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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	02/22/2022	11259338	4965.1056-001	3145

21005 7590 02/02/2022
HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

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 216 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.

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

Rudolf Strijkers, Zurich, SWITZERLAND;
Shuang Zhang, Delft, NETHERLANDS;

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

KONINKLIJKE KPN N.V., The Hague, NETHERLANDS;
Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek TNO, s-Gravenhage, NETHERLANDS;

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

PART B - FEE(S) TRANSMITTAL

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

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

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

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

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

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.

21005 7590 10/28/2021
HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001	3145

TITLE OF INVENTION: HANDLING OF CONNECTION SETUP REQUESTS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	01/28/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
MA, BASIL	2415	370-328000

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

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

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

Hamilton, Brook, Smith
& Reynolds, P.C.

1 _____

2 _____

3 _____

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

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

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

KONINKLIJKE KPN N.V.

NEDERLANDSE ORGANISATIE VOOR TOEGEPAST-NATUURWETENSCHAPPELIJK ONDERZOEK TNO

ROTTERDAM, NETHERLANDS

'S-GRAVENHAGE, NETHERLANDS

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

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

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

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

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 08-0380

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

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

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

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

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

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

Authorized Signature /Timothy J. Meagher, Reg. No. 39302/

Date 1/10/2022

Typed or printed name Timothy J. Meagher

Registration No. 39,302

Electronic Patent Application Fee Transmittal

Application Number:	15538182			
Filing Date:	20-Jun-2017			
Title of Invention:	HANDLING OF CONNECTION SETUP REQUESTS			
First Named Inventor/Applicant Name:	Rudolf Strijkers			
Filer:	Timothy J. Meagher/Jennifer Torpey			
Attorney Docket Number:	4965.1056-001			
Filed as Large Entity				
Filing Fees for U.S. National Stage under 35 USC 371				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	1200	1200

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

Electronic Acknowledgement Receipt

EFS ID:	44707325
Application Number:	15538182
International Application Number:	
Confirmation Number:	3145
Title of Invention:	HANDLING OF CONNECTION SETUP REQUESTS
First Named Inventor/Applicant Name:	Rudolf Strijkers
Customer Number:	21005
Filer:	Timothy J. Meagher/Jennifer Torpey
Filer Authorized By:	Timothy J. Meagher
Attorney Docket Number:	4965.1056-001
Receipt Date:	10-JAN-2022
Filing Date:	20-JUN-2017
Time Stamp:	17:05:25
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 1200
RAM confirmation Number	E202210H05403621
Deposit Account	
Authorized User	

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

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	49651056001_IF_Transmittal. PDF	136139	no	1
			846d16a56b1f249ff23d8bc4d203adb9fdbb7fc0		
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	38299	no	2
			d4ca6dddf09ff7702acf373e06e358482b73ca b44		
Warnings:					
Information:					
Total Files Size (in bytes):			174438		
<p>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.</p> <p><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.</p> <p><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.</p> <p><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.</p>					



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www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

21005 7590 10/28/2021
HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

EXAMINER

MA, BASIL

ART UNIT

PAPER NUMBER

2415

DATE MAILED: 10/28/2021

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001	3145

TITLE OF INVENTION: HANDLING OF CONNECTION SETUP REQUESTS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	01/28/2022

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

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

PART B - FEE(S) TRANSMITTAL

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 Alexandria, Virginia 22313-1450

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

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21005 7590 10/28/2021
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(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001	3145

TITLE OF INVENTION: HANDLING OF CONNECTION SETUP REQUESTS

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nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	01/28/2022

EXAMINER	ART UNIT	CLASS-SUBCLASS
MA, BASIL	2415	370-328000

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

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

1 _____

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

2 _____

3 _____

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

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

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

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

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

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

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

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

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

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

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

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001	3145
21005	7590	10/28/2021	EXAMINER	
HAMILTON, BROOK, SMITH & REYNOLDS, P.C. 530 VIRGINIA ROAD P.O. BOX 9133 CONCORD, MA 01742-9133			MA, BASIL	
			ART UNIT	PAPER NUMBER
			2415	

DATE MAILED: 10/28/2021

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

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

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

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

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

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

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 15/538,182	Applicant(s) Strijkers et al.	
	Examiner Basil Ma	Art Unit 2415	AIA (FITF) Status Yes

-- 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 IDS filing of 9/2/2021.
☐ 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 claims 1-10 12-15 renumbered as 1-14 of 8/13/2021. 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. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____ 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material _____ 4. <input type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date _____	5. <input checked="" type="checkbox"/> Examiner's Amendment/Comment 6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 7. <input type="checkbox"/> Other _____
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/B.M./ Examiner, Art Unit 2415	/JEFFREY M RUTKOWSKI/ Supervisory Patent Examiner, Art Unit 2415
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Notice of Pre-AIA or AIA Status

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

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 allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). 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, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 09/02/2021 has been entered.

Applicant has submitted IDS of 9/02/2021 for review.

EXAMINER'S AMENDMENT (from previous NOA 8/13/2021)

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

Authorization for this examiner's amendment was given in an interview with attorney Tim Meagher on 7/21/2021.

The application has been amended as follows:

1. (Currently Amended) A method for assisting in handling of connection setup requests in a telecommunications network, the method comprising:

intercepting, by a node, a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of the telecommunications network;

identifying, by the node, from the connection setup request, a service for which the connection setup is requested;

determining, by the node, that the identified service is not an emergency service;

determining, by the node, whether the connection setup request is to be fulfilled based at least on information comprising available resources in ~~the~~ a network access point (NAP) serving the UE that are not reserved for premium services, a determination being a positive determination if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more premium services; and

passing, by the node, the connection setup request for further processing within the telecommunications network only upon positive determination.

9. (Currently Amended) A computer program product, stored on a computer-readable non-transitory storage medium, comprising software code portions configured for, when executed in a computer, carrying out a method ~~steps according to claim 1~~ comprising:

intercepting, by a node, a connection setup request from a user equipment (UE) to

a control node of a radio access network (RAN) part of the telecommunications network;

identifying, by the node, from the connection setup request, a service for which the connection setup is requested;

determining, by the node, that the identified service is not an emergency service;

determining, by the node, whether the connection setup request is to be fulfilled based at least on information comprising available resources in a network access point (NAP) serving the UE that are not reserved for premium services, a determination being a positive determination if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more premium services; and

passing, by the node, the connection setup request for further processing within the telecommunications network only upon positive determination.

10. (Currently Amended) A data structure stored in a non-transitory computer-readable storage medium of a node, the data structure comprising at least:

an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more premium services;

an indication of an amount of resources currently used by the NAP for the one or more premium services; and

an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more premium services;

the data structure, used by the node, to determine whether the connection setup requests are to be fulfilled based at least on information comprising available resources in the NAP serving the UE that are not reserved for premium services, a determination being a positive determination if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more premium services; and

passing, by the node, the connection setup request for further processing within
the telecommunications network only upon positive determination.

11. (Canceled)

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

From NOA of 8/13/2021, the Instant Invention is directed towards supporting *premium services in a wireless telecommunication network* by blocking non-premium traffic and giving preference to *premium* traffic depending on available capacity. The cited prior art discloses access class barring which is used to give priority to a particular class of traffic, however, the instant claims distinguishes.

IDS of 9/02/2021 has been considered. The allowed claims of 8/13/2021 distinguishes from the references cited in the IDS.

Allowable Subject Matter

Claims 1-10 and 12-15 renumbered as **claims 1-14** from the Notice of Allowance of 8/13/2021 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Basil Ma whose telephone number is (408)918-7571. The examiner can normally be reached on Monday-Thursday 8AM-6PM PST.

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


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffery Rutkowski can be reached on (571) 270-1215. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <https://ppair-my.uspto.gov/pair/PrivatePair>. 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.

/B.M./
Examiner, Art Unit 2415

/JEFFREY M RUTKOWSKI/
Supervisory Patent Examiner, Art Unit 2415

<i>Search Notes</i> 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner Basil Ma	Art Unit 2415

CPC - Searched*		
Symbol	Date	Examiner


CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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


Search Notes		
Search Notes	Date	Examiner
Inventor Search on PALM	05/07/2019	/BM/
CPC and Keyword Search on EAST	05/07/2019	/BM/
Update Search	01/24/2020	/BM/
Update Search	08/01/2020	/BM/
Update Search	03/01/2021	/BM/
Update Search	07/24/2021	/BM/
IDS of 9/2/2021 Considered	09/26/2021	/BM/

/BASIL MA/ Examiner, Art Unit 2415	
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<i>Search Notes</i> 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner Basil Ma	Art Unit 2415

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
H04W	76/10 76/20	07/24/2021	/BM/


/BASIL MA/ Examiner, Art Unit 2415	
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Issue Classification 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner Basil Ma	Art Unit 2415

CPC						
Symbol					Type	Version
H04W	/	76	/	10	F	2018-02-01
H04W	/	76	/	20	I	2018-02-01
H04W	/	72	/	0486	I	2013-01-01
H04W	/	28	/	26	I	2013-01-01
H04W	/	88	/	02	A	2013-01-01

CPC Combination Sets					
Symbol				Type	Version
/	/	/	/		

/BASIL MA/ Examiner, Art Unit 2415 (Assistant Examiner)	(Date)	Total Claims Allowed: 14	
/JEFFREY M RUTKOWSKI/ Supervisory Patent Examiner, Art Unit 2415 (Primary Examiner)	07 August 2021 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 3


Issue Classification 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner Basil Ma	Art Unit 2415

INTERNATIONAL CLASSIFICATION				
CLAIMED				
H04W76/10	/	76	/	10
H04W76/20	/	76	/	20
H04W72/04	/	72	/	04
H04W28/26	/	28	/	26
H04W88/02	/	88	/	02
NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

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

/BASIL MA/ Examiner, Art Unit 2415 (Assistant Examiner)	(Date) 07 August 2021	Total Claims Allowed: 14	
/JEFFREY M RUTKOWSKI/ Supervisory Patent Examiner, Art Unit 2415 (Primary Examiner)	(Date)	O.G. Print Claim(s) 1	O.G. Print Figure 3

Issue Classification 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner Basil Ma	Art Unit 2415

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant <input type="checkbox"/> CPA <input type="checkbox"/> T.D. <input type="checkbox"/> R.1.47															
CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	10	10												
2	2		11												
3	3	11	12												
4	4	12	13												
5	5	13	14												
6	6	14	15												
7	7														
8	8														
9	9														

/BASIL MA/ Examiner, Art Unit 2415 (Assistant Examiner)	(Date)	Total Claims Allowed: 14	
/JEFFREY M RUTKOWSKI/ Supervisory Patent Examiner, Art Unit 2415 (Primary Examiner)	07 August 2021 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 3

CONSIDERED: /B.M./

Sheet 1 of 3

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION LISTING OF REFERENCES September 2, 2021 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 4965.1056-001	APPLICATION NO. 15/538,182
	FIRST NAMED INVENTOR Rudolf Strijkers	FILING DATE December 17, 2015
	CONFIRMATION NO. 3145	

U.S. PATENT DOCUMENTS				
Examiner's Initials	Cite No.	DOCUMENT NUMBER Number-Kind Code (if known)	ISSUE DATE / PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE OR APPLICANT OF CITED DOCUMENT
	1.	2012014332 A1	01-19-2012	Smith, et al.
	2.	2014086177 A1	03-27-2014	Adjakple, et al.
	3.			
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Copies of issued U.S. Patents and Published U.S. Applications are not required and are not being provided. We are not listing separately prior U.S. Patent Office communications regarding the cited documents because the Examiner has access to any such actions through PAIR.

EXAMINER /BASIL MA/	DATE CONSIDERED 09/26/2021
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Sheet 2 of 3

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION LISTING OF REFERENCES September 2, 2021 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 4965.1056-001	APPLICATION NO. 15/538,182
	FIRST NAMED INVENTOR Rudolf Strijkers	FILING DATE December 17, 2015
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FOREIGN PATENT DOCUMENTS				
Examiner's Initials	Cite No.	DOCUMENT NUMBER Country Code-Number-Kind Code (if known)	DATE MM-DD-YYYY	NAME OF PATENTEE OR APPLICANT OF CITED DOCUMENT
	1.	EP 2 491 685	08-29-2012	Telefonaktiebolaget L M Ericsson
	2.			
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EXAMINER /BASIL MA/	DATE CONSIDERED 09/26/2021
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Sheet 3 of 3

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION LISTING OF REFERENCES September 2, 2021 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 4965.1056-001	APPLICATION NO. 15/538,182
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Examiner's Initials	Cite No.	OTHER DOCUMENTS <i>(Including Author, Title, Date, Pertinent Pages, Etc.)</i>
	1.	Alcatel Lucent – Strategic White Paper, The LTE Network Architecture, a comprehensive tutorial, pages 1-23 (no date given).
	2.	Quality of Service (QoS) and Policy Management in Mobile Data Networks, Validating Service Quality to Ensure Subscriber Quality of Experience, pages 1-21 (QoE), December 2013.
	3.	3 rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Study on System Enhancements for User Plane Congestion Management, 3GPP TR 23.705 v13.0.0, (Release 13) pages 1-61 (December 2014).
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	5.	3 rd Generation Partnership Project; Technical Specification Group Services and System Aspects; General Packet Radio Service (GPRS) Enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access, 3GPP TR 23.401 v9.16.0, (Release 9) pages 1-256 (December 2014).
	6.	3 rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Policy and Charging Control Architecture, 3GPP TR 23.203 v9.14.0, (Release 9) pages 1-124 (December 2014).
	7.	3 rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Network Architecture, 3GPP TR 23.002 v13.1.0, (Release 13) pages 1-109 (December 2014).
	8.	3 rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation, 3GPP TR 36.211 v12.3.0, (Release 12) pages 1-124 (September 2014).
	9.	3 rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication Management; Performance Management (PM); Performance Measurements Evolved Packet Core (EPC) Network, 3GPP TR 32.426 v12.0.0, (Release 12) pages 1-84 (October 2014).

