) 2 May 2003 (2003-05-02) * page 2, line 5 - line 9 * * page 5, line 36 - line 54 * * page 6, line 55 - line 57 * * page 8, line 28 - line 34 * * tables 1,6 * * figures 1,3 * -----	1-9	H04L12/56
A	US 2002/155829 A1 (FRANCESCA ANTHONY ET AL) 24 October 2002 (2002-10-24) * page 2, paragraph 21 - page 3, paragraph 23 * * page 3, paragraph 25 * * figures 3A,3B,4A,4B,4C * -----	1-9	
A	US 2002/080758 A1 (LANDAIS BRUNO) 27 June 2002 (2002-06-27) * page 3, paragraph 47 - paragraph 49 * * page 4, paragraph 77 - paragraph 83 * * figures 2,3 * -----	1-9	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	WO 03/103235 A (ERICSSON TELEFON AB L M ; HEDEN KARIN (SE); ERIKSSON ANN-CHRISTINE (SE) 11 December 2003 (2003-12-11) * page 3, line 2 - line 23 * * page 5, line 8 - page 6, line 11 * * page 9, line 27 - page 10, line 4 * * figures 2,5 * -----	1-9	H04Q H04L

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 February 2005	Rosenauer, H

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

2

EPO FORM 1503 03.82 (P04C01)

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 42 5636

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	3GPP: "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UE Radio Access capabilities (Release 6)" 3GPP TS 25.306 V6.2.0, [Online] June 2004 (2004-06), page 1-29, XP002311641 Retrieved from the Internet: URL:http://www.3gpp.org/ftp/Specs/archive/25_series/25.306/25306-620.zip> [retrieved on 2004-12-21] * page 5, paragraph 4 * * tables 5.2.1.1,5.2.2.1,5.2.3.1 * -----	1-9	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 February 2005	Rosenauer, H

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

2

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 42 5636

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-02-2005

Patent document cited in search report		Publication date	Patent family member(s)			Publication date
EP 1307009	A	02-05-2003	EP	1307009	A1	02-05-2003
US 2002155829	A1	24-10-2002	NONE			
US 2002080758	A1	27-06-2002	FR	2818864	A1	28-06-2002
			CN	1360447	A	24-07-2002
			EP	1220562	A1	03-07-2002
WO 03103235	A	11-12-2003	EP	1497959	A1	19-01-2005
			WO	03103235	A1	11-12-2003

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

IFW

PTO/SB/21 (04-07)
Approved for use through 09/30/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	5+4 Refs

Application Number	11/416,865
Filing Date	May 2, 2006
First Named Inventor	Chandrika K. WORRALL
Art Unit	2617
Examiner Name	Not Yet Assigned
Attorney Docket Number	562492006900

ENCLOSURES (*Check all that apply*)

- [ ] Fee Transmittal Form
  - [ ] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [x] Information Disclosure Statement (3 pages)
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
  - [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (please Identify below):
  1. PTO/SB/08A/B (1 page)
  2. 4 of 5 cited references
  3. Return Receipt Postcard

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	MORRISON & FOERSTER LLP (Customer No. 20872)		
Signature	Robert Saltzberg		
Printed name	Robert A. Saltzberg		
Date	September 28, 2007	Reg. No.	36,910

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Dated: September 28, 2007 Signature: Janet Hollrah (Janet Hollrah)

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Dated: 9-28-07 Signature: Janet Hollrah (Janet Hollrah)

Patent
Docket No. 562492006900

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Chandrika K. WORRALL

Serial No.: 11/416,865

Filing Date: May 2, 2006

For: NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN CELLULAR SYSTEM

Examiner: Not Yet Assigned

Group Art Unit: 2617

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97 & 1.98

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

Dear Sir:

Pursuant to 37 C.F.R. §1.97 and § 1.98, Applicants submit for consideration in the above-identified application the documents listed on the attached Form PTO/SB/08a/b. Copies of foreign documents and non-patent literature are submitted herewith. The Examiner is requested to make these documents of record.

sf-2384516

This Supplemental Information Disclosure Statement is submitted:

- ☐ With the application; accordingly, no fee or separate requirements are required.
- ☐ Before the mailing of a first Office Action after the filing of a Request for Continued Examination under § 1.114. However, if applicable, a certification under 37 C.F.R. § 1.97 (e)(1) has been provided.
- ☒ **Within three months of the application filing date or before mailing of a first Office Action on the merits; accordingly, no fee or separate requirements are required. However, if applicable, a certification under 37 C.F.R. § 1.97 (e)(1) has been provided.**
- ☐ After receipt of a first Office Action on the merits but before mailing of a final Office Action or Notice of Allowance.
  - ☐ A fee is required. A check in the amount of __ is enclosed.
  - ☐ A fee is required. Accordingly, a Fee Transmittal form (PTO/SB/17) is attached to this submission in duplicate.
  - ☐ A Certification under 37 C.F.R. § 1.97(e) is provided above; accordingly; no fee is believed to be due.
- ☐ After mailing of a final Office Action or Notice of Allowance, but before payment of the issue fee.
  - ☐ A Certification under 37 C.F.R. § 1.97(e) is provided above and a check in the amount of __ is enclosed.
  - ☐ A Certification under 37 C.F.R. § 1.97(e) is provided above and a Fee Transmittal form (PTO/SB/17 is attached to this submission in duplicate.)

Applicants would appreciate the Examiner initialing and returning the Form PTO/SB/08a/b, indicating that the information has been considered and made of record herein.

The information contained in this Supplemental Information Disclosure Statement under 37 C.F.R. § 1.97 and § 1.98 is not to be construed as a representation that: (i) a complete search has been made; (ii) additional information material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the above information constitutes prior art to the subject invention.

sf-2384516

In the unlikely event that the transmittal form is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief (such as payment of a fee under 37 C.F.R. § 1.17 (p)) is required, Applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petition and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing 562492006900.

Dated: 9/28/07

Respectfully submitted,

By _____

Robert A. Saltzberg
Registration No.: 36,910
MORRISON & FOERSTER LLP
425 Market Street
San Francisco, California 94105-2482
(415) 268-6428

sf-2384516

IFW

PTO/SB/21 (04-07)
Approved for use through 09/30/2007. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	11/416,865
Filing Date	May 2, 2006
First Named Inventor	Chandrika K. WORRALL
Art Unit	2617
Examiner Name	Not Yet Assigned
Attorney Docket Number	562492006900
Total Number of Pages in This Submission	5 + 6 Refs.

ENCLOSURES (*Check all that apply*)

- [ ] Fee Transmittal Form
  - [ ] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [x] Information Disclosure Statement (3 pages)
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
  - [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (please Identify below):
  1. Form PTO/SB/08A/B (1 page)
  2. Cited 6: Copies of 6 References Attached
  3. Return Receipt Postcard

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	MORRISON & FOERSTER LLP (Customer No. 20872)		
Signature	Robert Saltzberg		
Printed name	Robert A. Saltzberg		
Date	July 18, 2007	Reg. No.	36,910

I hereby certify that this paper is being deposited with the U.S. Postal Service on the date shown below with sufficient postage as First Class Mail, in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dated: July 18, 2007 Signature: Ariana Sanchez (Ariana Sanchez)

sf-2351770

I hereby certify that this paper is being deposited with the U.S. Postal Service on the date shown below with sufficient postage as First Class Mail, in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dated: July 18, 2007 Signature: (Ariana Sanchez)

Patent
Docket No. 562492006900

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Chandrika K. WORRALL

Serial No.: 11/416,865

Filing Date: May 2, 2006

For: NETWORK INITIATED COMMUNICATION ESTABLISHMENT IN CELLULAR SYSTEM

Examiner: Not Yet Assigned

Group Art Unit: 2617

INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. § 1.97 & 1.98

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

Dear Sir:

Pursuant to 37 C.F.R. § 1.97 and § 1.98, Applicants submit for consideration in the above-identified application the documents listed on the attached Form PTO/SB/08a/b. Copies of the documents are also submitted herewith. The Examiner is requested to make these documents of record.

sf-2347051

This Information Disclosure Statement is submitted:

- ☐ With the application; accordingly, no fee or separate requirements are required.
- ☐ Before the mailing of a first Office Action after the filing of a Request for Continued Examination under § 1.114. However, if applicable, a certification under 37 C.F.R. § 1.97 (e)(1) has been provided.
- ☒ **Within three months of the application filing date or before mailing of a first Office Action on the merits; accordingly, no fee or separate requirements are required. However, if applicable, a certification under 37 C.F.R. § 1.97 (e)(1) has been provided.**
- ☐ After receipt of a first Office Action on the merits but before mailing of a final Office Action or Notice of Allowance.
  - ☐ A fee is required. A check in the amount of __ is enclosed.
  - ☐ A fee is required. Accordingly, a Fee Transmittal form (PTO/SB/17) is attached to this submission in duplicate.
  - ☐ A Certification under 37 C.F.R. § 1.97(e) is provided above; accordingly; no fee is believed to be due.
- ☐ After mailing of a final Office Action or Notice of Allowance, but before payment of the issue fee.
  - ☐ A Certification under 37 C.F.R. § 1.97(e) is provided above and a check in the amount of __ is enclosed.
  - ☐ A Certification under 37 C.F.R. § 1.97(e) is provided above and a Fee Transmittal form (PTO/SB/17 is attached to this submission in duplicate.)

Applicants would appreciate the Examiner initialing and returning the Form PTO/SB/08a/b, indicating that the information has been considered and made of record herein.

The information contained in this Information Disclosure Statement under 37 C.F.R. § 1.97 and § 1.98 is not to be construed as a representation that: (i) a complete search has been made; (ii) additional information material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the above information constitutes prior art to the subject invention.

sf-2347051

In the unlikely event that the transmittal form is separated from this document and the Patent and Trademark Office determines that an extension and/or other relief (such as payment of a fee under 37 C.F.R. § 1.17 (p)) is required, Applicants petition for any required relief including extensions of time and authorize the Commissioner to charge the cost of such petition and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing **562492006900**.

Dated: July 18, 2007

Respectfully submitted,

By

Robert A. Saltzberg
Registration No.: 36,910
MORRISON & FOERSTER LLP
425 Market Street
San Francisco, California 94105-2482
(415) 268-6428

sf-2347051

ALTERNATIVE TO PTO/SB/08A/B (04/07)

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	1	of	1

Complete if Known	
Application Number	11/416,865
Filing Date	May 2, 2006
First Named Inventor	Chandrika K. WORRALL
Art Unit	2617
Examiner Name	Not Yet Assigned
Attorney Docket Number	562492006900

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

*EXAMINER: Initial if information considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	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, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	1.	"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Multimedia Broadcast/Multicast Service (MBMS); Architecture and functional description (Release 6)," (September 2004). 3GPP:Valbonne, France, TS 23.246 v6.4.0:1-42.	
	2.	Radio Electronics.com. "UMTS/WCDMA tutorial [1]- a tutorial about the 3G Wideband CDMA, WCDMA, or UMTS cellular telecommunications system," located at <http://www.radio-electronics.com/info/cellulartelecomms/umts/umts_wcdma_tutorial.php> visited on June 29, 2007. (3 pages).	
	3.	Radio Electronics.com. "UMTS/WCDMA tutorial [2]- the basic system architecture including the User Equipment - UE -, the Radio Network Subsystem, and the Core Network," located at <http://www.radio-electronics.com/info/cellulartelecomms/umts/umts_wcdma_architecture.php> visited on June 29, 2007. (3 pages).	
	4.	Radio Electronics.com. "UMTS/WCDMA tutorial [3]- the air interface, frequencies, spreading and power control used within UMTS or Wideband CDMA, WCDMA, cellular telecommunications system," located at <http://www.radio-electronics.com/info/cellulartelecomms/umts/umts_wcdma_radio.php> visited on June 29, 2007. (4 pages).	
	5.	Radio Electronics.com. "UMTS/WCDMA tutorial [4]- the frames slots and channels used within UMTS or Wideband CDMA, WCDMA, cellular telecommunications system," located at <http://www.radio-electronics.com/info/cellulartelecomms/umts/umts_wcdma_channels.php> visited on June 29, 2007. (4 pages).	
	6.	Radio Electronics.com. "UMTS/WCDMA tutorial [5]- packet data, speech coding and handover used within UMTS or Wideband CDMA cellular telecommunication system," located at <http://www.radio-electronics.com/info/cellulartelecomms/umts/umts_wcdma_coding_handover.php> visited on June 29, 2007. (3 pages).	