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EXAMINER /BASIL MA/	DATE CONSIDERED 09/26/2021
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	0	("2012014332").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2021/09/26 22:08
L2	1	("20120014332").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2021/09/26 22:09
L4	0	("2014086177").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2021/09/26 22:14
L5	1	("20140086177").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2021/09/26 22:14
L6	0	("EP2491685").PN.	US-PGPUB; USPAT; USOCR; EPO	OR	OFF	2021/09/26 22:18
L7	1	("20120230287").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2021/09/26 22:20
L8	151	"TR 23.852"	US-PGPUB; USPAT	OR	OFF	2021/09/26 22:30
L9	35	"TR 23.852" and qci	US-PGPUB; USPAT	OR	OFF	2021/09/26 22:30
L10	9	"TR 23.852" and qci and premium	US-PGPUB; USPAT	OR	OFF	2021/09/26 22:30
L11	7	"TR 23.705" and qci and premium	US-PGPUB; USPAT	OR	OFF	2021/09/26 22:32
L12	0	"TR 23.401" and qci and premium	US-PGPUB; USPAT	OR	OFF	2021/09/26 22:33
L13	5	"TR 23.401" and qci	US-PGPUB; USPAT	OR	OFF	2021/09/26 22:34
L14	2	"TR 23.203" and qci	US-PGPUB; USPAT	OR	OFF	2021/09/26 22:36
L15	0	"TR 23.002" and qci	US-PGPUB; USPAT	OR	OFF	2021/09/26 22:37
L16	1	"TR 23.002"	US-PGPUB; USPAT	OR	OFF	2021/09/26 22:37
L17	0	"TR 23.002" and connection with request	US-PGPUB; USPAT	OR	OFF	2021/09/26 22:37
L18	3	"TR 36.211" and qci	US-PGPUB; USPAT	OR	OFF	2021/09/26 22:37
L19	0	"TR 32.426" and qci	US-PGPUB; USPAT	OR	OFF	2021/09/26 22:38

9/26/2021 10:38:57 PM

C:\Users\bma\Documents\EAST\Workspaces\posted\15538182-Dutch-connection-setup.wsp

Bibliographic Data

Application No: 15/538,182

Foreign Priority claimed: ☒ Yes ☐ No

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

Verified and Acknowledged:

/BASIL MA/

Examiner's Signature

Initials

Title:

HANDLING OF CONNECTION SETUP REQUESTS

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/20/2017	370	2415	4965.1056-001
RULE			

APPLICANTS

KONINKLIJKE KPN N.V., The Hague, NETHERLANDS

Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek TNO, s-Gravenhage, NETHERLANDS

INVENTORS

Rudolf Strijkers, Zurich, SWITZERLAND

Shuang Zhang, Delft, NETHERLANDS

CONTINUING DATA

This application is a 371 of PCT/EP2015/080174 12/17/2015

FOREIGN APPLICATIONS

EPO EP14199719.7 12/22/2014

IF REQUIRED, FOREIGN LICENSE GRANTED**

08/28/2017

STATE OR COUNTRY

SWITZERLAND

ADDRESS

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

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UNITED STATES

FILING FEE RECEIVED

\$1,620

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION LISTING OF REFERENCES September 2, 2021 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 4965.1056-001	APPLICATION NO. 15/538,182
	FIRST NAMED INVENTOR Rudolf Strijkers	FILING DATE December 17, 2015
	CONFIRMATION NO. 3145	

U.S. PATENT DOCUMENTS				
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	2.	2014086177 A1	03-27-2014	Adjakple, et al.
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EXAMINER	DATE CONSIDERED
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Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION LISTING OF REFERENCES September 2, 2021 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 4965.1056-001	APPLICATION NO. 15/538,182
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Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION LISTING OF REFERENCES September 2, 2021 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 4965.1056-001	APPLICATION NO. 15/538,182
	FIRST NAMED INVENTOR Rudolf Strijkers	FILING DATE December 17, 2015
	CONFIRMATION NO. 3145	

Examiner's Initials	Cite No.	OTHER DOCUMENTS <i>(Including Author, Title, Date, Pertinent Pages, Etc.)</i>
	1.	Alcatel Lucent – Strategic White Paper, The LTE Network Architecture, a comprehensive tutorial, pages 1-23 (no date given).
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	8.	3 rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation, 3GPP TR 36.211 v12.3.0, (Release 12) pages 1-124 (September 2014).
	9.	3 rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication Management; Performance Management (PM); Performance Measurements Evolved Packet Core (EPC) Network, 3GPP TR 32.426 v12.0.0, (Release 12) pages 1-84 (October 2014).

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EXAMINER	DATE CONSIDERED
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Electronic Patent Application Fee Transmittal

Application Number:	15538182			
Filing Date:	20-Jun-2017			
Title of Invention:	HANDLING OF CONNECTION SETUP REQUESTS			
First Named Inventor/Applicant Name:	Rudolf Strijkers			
Filer:	Timothy J. Meagher/Jennifer Torpey			
Attorney Docket Number:	4965.1056-001			
Filed as Large Entity				
Filing Fees for U.S. National Stage under 35 USC 371				
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:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	2000	2000
Total in USD (\$)				2000

Electronic Acknowledgement Receipt

EFS ID:	43668793
Application Number:	15538182
International Application Number:	
Confirmation Number:	3145
Title of Invention:	HANDLING OF CONNECTION SETUP REQUESTS
First Named Inventor/Applicant Name:	Rudolf Strijkers
Customer Number:	21005
Filer:	Timothy J. Meagher/Jennifer Torpey
Filer Authorized By:	Timothy J. Meagher
Attorney Docket Number:	4965.1056-001
Receipt Date:	02-SEP-2021
Filing Date:	20-JUN-2017
Time Stamp:	15:32:03
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
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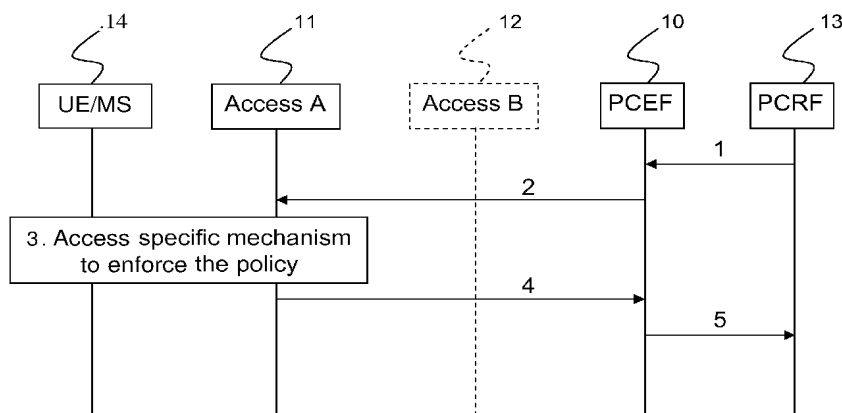


FIG 2

(57) Abstract: The present invention relates to a method for enabling resource allocation for a service data flow between a user equipment (14) and a gateway in a multiple access environment. The method comprises the steps of: - A resource reservation device (10,19) receives reservation instructions from a policy control node (13). The reservation instructions require dedicated access resources to be reserved for the service data flow. - The resource reservation device (10,19) reports the result of the resource reservation required by the reservation instructions to the policy control node (13). What particularly characterize the method are the steps of: - The resource reservation device (10,19) requests reservation of the resources required by the reservation instructions in a plurality of accesses (11,12). - The resource reservation device (10,19) reports the selected single access (11,12) that enables the requested resources to the policy control node (13). This is reported when the access (11,12) is selected.

Resource reservation in multiple accesses

TECHNICAL FIELD

The present invention relates to a method for enabling resource allocation for a service data flow between a User Equipment and a Gateway in a multiple access environment. It also relates to a resource reservation device, a policy control node and a system adapted for the same purpose.

BACKGROUND

It has become more and more common that a terminal (UE/MS) can get access via a number of different access technologies. For example, mobile phones often come equipped with both cellular and WLAN (Wireless LAN) access capabilities. Laptops often have Ethernet, WLAN and sometimes also cellular access capabilities. Typically these different interfaces are used one at a time. And more importantly, a given service or a given IP session is only using one access at a time.

Currently, 3GPP EPS - Evolved Packet System (also known as 3GPP SAE - System Architecture Evolution) defines solutions for how session continuity can be achieved when a UE moves between different accesses. This can e.g. mean that a service that is running over a cellular access is moved to run over a WLAN access instead. But also with this solution, the UE is only using one access at a time and during an access change, the whole IP session and all running services within that IP session is moved from source access to target access. Simultaneous use of multiple accesses (a.k.a. multihoming) is not supported, except for very short times during a handover between two accesses.

There is work ongoing in IETF (Internet Engineering Task Force), and related work is started up in 3GPP, for defining mobility solutions in multihoming scenarios. As part of this work the concept of "flow mobility" is investigated, i.e. only a subset of the IP flows for a given IP session is moved from one access to another. For example, it could be that only the video component of a multimedia call is moved from a cellular access to WLAN, while the IP flows related to the voice component of the same call stays in the cellular access.

Policy and Charging Control (PCC) architecture was introduced in 3GPP Rel-7 and has been further evolved in 3GPP Rel-8, see figure 1. It provides operators with

advanced tools for service-aware QoS (Quality of Service) and charging control. A PCEF (Policy and Charging Enforcement Function) is encompassed in a GW (Gateway), i.e. GGSN (Gateway GPRS Support Node) for GPRS (General Packet Radio Service) based core network and a PDN-GW (Packet Data Network Gateway) for EPC (Evolved Packet Core) based core network. When GTP (GPRS Transfer Protocol) is used to connect to the PCEF, the PCEF has bearer binding and QoS reservation capabilities. This architecture variant is referred to as on-path PCC.

The amendments in Rel-8 include support for Mobile IP based protocols in the EPC. When mobile IP is used between the GW and the Serving GW (for 3GPP based access) or in the Access GW (for non-3GPP based access), the PCC architecture must also rely on a BBERF (Bearer Binding and Event Reporting Function) for bearer binding and event reporting. The BBERF is encompassed in the Serving GW for 3GPP based access and in the Access GW for non-3GPP based access. This architecture variant is referred to as off-path PCC. In the off-path architecture the PCEF do not have the capabilities to reserve resources or to do bearer binding. A PCRF (Policy and Charging Rules Function) authorize the use of a service by installing and removing PCC rules into the PCEF and QoS rules into the BBERF (if applicable).

Figure 1 also shows a SGSN (Serving GPRS Support Node and an MME (Mobility Management Entity). It also shows a number of reference points (Sp, Rx, Gxc, S5, Gxa, S2a, Gz, Gy, Gx, SGi) for the communication between the nodes. These nodes and reference points and part of 3GPP or non-3GPP and will not be described more in detail in this patent application.

A PCC or QoS rule defines a set of filters used to classify packets to a service data flow and an associated resource, i.e. a QoS class and a bitrate. For on-path PCC, the installation or removal of a PCC rule in the PCEF may trigger a resource request in the applicable access. For off-path PCC, the installation or removal of a QoS rule in the BBERF may trigger a resource request in the applicable access. PCC rules are installed and removed in the PCEF also in the case of off-path PCC however for this case they can not trigger a resource request in the access but they are only used for access control and charging.

Some services e.g. telephony or audio/video streaming require resources to be reserved in the target access in order to be able to provide a good enough quality of service level to the end user(s). The functionality to admit or deny the addition of any such service in the network is based on current network load. Admission control
5 takes place at various points in the network at session setup and during handovers. For the case when dynamic PCC is deployed it is the installation of PCC or QoS rules (if applicable) with a GBR-component in the PCEF or BBERF (if applicable) that triggers this reservation of resources in the network. If the reservation of resources fails (not enough capacity in the system at some level) then the PCEF or BBERF will
10 report this back to the PCRF and the associated service will not be admitted (for new service requests) or discontinued (handover).

Many operators today already have parallel cellular access technologies deployed such as GSM and UMTS. One lesson learned from the 1G to 2G and 2G to 3G migration is that customers are often reluctant to using the new access since
15 coverage and capacity is not good enough in the new networks. As a consequence operators are forced to rollout their networks in a very aggressively pace in order to prevent an unacceptable call blocking rate in the new access. This is of course very expensive to the operators and even worse it creates a threshold for when a new access network may be commercially launched. A serious consequence of this is that
20 it delays the time before the network will start to generate revenue for the operator.

SUMMARY

The object of the present invention is therefore to reduce the call blocking rate in new networks rolled out.

The object of the present invention is solved by means of a method for enabling
25 resource allocation for a service data flow between a User Equipment and a Gateway in a multiple access environment. The method comprises the steps of:

- A resource reservation device receives reservation instructions from a policy control node. The reservation instructions require dedicated access resources to be reserved for the service data flow.
- 30 - The resource reservation device reports the result of the resource reservation required by the reservation instructions to the policy control node.

What particularly characterize the method are the steps of:

- The resource reservation device requests reservation of the resources required by the reservation instructions in a plurality of accesses.
- The resource reservation device reports the selected single access that enables the requested resources to the policy control node. This is reported when the access is selected.

The object of the present invention is also solved by means of a resource reservation device. The resource reservation device is adapted to enable resource allocation for a service data flow between a User Equipment and a Gateway in a multiple access environment. The resource reservation device is further adapted to receive reservation instructions from a policy control node (see below). The reservation instructions require dedicated access resources to be reserved for the service data flow. The resource reservation device is moreover adapted to report the result of the resource reservation required by the reservation instructions to the policy control node.

What particularly characterize the resource reservation device is that it is further adapted to request reservation of the resources required by the reservation instructions in a plurality of accesses. It is also adapted to report the selected single access that enables the requested resources to the policy control node. This is reported when the access is selected.

The object of the present invention is also solved by means of a policy control node. The policy control node is adapted to enable resource allocation for a service data flow between a User Equipment and a Gateway in a multiple access environment. The policy control node is further adapted to send reservation instructions to a resource reservation device (see above). The reservation instructions require dedicated access resources to be reserved for the service data flow. The policy control node is moreover adapted to receive a report from the resource reservation device regarding the result of the resource reservation required by the reservation instructions.

What particularly characterize the policy control node is that it is further adapted to receive a report from the resource reservation device. The report is received when the access is selected and regards the selected single access that enables the requested resources.

- 5 The object of the present invention is finally solved by means of a system. The system is adapted to enable resource allocation for a service data flow between a User Equipment and a Gateway in a multiple access environment. A resource reservation device in the system is adapted to being adapted to receive reservation instructions from a policy control node in the system. The reservation instructions
10 require dedicated access resources to be reserved for the service data flow. The resource reservation device is moreover adapted to report the result of the resource reservation required by the reservation instructions to the policy control node.

- What particularly characterize the system is that the resource reservation device is further adapted to request reservation of the resources required by the reservation
15 instructions in a plurality of accesses. The resource reservation device is also adapted to report the selected single access that enables the requested resources to the policy control node. This is reported when the access is selected.

- The main advantage with the present invention is that, since resource reservation is attempted in multiple accesses before a failure is reported back to the PCRF, no calls
20 will be lost during high load situations unless all available accesses are congested. As a result call blocking probability will decrease and the aggregated utilization of all access types of an operator will increase.

- New networks with less capacity initially can be implemented without the risk of users being blocked due to the initial limited capacity of the new access. If a call is not
25 admitted in the new access, then legacy access types will be used for the call. The requirement is however that a more mature legacy networks exist in parallel that are able to handle the excess voice and video traffic.

Additional advantages are achieved by implementing one or several of the features of the dependent claims not mentioned above. This will be further explained below.

- 30 BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described in greater detail in the following, with reference to the embodiments that are shown in the attached drawings, in which:

Figure 1 illustrates 3GPP Release 8 PCC non-roaming architecture for EPS.

Figure 2 illustrates the known solution for resource allocation.

5 Figure 3 illustrates the method according to the present invention.

Figure 4 illustrates a first alternative of sequential reservation of resources according to the present invention.

Figure 5 illustrates a second alternative of sequential reservation of resources according to the present invention.

10 Figure 6 illustrates a first alternative of parallel reservation of resources according to the present invention.

Figure 7 illustrates a third alternative of sequential reservation of resources according to the present invention.

15 Figure 8 illustrates a fourth alternative of sequential reservation of resources according to the present invention.

Figure 9 illustrates a second alternative of parallel reservation of resources according to the present invention.

DETAILED DESCRIPTION

20 The present invention relates to a method for enabling resource allocation for a service data flow between a User Equipment and a Gateway in a multiple access environment. It also relates to a resource reservation device, a policy control node and a system adapted for the same purpose. A person skilled in the art would realize that a resource reservation device, a policy control node and a system adapted to perform said method described below are also disclosed in the following. The service
25 data flow relates to data traffic for a particular service in the User Equipment.

Figure 2 illustrates an existing procedure for allocation of resources when only a single access network at a time is considered. The resources are allocated in a scenario when on-path PCC is used:

1. A policy control node provides new or updated reservation instructions to the resource reservation device for a certain Service Data Flow. The reservation instructions require dedicated resources to be reserved in the access network 11 (Access A). Although multiple allowed accesses 11,12 may exist in parallel (illustrated by Access B in the figure) the UE/MS can only be active in one single access system at a time.
2. The resource reservation device requests reservation of the required resources in the access 11 where the UE/MS is currently active (access A).
3. In case resources are available then they are reserved in the access 11 (Access A). A User Equipment 14 (UE/MS) is a part in the reservation.
4. The result of the reservation request is communicated back to the resource reservation device 10.
5. The result of the resource reservation is reported back to the policy control node 13. In case the required resources could not be reserved then the associated service may not be admitted.

In the following, the inventive method enabling resource allocation for a service data flow between a User Equipment and a Gateway in a multiple access environment will be described. The method is intended to solve the problem that calls are lost during busy hour in a new network of low capacity since only a single access network is used for resource allocation. This is for instance a problem in the example shown in figure 2.

- The accesses are in the following for instance (see figure 1) GERAN (GSM Radio Access Network), UTRAN (UMTS Terrestrial Radio Access Network), E-UTRAN (Evolved UTRAN) or non-3GPP accesses, see figure 1. A person skilled in the art would realize that other types of accesses are also embraced within the term "access".

In the present invention the following method steps are performed, see figure 3:

1. A resource reservation device 10 receives 15 reservation instructions from a policy control node 13. The reservation instructions require dedicated access resources to be reserved for the service data flow.
- 5 2. The resource reservation device 10 reports 16 the result of the resource reservation required by the reservation instructions to the policy control node 13.
3. The resource reservation device requests 17 reservation of the resources required by the reservation instructions in a plurality of accesses.
4. The resource reservation device 10 reports 18 the selected single access that
10 enables the requested resources to the policy control node 13 when the access is selected.

The present invention does not require that the steps 1 - 4 are performed in consecutive order. Steps 1 and 2 are part of commonly known and used procedures (see figure 2) while steps 3 and 4 are further steps performed by the resource
15 reservation device 10 to reserve resources. These are performed when it has received the reservation instructions.

The resource reservation device is in the following exemplified by a PCEF 10 or a BBERF 19 (Bearer Binding and Event Reporting Function). The policy control node is in the following exemplified by a PCRF 13 (Policy and Charging Rules Function). The
20 reservation instructions are in the following exemplified by PCC (Policy and Charging Control) rules or QoS (Quality of Service) rules. The rules comprise a set of information enabling the detection of a service data flow and providing parameters for policy control and/or charging control. Further definition of PCC rules and QoS rules can be found in 3GPP.

25 The PCEF (Policy and Charging Enforcement Function) is encompassed in a GW (Gateway). For instance a GGSN (Gateway GPRS Support Node) for GPRS (General Packet Radio Service) based core network or a PDN-GW (Packet Data Network Gateway) for EPC (Evolved Packet Core) based core network. This architecture variant is referred to as on-path PCC. The BBERF is encompassed in a

Serving GW for 3GPP based access and in an Access GW for non-3GPP based access. This architecture variant is referred to as off-path PCC. See figure 1.

The PCC or QoS rule received in the present invention comprises information from which access or accesses the PCEF or BBERF should request reservation of resources. With MAPIM (Multi Access PDN connectivity and IP flow Mobility) multiple access types may be available that could potentially be used to carry services that requires dedicated resources. If a certain service is allowed to be provided over multiple access types, then the PCRF could e.g. indicate this in the rules as a list of allowed access types.

Firstly, with reference to figures 4 - 6, examples of resource reservation in on-path PCC will be illustrated. For on-path PCC, the PCEF reserves resources for the service. Moreover, PCC rules are used in on-path. Secondly, with reference to figures 7 - 9, examples of resource reservation in off-path PCC will be illustrated. For off-path PCC, the BBERF reserves resources for the service. Moreover, QoS rules are used in off-path.

As will be shown in the examples, resource reservation could both in on-path and off-path be done in two different ways. In a sequential resource reservation, the PCEF requests reservation of resources required in the plurality of accesses in sequential order. In a parallel resource reservation, the PCEF requests reservation of resources required in the plurality of accesses in parallel.

As will also be shown in the examples, the PCC rule may both for sequential and parallel reservation allow for requesting reservation of resources in a plurality of accesses. For sequential reservation, the rule may as an alternative allow for requesting reservation of resource in only one (a first) access. This will be described further in the following.

As will be shown in the examples, when the PCC rule in sequential reservation allows for requesting reservation of resources in a plurality of accesses, the request of resource reservation may be performed in priority order. When the rule instead allows for requesting reservation of resources in only one access, the PCEF may requests reservation of resources required in a first access. It then continues to request reservation of resources required in one following access after having

received a new rule allowing access to said following access. The PCRF then may select the following access in priority order.

When the PCC rule allows for reservation in a plurality of accesses, the PCEF 10 first attempts to reserve resources for the service in the access with the highest priority. If this would fail then the access type with the second highest priority would be attempted and so on. When a successful resource allocation has been done, the PCEF reports the access type result for the PCC rule back to the PCRF 13. Sequential reservation would e.g. be suitable at service setup when somewhat longer delays are acceptable.

- 10 Parallel resource reservation may be used when e.g. service setup times do not allow for sequential resource reservations. Then an attempt to reserve resources in multiple accesses for the same service at the same time could be attempted. In parallel resource reservation, when resources are available in a plurality of accesses, the procedure may be that the single access is selected from the available resources in priority order. This will be shown in the examples relating to parallel reservation. The PCEF 10 will select one access, where the reservation was successful (based e.g. on priority or some other criteria), release the resources in the other access that were not selected and then report the selected access to the PCRF.

- 20 Figures 4 - 6 illustrates examples of sequential and parallel resource reservation in an on-path PCC. For on-path PCC, the PCEF reserves resources for the service. Moreover, PCC rules are used in on-path. In the examples, the UE 14 is assumed to have access to the same APN (Access Point Name) using two different access types, Access A 11 and Access B 12. Both may be used to carry a certain service that requires dedicated resources. A person skilled in the art would realize that the present invention embraces also when the UE has access using more than 2 different access types.

Figure 4 illustrate an example of sequential reservation. In this example, a PCC rule is installed in the PCEF 10 that is valid for more than one access. In this example, the following steps are performed:

- 30 1. The PCRF 13 provides a new or updated PCC rule to the PCEF 10 for a certain Service Data Flow. The PCC rule requires dedicated resources to be reserved in the

access network. The service is further on allowed for both access type A 11 and access type B 12, but access type A is preferred.

2. The PCEF requests reservation of the required resources in access A.

3. In case resources are available then they are reserved in the access.

5 4. The result of the reservation request is communicated back to the PCEF. If this is successful then step 5 to 7 are skipped and access type A is reported back to the PCRF in step 8.

5. If the reservation in access A is not successful then the PCEF continues to request resources in access B.

10 6. In case resources are available then they are reserved in the access.

7. The result of the reservation request is communicated back to the PCEF.

If this is successful then the access type B is reported back to the PCRF in step 8. If this is not successful then the PCEF reports a failure to the PCRF in step 8.

8. The PCEF reports the outcome of the resource reservation for the PCC rule
15 installed in step 1. Based on this information the PCRF may initiate further action (e.g. change the charging-key/Rating Group).

Figure 5 illustrate another example of sequential reservation. In this example, a PCC rule is installed in the PCEF 10 that is valid only for one access. If the resource reservation fails, the PCRF 13 installs the same PCC rule for another access. Thus
20 this alternative demands less from the PCEF (and more from the PCRF) compared to the example according to figure 4. In this example, the following steps are performed:

1. The PCRF 13 provides a new or updated PCC rule to the PCEF 10 for a certain Service Data Flow. The PCC rule requires dedicated resources to be reserved in the access network. The service is further on allowed for both access type A 11 and
25 access type B 12, but access type A is preferred.

2. The PCEF initiated requests reservation of the required resources in access A.

3. In case resources are available then they are reserved in the access.

4. The result of the reservation request is communicated back to the PCEF.
5. The result of the resource reservation is reported back to the PCRF. If the result was successful then the use case terminates here.
6. If the reservation in access A was not successful then the PCRF provides new or updated PCC rules for the same Service Data Flow as in step 1 but this time access type B is allowed in the PCC rule.
7. The PCEF now requests resources in access B.
8. In case resources are available then they are reserved in the access.
9. The result of the reservation request is communicated back to the PCEF.
10. The PCEF reports the outcome of the resource reservation for the PCC rule installed in step 6.

Figure 6 illustrate an example of parallel reservation. A PCC rule is installed in the PCEF 10 that is valid for more than one access. The following steps are performed:

1. The PCRF 13 provides a new or updated PCC rule to the PCEF 10 for a certain Service Data Flow. The PCC rule requires dedicated resources to be reserved in the access network. The service is further on allowed for both access type A 11 and access type B 12, but access type A is preferred.
- 2a and 2b. The PCEF requests reservation of the required resources in access A and B at the same time. NOTE: The PCEF provides traffic mapping information for each access type. The filters included may be the same for each access; however they are separated by priority in order to avoid conflicting traffic mapping in the UE/MS.
- 3a and 3b. The resources in respective access are either allocated, pre-allocated or investigated.
- 4a and 4b. The result of the reservation request is communicated back to the PCEF
- 5a and 5b. A decision is then taken in PCEF which access to use, A or B. The resource request is finalized. This may include a) committing a pre-allocated resource, b) allocating a resource in an access where an investigation gave a

positive result, c) requesting a rollback/release of any pre-allocated or allocated resources in the access decided not to be used. The PCEF may update the traffic mapping information in the selected access (i.e. access A or access B) if this is required.

- 5 6a and 6b. The different decisions provided by the PCEF are enforced by access A and access B.

7a and 7b. The result of the reservation request is communicated back to the PCEF.

8. The PCEF reports the outcome of the resource reservation for the PCC rule installed in step 1. If resources could be reserved the PCEF will report the selected
10 access type to the PCRF. If resources could not be installed in access A or in access B then the PCEF reports a failure to the PCRF. Based on this information the PCRF may initiate further action (e.g. change the charging-key/Rating Group).

- Figures 7 - 9 illustrates examples of sequential and parallel resource reservation in an off-path PCC. For off-path PCC, the BBERF reserves resources for the service.
15 Moreover, QoS rules are used in off-path. The examples in many ways are similar with the examples according to figure 4 - 6. However, new final steps are introduced since the BBERF can not install applicable PCC rules.

- Also in these examples, the UE 14 is assumed to have access to the same APN (Access Point Name) using two different access types, Access A 11 and Access B
20 12. Both may be used to carry a certain service that requires dedicated resources. A person skilled in the art would realize that the present invention embraces also when the UE has access using more than 2 different access types.

- Figure 7 illustrate an example of sequential reservation. In this example, a QoS rule is installed in the BBERF 10 that is valid for more than one access. In this example,
25 the following steps are performed:

1. The PCRF 13 provides a new or updated QoS rule to the BBERF 19 for a certain Service Data Flow. The QoS rule requires dedicated resources to be reserved in the access network. The service is further on allowed for both access type A 11 and access type B 12, but access type A is preferred.

2. The BBERF initiated requests reservation of the required resources in access A.
3. In case resources are available then they are reserved in the access.
4. The result of the reservation request is communicated back to the BBERF. If this is successful then step 5 to 7 are skipped and access type A is reported back to the
- 5 PCRf in step 8.
5. If the reservation in access A is not successful then the BBERF continues to request resources in access B.
6. In case resources are available then they are reserved in the access.
7. The result of the reservation request is communicated back to the BBERF. If this is
- 10 successful then the access type B is reported back to the PCRf in step 8. If this is not successful then the BBERF reports a failure to the PCRf in step 8.
8. The BBERF reports the outcome of the resource reservation for the QoS rule installed in step 1.
9. The PCRf installs an applicable PCC rule into the PCEF 10 according to the
- 15 standard.
10. The PCEF reports back the outcome of the installation procedure.

Figure 8 illustrate another example of sequential reservation. In this example, a QoS rule is installed in the BBERF 19 that is valid only for one access. If the resource reservation fails, the PCRf 13 installs the same QoS rule for another access. Note

20 that this QoS rule might be installed in different BBERFs for different accesses. Thus this alternative demands less from the BBERF (and more from the PCRf) compared to the example according to figure 7. In this example, the following steps are performed:

1. The PCRf 13 provides a new or updated QoS rule to the BBERF 19 for a certain
- 25 Service Data Flow. The QoS rule requires dedicated resources to be reserved in the access network. The service is further on allowed for both access type A 11 and access type B 12, but access type A is preferred.

2. The BBERF initiated requests reservation of the required resources in access A.
3. In case resources are available then they are reserved in the access.
4. The result of the reservation request is communicated back to the BBERF.
5. The result of the resource reservation is reported back to the PCRF. If the result was successful then the use continues in step 11
6. If the reservation in access A was not successful then the PCRF provides new or updated QoS rules for the same Service Data Flow as in step 1 but this time access type B is allowed in the QoS rule.
7. The BBERF now requests resources in access B. Note that it might be possible that this is different BBERF than the one used to request resources in access A (this is not showed in the figure).
8. In case resources are available then they are reserved in the access.
9. The result of the reservation request is communicated back to the BBERF.
10. The BBERF reports the outcome of the resource reservation for the QoS rule installed in step 6.
11. The PCRF installs an applicable PCC rule into the PCEF 10 according to the standard.
12. The PCEF reports back the outcome of the installation procedure.