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

[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature		Date Considered	

sf-2347045

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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/416,865	05/02/2006	Chandrika K. Worrall	562492006900

CONFIRMATION NO. 8530
FORMALITIES LETTER

20872
MORRISON & FOERSTER LLP
425 MARKET STREET
SAN FRANCISCO, CA 94105-2482

Date Mailed: 05/31/2006

07/31/2006 HGEBREM1 00000048 031952 11416865
01 FC:1051 130.00 DA

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

11416865

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 and pay any fees required 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 oath or declaration is missing. *A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.*
  Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $130 for a non-small entity, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **$130** for a Large Entity

- **$130** Surcharge.

Replies should be mailed to: Mail Stop Missing Parts
Commissioner for Patents

P.O. Box 1450
Alexandria VA 22313-1450

A copy of this notice MUST be returned with the reply.

Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382
PART 2 - COPY TO BE RETURNED WITH RESPONSE

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MS MISSING PARTS **US Patent and Trademark Office**	**(571) 273-8300**

FROM: Robert A. Saltzberg
Reg. No. 36,910

DATE: July 28, 2006

Number of pages with cover page:	**12**	

Preparer of this slip has confirmed that facsimile number given is correct: **7638/VAW2**

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Comments:

ATTORNEY DOCKET NO.: 562492006900
SERIAL NO.: 11/416,865
FILING DATE: May 2, 2006
INVENTOR(S): Chandrika K. WORRALL
TITLE: NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM

Papers attached herewith:
1. **Transmittal - 1 page**
2. **Fee Transmittal (in duplicate) - 2 pages**
3. **Copy of Notice to File Missing Parts - 2 pages**
4. **Supplemental Application Data Sheet - 2 pages**
5. **Declaration - 1 page**
6. **Power of Attorney - 1 page**
7. **Statement Under 37 CFR 3.73(b) with copy of Assignment - 2 pages**

sf-2170264

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	11/416,865
Filing Date	May 2, 2006
First Named Inventor	Chandrika K. WORRALL
Art Unit	2617
Examiner Name	Not Yet Assigned
Total Number of Pages in This Submission: 11	Attorney Docket Number: 562492006900

ENCLOSURES (*Check all that apply*)

- [x] Fee Transmittal Form (in duplicate) - 2 pages
  - [ ] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [x] Power of Attorney, Revocation Change of Correspondence Address - 1 page
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
  - [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (please identify below):
  1. Copy of Notice to File Missing Parts - 2 pages
  2. Declaration (executed) - 1 page
  3. Supplemental Application Data Sheet - 2 pages
  4. Statement Under 37 CFR 3.73(b) w/copy of Assignment - 2 pages
  5. Fax Cover Sheet.

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	MORRISON & FOERSTER LLP (Customer No. 20872)		
Signature	Robert Saltzberg		
Printed name	Robert A. Saltzberg		
Date	July 28, 2006	Reg. No.	36,910

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office, facsimile no. (571) 273-8300, on the date shown below.

Dated: July 28, 2006 Signature: _____ (Victoria A. Wilson)

sf-2170032

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Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2006

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 130.00

Complete if Known	
Application Number	11/416,865
Filing Date	May 2, 2006
First Named Inventor	Chandrika K. WORRALL
Examiner Name	Not Yet Assigned
Art Unit	2617
Attorney Docket No.	562492006900

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☒ Deposit Account Deposit Account Number: 03-1952 Deposit Account Name: Morrison & Foerster LLP

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

☒ Charge fee(s) indicated below
☐ Charge fee(s) indicated below, except for the filing fee
☒ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17
☒ Credit any overpayments

FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims _____ - 20 = _____ Extra Claims _____ x Fee ($) _____ = Fee Paid ($) _____

HP = highest number of total claims paid for, if greater than 20.

Multiple Dependent Claims: Fee ($) _____ Fee Paid ($) _____

Indep. Claims _____ - 3 = _____ Extra Claims _____ x Fee ($) _____ = Fee Paid ($) _____

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 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).

Total Sheets _____ - 100 = _____ Extra Sheets _____ /50 _____ (round up to a whole number) x Fee ($) _____ = Fee Paid ($) _____

4. OTHER FEE(S) Fees Paid ($)

Non-English Specification, $130 fee (no small entity discount)

Other (e.g., late filing surcharge): 1051 Surcharge-Late oath or declaration 130.00

SUBMITTED BY					
Signature	Robert Saltzberg	Registration No. (Attorney/Agent)	36,910	Telephone	(415) 268-6428
Name (Print/Type)	Robert A. Saltzberg			Date	July 28, 2006

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sf-2170048

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Supplemental Application Data Sheet

Application Information

Application number::	11/416,865
Filing Date::	05/02/06
Application Type::	Regular
Subject Matter::	Utility
Suggested Group Art Unit::	~~Not Yet Assigned~~ 2617
CD-ROM or CD-R?::	None
Sequence submission?::	None
Computer Readable Form (CRF)?::	No
Title::	NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM
Attorney Docket Number::	562492006900
Request for Early Publication?::	No
Request for Non-Publication?::	No
Total Drawing Sheets::	13
Small Entity?::	No
Petition included?::	No
Secrecy Order in Parent Appl.?::	No

Applicant Information

Applicant Authority Type::	Inventor
Primary Citizenship Country::	Sri Lanka
Status::	Full Capacity
Given Name::	Chandrika
Middle Name::	K.
Family Name::	WORRALL
City of Residence::	~~Chippenham~~ Newbury
State or Province of Residence::	Berkshire
Country of Residence::	United Kingdom

Street of mailing address::	~~40 Louise Rayner Place~~ 11a Balfour Crescent
City of mailing address::	~~Chipponham~~ Newbury
State or Province of mailing address::	Berkshire
Country of mailing address::	United Kingdom
Postal or Zip Code of mailing address::	~~SN15 3BU~~ RG14 6SN

Correspondence Information

Correspondence Customer Number::	20872

Representative Information

Representative Customer Number::	20872

Domestic Priority Information

Foreign Priority Information

Assignee Information

Assignee name::	IPWireless, Inc.
Street of mailing address::	1001 Bayhill Drive, Second Floor
City of mailing address::	San Bruno
State or Province of mailing address::	CA
Postal or Zip Code of mailing address::	94066

PTO/SB/01A (05-04)
Approved for use through 07/31/2006 OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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

Title of Invention	NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM

As the below named inventor(s), I/we declare that:

This declaration is directed to:

☐ The attached application, or

☒ Application No. 11/416,865, filed on 05/02/2006,

☐ as amended on _____ (if applicable);

I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

All statements made herein of my/our own knowledge are true, all statements made herein on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF INVENTOR(S)

Inventor one: Chandrika K. WORRALL

Signature: _____ Citizen of: Sri Lanka

Inventor two: _____

Signature: _____ Citizen of: _____

Inventor three: _____

Signature: _____ Citizen of: _____

Inventor four: _____

Signature: _____ Citizen of: _____

☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

sf-2143706

DOCKET NO. 562492006900

PTO/SB/81 (01-06)
Approved for use through 12/31/2006. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

POWER OF ATTORNEY and CORRESPONDENCE ADDRESS INDICATION FORM

Application Number	11/416,865
Filing Date	May 2, 2006
First Named Inventor	Chandrika K. WORRALL
Title	NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM
Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned
Attorney Docket No.	562492006900

I hereby revoke all previous powers of attorney given in the above-identified application.

I hereby appoint:

[x] Practitioners associated with the Customer Number: 20872

OR

[ ] Practitioner(s) named below:

Name	Registration Number	Name	Registration Number

as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

Please recognize or change the correspondence address for the above-identified application to:

[ ] The address associated with the above-mentioned Customer Number:

OR

[ ] The address associated with Customer Number:

OR

[ ] Firm or Individual Name

Address					
City		State		Zip	
Country		Telephone		Email	

I am the:

[ ] Applicant/Inventor.

[x] Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

SIGNATURE of Applicant or Assignee of Record

Signature		Date	7/13/06
Name	Daniel W. Burke	Telephone	(650) 616-4163
Title and Company	Vice President and General Counsel, IPWireless, Inc.		

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

[ ] *Total of 1 forms are submitted.

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PTO/SB/96 (09-04)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Chandrika K. WORRALL

Application No./Patent No.: 11/416,865 Filed/Issue Date: May 2, 2006

Entitled: NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM

IPWireless, Inc., a Corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. [x] the assignee of the entire right, title, and interest; or
2. [ ] an assignee of less than the entire right, title and interest.
The extent (by percentage) of its ownership interest is _____ %

in the patent application/patent identified above by virtue of either:

A. [x] 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.

OR

B. [ ] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

1. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.
3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

[ ] Additional documents in the chain of title are listed on a supplemental sheet.

[x] Copies of assignments or other documents in the chain of title are attached.
[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, if the assignment is to be recorded 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.

Signature	7/13/06 Date
Daniel W. Burke Printed or Typed Name	(650) 616-4163 Telephone Number
Vice President and General Counsel Title	

sf-2143740 Docket No. 582492006900

COPY

Attorney Docket No.: 562492006900

ASSIGNMENT
SOLE

THIS ASSIGNMENT, by Chandrika K. WORRALL (hereinafter referred to as the assignor), residing at 11a Balfour Crescent, Newbury, Berkshire, United Kingdom, RG14 6SN, witnesseth:

WHEREAS, said assignor has invented certain new and useful improvements in NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM, set forth in an application for Letters Patent of the United States, bearing Serial No. 11/416,865 and filed on May 2, 2006; and

WHEREAS, IPWireless, a corporation duly organized under and pursuant to the laws of Delaware and having its principal place of business at 1001 Bayhill Drive, Second Floor, San Bruno, CA 94066 (hereinafter referred to as the assignee) is desirous of acquiring the entire right, title and interest in and to said inventions and said application for Letters Patent of the United States, and in and to any Letters Patent or Patents, United States or foreign, to be obtained therefor and thereon:

NOW, THEREFORE, in consideration of One Dollar ($1.00) and other good and sufficient consideration, the receipt of which is hereby acknowledged, said assignor has sold, assigned, transferred and set over, and by these presents does sell, assign, transfer and set over, unto said assignee, its successors, legal representatives and assigns, the entire right, title and interest in and to the above-mentioned inventions, application for Letters Patent, and any and all Letters Patent or Patents in the United States of America and all foreign countries which may be granted therefor and thereon, and in and to any and all divisions, continuations and continuations-in-part of said application, or reissues or extensions of said Letters Patent or Patents, and all rights under the International Convention for the Protection of Industrial Property, the same to be held and enjoyed by said assignee, for its own use and the use of its successors, legal representatives and assigns, to the full end of the term or terms for which Letters Patent or Patents may be granted, as fully and entirely as the same would have been held and enjoyed by the assignor, had this sale and assignment not been made.

AND for the same consideration, said assignor hereby covenants and agrees to and with said assignee its successors, legal representatives and assigns, that, at the time of execution and delivery of these presents, said assignor is the sole and lawful owner of the entire right, title and interest in and to said inventions and the application for Letters Patent above mentioned, and that the same are unencumbered and that said assignor has good and full right and lawful authority to sell and convey the same in the manner herein set forth.

AND for the same consideration, said assignor hereby covenants and agrees to and with said assignee, its successors, legal representatives and assigns, that said assignor will, whenever counsel of said assignee, or the counsel of its successor, legal representatives and assigns, shall advise that any proceeding in connection with said inventions, or said application for Letters Patent, or any proceeding in connection with Letters Patent for said inventions in any country, including interference proceedings, is lawful and desirable, or that any division, continuation or continuation-in-part of any application for Letters Patent or any reissue or extension of any Letters Patent, to be obtained thereon, is lawful and desirable, sign all papers and documents, take all lawful oaths, and do all acts necessary or required to be done for the procurement, maintenance, enforcement and defense of Letters Patent for said inventions, without charge to said assignee, its successors, legal representatives and assigns, but at the cost and expense of said assignee, its successors, legal representatives and assigns.

AND said assignor hereby requests the Commissioner of Patents to issue said Letters Patent of the United States to said assignee as the assignee of said inventions and the Letters Patent to be issued thereon for the sole use of said assignee, its successors, legal representatives and assigns.

12 - July - 2006
Date

Chandrika K. WORRALL

sf-2143724

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	ATTORNEY DOCKET NUMBER
11/416,865	05/02/2006	Chandrika K. Worrall	562492006900

CONFIRMATION NO. 8530

FORMALITIES LETTER

20872
MORRISON & FOERSTER LLP
425 MARKET STREET
SAN FRANCISCO, CA 94105-2482

Date Mailed: 05/31/2006

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 and pay any fees required 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 oath or declaration is missing. *A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.*
  Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $130 for a non-small entity, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **$130** for a Large Entity

- **$130** Surcharge.

Replies should be mailed to: Mail Stop Missing Parts
Commissioner for Patents

P.O. Box 1450
Alexandria VA 22313-1450

A copy of this notice MUST be returned with the reply.

RJ

Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382
PART 3 - OFFICE COPY

17667 U.S. PTO
050206

PTO/SB/05 (05-05)
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112935 U.S. PTO
11/416865
050206

UTILITY PATENT APPLICATION TRANSMITTAL

(ONLY FOR NEW NONPROVISIONAL APPLICATIONS UNDER 37 CFR 1.53(B))

Attorney Docket No.	562492006900
First Inventor	Chandrika K. WORRALL
Title	NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM
Express Mail Label No.	EV739862178US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

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

1. [X] **Fee Transmittal Form** (e.g., PTO/SB/17) *(Submit an original and a duplicate for fee processing)*
2. [ ] **Applicant claims small entity status.** See 37 CFR 1.27.
3. [X] **Specification** [*Total Pages* 28]
   Both the claims and abstract must start on a new page
   (For information on the preferred arrangement, see MPEP 608.01(a))
4. [X] **Drawing(s)** *(35 U.S.C. 113)* [*Total Sheets* 13]
5. **Oath or Declaration** [*Total Sheets*]
   a. [ ] Newly executed (original or copy)
   b. [ ] A copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional with Box 18 completed)*
      i. [ ] DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. [X] **Application Data Sheet.** See 37 CFR 1.76 - 2 pages
7. [ ] **CD-ROM or CD-R** in duplicate, large table or Computer Program *(Appendix)*
   [ ] Landscape Table on CD
8. **Nucleotide and/or Amino Acid Sequence Submission** *(if applicable, items a. – c. are required)*
   a. Computer Readable Form (CRF)
      i. [ ] Computer Readable Form (CRF)
      ii. [ ] Transfer Request (37 CFR 1.821(e))
   b. Specification Sequence Listing on:
      i. [ ] CD-ROM or CD-R (2 copies); or ii. [ ] Paper
   c. [ ] Statements verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

9. [ ] **Assignment Papers** (cover sheet & document(s))
   Name of Assignee:
10. [ ] **37 CFR 3.73(b) Statement** *(when there is an assignee)* [ ] **Power of Attorney**
11. [ ] **English Translation Document** *(if applicable)*
12. [ ] **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    [ ] Copies of foreign patent documents, publications, & other information
13. [ ] **Preliminary Amendment**
14. [X] **Return Receipt Postcard** (MPEP 503) *(Should be specifically itemized)*
15. [ ] **Certified Copy of Priority Document(s)** *(if foreign priority is claimed)*
16. [ ] **Nonpublication Request** under 35 U.S.C.122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
17. [ ] Other:

18. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:*
[ ] Continuation [ ] Divisional [ ] Continuation-in-part (CIP) of prior application No.:
Prior application information: Examiner *Art Unit:*

19. CORRESPONDENCE ADDRESS

[X] The address associated with Customer Number: 20872 *OR* [ ] Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email Address	

Signature	Robert Saltzberg	Date	May 2, 2006
Name (Print/Type)	Robert A. Saltzberg	Registration No. (Attorney/Agent)	36,910

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail, Airbill No. EV739862178US, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Dated: May 2, 2006 Signature: (Victoria A. Wilson)

EV739862178US

sf-2121347

PTO/SB/17 (01-06)
Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2006

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 4,700.00

Complete if Known	
Application Number	Not Yet Assigned
Filing Date	Concurrently Herewith
First Named Inventor	Chandrika K. WORRALL
Examiner Name	Not Yet Assigned
Art Unit	Not Yet Assigned
Attorney Docket No.	562492006900

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☒ Deposit Account Deposit Account Number: 03-1952 Deposit Account Name: Morrison & Foerster LLP

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

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

☒ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fees Paid ($)**
Utility	300	150	500	250	200	100	1,000.00
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	**Fee ($)**	**Small Entity Fee ($)**
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims		**Extra Claims**		**Fee ($)**		**Fee Paid ($)**
82	- 20 =	62	x	50	=	3,100.00

HP = highest number of total claims paid for, if greater than 20.

Multiple Dependent Claims	
Fee ($)	**Fee Paid ($)**
360	0.00

Indep. Claims		**Extra Claims**		**Fee ($)**		**Fee Paid ($)**
6	- 3 =	3	x	200	=	600

HP = highest number of independent claims paid for, if greater than 3.

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 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).

Total Sheets		**Extra Sheets**		**Number of each additional 50 or fraction thereof**		**Fee ($)**		**Fee Paid ($)**
41	- 100 =	0	/50	0	(round up to a whole number) x	250	=	0.00

4. OTHER FEE(S) **Fees Paid ($)**

Non-English Specification, $130 fee (no small entity discount)

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

SUBMITTED BY

Signature	Robert Saltzberg	Registration No. (Attorney/Agent)	36,910	Telephone	(415) 268-6428
Name (Print/Type)	Robert A. Saltzberg			Date	May 2, 2006

sf-2121353

17667 U.S. PTO
050206

PTO/SB/05 (05-05)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office. U.S. DEPARTMENT OF COMMERCE
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112935 U.S. PTO
11/416865
050206

UTILITY PATENT APPLICATION TRANSMITTAL

(ONLY FOR NEW NONPROVISIONAL APPLICATIONS UNDER 37 CFR 1.53(B))

Attorney Docket No.	562492006900
First Inventor	Chandrika K. WORRALL
Title	NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM
Express Mail Label No.	EV739862178US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

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

1. [X] **Fee Transmittal Form** (e.g., PTO/SB/17) *(Submit an original and a duplicate for fee processing)*
2. [ ] **Applicant claims small entity status.** See 37 CFR 1.27.
3. [X] **Specification** [*Total Pages* 28]
   Both the claims and abstract must start on a new page
   (For information on the preferred arrangement, see MPEP 608.01(a))
4. [X] **Drawing(s)** *(35 U.S.C. 113)* [*Total Sheets* 13]
5. **Oath or Declaration** [*Total Sheets*]
   a. [ ] Newly executed (original or copy)
   b. [ ] A copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional with Box 18 completed)*
      i. [ ] DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. [X] **Application Data Sheet.** See 37 CFR 1.76 - 2 pages
7. [ ] **CD-ROM or CD-R** in duplicate, large table or Computer Program *(Appendix)*
   [ ] Landscape Table on CD
8. **Nucleotide and/or Amino Acid Sequence Submission** *(if applicable, items a. – c. are required)*
   a. Computer Readable Form (CRF)
      i. [ ] Computer Readable Form (CRF)
      ii. [ ] Transfer Request (37 CFR 1.821(e))
   b. Specification Sequence Listing on:
      i. [ ] CD-ROM or CD-R (2 copies); or ii. [ ] Paper
   c. [ ] Statements verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

9. [ ] **Assignment Papers** (cover sheet & document(s))
   Name of Assignee:
10. [ ] **37 CFR 3.73(b) Statement** *(when there is an assignee)* [ ] **Power of Attorney**
11. [ ] **English Translation Document** *(if applicable)*
12. [ ] **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    [ ] Copies of foreign patent documents, publications, & other information
13. [ ] **Preliminary Amendment**
14. [X] **Return Receipt Postcard** (MPEP 503) *(Should be specifically itemized)*
15. [ ] **Certified Copy of Priority Document(s)** *(if foreign priority is claimed)*
16. [ ] **Nonpublication Request** under 35 U.S.C.122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
17. [ ] Other:

18. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:*
[ ] Continuation [ ] Divisional [ ] Continuation-in-part (CIP) of prior application No.:
Prior application information: Examiner *Art Unit:*

19. CORRESPONDENCE ADDRESS

[X] The address associated with Customer Number: 20872 *OR* [ ] Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email Address	

Signature	Robert Saltzberg	Date	May 2, 2006
Name (Print/Type)	Robert A. Saltzberg	Registration No. (Attorney/Agent)	36,910

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail, Airbill No. EV739862178US, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Dated: May 2, 2006 Signature: (Victoria A. Wilson)

EV739862178US

sf-2121347

PTO/SB/17 (01-06)
Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2006

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 4,700.00

Complete if Known	
Application Number	Not Yet Assigned
Filing Date	Concurrently Herewith
First Named Inventor	Chandrika K. WORRALL
Examiner Name	Not Yet Assigned
Art Unit	Not Yet Assigned
Attorney Docket No.	562492006900

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☒ Deposit Account Deposit Account Number: 03-1952 Deposit Account Name: Morrison & Foerster LLP

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

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

☒ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

FEE CALCULATION (All the fees below are due upon filing or may be subject to a surcharge.)

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fees Paid ($)**
Utility	300	150	500	250	200	100	1,000.00
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	**Fee ($)**	**Small Entity Fee ($)**
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims		Extra Claims		Fee ($)		Fee Paid ($)
82	- 20 =	62	x	50	=	3,100.00

HP = highest number of total claims paid for, if greater than 20.

Multiple Dependent Claims	
Fee ($)	**Fee Paid ($)**
360	0.00

Indep. Claims		Extra Claims		Fee ($)		Fee Paid ($)
6	- 3 =	3	x	200	=	600

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Total Sheets		Extra Sheets		Number of each additional 50 or fraction thereof		Fee ($)		Fee Paid ($)
41	- 100 =	0	/50	0	(round up to a whole number) x	250	=	0.00

4. OTHER FEE(S) **Fees Paid ($)**

Non-English Specification, $130 fee (no small entity discount)

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

SUBMITTED BY

Signature	Robert Saltzberg	Registration No. (Attorney/Agent)	36,910	Telephone	(415) 268-6428
Name (Print/Type)	Robert A. Saltzberg			Date	May 2, 2006

sf-2121353

NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The invention generally relates to wireless communication systems, and,more particularly, to establishing connectivity in a cellular communication system.

Description of the Related Art

[0002] Wireless communication systems support a sleep mode to minimize battery power consumption of user equipment (UE), such as a mobile terminal. In sleep mode, the mobile terminal performs little or no activity, and does not transmit/receive traffic data. Therefore, the mobile terminal in sleep mode only consumes a small amount of radio link resources, if any. Consequently, a large number of users can simultaneously be supported in the system.