Figure 9 illustrate an example of parallel reservation. A QoS rule is installed in the BBERF 19 that is valid for more than one access. The following steps are performed:

1. The PCRF 13 provides a new or updated QoS rule to the BBERF 19 for a certain Service Data Flow. The QoS rule requires dedicated resources to be reserved in the access network. The service is further on allowed for both access type A 11 and access type B 12, but access type A is preferred.
- 2a and 2b. The BBERF requests reservation of the required resources in access A and B at the same time. The BBERF provides traffic mapping information for each

access type. The filters included may be the same for each access; however they are separated by priority in order to avoid conflicting traffic mapping in the UE/MS.

3a and 3b. The resources in respective access are either allocated, pre-allocated or investigated.

5 4a and 4b. The result of the reservation request is communicated back to the BBERF.

5a and 5b. A decision is then taken in BBERF which access to use, A or B. The resource request is finalized. This may include a) committing a pre-allocated resource, b) allocating a resource in an access where an investigation gave a
10 positive result, c) requesting a rollback/release of any pre-allocated or allocated resources in the access decided not to be used. The BBERF may update the traffic mapping information in the selected access (i.e. access A or access B) if this is required.

6a and 6b. The different decisions provided by the BBERF are enforced by access A
15 and access B.

7a and 7b. The result of the reservation request is communicated back to the BBERF.

8. The BBERF reports the outcome of the resource reservation for the QoS rule installed in step 1. If resources could be reserved the BBERF will report the selected
20 access type to the PCRF. If resources could not be installed in access A or in access B then the BBERF reports a failure to the PCRF.

9. The PCRF installs an applicable PCC rule into the PCEF according to the standard.

10. The PCRF reports back the outcome of the installation procedure.

25 The invention is not to be regarded as being limited to the examples shown in figures 4 - 9 and described above. A number of additional variants and modifications are possible within the scope of the subsequent patent claims. For instance, combinations of sequential and parallel resource requests could be considered. For

instance, parallel reservations are performed for the 2 highest prioritized accesses and if that fails then sequential reservation are performed of the next 2 etc. Moreover, the presented invention is possible to use both at initial connection setup and in mobility/handover situations.

CLAIMS

1. A method for enabling resource allocation for a service data flow between a user equipment (14) and a gateway in a multiple access environment, the method comprising the steps of:

5 a resource reservation device (10,19) receiving (15) reservation instructions from a policy control node (13), the reservation instructions requiring dedicated access resources to be reserved for the service data flow,

the resource reservation device (10,19) reporting (16) the result of the resource reservation required by the reservation instructions to the policy control node (13),

10 **characterized in** the steps of:

the resource reservation device (10,19) requesting (17) reservation of the resources required by the reservation instructions in a plurality of accesses (11,12),

15 the resource reservation device (10,19) reporting (18) the selected single access (11,12) that enables the resources to the policy control node (13) when the access (11,12) is selected.

2. A method according to claim 1 wherein the reservation instructions received comprises information from which access or accesses (11,12) the resource reservation device (10,19) should request reservation of resources.

20 3. A method according to any of the preceding claims wherein the reservation instructions consist in a policy and charging control rule and where the resource reservation device consists in a policy control and enforcement function (10).

4. A method according to any of the claim 1 - 2 wherein the reservation instructions consist in a quality of service rule and where the resource reservation device consists in a bearer binding and an event reporting function (19).

25 5. A method according to any of the preceding claims wherein the reservation instructions allows for requesting reservation of resources in a plurality of accesses.

6. A method according to claim 5 wherein the request of resource reservation is performed in priority order.

7. A method according to any of the claims 5 - 6 wherein the resource reservation device (10,19) requests reservation of resources required in the plurality of accesses (11,12) in sequential order.

8. A method according to claim 5 wherein the resource reservation device (10,19) requests reservation of resources required in the plurality of accesses (11,12) in parallel.

9. A method according to claim 8 wherein if resources are available in a plurality of accesses (11,12) the single access is selected from the available resources in priority order.

10. A method according to any of the claims 1 - 4 wherein the reservation instructions allow for requesting reservation of resource in only a first access (11,12).

11. A method according to claim 10 wherein the resource reservation device (10,19) requests reservation of resources required in the first access (11,12) and continues to request reservation of resources required in one following access (11,12) after having received new reservation instructions allowing access to said following access.

12. A method according to claim 11 wherein the following access (11,12) is selected in priority order.

13. A resource reservation device (10,19) being adapted to enable resource allocation for a service data flow between a user equipment (14) and a gateway in a multiple access environment, the resource reservation device (10,19) further being adapted to:

receive (15) reservation instructions from a policy control node (13), the reservation instructions requiring dedicated access resources to be reserved for the service data flow,

report (16) the result of the resource reservation required by the reservation instructions to the policy control node (13),

characterized in that the resource reservation device is further adapted to:

5 request (17) reservation of the resources required by the reservation instructions in a plurality of accesses (11,12),

report (18) the selected single access (11,12) that enables the resources to the policy control node (13) according to any of the claims 16 - 17 when the access (11,12) is selected.

10 14. A resource reservation device (10,19) according to claim 13 wherein the resource reservation device consists in a policy control and enforcement function (10).

15. A resource reservation device according to any of the claims 13 - 14 wherein the resource reservation device consists in a bearer binding and an event reporting function (19).

15 16. A policy control node (13) being adapted to enable resource allocation for a service data flow between a user equipment (14) and a gateway in a multiple access environment, the policy control node (13) further being adapted to:

send reservation instructions to a resource reservation device (10,19), the reservation instructions requiring dedicated access resources to be reserved for the service data flow,

20 receive a report from the resource reservation device regarding the result of the resource reservation required by the reservation instructions,

characterized in that the policy control node (13) is further adapted to:

25 receive a report from the resource reservation device (10,19) according to any of the claims 13 - 15 when the access (11,12) is selected regarding the selected single access (11,12) that enables the resources.

17. A policy control node (13) according to claim 16 wherein the policy control node consists in a policy and charging rules function (13).

18. A system adapted to enable resource allocation for a service data flow between a user equipment (14) and a gateway in a multiple access environment, a resource reservation device (10,19) in the system being adapted to

5 receive (15) reservation instructions from a policy control node (13) according to any of the claims 16 - 17, the reservation instructions requiring dedicated access resources to be reserved for the service data flow,

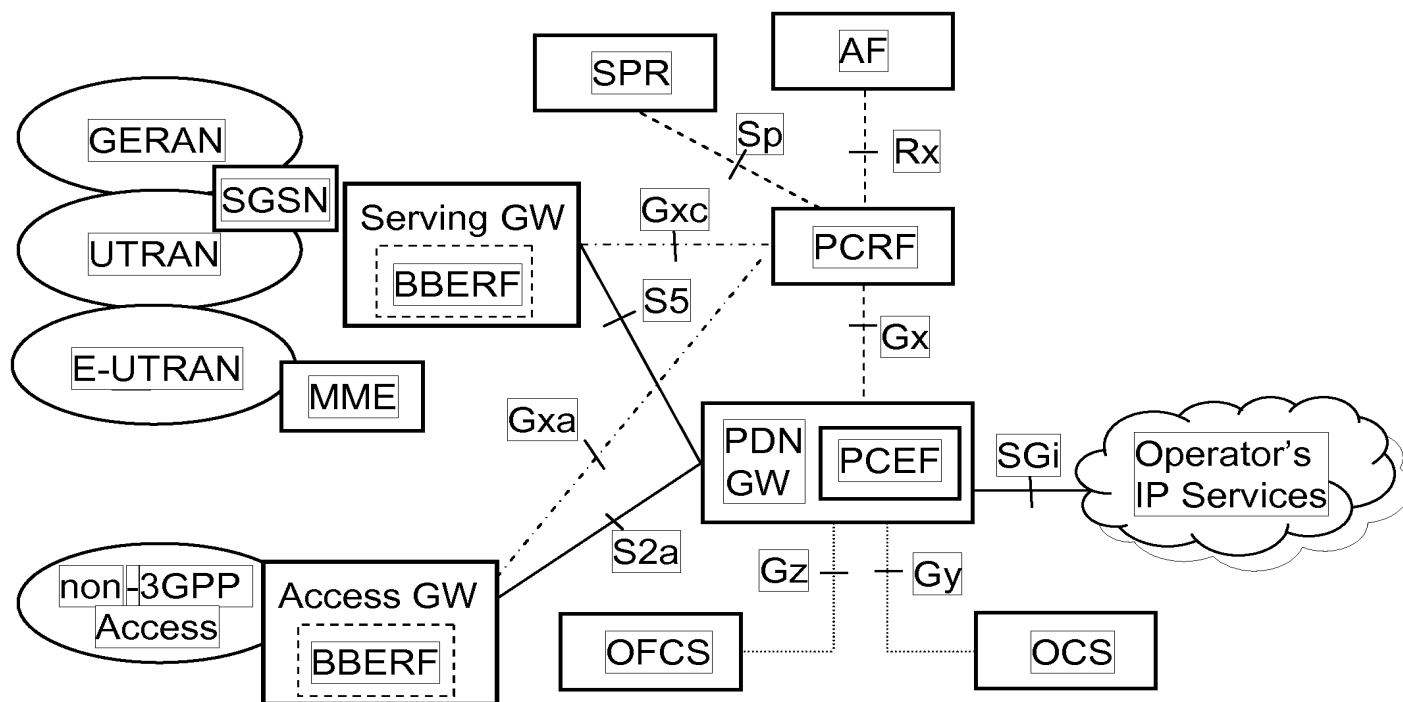
report (16) the result of the resource reservation required by the reservation instructions to the policy control node (13),

10 **characterized in** that the resource reservation device in the system further being adapted to:

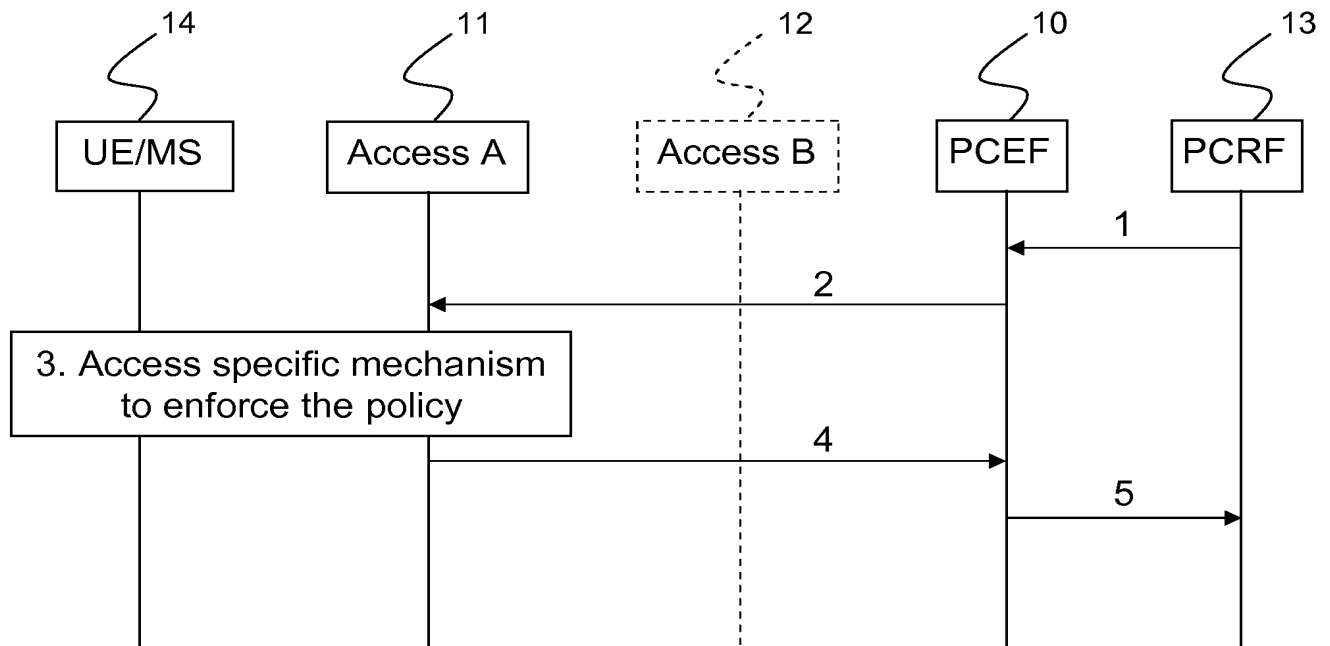
request (17) reservation of the resources required by the reservation instructions in a plurality of accesses (11,12),

report (18) the selected single access (11,12) that enables the resources to the policy control node (13) when the access (11,12) is selected.