[0003] A mobile terminal can terminate sleep mode and connect to a Radio Access Network (RAN) of base stations (otherwise known as "Node B"s according to the 3GPP protocol) in two ways. If traffic needs to be transmitted from the mobile terminal, the mobile terminal may terminate the sleep mode by requesting a connection to the network. This is denoted a "mobile terminal initiated (originated) connection." Otherwise, the network may request the mobile terminal to make a connection to the network. This is denoted a "network-initiated connection". The procedure used for waking up the mobile terminal from the sleep mode in "network-initiated connection" employs paging.

[0004] Paging involves waking up the mobile terminal from the sleep state. After waking up, the mobile terminal reads the paging message(s) transmitted in a downlink paging channel(s). The mobile terminal either connects to the network or performs the task instructed by the network via the paging message(s).

[0005] Depending on the amount of activity and connectivity involved, the sleep mode can be categorized into two sub-modes as "idle (standby)" and "dormant". In idle mode, the mobile terminal has no connection to the RAN; however, it is connected to the core network. In contrast, in the dormant state the mobile terminal is connected to the RAN. In order to assist mobility in sleep mode, the mobile terminal is registered in a registration area or "paging zone". The mobile terminal informs the network of its location and status in the registration process. This enables efficient paging in case of network-initiated connection establishment. A registration area may be defined as a zone (e.g., one or more cells) respectively controlled by a base station (or Node-B) or a plurality of base stations (or Node-Bs). A registration area may be also be known as a "routing area", "tracking area", "location area", or, for Universal Mobile Telecommunications Systems (UMTS) implementing 3G wireless communications, "UTRAN registration area (URA)".

[0006] The mobile terminal performs a registration whenever the "registration area" is changed. In other words, whenever the cell the mobile terminal is camped on broadcasts a "registration area" identity which is different from the registration area that the mobile terminal previously registered, then the mobile terminal should perform a registration update. Here, it is assumed each cell broadcasts only one "registration area" identity. However, the registration area may be defined to include overlapping zones. In that case, the cell would broadcast multiple registration area IDs.

[0007] In the conventional paging procedure, two signals are used to convey the paging message. The first paging signal is used to indicate whether a paging message is being transmitted to a particular UE or group of UEs. The second paging signal carries the paging message(s) for the particular UE or group of UEs. The second paging signal is transmitted following the first paging signal at a fixed time offset from the first paging signal.

[0008] The mobile terminal uses Discontinuous Reception (DRX) in sleep mode in order to reduce power consumption. When DRX is used, the mobile terminal needs to monitor the first paging signal only at one paging occasion per DRX cycle. The length of the DRX cycle is core network domain specific and may be updated locally in the mobile terminal using information given in system information from the core network.

[0009] The core network usually knows when the mobile terminal will be monitoring the first paging signal within DRX cycle. Thus, if the network intends to page a particular mobile terminal, it sends the first paging signal at the time when the mobile terminal will monitor the paging channel. If the mobile terminal does not receive any paging in the first paging signal, it goes back to the sleep mode. Otherwise, the mobile terminal reads the second paging signal.

[0010] The network may page the mobile terminal to establish a network originated call or to trigger reading of updated system information. In response to the paging message, the mobile may establish a connection with the RAN (if the mobile terminal is in an "idle" state), or update the mobile terminal location using a cell update procedure (if the mobile terminal is in a "dormant" state).

[0011] Upon receipt of the paging response, the RAN knows the location of the mobile terminal at the cell level. Thus, the radio resources can efficiently be allocated to the mobile terminal for the call.

[0012] In the conventional system, the connection establishment and cell update response to a paging message (network-initiated connection) follow the same procedures as when the connection establishment/ cell update is performed in response to a "terminal initiated connection". In the latter case, the establishment cause is not known to the network until a connection request message is received by the mobile terminal. Therefore, the network can manage the connection setup only after receiving the initial connection request from the mobile terminal.

BRIEF SUMMARY OF THE INVENTION

[0013] In the case of a network-initiated connection, before the network pages the mobile terminal it knows the cause for connection establishment, and also the terminal context, to some extent, because the terminal is connected to the core network even when it is in the idle state. Therefore, the information known at the network may be used to optimize (speed up) connection establishment between the mobile terminal and the RAN.

[0014] Embodiments of the present invention provide a network-initiated connection establishment procedure which uses the information known at the network to speed up the connection between the mobile terminal and RAN. The invention uses a paging procedure to inform the mobile terminal of a network-initiated connection. The paging message is designed to support fast connection establishment over a shared channel..

[0015] Embodiments of the present invention provide a method of establishing a network-initiated connection between a mobile terminal User Equipment (UE) and a Radio Access Network (RAN) in which (1) the network (e.g., an aGW) initiates the connection by transmitting a paging message to the Node Bs in the UE registered tracking area, and (2) the Node Bs (belonging to the tracking area) receive the paging message and affix the paging message with a cell-specific radio network temporary identity (c-RNTI) and index(es) to one or a set of shared control channels (SCCHs). The c-RNTI and SCCHs are selected from the available c-RNTIs and SCCHs for the cell. The selection of c-RNTI and SCCH may be managed by the scheduler at the Node B, the core network (e.g., the aGW), or a separate radio resource manager (RRM) server.

[0016] The complete message is broadcast in the cell. The recipient UE may use the c-RNTI as a temporary cell-specific identity, and the SCCH as the associated shared control channel for shared channel operation. If the message is intended for the UE then it sends a paging acknowledgement message in the uplink. The message may be sent over a contention-based uplink channel (e.g. RACH) or a dedicated physical channel.

[0017] Upon the network's receipt of the paging acknowledgment from the UE, a shared channel connection is established between the UE and the network. After establishment of the shared channel connection, signalling and traffic data is transmitted over scheduled shared channel resources.

[0018] The paging message may be conveyed to the UE using: (1) paging indicators mapped onto a paging indicator channel (PICH), and the paging message mapped onto separate paging channels (PCH); (2) paging indicators mapped onto a shared control channel (SCCH) and the paging message mapped onto separate paging channels (PCH); or (3) paging indicators mapped

onto a shared control channel (SCCH) and the paging message mapped onto a downlink shared transport channel (SCH).

[0019] The paging acknowledgment message may be transmitted along with an uplink (UL) synchronization message over a contention-based random access channel, or as a separate paging acknowledgment message over such a channel.

[0020] The selection of c-RNTI and SCCH (to be attached to the paging message) may be managed by the Node B. The Node B selects an unused c-RNTI and one or a set of SCCHs, and signals these to the UE with the paging message. The paging message broadcast in different cells may have different c-RNTIs and SCCHs.

[0021] Alternatively, the selection of c-RNTI and SCCH may be managed by the aGW or a separate RRM server, in which case the c-RNTI and SCCH may be selected as cell-specific so that each Node B sends a paging message using different c-RNTIs and SCCHs. The c-RNTI and SCCH may alternatively be tracking-area specific, so that each Node B in the tracking area sends paging messages including the same c-RNTI and SCCH.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] Figure 1 illustrates an example of a cellular communication system according to embodiments of the invention.

[0023] Figure 2 illustrates network-initiated connection establishment according to embodiments of the invention.

[0024] Figure 3 illustrates an example of signaling flow according to embodiments of the invention.

[0025] Figure 4 illustrates the format of a paging signal broadcast in a cell according to embodiments of the invention.

[0026] Figure 5 illustrates the format of a paging signal broadcast in a cell according to embodiments of the invention where dedicated access resources are signalled to the UE.

[0027] Figure 6 illustrates resources available for allocation according to embodiments of the invention.

[0028] Figures 7-9 illustrate three different ways in which a paging message may be mapped according to embodiments of the invention.

[0029] Figure 10 illustrates the format of a paging acknowledgement including uplink synchronization according to embodiments of the invention.

[0030] Figure 11 illustrates the paging messages broadcast in different cells having different c-RNTIs and SCCHs, according to embodiments of the invention..

[0031] Figure 12 illustrates the paging messages broadcast in different cell having the same c-RNTI and SCCH in all cells within a tracking area, according to embodiments of the invention..

[0032] Figure 13 illustrates signalling flow in idle mode according to embodiments of the invention..

DETAILED DESCRIPTION OF THE INVENTION

[0033] Embodiments of the invention enable the RAN to perform network-initiated (originated) connection establishment over shared transport channels (SCHs). The SCHs are associated with a set of physical Shared Control Channels (SCCHs). Specific information required by the UE for correct transmission/reception over the SCHs is conveyed from RAN to UE over the SCCHs. For downlink, this information may specify the resources to be used for the downlink transmission; and information regarding the formatting of the data to enable its correct reception at the UE. For the uplink, the information might again specify which transmission resources are to be used along with other shared channel grant information (power allocation, etc.). In both cases, the terminal to which the shared channel grant is directed is identified on the shared channel based on a RAN (or cell) Specific Temporary Identification (c-RNTI), which is signalled to the UE by the RAN within the SCCH itself.

[0034] Figure 1 illustrates an example of a cellular communication system according to embodiments of the invention. The network includes a user equipment (UE) domain, a radio access network (RAN) domain, and a core network domain. The UE domain includes user equipment 110 that communicate with at least one base station 112 in the RAN domain via a wireless interface. The RAN domain may also include a network controller (e.g., radio network controller) (not shown), such as that used in UMTS systems. Alternatively, such funcationality may be distributed between the Node Bs and the aGW or other controller in the core network. Figure 1 also illustrates an optional radio resource manager (RRM) 114. As described below, the RRM may perform functions otherwise performed by the Node Bs or aGW in some embodiments.

[0035] The core network (CN) 116 includes, in this example, an access gateway (aGW) 118, a serving GPRS support node (SGSN) 120, and a gateway GPRS support node (GGSN) 122. The core network is coupled to an external network 124. The SGSN 120 is responsible for session control, including keeping track of the location of the UEs. The GGSN 122 concentrates and tunnels user data within the core network 116 to the ultimate destination (e.g., an Internet service provider) in the external network 124. Further details may be found in the 3GPP UMTS technical specifications, such as TS23.246 v6.4.0 "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Multimedia Broadcast/Multicast Service (MBMS); Architecture and Functional Description (Release 6)," published by the 3GPP Support Office, 650 Route des Lucioles - Sophia Antipolis, Valbonne - FRANCE, which are incorporated by reference herein.

[0036] Figure 2 illustrates network-initiated connection establishment according to embodiments of the invention. A network controller (e.g., an access gateway 118 in a core network) sends a paging message to the Node Bs 112 in the registration area to be broadcast in the cells. Before the paging message is broadcast in each cell, the Node B attaches a c-RNTI and SCCH index to the message. The c-RNTI and SCCH is selected from the available c-RNTIs and SCCHs in the cell and may, in some embodiments, be managed by a scheduler at the Node B. The corresponding UE 110 (the UE to which paging is indicated) uses this c-RNTI and SCCH index for data transmission over shared channels.

[0037] Figure 3 illustrates an example of signaling flow in an embodiment of the network-initiated connection establishment procedure. The network sends a paging message to the UE via the Node Bs to initiate a connection. First, the core network (or, more particularly in some embodiments, the access gate way within the core network) transmits the paging message to the relevant Node Bs in the registration area. After receiving the paging message from the core network, each Node B selects a c-RNTI and SCCH index (in one embodiment), and forms the paging signal to be broadcast in the corresponding cell. Thus the paging signal broadcast in the cell includes the paging message (cause, UE identity) from the core network, c-RNTI and the SCCH index (see Figure 4). The UE identity may be expressed by the international mobile subscriber identity (IMSI) or temporary mobile subcriber identity (TMSI), which are known in the 3G standard. The recipient UE may use this c-RNTI as the cell-specific identity and the SCCH as the associated shared control channel for the shared channel operation.

[0038] After decoding the paging message, the UE sends a paging acknowledgement message to the Node Bs in the RAN. The message may be combined with uplink synchronisation information and transmitted over a contention-based uplink channel (such as a random access channel (RACH)).

[0039] Due to possible UE collision on the contention-based uplink channel, the paging acknowledgement message may experience some delay. This can be avoided by allocating dedicated physical access resources for the transmission of the paging response message. If this is used, then the allocated physical access resources for the uplink transmission (paging response) may be signalled to the UE together with the paging message. Thus the paging signal may take the format shown in Figure 5.

[0040] The dedicated access resources may be a subset of resources allocated for access channels (see Figure 6). However, these resources may be reserved for allocation by the network, in contrast to selection by the UE in a normal contention-based RACH operation. The same message format is used for both the RACH channel and the dedicated access channel. The information on random access resources (RACH channels) is broadcast over a broadcast control channel (BCCH), whereas the channel information for the dedicated access channels is not broadcast in the cell. This

information is transmitted to the UE together with the paging signal according to one embodiment of the invention.

[0041] Upon receipt of the paging acknowledgment from the UE, a shared channel connection is established between the RAN and the UE, and signalling and traffic data will be transmitted over scheduled shared channel resources.

Mapping of paging message

[0042] In some embodiments, two-stage paging is employed. Referring to Figures 7-9, paging signal 1 wakes up a group of UEs to read the paging message(s), which are transmitted in paging signal 2. Three different implementations of two-stage paging are described herein.

Implementation 1

[0043] A paging signal 1 is mapped onto a separate physical channel, such as a paging indicator channel (PICH). A group of UEs wake up and read the PICH channel at a paging occasion calculated based on the DRX cycle and IMSI (used herein as an example of a UE identifier known by the core network). If a paging indicator is set to true, the UEs corresponding to the paging indicator read the paging message transmitted in paging signal 2.

[0044] The paging signal 2 may be mapped to separate paging channels (PCH). From the IMSI, the UE may calculate which paging channel to read, and read the paging message within the paging channel carrying the UE's IMSI. The system may use one PICH and a set of PCHs to enable paging for multiple UEs at a given paging occasion (see Figure 7).

Implementation 2

[0045] In another embodiment, the paging signal 1 may be mapped onto SCCH. In this case a group ID or an ID specified for paging (paging ID) can be used in an ID field of SCCH. The paging indicators may be mapped to an SCCH information field (Figure 8). Note that the channel format of SCCH (used for paging signal 1) is different from that used in the "normal" shared channel operation.

[0046] The paging signal 2 is transmitted over the paging channel (PCH). In this case, the UEs wake up from sleep mode as defined by the DRX cycle and IMSI, and read the SCCH for paging indicators. The location of a paging indicator within a paging signal 1 may be calculated based on the IMSI. If only one SCCH is used for paging indicators, a predefined paging ID may be used to inform the UE that paging signal 1 is a paging indicator-specific message. Otherwise, several SCCH may be used.

[0047] The UE corresponding to the same paging occasion may be assigned to a group, and each group is assigned a group ID. The user group ID may be located in the identity field in SCCH. The UEs belonging to the user group defined by the user group ID read the SCCH corresponding to the UEs' user group for their paging indicators. If the corresponding paging indicator is set to true, then the UE reads the paging signal 2, which is transmitted over the PCH and defined by the UE's IMSI. From the IMSI, the UE calculates which paging channel to read, and reads the paging message within the paging channel carrying the UE's IMSI. The system may use one or a set of SCCHs and one or a set of PCHs to enable paging for multiple UEs at a given paging occasion.

Implementation 3

[0048] This implementation uses SCCH and SCH to transmit paging signals. In addition, the same channel format as used in the normal shared channel operation is employed. Each UE learns which SCCH to monitor based upon either system information broadcast to the UEs, or because the SCCH index is preprogrammed in the UE pursuant to the applicable standard. The UEs listen to the appropriate SCCH for paging indicators at their paging occasion calculated based on DRX cycle and IMSI. The UEs with the same paging occasion are divided into groups based on the IMSI. Each group is given a user group ID, as indicated in the SCCH ID field. The message part of SCCH indicates the resources allocated for a corresponding SCH channel, which carries the paging message(s) (paging signal 2). If the UE belongs to the user group indicated in the SCCH ID field, the UE reads the allocated SCH for its paging message. An example implementation is shown in Figure 9. The system may use a set of SCCHs/SCHs to enable paging for multiple UEs at a given paging occasion.

Paging acknowledgement/UL synchronisation

[0049] After receiving the paging message from the network, the UE sends a paging acknowledgment message in the uplink (UL). The message may be sent over a contention-based channel (such as a random access channel (RACH)) or an allocated, dedicated access channel.

[0050] The paging acknowledgement may be sent separately or combined with a UL synchronisation request message. If the paging acknowledgment is combined with the UL synchronisation request message, the message may contain c-RNTI, which is signalled in the paging message, and a signature sequence which is selected from a set of sequences broadcast in a broadcast channel (BCH), or specified in the applicable communication standard specification (to be used for UL synchronisation), which may be programmed into the UE. The message format is shown in Figure 10.

[0051] In another embodiment, the UE may send the paging acknowledgment and UL synchronisation in separate messages, in which case the paging acknowledgment message only contains the c-RNTI value signalled in the paging message. This may be sent over RACH or over an allocated, dedicated access channel.

[0052] After receiving the paging acknowledgment from the UE, the Node B knows the UE location at the cell level. The Node B then establishes a radio connection between the UE and the Node B over a shared channel. The UE uses the c-RNTI and the SCCH index, which are signalled with the paging message to identify the UE and the SCCH, respectively, during shared channel operations. The Node B conveys the paging acknowledgment from the UE to the Core network. This completes the connection between the UE and the network.

SCCH and c-RNTI management

[0053] One way to manage the allocation of c-RNTI and SCCH is to allow the Node Bs to select c-RNTIs and SCCHs. After receiving a paging request from the aGW, the Node B may select an unused c-RNTI and one or a set of SCCHs to be used by the UE, if, e.g., the UE is in the idle state. During idle mode, the UE is not connected to a Node B, but is connected to the core network. The UE is known by its UE identifier (e.g., IMSI or TMSI) at the core network. In some embodiments, the Node B provides a temporary ID to the UE to connect the UE and the base

station. After the Node B receives a paging acknowledgement from the UE, the Node B sends the paging acknowledgement to the core network to complete the binding, enabling the core network to know that the UE is within the coverage area of the Node B.

[0054] If the paged UE has already been assigned a c-RNTI and a set of SCCHs by the Node B (e.g., the case when the UE is in dormant state), the previously assigned c-RNTI and SCCHs may be used within the paging signal by the Node B. This results in the paging messages broadcast in different cells having different c-RNTIs and SCCHs, as shown in Figure 11.

[0055] Alternatively, the c-RNTI and SCCH may be managed/selected by the aGW in the core network or a separate RRM server. C-RNTI and SCCH may be selected as cell-specific, in which case each Node B sends a paging message including different c-RNTIs and SCCHs affixed to the same initial paging message from the core network or RRM. Alternatively, the paging message may be sent including the same c-RNTI and SCCH in all cells within a tracking area (Figure 12). In that case, the aGW or RRM may reserve a set of c-RNTIs and SCCHs for use in paging requests.

[0056] When the RRM is employed, it takes over the function of assigning c-RNTI and SCCHs. (The aGW, in one embodiment, still sends the paging message.) The RRM server reserves a set of temporary identifiers and SCCHs. The RRM selects, allocates and keeps track of the assignment of temporary identifiers and SCCHs to paging messages. The RRM does not need to know the UE identifier (e.g., IMSI or TMSI).

[0057] Network-initiated connection establishment may vary depending on the UE connection states (e.g., idle or dormant states) and the paging cause.

Paging for idle state UEs

[0058] Idle state UEs are not known at the cell level because they are generally not connected to the RAN. Therefore, the UE would not have a c-RNTI or SCCH specified for its use in shared channel operation. However, the level of connection to the network may have two definitions. In one definition, the UE has no connection to the RAN, but it is connected to the core network. The

network does not store UE capability or security information regarding Idle mode UEs (this is the definition used for idle mode in conventional systems).

[0059] According to the second definition of the idle state, the UE is connected to the core network and has limited connection to the RAN. With this limited connection, however, the UE does not have c-RNTI, SCCH or radio resources allocated. Nevertheless, the UE is registered within the network, in which case the network would have a UE context (such as UE capabilities) stored in the network. Also, the security mode control and authentication procedures have been performed during the UE registration, and the security keys (ciphering, integrity protection) may have been exchanged between the network and the UE. The security keys would be stored in the UE and the network. (This is a possible definition of the idle state that may be used in LTE, i.e., the "long-term evolution" or next generation of the communications standard after UMTS.)

[0060] According to the two definitions for idle mode, two alternative network-initiated connection establishment procedures may be implemented.

[0061] Figure 13 depicts the signalling flow involved in network-initiated connection establishment in the case for an Idle mode UE with limited connection to the RAN (possible Idle state definition in LTE).

[0062] The paging message indicates with a UE identifier, such as IMSI, which UE has been paged. The paging message may be ciphered and sent (from aGW or other core network element) transparent to the Node B. Paging is broadcast in the cell (by Node Bs) according to the paging procedure described with respect to Figure 3. After receiving the paging message, the UE sends a paging acknowledgment (with or without UL synchronisation request). The Node B conveys the paging acknowledgment to the aGW. Note that security control or authentication is not necessary as the authentication has already been performed and the security information is stored in the aGW.

[0063] When the paging acknowledgment is received by the network, the connection is established between the UE and the network for shared channel operation. The c-RNTI and SCCH index signalled with the paging message is used by the UE as the shared channel IDs.

[0064] After sending the paging acknowledgment message, the UE listens to the allocated SCCH (which is signalled with the paging message) for resource allocation on SCH. The aGW issues a Radio Access Bearer (RAB) assignment request to the Node B. The Node B assigns radio resources for the message transmission, and the UE is informed about the allocated resources over SCCH. The timing advance information calculated at the Node B for uplink time synchronisation may also be mapped on to the SCCH. The timing advance information may alternatively be conveyed using a separate physical channel. [Node B computes propagation delay and signals back timing advance information to UE, so that signals from all UEs will be time synchronized at the Node B.]

[0065] The Node B sends a radio bearer setup message using the allocated physical resources on DL-SCH (downlink shared channel). The radio bearer setup complete message is sent on UL-SCH (uplink shared channel). Upon receipt of RAB assignment response by the aGW, the data transmission is commenced over the shared channel.

[0066] The radio bearer setup/response message may be sent using a logical dedicated control channel (DCCH) mapped onto a shared transport channel (SCH). In that case, a default bearer configuration is used for the message (radio bearer setup/response message) transmission.

[0067] In some embodiments, the system may employ a default (or stored) radio bearer configuration (or some part of that configuration) for the data transmission. In this case, the use of default (or stored) configuration information may be signalled within the paging message. If so, only the additional information needed in the case of a radio bearer re-configuration needs to be communicated between the RAN and UE before the data transmission is commenced.

[0068] If no UE security or authentication information is kept in the network in the idle state, the security control and authentication may be performed before the radio bearer configuration step. The security control may also be performed over SCH using the allocated c-RNTI as the UE identification over SCH. The resource allocation is communicated over the allocated SCCH.

Paging for dormant state UEs

[0069] In the dormant state, the UE is connected to the network. Thus, it is given a c-RNTI from the Node B with which the UE was last registered. The UE may have gone out of the coverage area of the Node B. Thus the UE is paged in the cells (Node Bs) belonging to the tracking area.

[0070] The paging for dormant state UEs is similar to that for idle state UEs described above. However, as the UE has already allocated a c-RNTI, the same c-RNTI may be used with the paging message when the UE is paged in the cell with which it was last registered.

[0071] 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 UMTS or 3G systems.

[0072] 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 digital circuitry or processors 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.

[0073] 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.

[0074] Although the present invention has been described in connection with some 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.

[0075] 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.

What is claimed is:

1. A base station for establishing a network-initiated connection with a user equipment over a radio interface in a cellular communication system, the base station comprising:

logic for receiving a paging message;

logic for sending the paging message and a temporary identifier to at least one cell;

logic for receiving a paging acknowledgement from the user equipment (UE) within the at least one cell; and

logic for establishing a shared channel connection between the base station and the UE in response to the paging acknowledgement, wherein the temporary identifier identifies the UE on the shared channel.