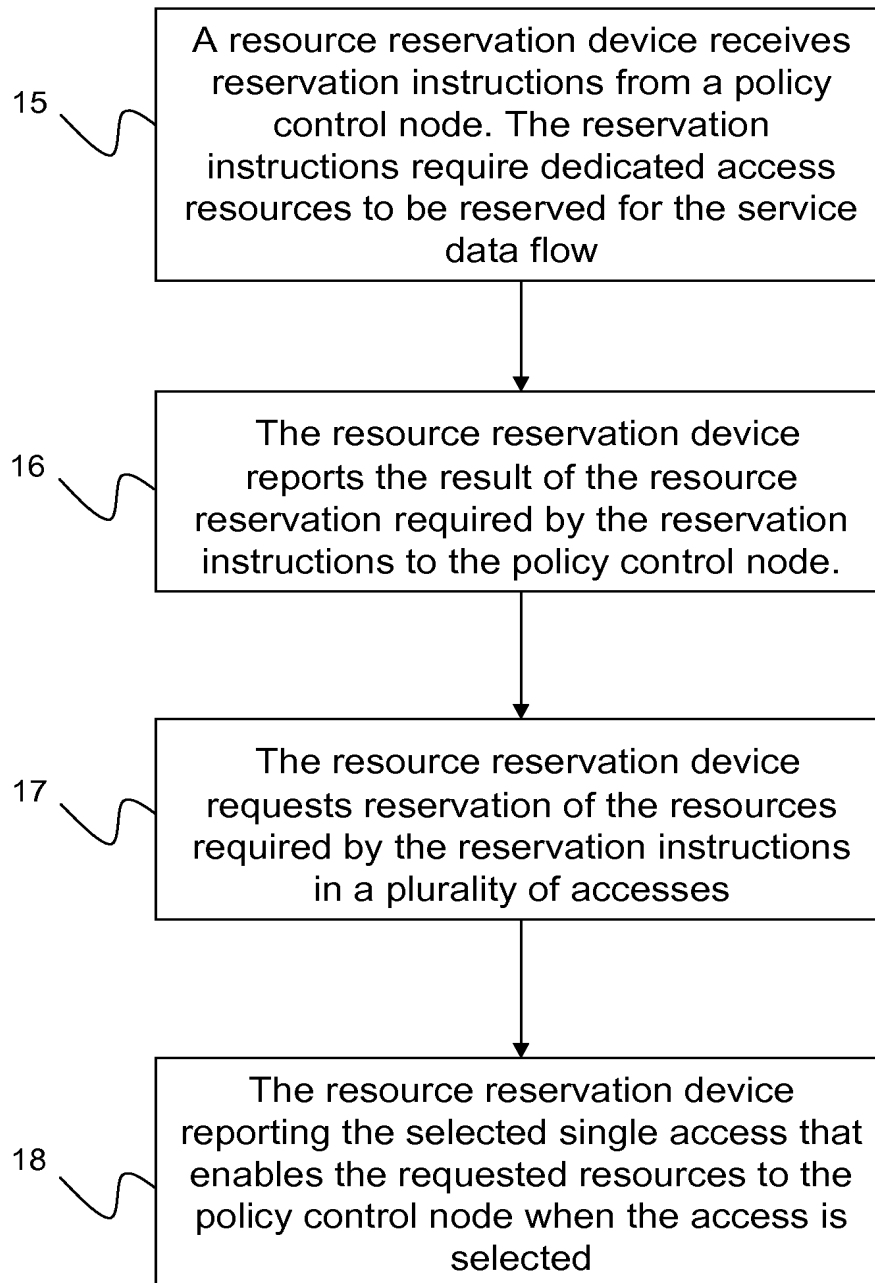
1/9

**FIG 1**

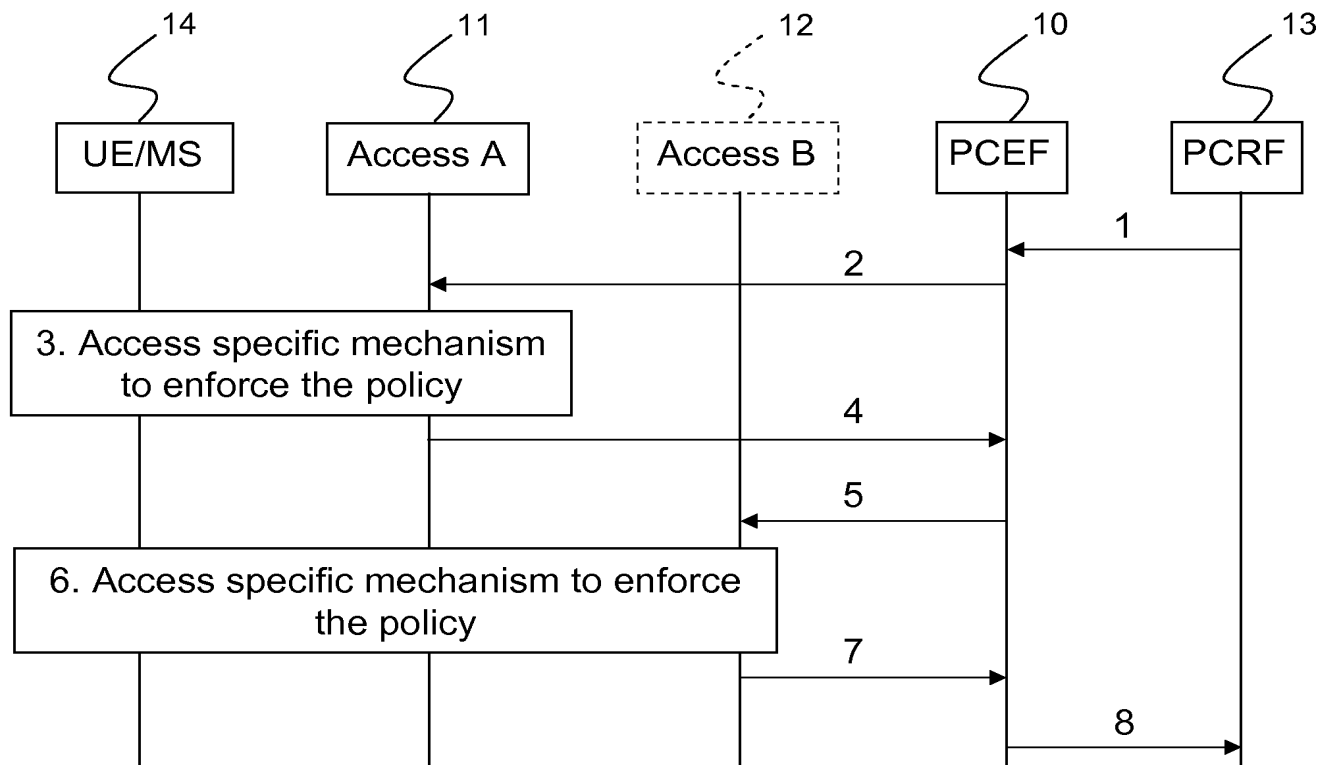
2/9

**FIG 2**

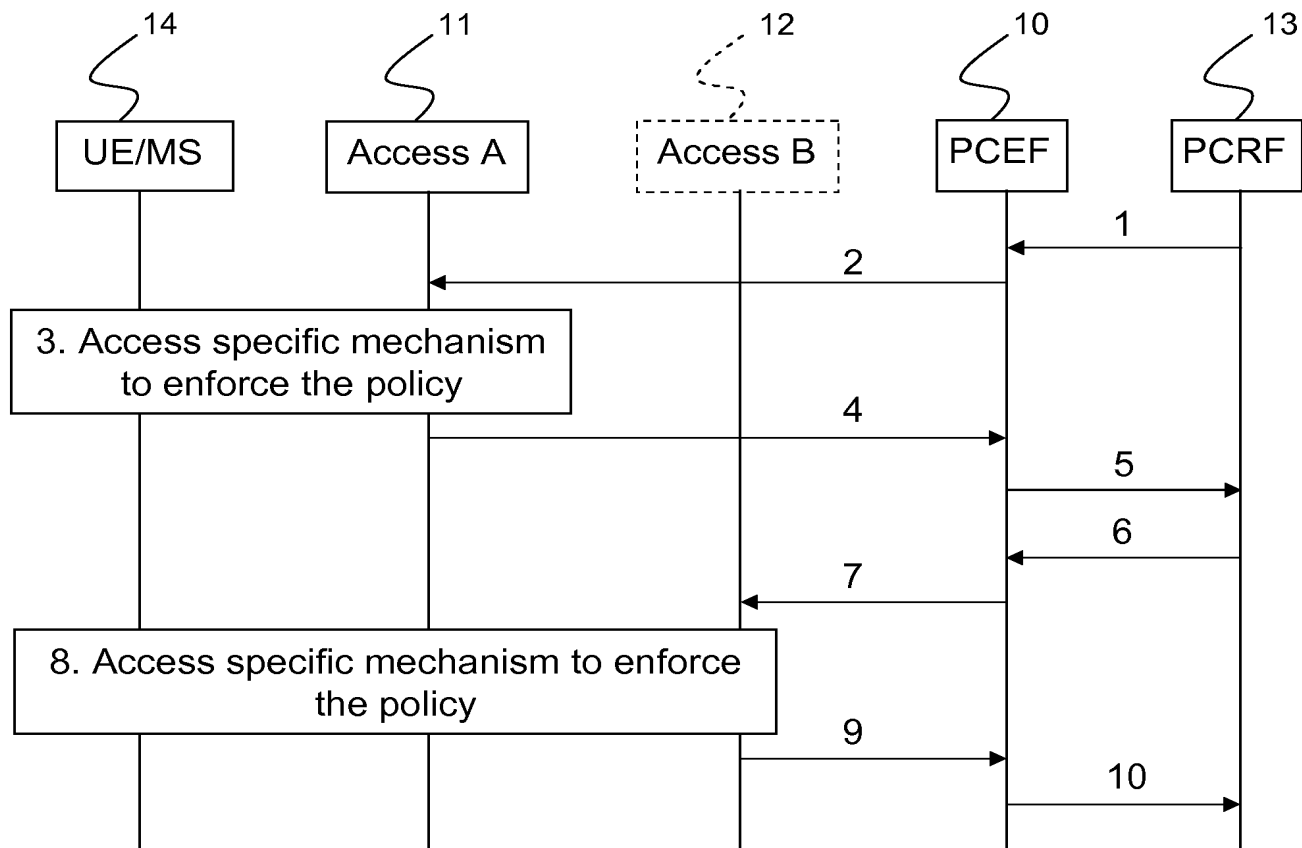
3/9

**FIG 3**

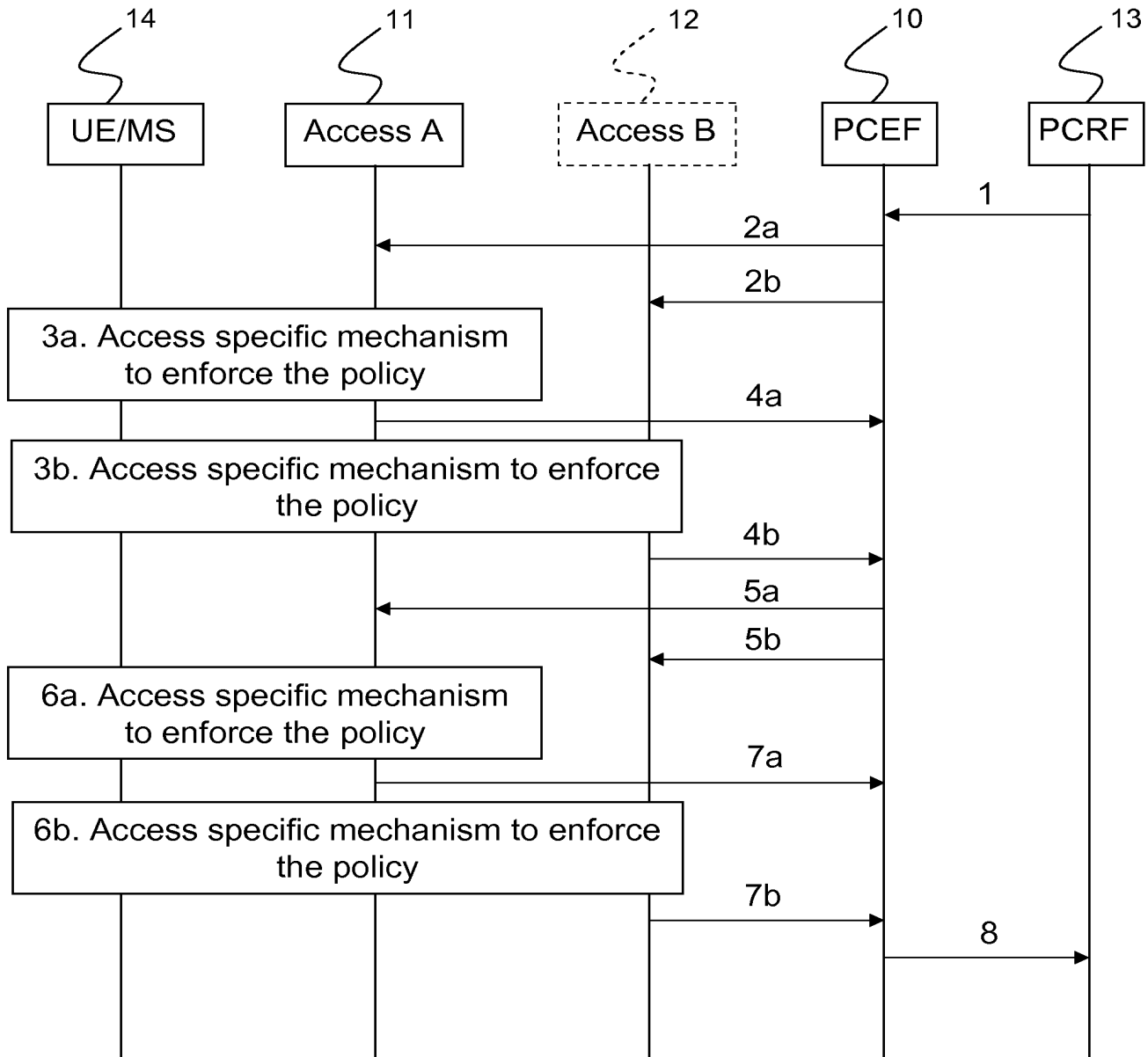
4/9

**FIG 4**

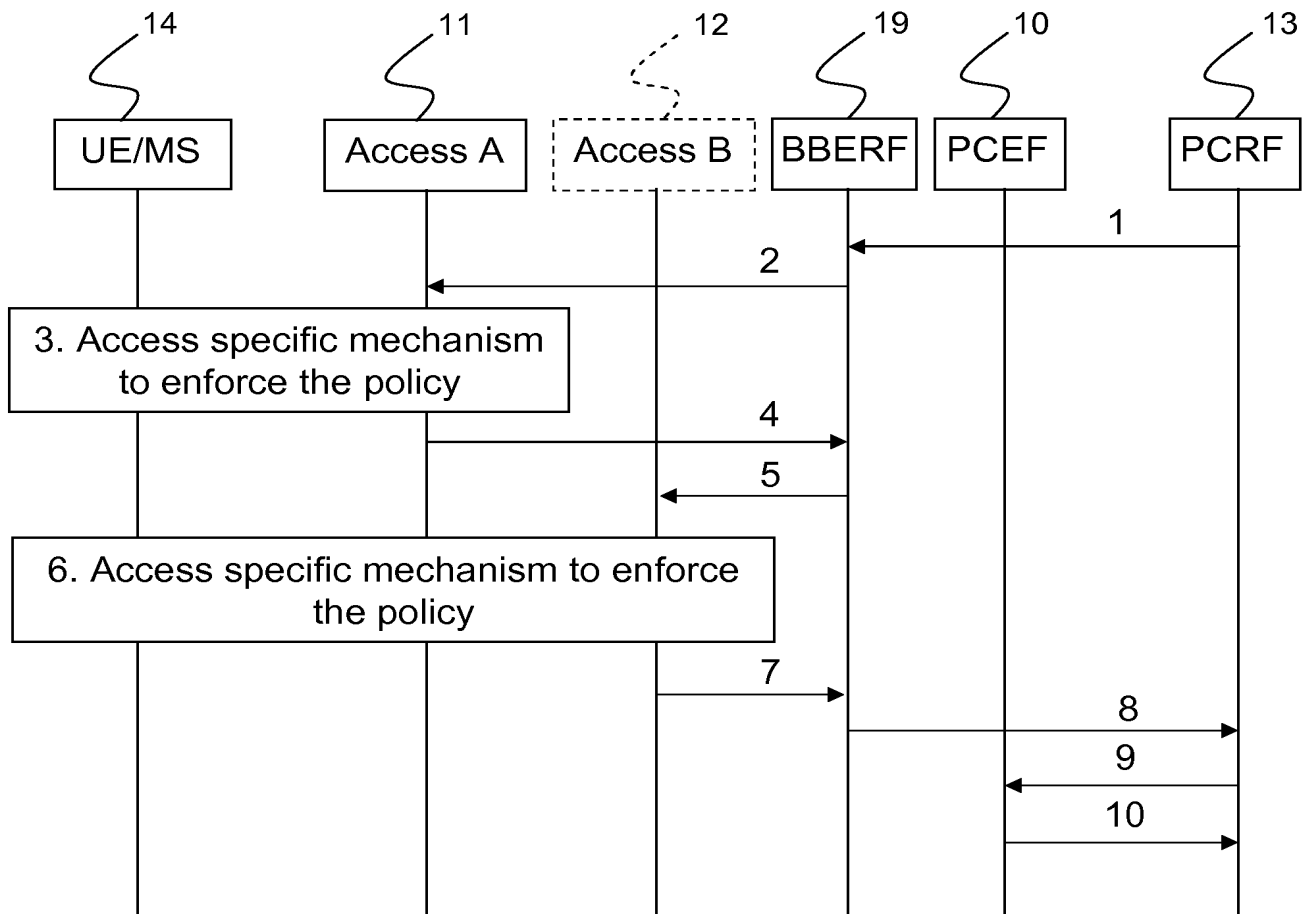
5/9

**FIG 5**

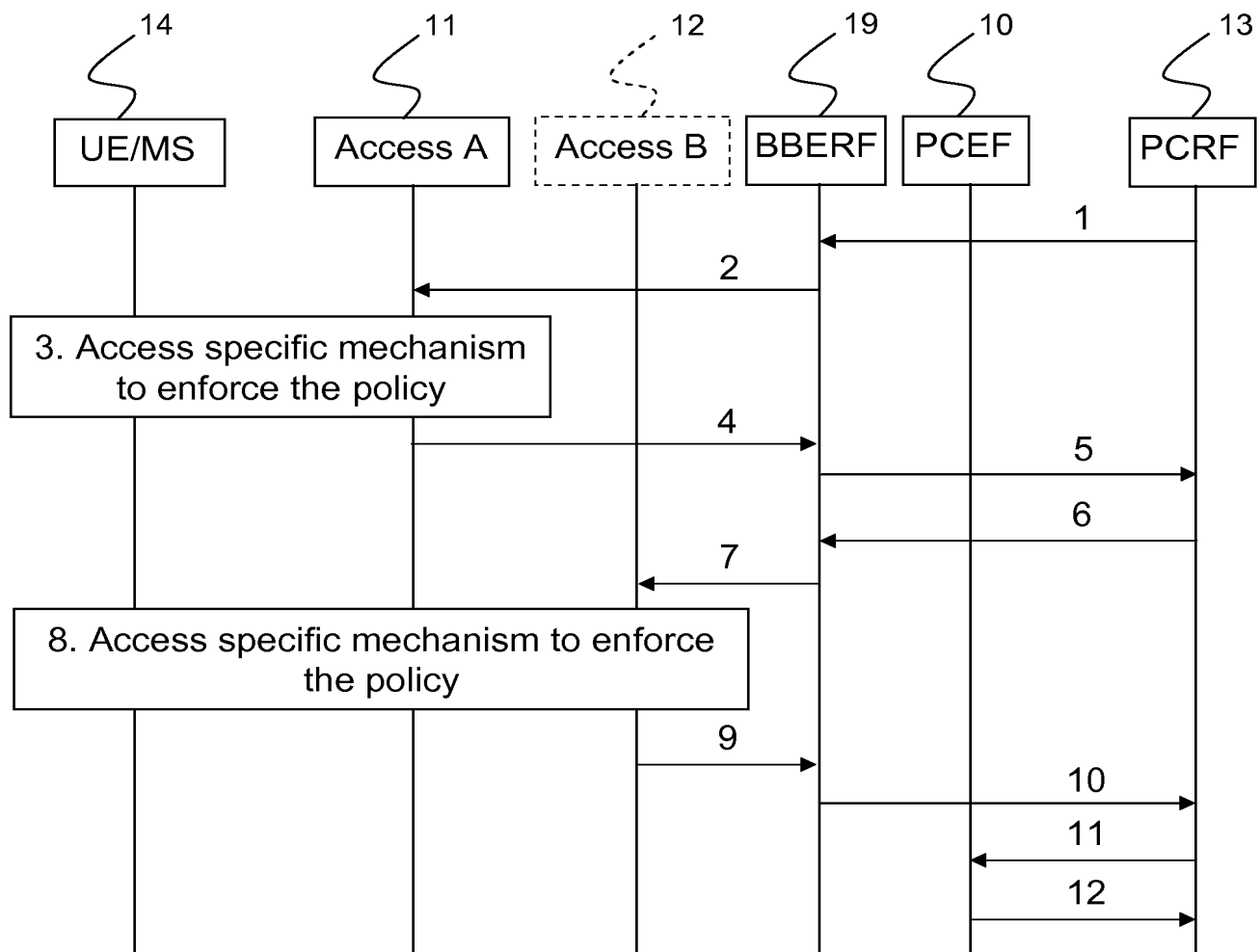
6/9

**FIG 6**

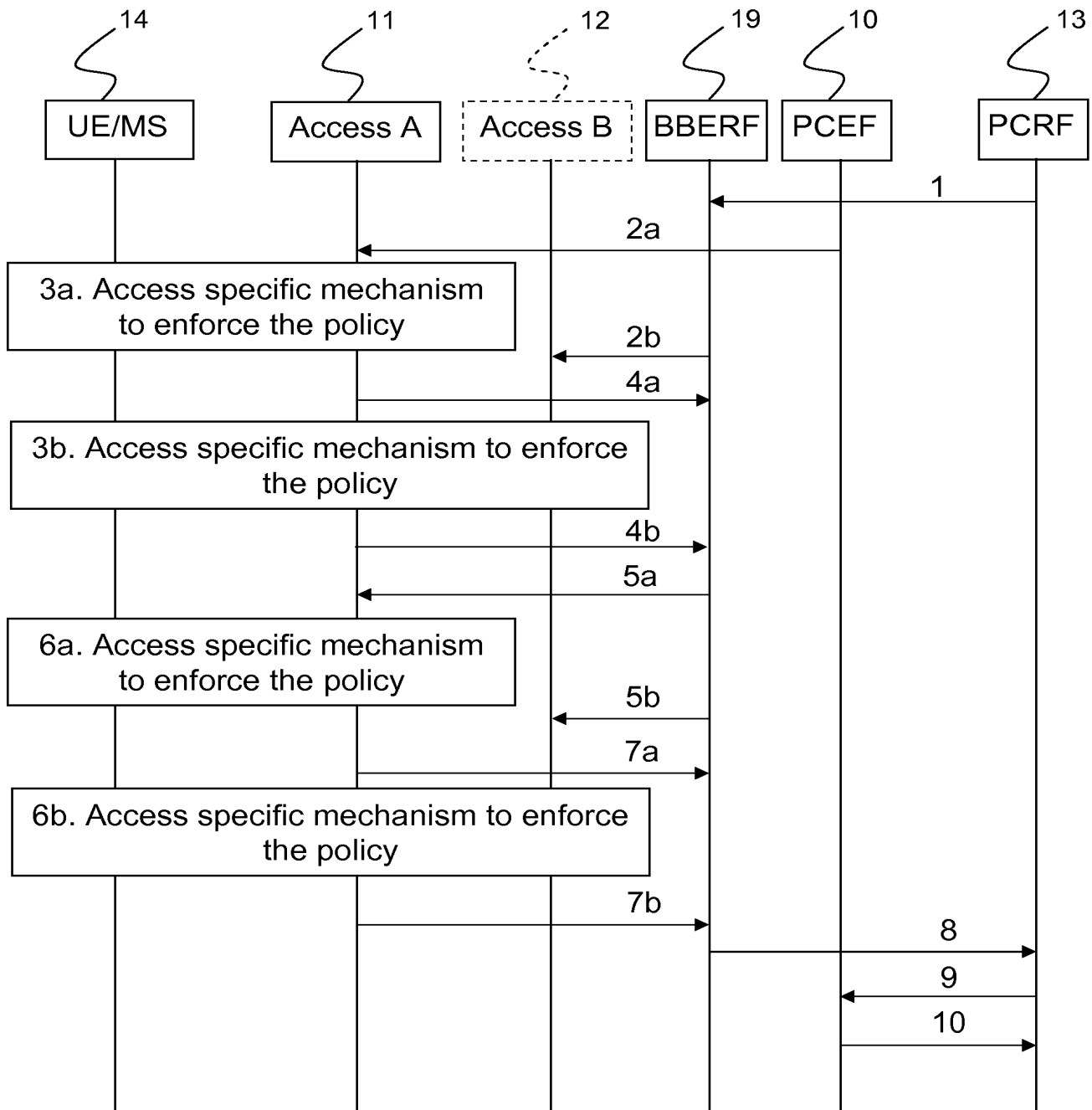
7/9

**FIG 7**

8/9

**FIG 8**

9/9

**FIG 9**

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2009/063814

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04L12/56

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)
H04L

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 , WPI Data, INSPEC , COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>J-J P BALBAS ET AL: "Pol icy and charging control in the evol ved packet system" IEEE COMMUNICATIONS MAGAZINE, IEEE SERVICE CENTER, PISCATAWAY, US, vol . 44, no. 2, 1 February 2009 (2009-02-01), pages 68-74, XP011251778 ISSN: 0163-6804 abstract figures 1,2,4 page 68, column 1, lines 35,36 page 69 - page 70 page 71, col umn 1 page 71, col umn 2, lines 71-11 page 72, col umn 1</p> <p style="text-align: center;">----- --/--</p>	1-18



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

7 January 2010

Date of mailing of the international search report

26/01/2010

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
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Authorized officer

Vol pato, Andrea

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/063814

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>MARIUS IULIAN CORICI ET AL: "A Network Control led QoS Model over the 3GPP System Architecture Evolution"</p> <p>WIRELESS BROADBAND AND ULTRA WIDEBAND COMMUNICATIONS, 2007. AUSWIRELES S 2007. THE 2ND INTERNATIONAL CONFERENCE ON, IEEE, PI, 1 August 2007 (2007-08-01), pages 39-39, XP031132781</p> <p>ISBN: 978-0-7695-2842-7</p> <p>abstract</p> <p>figures 1-5</p> <p>paragraph [0002]</p> <p>paragraph [0003]</p> <p>paragraph [03. 1]</p> <p>paragraph [03. 2]</p> <p>-----</p>	1-18
X	<p>US 2008/130656 A1 (KIM HYUNG-SUB [KR] ET AL) 5 June 2008 (2008-06-05)</p> <p>abstract</p> <p>figures 1-3</p> <p>paragraph [0003]</p> <p>paragraphs [0036] - [0038]</p> <p>paragraphs [0047] - [0056]</p> <p>paragraphs [0062] , [0063]</p> <p>paragraphs [0069] - [0071]</p> <p>-----</p>	1-18
A	<p>"3rd Generation Partnership Project ; Technical Specificati on Group Services and System Aspects ; Pol icy and charging control architecture; (Release 7); 3GPP TS 23.203"</p> <p>ETSI STANDARDS, LIS, SOPHIA ANTIPOLIS</p> <p>CEDEX, FRANCE,</p> <p>vol . 3-SA2, no. vo.4.0,</p> <p>1 February 2006 (2006-02-01), XP014033549</p> <p>ISSN: 0000-0001</p> <p>paragraph [0005]</p> <p>paragraph [0006]</p> <p>paragraph [07. 1]</p> <p>-----</p>	1-18

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2009/063814