2. The base station of claim 1, wherein the logic for receiving the paging message is operable to receive the paging message from a core network.

3. The base station of claim 1, comprising logic for assigning to the UE a temporary identifier from the base station to which it was last registered in response to the UE being in a dormant state.

4. The base station of claim 1, wherein the logic for sending is operable to send at least one channel index to at least one shared control channel (SCCH) along with the paging message, the SCCH for communicating control information for the UE during shared channel operation.

5. The base station of claim 1, comprising logic for signaling to the UE an indication of dedicated access resources to be used by the UE for paging acknowledgement.

6. The base station of claim 5, wherein the dedicated access resources include a dedicated physical channel.

7. The base station of claim 5, wherein the dedicated access resources include a dedicated signal sequence to be used on a contention-based channel.

8. The base station of claim 1, wherein the logic for receiving the paging acknowledgement is operable to for receive the paging acknowledgement over a contention-based uplink channel.

9. The base station of claim 2, further comprising logic for sending the paging acknowledgment to the core network to establish shared channel communications between the UE and the core network.

10. The base station of claim 1, wherein the logic for sending is operable to send the paging message using a broadcast channel.

11. The base station of claim1, wherein the temporary identifier is cell-specific, the base station further comprising logic for selecting the temporary identifier at the base station.

12. The base station of claim 11, further comprising logic for selecting the SCCH at the base station.

13. The base station of claim 1, wherein the logic for receiving the paging acknowledgement comprises logic for synchronizing communication with the UE based upon an uplink synchronization request from the UE.

14. The base station of claim 13, wherein the uplink synchronization request is part of a paging acknowledgement message.

15. The base station of claim 2, wherein the temporary identifier is cell-specific, the base station further comprising logic for receiving the temporary identifier from the core network.

16. The base station of claim 1, wherein the temporary identifier is cell-specific, the base station further comprising logic for receiving the temporary identifier from a resource manager outside the core network.

17. The base station of claim 15, the base station further comprising logic for receiving the channel index is selected from the core network.

18. The base station of claim 16, the base station further comprising logic for receiving the channel index from the resource manager.

19. The base station of claim 1, wherein the temporary identifier is cell-specific.

20. The base station of claim 2, wherein the temporary identifier is common to a plurality of cells within a registration area, the base station further comprising logic for receiving the temporary identifier from the core network.

21. The base station of claim 1, wherein the temporary identifier is common to a plurality of cells within a registration area, the base station further comprising logic for receiving the temporary identifier from a resource manager.

22. The base station of claim 4, wherein the temporary identifier and the SCCH are cell-specific.

23. The base station of claim 1, wherein the logic for sending comprises logic for:

sending at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

sending the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

24. The base station of claim 23, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

25. The base station of claim 23, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

26. The base station of claim 25, further comprising logic for sending in the SCCH a group identifier identifying a group of UEs to which paging messages are directed.

27. The base station of claim 23, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

28. The base station of claim 27, further comprising logic for:

sending in the SCCH a group identifier identifying a group of UEs to which at least one paging message is directed; and

sending in the SCCH an indication of resources allocated to the group of UEs for receiving paging messages in the shared channel.

29. A method for establishing a network-initiated connection between a user equipment and a base station over a radio interface in a cellular communication system, the method comprising, at a base station:

receiving a paging message;

sending the paging message and a temporary identifier to at least one cell;

receiving a paging acknowledgement from the user equipment (UE) within the at least one cell; and

in response to the paging acknowledgement, establishing a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

30. The method of claim 29, wherein receiving the paging message comprises receiving the paging message from a core network.

31. The method of claim 29, wherein, in response to the UE being in a dormant state, the UE is assigned the same temporary identifier it had been assigned from the base station to which it was last registered.

32. The method of claim 29, wherein sending further comprises sending at least one channel index to at least one shared control channel (SCCH) along with the paging message, the SCCH for communicating control information for the UE during shared channel operation.

33. The method of claim 29, wherein sending the paging message comprises signaling to the UE an indication of dedicated access resources to be used by the UE for paging acknowledgement.

34. The method of claim 30, further comprising sending the paging acknowledgment to the core network to establish shared channel communications between the UE and the core network.

35. The method of claim 29, wherein the temporary identifier is cell-specific, the method further comprising selecting the temporary identifier at the base station.

36. The method of claim 35, further comprising selecting the SCCH at the base station.

37. The method of claim 29, further comprising synchronizing communications between the base station and the UE based upon an uplink synchronization request from the UE.

38. The method of claim 30, wherein the temporary identifier is cell-specific, and the temporary identifier is selected by the core network that sent the paging message.

39. The method of claim 30, wherein the temporary identifier is common to a plurality of cells within a registration area, and is selected by the core network.

40. The method of claim 29, wherein sending the paging message comprises:

sending at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

sending the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

41. The method of claim 40, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

42. The method of claim 40, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

43. The method of claim 42, further comprising sending in the SCCH a group identifier identifying a group of UEs to which paging messages are directed.

44. The method of claim 40, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

45. A resource manager for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the resource manager comprising:

logic for selecting a temporary identifier for the UE; and

logic for providing the temporary identifier to the base station for transmission by the base station to the UE along with a paging message, the temporary identifier for identifying the UE during shared channel operation between the UE and the base station.

46. The resource manager of claim 45, wherein the paging message is provided to the base station by a core network.

47. The resource manager of claim 45, wherein the resource manager is a radio resource manager outside a core network that provides the paging message to the base station.

48. The resource manager of claim 45, further comprising logic for:

sending a paging message to at least one base station within a registration area, wherein the paging message includes a UE identifier;

receiving a paging acknowledgement from a UE associated with the UE identifier via a first base station to establish a shared channel connection between the first base station and the UE.

49. The resource manager of claim 48, wherein the resource manager is part of the core network that provides the paging message to the base station.

50. The resource manager of claim 49, wherein the resource manager is an access gateway.

51. The resource manager of claim 45, further comprising logic for:

selecting a channel index to a shared control channel (SCCH); and

providing the channel index to the base station for transmission by the base station to the UE along with the paging message and the temporary identifier, the SCCH for communicating control information including the temporary identifier between the UE and the base station during shared channel operation.

52. The resource manager of claim 51, wherein the temporary identifier and the SCCH are cell-specific.

53. The resource manager of claim 51, wherein the temporary identifier and the SCCH are common to a plurality of cells within a registration area of the core network.

54. A method for establishing a network-initiated connection between a user equipment (UE) and a base station over a radio interface in a cellular communication system, the method comprising, at a resource manager:

selecting a temporary identifier for the UE; and

providing the temporary identifier to the base station for transmission by the base station to the UE along with a paging message, the temporary identifier for identifying the UE during shared channel operation between the UE and the base station.

55. The method of claim 54, wherein the paging message is provided to the base station by a core network.

56. The method of claim 54, wherein the resource manager is a radio resource manager outside a core network that provides the paging message to the base station.

57. The method of claim 54, further comprising:

sending a paging message to at least one base station within a registration area, wherein the paging message includes a UE identifier; and

receiving a paging acknowledgement from a UE associated with the UE identifier via a first base station to establish a shared channel connection between the first base station and the UE.

58. The method of claim 57, wherein the resource manager is part of the core network that provides the paging message to the base station.

59. The method of claim 54, further comprising, at the resource manager:

selecting a channel index to a shared control channel (SCCH); and

providing the channel index to the base station for transmission by the base station to the UE along with the paging message and the temporary identifier, the SCCH for communicating control information including the temporary identifier between the UE and the base station during shared channel operation.

60. The method of claim 59, wherein the temporary identifier and the SCCH are cell-specific.

61. The method of claim 59, wherein the temporary identifier and the SCCH are common to a plurality of cells within a registration area of the core network.

62. A user equipment (UE) for establishing a network-initiated connection with a base station over a radio interface in a cellular communication system, the UE comprising:

logic for receiving from the base station a paging message and a temporary identifier; and

logic for sending a paging acknowledgement to the base station to establish a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

63. The UE of claim 62, further comprising logic for communicating control information during shared channel operation using a channel index to at least one shared control channel (SCCH) received along with the paging message from the base station.

64. The UE of claim 62, wherein the logic for receiving is operable to receive an indication of dedicated access resources from the base station, the UE further comprising logic for employing the dedicated access resources for paging acknowledgement.

65. The UE of claim 62, wherein the temporary identifier is cell-specific.

66. The UE of claim 62, wherein the logic for sending the paging acknowledgement is operable to send an uplink synchronization request to the base station.

67. The UE of claim 66, wherein the uplink synchronization request is part of a paging acknowledgement message.

68. The UE of claim 62, wherein the logic for receiving is operable to:

receive at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

receive the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

69. The UE of claim 68, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

70. The UE of claim 68, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

71. The UE of claim 70, further comprising logic for receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs.

72. The UE of claim 68, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

73. The UE of claim 72, further comprising logic for:

receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs; and

receiving in the SCCH an indication of resources allocated to the group of UEs to which the UE belongs for receiving paging messages in the shared channel.

74. A method for establishing a network-initiated connection with a base station over a radio interface in a cellular communication system, the UE comprising, at a UE:

receiving from the base station a paging message and a temporary identifier; and

sending a paging acknowledgement to the base station to establish a shared channel connection between the base station and the UE, wherein the temporary identifier identifies the UE on the shared channel.

75. The method of claim 74, comprising communicating control information during shared channel operation using a channel index to at least one shared control channel (SCCH) received along with the paging message from the base station.

76. The method of claim 74, wherein receiving comprises receiving an indication of dedicated access resources from the base station, the method further comprising employing the dedicated access resources for paging acknowledgement.

77. The method of claim 74, further comprising sending an uplink synchronization request to the base station.

78. The method of claim 74, wherein receiving comprises:

receiving at least one paging indicator in a first physical channel, wherein each paging indicator corresponds to at least one UE; and

receiving the paging message in at least one second physical channel different from the first physical channel, wherein each second physical channel corresponds to at least one UE.

79. The method of claim 78, wherein the first physical channel is a paging indicator channel for carrying a plurality of paging indicators, and the second physical channel is a paging channel.

80. The method of claim 78, wherein the first physical channel is an SCCH channel, and the second physical channel is a paging channel.

81. The method of claim 80, further comprising logic for receiving in the SCCH a group identifier identifying a group of UEs to which the UE belongs.

82. The method of claim 78, wherein the first physical channel is an SCCH channel, and the second physical channel is a shared channel.

NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM

ABSTRACT

Network-initated connection establishment employs base stations that affix a temporary identifier and a shared control channel index to a paging message. User equipment for which the paging message is intended responds with a paging acknowledgement. In response to the paging acknowledgement, the network establishes shared channel connectivity with the UE.