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008130656 AI	05-06-2008	KR 100822707 BI	18-04-2008

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

Application Number	15538182	Filing Date	2015-12-17	Docket Number (if applicable)	4965.1056-001	Art Unit	2415
First Named Inventor	Rudolf Strijkers			Examiner Name	Basil Ma		

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 080380

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

Signature of Registered U.S. Patent Practitioner			
Signature	Timothy J. Meagher, Reg. No. 39302/	Date (YYYY-MM-DD)	2021-09-02
Name	Timothy J. Meagher	Registration Number	39302

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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

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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.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Rudolf Strijkers

Application No.: 15/538,182

Filed: December 17, 2015

Confirmation No.: 3145

For: Handling Of Connection Setup Requests

**TRANSMITTAL LETTER FOR
INFORMATION DISCLOSURE STATEMENT**

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

Commissioner:

This Information Disclosure Statement is submitted:

- ☒ under 37 CFR 1.97(b), or
(Within any one of the following time periods: three months of filing national application (other than a CPA) or date of entry of the national stage in an international application; or before the mailing date of a first office action on the merits; or before the mailing of a first office action after the filing of a Request for Continued Examination)
- ☐ under 37 CFR 1.97(c) together with either:
 - ☐ a Statement under 37 CFR 1.97(e), as checked below, or
 - ☐ a \$[260/130/65] fee under 37 CFR 1.17(p), or
(After the 37 CFR 1.97(b) time period, but before any of a final action, notice of allowance, or an action that closes prosecution, whichever occurs first)
- ☐ under 37 CFR 1.97(d) together with:
 - ☐ a Statement under 37 CFR 1.97(e), as checked below, and
 - ☐ a \$[260/130/65] fee under 37 CFR 1.17(p), or
(Filed after final action, notice of allowance, or an action that otherwise closes prosecution, but on or before payment of the issue fee)
- ☐ under 37 CFR 1.97(i):
Applicant requests that the IDS and cited reference(s) be placed in the application file.
(Filed after payment of issue fee) [Consider QPIDS Pilot]

No aspect of this submission constitutes a disclaimer of claim scope.

Certification Statement Under 37 CFR 1.97(e)

- ☐ Each item of information contained in this 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 this Information Disclosure Statement; or
- ☐ No item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned, 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 this Information Disclosure Statement.

Statement Under 37 CFR 1.704(d) (Patent Term Adjustment)

Applies to original applications (other than design) filed on or after May 29, 2000

- ☐ (1) A paper containing only an information disclosure statement in compliance with §§ 1.97 and 1.98 will not be considered a failure to engage in reasonable efforts to conclude prosecution (processing or examination) of the application under paragraphs (c)(6), (c)(8), (c)(9), or (c)(10) of this section if it is accompanied by a statement that each item of information contained in the information disclosure statement:
- ☐ (i) Was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office, and this communication was not received by any individual designated in §1.56(c) more than thirty days prior to the filing of the information disclosure statement; or
- ☐ (ii) Is a communication that was issued by a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in §1.56(c) more than thirty days prior to the filing of the information disclosure statement.
- ☒ Enclosed herewith is a Listing of References. Copies of the cited references are enclosed except as indicated below or in the attached Listing of References.
- ☐ Copies of the cited references submitted with an Information Disclosure Statement in prior application, U.S. Application No. [], to which priority under 35 U.S.C. 120 is claimed, are not required under 37 CFR 1.98(d)(1) and (2) and are thus not provided.
- ☐ The listed references were cited in the enclosed Search Report in counterpart foreign application [add application number], which is listed in the attached Listing of References.

- ☐ The “concise explanation” requirement (non-English references) for reference(s) [] under 37 CFR 1.98(a)(3) is satisfied by:
- ☐ the explanation provided on the attached sheet.
 - ☐ the explanation provided in the Specification.
 - ☐ submission of the enclosed International Search Report.
 - ☐ submission of the enclosed English-language version of a foreign Search Report and/or foreign Office Action.
 - ☐ the enclosed English language abstract.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By /Timothy J. Meagher, Reg. No. 39302/

Timothy J. Meagher

Registration No. 39,302

Telephone: (978) 341-0036

Facsimile: (978) 341-0136

Concord, MA 01742-9133

Dated: 9/2/2021



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

NOTICE OF ALLOWANCE AND FEE(S) DUE

21005 7590 08/13/2021
HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

EXAMINER

MA, BASIL

ART UNIT

PAPER NUMBER

2415

DATE MAILED: 08/13/2021

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001	3145

TITLE OF INVENTION: HANDLING OF CONNECTION SETUP REQUESTS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	11/15/2021

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

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

HOW TO REPLY TO THIS NOTICE:

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

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

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

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

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

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

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

PART B - FEE(S) TRANSMITTAL

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

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

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

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

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

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.

21005 7590 08/13/2021
HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001	3145

TITLE OF INVENTION: HANDLING OF CONNECTION SETUP REQUESTS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1200	\$0.00	\$0.00	\$1200	11/15/2021

EXAMINER	ART UNIT	CLASS-SUBCLASS
MA, BASIL	2415	370-328000

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

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

1 _____

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

2 _____

3 _____

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

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

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

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

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

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

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

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

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

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

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

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

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

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

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001	3145
21005	7590	08/13/2021	EXAMINER	
HAMILTON, BROOK, SMITH & REYNOLDS, P.C. 530 VIRGINIA ROAD P.O. BOX 9133 CONCORD, MA 01742-9133			MA, BASIL	
			ART UNIT	PAPER NUMBER
			2415	

DATE MAILED: 08/13/2021

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

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

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

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

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

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

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Notice of Allowability	Application No. 15/538,182	Applicant(s) Strijkers et al.	
	Examiner Basil Ma	Art Unit 2415	AIA (FITF) Status Yes

-- 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 7/12/21.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-10 12-15 renumbered as 1-14. 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. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	5. <input checked="" type="checkbox"/> Examiner's Amendment/Comment
2. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date ____.	6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance
3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material ____.	7. <input type="checkbox"/> Other ____.
4. <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No./Mail Date ____.	

/BASIL MA/ Examiner, Art Unit 2415	/JEFFREY M RUTKOWSKI/ Supervisory Patent Examiner, Art Unit 2415
---------------------------------------	---

Notice of Pre-AIA or AIA Status

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

DETAILED ACTION

This communication is in response to Applicant's Remarks filed on 7/12/2021. An interview held on 7/19/2021 resulted in amendments to **claims 1, 9 and 10** and cancellation of **claim 11**.

Priority

This application is a national stage of International Application No. PCT/EP2015/080174 filed on 12/17/2015.

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119 (a)-(d). The certified copy has been filed in parent Application No. EP 14199719, filed on 12/22/2014.

EXAMINER'S AMENDMENT

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

Authorization for this examiner's amendment was given in an interview with attorney Tim Meagher on 7/21/2021.

The application has been amended as follows:

1. (Currently Amended) A method for assisting in handling of connection setup requests in a telecommunications network, the method comprising:

intercepting, by a node, a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of the telecommunications network;

identifying, by the node, from the connection setup request, a service for which the connection setup is requested;

determining, by the node, that the identified service is not an emergency service;

determining, by the node, whether the connection setup request is to be fulfilled based at least on information comprising available resources in ~~the~~ a network access point (NAP) serving the UE that are not reserved for premium services, a determination being a positive determination if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more premium services; and

passing, by the node, the connection setup request for further processing within the telecommunications network only upon positive determination.

9. (Currently Amended) A computer program product, stored on a computer-readable non-transitory storage medium, comprising software code portions configured for, when

executed in a computer, carrying out a method steps according to claim 1 comprising:

intercepting, by a node, a connection setup request from a user equipment (UE) to
a control node of a radio access network (RAN) part of the telecommunications network;

identifying, by the node, from the connection setup request, a service for which
the connection setup is requested;

determining, by the node, that the identified service is not an emergency service;

determining, by the node, whether the connection setup request is to be fulfilled
based at least on information comprising available resources in a network access point
(NAP) serving the UE that are not reserved for premium services, a determination being a
positive determination if, at the NAP serving the UE, there is sufficient unused resource
capacity that is not reserved for the connection setup requests for the one or more
premium services; and

passing, by the node, the connection setup request for further processing within
the telecommunications network only upon positive determination.

10. (Currently Amended) A data structure stored in a non-transitory computer-readable storage medium
of a node, the data structure comprising at least:

an indication of a resource capacity of a network access point (NAP) reserved for
connection setup requests for one or more premium services;

an indication of an amount of resources currently used by the NAP for the one or
more premium services; and

an indication of an amount of resources currently used by the NAP for services
that do not belong to the one or more premium services;

the data structure, used by the node, to determine whether the connection setup requests are
to be fulfilled based at least on information comprising available resources in the NAP serving the UE

that are not reserved for premium services, a determination being a positive determination if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more premium services; and

passing, by the node, the connection setup request for further processing within the telecommunications network only upon positive determination.

11. (Canceled)

Reasons for Allowance

The following is an examiner's statement of reasons for allowance:

The Instant Invention is directed towards supporting *premium services in a wireless telecommunication network* by blocking non-premium traffic and giving preference to *premium* traffic depending on available capacity. The cited prior art discloses access class barring which is used to give priority to a particular class of traffic, however, the instant claims distinguishes.

Allowable Subject Matter

Claims 1-10, and 12-15 renumbered as **claims 1-14** are allowed.

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

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Basil Ma whose telephone number is (408)918-7571. The examiner can normally be reached on Monday-Thursday 8AM-6PM PST.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffery Rutkowski can be reached on (571) 270-1215. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <https://ppair-my.uspto.gov/pair/PrivatePair>. 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.

/B.M./
Examiner, Art Unit 2415

/JEFFREY M RUTKOWSKI/
Supervisory Patent Examiner, Art Unit 2415

<i>Examiner-Initiated Interview Summary</i>	Application No. 15/538,182	Applicant(s) Strijkers et al.		
	Examiner Basil Ma	Art Unit 2415	AIA (First Inventor to File) Status Yes	Page 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	Title	Type
Basil Ma	Examiner	Telephonic
Tim Meagher	Attorney	

Date of Interview: 19 July 2021

Issues Discussed:

Proposed Amendment(s)

Amendments proposed.

Notes on proposal:

Claim 1: tweak for antecedent

Claim 9: avoid mixing statutory categories, re-statement of claim 1

Claim 10,11: combine and adding more specifics.

/BASIL MA/ Examiner, Art Unit 2415	/JEFFREY M RUTKOWSKI/ Supervisory Patent Examiner, Art Unit 2415
<p>Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04</p> <p>Please further see: MPEP 713.04 Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b) 37 CFR § 1.2 Business to be transacted in writing</p>	

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

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

<i>Notice of References Cited</i>	Application/Control No. 15/538,182		Applicant(s)/Patent Under Reexamination Strijkers et al.	
	Examiner Basil Ma		Art Unit 2415	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-6192248-B1	02-2001	Solondz; Max A.	H04W28/18	455/450
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					


FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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


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

Issue Classification 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner Basil Ma	Art Unit 2415

CPC						
Symbol					Type	Version
H04W	/	76	/	10	F	2018-02-01
H04W	/	76	/	20	I	2018-02-01
H04W	/	72	/	0486	I	2013-01-01
H04W	/	28	/	26	I	2013-01-01
H04W	/	88	/	02	A	2013-01-01

CPC Combination Sets				
Symbol	Type	Set	Ranking	Version
/				

/BASIL MA/ Examiner, Art Unit 2415 (Assistant Examiner)	24 July 2021 (Date)	Total Claims Allowed: 14	
/JEFFREY M RUTKOWSKI/ Supervisory Patent Examiner, Art Unit 2415 (Primary Examiner)	07 August 2021 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 3


Issue Classification 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner Basil Ma	Art Unit 2415

INTERNATIONAL CLASSIFICATION				
CLAIMED				
H04W76/10	/	76	/	10
H04W76/20	/	76	/	20
H04W72/04	/	72	/	04
H04W28/26	/	28	/	26
H04W88/02	/	88	/	02
NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS


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

/BASIL MA/ Examiner, Art Unit 2415 (Assistant Examiner)	24 July 2021 (Date)	Total Claims Allowed: 14	
/JEFFREY M RUTKOWSKI/ Supervisory Patent Examiner, Art Unit 2415 (Primary Examiner)	07 August 2021 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 3

Issue Classification 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner Basil Ma	Art Unit 2415

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant <input type="checkbox"/> CPA <input type="checkbox"/> T.D. <input type="checkbox"/> R.1.47															
CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	10	10												
2	2		11												
3	3	11	12												
4	4	12	13												
5	5	13	14												
6	6	14	15												
7	7														
8	8														
9	9														

/BASIL MA/ Examiner, Art Unit 2415 (Assistant Examiner)	24 July 2021 (Date)	Total Claims Allowed: 14	
/JEFFREY M RUTKOWSKI/ Supervisory Patent Examiner, Art Unit 2415 (Primary Examiner)	07 August 2021 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 3

<i>Search Notes</i> 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner Basil Ma	Art Unit 2415

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
Inventor Search on PALM	05/07/2019	/BM/
CPC and Keyword Search on EAST	05/07/2019	/BM/
Update Search	01/24/2020	/BM/
Update Search	08/01/2020	/BM/
Update Search	03/01/2021	/BM/
Update Search	07/24/2021	/BM/

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
H04W	76/10 76/20	07/24/2021	/BM/

/BASIL MA/ Examiner, Art Unit 2415	
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	601	h04w76/10.cpc. and h04w76/20.cpc.	US-PGPUB; USPAT	OR	OFF	2021/07/16 10:06
L2	19	L1 and (eab premium)	US-PGPUB; USPAT	OR	OFF	2021/07/16 10:06
L3	10	(US-20170353980-\$ or US-20140016616-\$ or US-20130201870-\$ or US-20120039168-\$ or US-20110216761-\$ or US-20150373733-\$ or US-20140128029-\$ or US-20150304937-\$).did. or (US-6192248-\$ or US-6577871-\$).did.	US-PGPUB; USPAT	OR	OFF	2021/07/16 10:17
L4	3	I3 and premium	US-PGPUB; USPAT	OR	OFF	2021/07/16 10:17
L5	6	I3 and ((premium) ("high" near priority))	US-PGPUB; USPAT	OR	OFF	2021/07/16 10:23

7/16/2021 10:25:01 AM

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Bibliographic Data

Application No: 15/538,182

Foreign Priority claimed: ☒ Yes ☐ No

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

Verified and Acknowledged:

/BASIL MA/

Examiner's Signature

Initials

Title:

Handling of Connection Setup Requests

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/20/2017	370	2415	4965.1056-001
RULE			

APPLICANTS

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INVENTORS

Rudolf Strijkers, Zurich, SWITZERLAND

Shuang Zhang, Delft, NETHERLANDS

CONTINUING DATA

This application is a 371 of PCT/EP2015/080174 12/17/2015

FOREIGN APPLICATIONS

EPO EP14199719.7 12/22/2014

IF REQUIRED, FOREIGN LICENSE GRANTED**

08/28/2017

STATE OR COUNTRY

SWITZERLAND

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UNITED STATES

FILING FEE RECEIVED

\$1,620

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L7	0	(UE "user equipment").clm. and "connection setup request".clm. and premium.clm.	US-PGPUB; USPAT	OR	OFF	2021/07/16 10:42
L8	120	(UE "user equipment").clm. and "connection setup request".clm.	US-PGPUB; USPAT	OR	OFF	2021/07/16 10:42

7/16/2021 10:56:42 AM

C:\Users\bma\Documents\EAST\Workspaces\posted\15538182-Dutch-connection-setup.wsp

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

Application Number	15538182	Filing Date	2015-12-17	Docket Number (if applicable)	4965.1056-001	Art Unit	2415
First Named Inventor	Rudolf Strijkers			Examiner Name	Basil Ma		

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

Petition for Extension of Time

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

Applicant requests non-entry of Amendment After Final as filed on June 11, 2021

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 080380

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

Signature of Registered U.S. Patent Practitioner			
Signature	Timothy J. Meagher, Reg. No. 39302/	Date (YYYY-MM-DD)	2021-07-12
Name	Timothy J. Meagher	Registration Number	39302

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Privacy Act Statement

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

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

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

Electronic Patent Application Fee Transmittal

Application Number:	15538182			
Filing Date:	20-Jun-2017			
Title of Invention:	Handling of Connection Setup Requests			
First Named Inventor/Applicant Name:	Rudolf Strijkers			
Filer:	Timothy J. Meagher/Jennifer Torpey			
Attorney Docket Number:	4965.1056-001			
Filed as Large Entity				
Filing Fees for U.S. National Stage under 35 USC 371				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
INDEPENDENT CLAIMS IN EXCESS OF 3	1614	1	480	480
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Extension - 1 month with \$0 paid	1251	1	220	220
Miscellaneous:				
RCE- 2ND AND SUBSEQUENT REQUEST	1820	1	2000	2000
Total in USD (\$)				2700

Electronic Acknowledgement Receipt

EFS ID:	43221286
Application Number:	15538182
International Application Number:	
Confirmation Number:	3145
Title of Invention:	Handling of Connection Setup Requests
First Named Inventor/Applicant Name:	Rudolf Strijkers
Customer Number:	21005
Filer:	Timothy J. Meagher/Jennifer Torpey
Filer Authorized By:	Timothy J. Meagher
Attorney Docket Number:	4965.1056-001
Receipt Date:	12-JUL-2021
Filing Date:	20-JUN-2017
Time Stamp:	18:20:34
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$2700
RAM confirmation Number	E20217BI20492571
Deposit Account	
Authorized User	

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

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		49651056001_Amendment.pdf	112445	yes	10
			c04c521f8bbcec3b255c84328da300ea2c96d06a		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment Submitted/Entered with Filing of CPA/RCE		1	1	
	Claims		2	6	
	Applicant Arguments/Remarks Made in an Amendment		7	10	
Warnings:					
Information:					
2	Extension of Time	49651056001_EXT.PDF	833922	no	2
			732775cee007f21ecd58dcde15cf1c7b0510ae31		
Warnings:					
Information:					
3	Request for Continued Examination (RCE)	49651056001_RCE2.PDF	1351910	no	3
			5578ee4914c3fb63b8f0c28e0ec460a1cd27a055		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	34464	no	2
			87a967bb630e8466f4d9233e5f525ec7146f12be		
Warnings:					
Information:					
Total Files Size (in bytes):			2332741		

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

First Named Inventor: Rudolf Strijkers

Application No.: 15/538,182

Filed: December 17, 2015

Confirmation No.: 3145

For: Handling Of Connection Setup Requests

AMENDMENT

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

Commissioner:

This Amendment is being filed in response to the Final Office Action mailed from the U.S. Patent and Trademark Office on March 11, 2021 in the above-identified application.