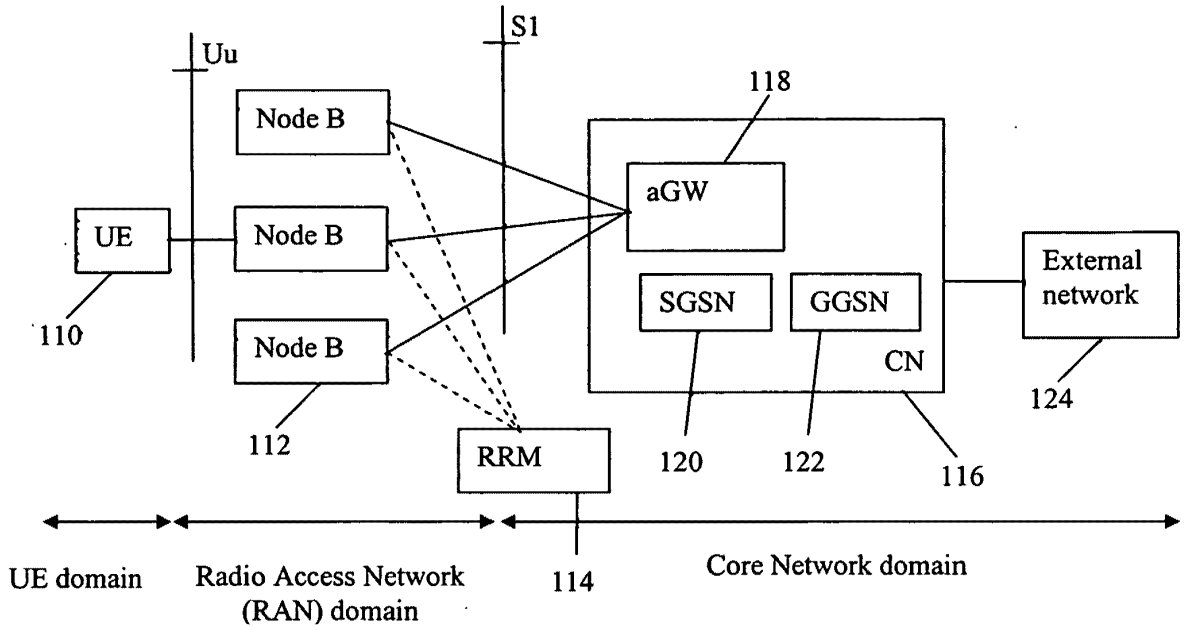
Uu
S1
118
Node B
aGW
UE
Node B
External network
SGSN
GGSN
110
Node B
CN
124
112
RRM
120
122
116
114
UE domain
Radio Access Network (RAN) domain
Core Network domain

Figure 1

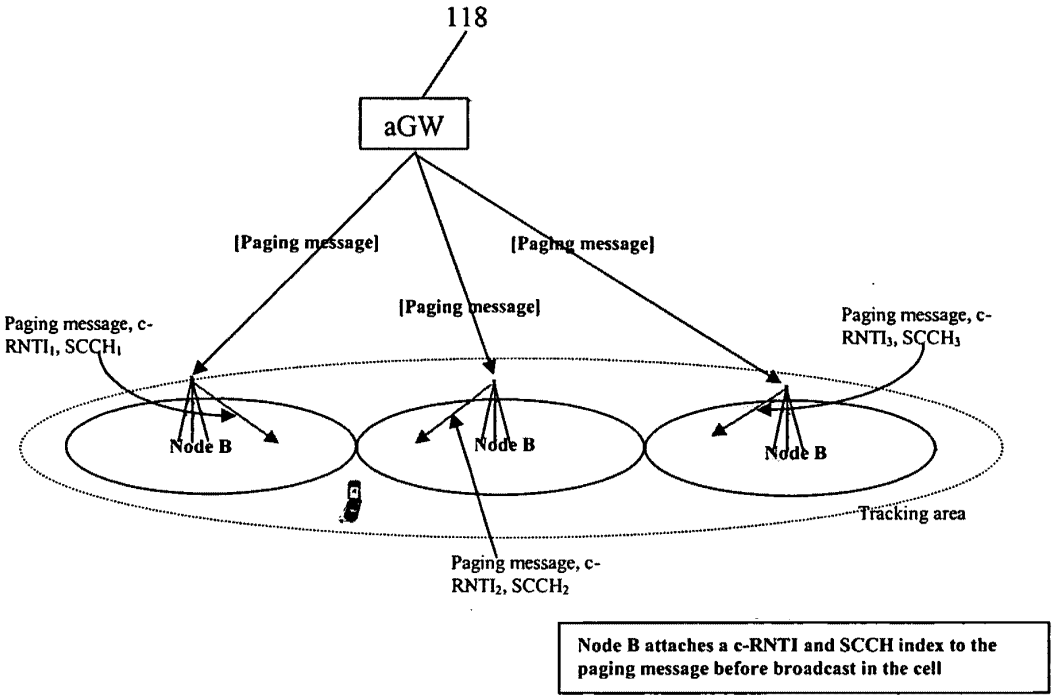
118
aGW
[Paging message]
[Paging message]
[Paging message]
Paging message, c-RNTI$_1$, SCCH$_1$
Paging message, c-RNTI$_3$, SCCH$_3$
Node B
Node B
Node B
Tracking area
Paging message, c-RNTI$_2$, SCCH$_2$
Node B attaches a c-RNTI and SCCH index to the paging message before broadcast in the cell

Figure 2

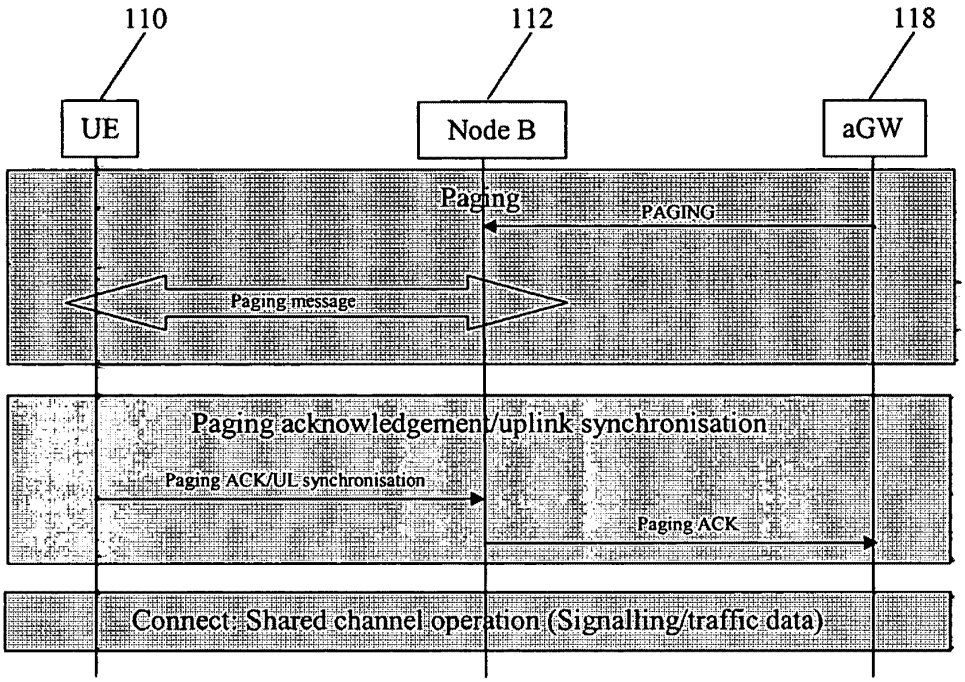
110
112
118
UE
Node B
aGW
Paging
PAGING
Paging message
Paging acknowledgement/uplink synchronisation
Paging ACK/UL synchronisation
Paging ACK
Connect: Shared channel operation (Signalling/traffic data)

Figure 3

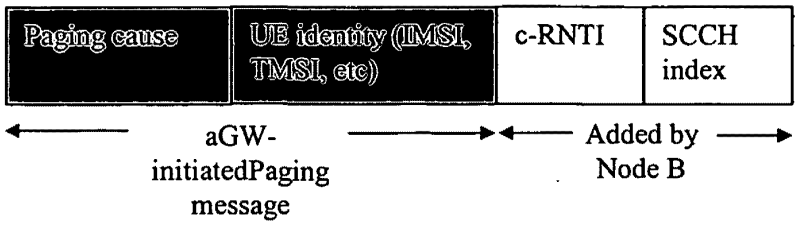
Paging cause
UE identity (IMSI, TMSI, etc)
c-RNTI
SCCH index
aGW-initiatedPaging message
Added by Node B

Figure 4

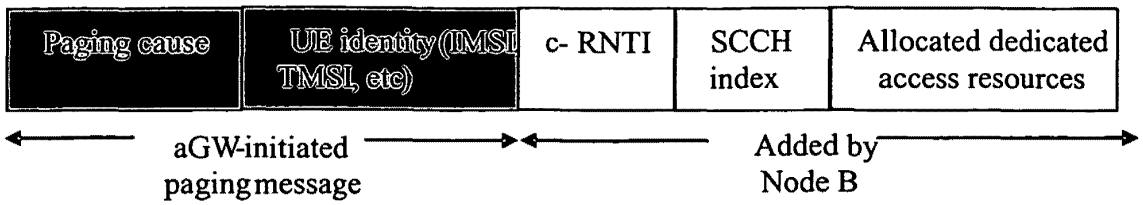
Paging cause
UE identity (IMSI TMSI, etc)
c- RNTI
SCCH index
Allocated dedicated access resources
aGW-initiated paging message
Added by Node B

Figure 5

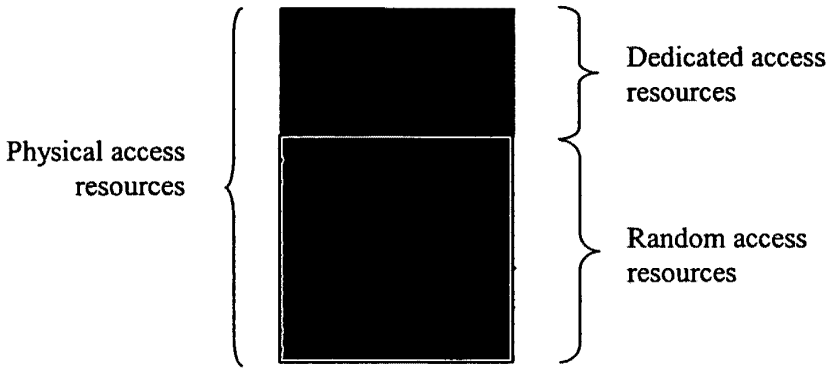
Physical access resources
Dedicated access resources
Random access resources

Figure 6

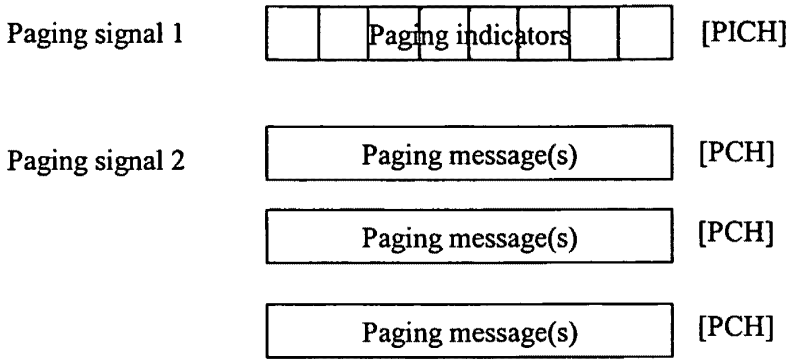
Paging signal 1
Paging indicators
[PICH]
Paging signal 2
Paging message(s)
[PCH]
Paging message(s)
[PCH]
Paging message(s)
[PCH]

Figure 7

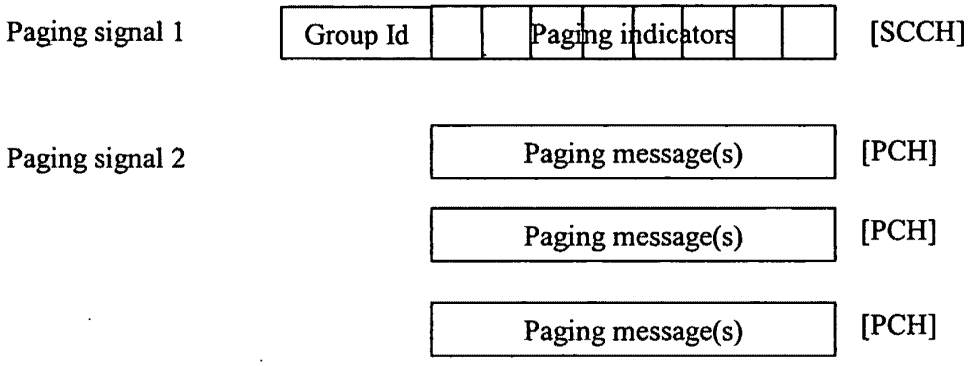
Paging signal 1
Group Id
Paging indicators
[SCCH]
Paging signal 2
Paging message(s)
[PCH]
Paging message(s)
[PCH]
Paging message(s)
[PCH]

Figure 8

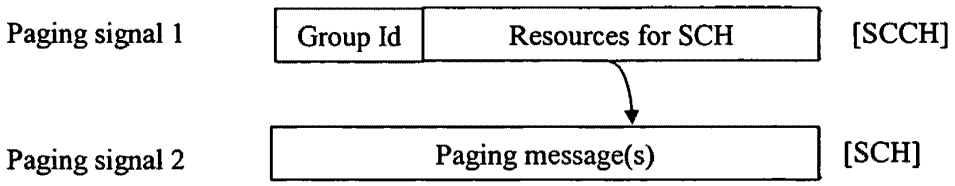
Paging signal 1
Group Id
Resources for SCH
[SCCH]
Paging signal 2
Paging message(s)
[SCH]

Figure 9

c-RNTI (which is signalled in the paging message)	Signature sequence (for UL synchronisation)

Figure10

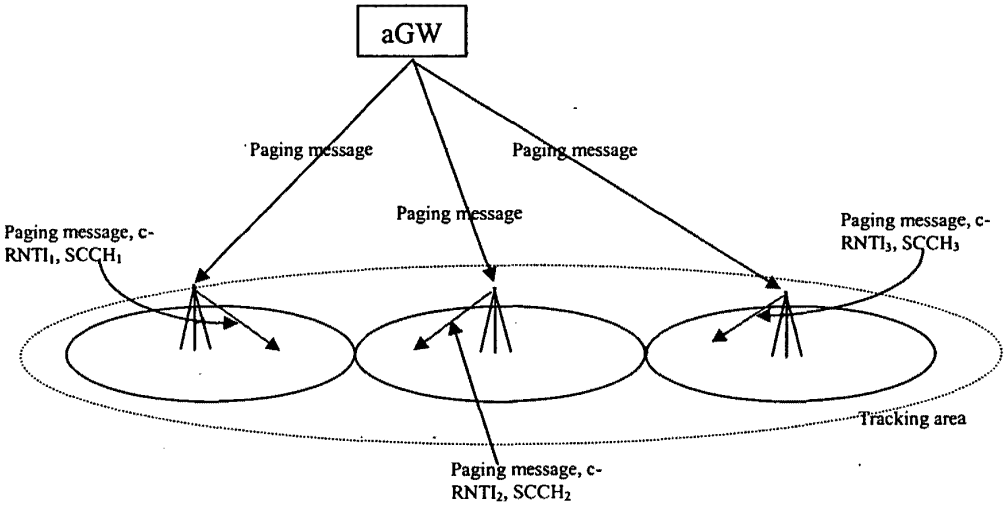
aGW
Paging message
Paging message
Paging message
Paging message, c-RNTI1, SCCH1
Paging message, c-RNTI3, SCCH3
Tracking area
Paging message, c-RNTI2, SCCH2

Figure 11

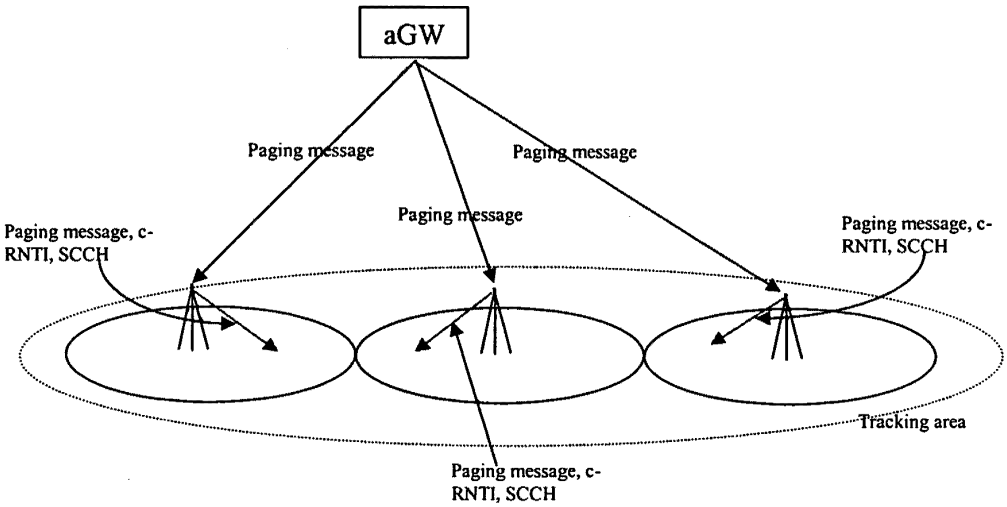
aGW
Paging message
Paging message
Paging message
Paging message, c-RNTI, SCCH
Paging message, c-RNTI, SCCH
Tracking area
Paging message, c-RNTI, SCCH

Figure 12

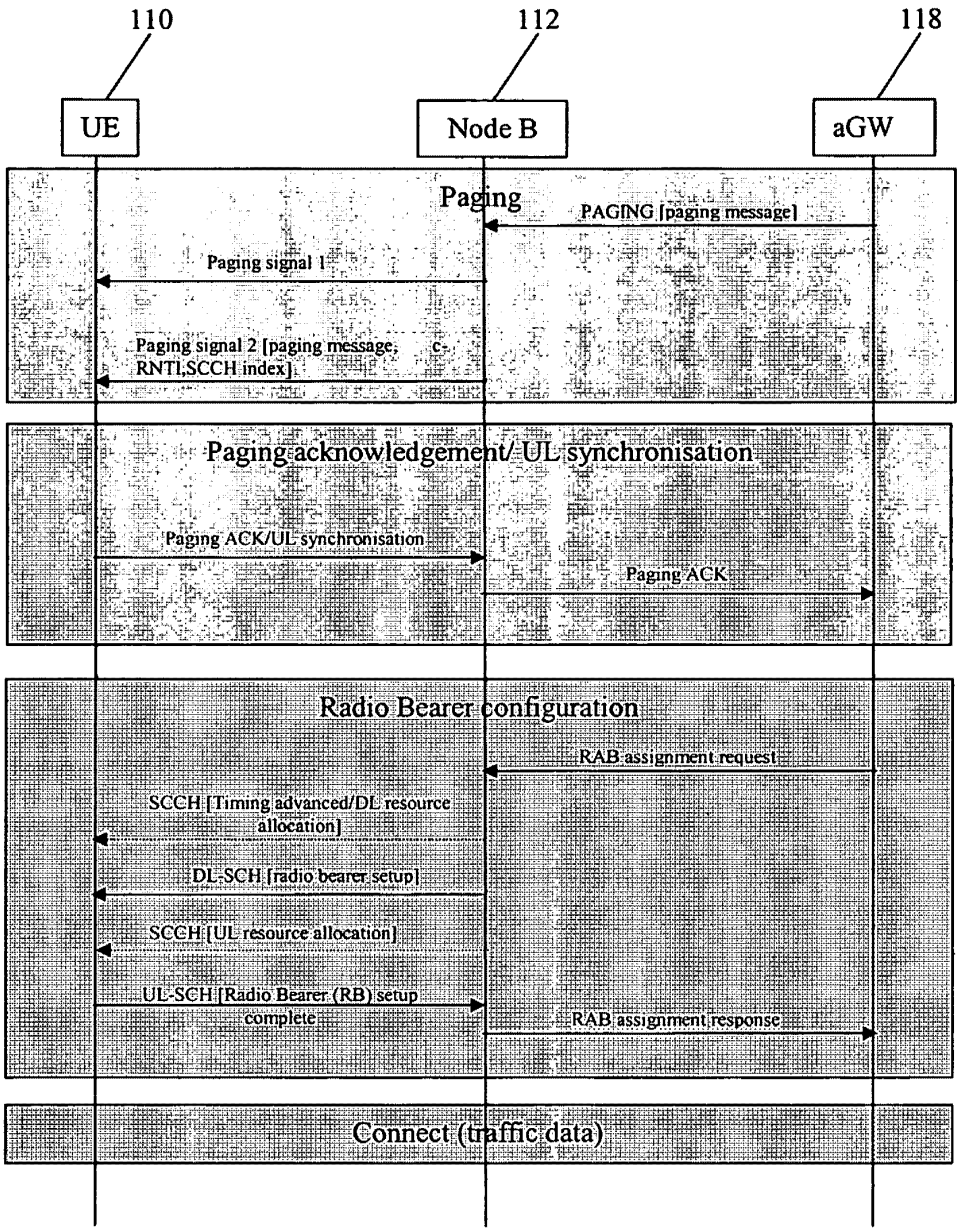
110
112
118
UE
Node B
aGW
Paging
PAGING [paging message]
Paging signal 1
Paging signal 2 [paging message, c-RNTI,SCCH index]
Paging acknowledgement/ UL synchronisation
Paging ACK/UL synchronisation
Paging ACK
Radio Bearer configuration
RAB assignment request
SCCH [Timing advanced/DL resource allocation]
DL-SCH [radio bearer setup]
SCCH [UL resource allocation]
UL-SCH [Radio Bearer (RB) setup complete
RAB assignment response
Connect (traffic data)

Figure 13

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

05/05/2006 SFELEKE1 00000110 031952 11416865

01 FC:1011	300.00	DA
02 FC:1111	500.00	DA
03 FC:1311	200.00	DA
04 FC:1201	600.00	DA
05 FC:1202	3100.00	DA

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875 Effective December 8, 2004

Application or Docket Number: 11416865

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	150.00		N/A	300.00
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	$250		N/A	$500
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	$100		N/A	$200
TOTAL CLAIMS (37 CFR 1.16(i))	82 minus 20 =	* 62	X$ 25 =		OR	X$50 =	3100
INDEPENDENT CLAIMS (37 CFR 1.16(h))	6 minus 3 =	* 3	X100 =			X200 =	600
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 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))			+180=			+360=	
			TOTAL			TOTAL	4700

* If the difference in column 1 is less than zero, enter "0" in column 2.

APPLICATION AS AMENDED – PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	X$ 25 =		OR	X$50 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X100 =		OR	X200 =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					+180=		OR	+360=	
	1, 29, 45, 54, 62, 74					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	X$ 25 =		OR	X$50 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X100 =		OR	X200 =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					+180=		OR	+360=	
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Application Data Sheet

Application Information

Application Type::	Regular
Subject Matter::	Utility
Suggested Group Art Unit::	Not Yet Assigned
CD-ROM or CD-R?::	None
Sequence submission?::	None
Computer Readable Form (CRF)?::	No
Title::	NETWORK-INITIATED COMMUNICATION ESTABLISHMENT IN A CELLULAR SYSTEM
Attorney Docket Number::	562492006900
Request for Early Publication?::	No
Request for Non-Publication?::	No
Total Drawing Sheets::	13
Small Entity?::	No
Petition included?::	No
Secrecy Order in Parent Appl.?::	No

Applicant Information

Applicant Authority Type::	Inventor
Primary Citizenship Country::	Sri Lanka
Status::	Full Capacity
Given Name::	Chandrika
Middle Name::	K.
Family Name::	WORRALL
City of Residence::	Chippenham
Country of Residence::	United Kingdom
Street of mailing address::	40 Louise Rayner Place
City of mailing address::	Chippenham
Country of mailing address::	United Kingdom

Postal or Zip Code of mailing address::	SN15 3BU

Correspondence Information

Correspondence Customer Number::	20872

Representative Information

Representative Customer Number::	20872

Domestic Priority Information

Foreign Priority Information

Assignee Information

Assignee name::	IPWireless, Inc.
Street of mailing address::	1001 Bayhill Drive, Second Floor
City of mailing address::	San Bruno
State or Province of mailing address::	CA
Postal or Zip Code of mailing address::	94066