Reconsideration and further examination are requested.

In lieu of filing a Notice of Appeal, a Request for Continued Examination (RCE) is being filed concurrently herewith.

An extension of time to respond to the Office Action is respectfully requested. A Petition for Extension of Time and the appropriate fee are being filed concurrently with this document.

Please amend the application as follows:

Amendments to the Claims

Please amend claims 1, 3, 7, 10, 12, 14, and 15.

The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1. (Currently Amended) A method for assisting in handling of connection setup requests in a telecommunications network, the method comprising:
 - intercepting, by a node, a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of the telecommunications network;
 - identifying, by the node, from the connection setup request, a service for which the connection setup is requested;
 - determining, by the node, that the identified service is not an emergency service;
 - determining, by the node, whether the connection setup request is to be fulfilled based at least on information comprising available resources in the network access point (NAP) serving the UE that are not reserved for premium services, a determination being a positive determination if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more premium services ~~regarding resource use within a network access point (NAP) serving the UE~~; and
 - passing, by the node, the connection setup request for further processing within the telecommunications network only upon positive determination.
2. (Original) The method according to claim 1, wherein the determination of whether the connection setup request is to be fulfilled is further based on one or more agreements with one or more service providers regarding resource capacity in an access network part of the telecommunications network.
3. (Currently Amended) The method according to claim 2, wherein the one or more agreements comprise reservation, at the NAP serving the UE, of a predefined resource capacity for connection setup requests for one or more ~~predefined~~ premium services.

4. (Original) The method according to claim 3, wherein the predefined resource capacity is set as a percentage of the total resource capacity of the NAP.
5. (Original) The method according to claim 3, wherein the predefined resource capacity is set as a predefined amount of the total resource capacity of the NAP, the predefined amount being less than the total resource capacity of the NAP.
6. (Previously Presented) The method according to claim 3, wherein the predefined resource capacity is dynamically adjusted.
7. (Currently Amended) The method according to claim 3, further comprising:
 - determining that the identified service is not one of the one or more ~~predefined~~premium services and, optionally, determining that the identified service is not one of one or more additional ~~predefined~~premium services; and
 - ~~determining that the connection setup request is to be fulfilled if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more predefined services.~~
8. (Previously Presented) The method according to claim 1, further comprising providing an indication to the UE of whether the connection setup request was determined to be fulfilled.
9. (Previously Presented) A computer program product, stored on a computer-readable non-transitory storage medium, comprising software code portions configured for, when executed in a computer, carrying out method steps according to claim 1.
10. (Currently Amended) A data structure comprising at least:
 - an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more ~~predefined~~premium services;
 - an indication of an amount of resources currently used by the NAP for the one or more ~~predefined~~premium services; and
 - an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more ~~predefined~~premium services.

11. (Previously Presented) A non-transitory computer-readable storage medium storing the data structure according to claim 10.
12. (Currently Amended) A node comprising:
 - a computer readable storage medium having computer readable program code embodied therewith, and
 - a processor coupled to the computer readable storage medium, wherein responsive to executing the computer readable program code, the processor is configured to perform executable operations comprising:
 - intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of a telecommunications network;
 - identifying, from the connection setup request, a service for which the connection setup is requested;
 - determining that the identified service is not an emergency service;
 - determining whether the connection setup request is to be fulfilled based at least on information comprising available resources in the network access point (NAP) serving the UE that are not reserved for premium services, a determination being a positive determination if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more premium services ~~regarding resource use within a network access point (NAP) serving the UE~~; and
 - passing the connection setup request for further processing within the telecommunications network only upon positive determination.
13. (Original) The node according to claim 12, wherein the node is a mobile management entity (MME) of the telecommunications network.
14. (Currently Amended) The node according to claim 12, wherein:
 - the node is communicatively connected to a computer-readable storage medium storing a data structure comprising at least:
 - an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more ~~predefined~~ premium services;

an indication of an amount of resources currently used by the NAP for the one or more ~~predefined~~premium services;

an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more ~~predefined~~premium services; and

the information regarding resource use within the NAP serving the UE comprises at least a portion of information stored on the computer-readable storage medium.

15. (Currently Amended) A system comprising:

~~the node according to claim 12, and~~

a node comprising:

a computer readable storage medium having computer readable program code embodied therewith, and

a processor coupled to the computer readable storage medium, wherein responsive to executing the computer readable program code, the processor configured to perform executable operations comprising:

intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of a telecommunications network;

identifying, from the connection setup request, a service for which the connection setup is requested;

determining that the identified service is not an emergency service;

determining whether the connection setup request is to be fulfilled based at least on information comprising available resources in the network access point (NAP) serving the UE that are not reserved for premium services, a determination being a positive determination if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more premium services; and

passing the connection setup request for further processing within the telecommunications network only upon positive determination; and

a computer-readable storage medium storing a data structure comprising at least:

an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more ~~predefined~~premium services;

an indication of an amount of resources currently used by the NAP for the one or more ~~predefined~~premium services; and

an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more ~~predefined~~premium services.

REMARKS

Amendments to the Claims

Claims 1, 3, 7, 10, 12, 14, and 15 are being amended.

Claims 1 and 12 have been amended to include “wherein the information regarding resource use comprises used resources for predefined services and for non-predefined services.” Claim 15 has been amended to independent form by including the text of amended claim 12. Support for the amendment may be found on page 12, lines 8-14 of the application as filed.

The amendments are made to expedite prosecution of this application. Applicant is not conceding that the claims prior to amendment are not patentable. No inference should be made that Applicant is disclaiming any subject matter of the present application, and Applicant reserves the right to pursue the unamended claims or any other broader or narrower claims supported by the disclosure at a later date, including in one or more continuing applications. Cancellation of any claim herein is without prejudice to reinstatement in this or continuing application.

Entry of the amendment to the claims is respectfully requested.

Rejection Under 35 U.S.C. § 103

Claims 1-9 and 12-15

Claims 1-9 and 12-15 were rejected under 35 U.S.C. § 103 as being unpatentable over Gupta (US2013/0201870) in view of Fong et al. (US 2014/0128029; hereafter Fong) and further in view of Kim et al. (US2015/0304937; hereafter Kim) and further in view of Budka et al. (US6577871; hereafter Budka). Applicant respectfully disagrees.

Amended claim 1 further details the information regarding resource use within a network access point (NAP) serving the UE to comprise “available resources in the network access point (NAP) serving the UE that are not reserved for premium services, a determination being a positive determination if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more premium services.” This detailed information allows the node to determine whether to pass a connection setup request for further processing within the telecommunications network based on available resources in the NAP that are not reserved for connection setup requests for an emergency service and for connection setup requests for premium services.

Although the combination of Gupta, Fong, Kim and Budka may teach to reject some requests in case there is an overload situation in the network while always allowing requests from emergency services, it does not teach to differentiate based on used resources for premium and non-premium services. In case of an overload situation, and if the requested service is not an emergency service, Gupta teaches to reject all Radio Resource Control (RRC) connection requests (Gupta, para. [0033]), Fong teaches to restrict access from mobile devices configured for extended access barring (EAB) while permitting access from other mobile devices (Fong, para. [0030]), Kim teaches to allow access in case an establishment cause field in the request comprises a cause value indicating signaling or indicating that it is caused by IP multimedia subsystem (IMS)-based service (Kim, Abstract), and Budka teaches to bar mobile units of one or more access classes (Budka, col. 5, lines 18-21). None of these references applies the fine-grained method to determine whether to fulfill the request based on used resources for premium and for non-premium services in the NAP. The combination of references teaches that in case of overload (if too many resources are used), all requests are barred except some having a specific indication in the request or coming from some devices having a certain access class.

Even if the references could be combined, which Applicant does not concede, the cited hypothetical combination is missing at least one element, namely, “comprising available resources in the network access point (NAP) serving the UE that are not reserved for premium services, a determination being a positive determination if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more premium services,” as recited, in part, in Applicant’s amended claim 1.

In light of the above, Applicant respectfully submits that amended claim 1 is novel and non-obvious over the cited hypothetical combination of art.

Independent claims 12 and 15 recite similar features as claim 1, and are patentable for at least the same reasons given for claim 1.

Applicant respectfully submits that claims 2-9 and 13-15 which depend from claims 1 and 12, respectively, include the same elements as the claim(s) from which they depend, and are novel and non-obvious for at least the same reasons set forth above in regard to claims 1 and 12.

Claims 10 and 11

Claims 10 and 11 were rejected under 35 U.S.C. 103 as being unpatentable over Gupta in view of Fong and further in view of Budka. Applicant respectfully disagrees.

Independent claim 10 recites a data structure that requires three indications in relation to a network access point (NAP).

Claim 10 recites “an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more premium services.”

The Office noted at page 9 that Budka identifies premium “access priority classes.” However, such classes are not premium *services*.

At best, Budka teaches to further process connection requests for all services requested by a device having access class 11.

In light of the above, Applicant respectfully submits that the Office fails to establish a *prima facie* case of obviousness with regard to Applicant’s claim 10. As such, Applicant respectfully submits that claim 10 is novel and non-obvious over the cited hypothetical combination of art.

Applicant respectfully submits that claim 11, which depends from claim 10, is novel and non-obvious for at least the same reasons set forth above in regard to claim 10.

Accordingly, Applicant respectfully requests withdrawal of the rejections of claims 1-15 under 35 U.S.C. § 103 and requests the claims be accepted for allowance.

Payment of Fees

Authorization is hereby granted to charge the fees due with this submission, including any extension of time fee, to Deposit Account No. 08-0380.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By /Timothy J. Meagher, Reg. No. 39302/

Timothy J. Meagher

Registration No. 39,302

Telephone: (978) 341-0036

Facsimile: (978) 341-0136

Concord, MA 01742-9133

Date: 7/12/2021

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.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional) 4965.1056-001
Application Number 15/538,182	Filed 2015-12-17	
For Handling Of Connection Setup Requests		
Art Unit 2415	Examiner Basil Ma	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>	
<input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$220	\$110	\$55	\$ <u>220</u>
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$640	\$320	\$160	\$ _____
<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1,480	\$740	\$370	\$ _____
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$2,320	\$1,160	\$580	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$3,160	\$1,580	\$790	\$ _____

☐ Applicant asserts small entity status. See 37 CFR 1.27.
☐ Applicant certifies micro entity status. See 37 CFR 1.29.
 Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.
☐ A check in the amount of the fee is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director has already been authorized to charge fees in this application to a Deposit Account.
☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to
 Deposit Account Number 080380.
☒ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.
☒ attorney or agent of record. Registration number 39,302.
☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Timothy J. Meagher, Reg. No. 39302/

Signature

7/12/2021

Date

Timothy J. Meagher

Typed or printed name

978-341-0036

Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☒ * Total of 1 forms are submitted.

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

Privacy Act Statement

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

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

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

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

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/538,182		Filing Date 06/20/2017		<input type="checkbox"/> To be Mailed			
ENTITY: <input checked="" type="checkbox"/> LARGE <input type="checkbox"/> SMALL <input type="checkbox"/> MICRO											
APPLICATION AS FILED - PART I											
		(Column 1)	(Column 2)								
FOR		NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)				
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A		N/A						
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A	N/A		N/A						
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A		N/A						
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 = *		x \$80 =							
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 = *		x \$420 =							
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))											
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL					
APPLICATION AS AMENDED - PART II											
		(Column 1)		(Column 2)	(Column 3)						
AMENDMENT	07/12/2021	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0	x \$100 =		0			
	Independent (37 CFR 1.16(h))	* 4	Minus	*** 3	= 1	x \$480 =		480			
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))										
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
						TOTAL ADD'L FEE		480			
		(Column 1)		(Column 2)	(Column 3)						
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)			
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =					
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =					
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))										
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
						TOTAL ADD'L FEE					
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						LIE					
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/DENISE HOPKINS/					
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".											
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.											

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

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



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001	3145
21005	7590	07/07/2021		
HAMILTON, BROOK, SMITH & REYNOLDS, P.C. 530 VIRGINIA ROAD P.O. BOX 9133 CONCORD, MA 01742-9133			EXAMINER MA, BASIL	
			ART UNIT	PAPER NUMBER
			2415	
			NOTIFICATION DATE	DELIVERY MODE
			07/07/2021	ELECTRONIC

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

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

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

docketing.department@hbsr.com

Advisory Action Before the Filing of an Appeal Brief	Application No. 15/538,182	Applicant(s) Strijkers et al.	
	Examiner Basil Ma	Art Unit 2415	AIA (FITF) Status Yes

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

THE REPLY FILED 11 June 2021 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:

a) ☐ The period for reply expires ____ months from the mailing date of the final rejection.

b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires ____ months from the mailing date of the prior Advisory Action or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.

Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANTS FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37CFR 41.37(a).

AMENDMENTS

3. ☒ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because

a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);

b) ☐ They raise the issue of new matter (see NOTE below);

c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: See 12 (See 37CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).

5. ☐ Applicants reply has overcome the following rejection(s): _____

6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

7. ☒ For purposes of appeal, the proposed amendment(s): (a) ☒ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____

9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).

10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).

11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:
Discussion started to bring claims in condition for allowance See interview summary..

13. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). _____

14. ☒ Other: PTO-2323 attached.

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: _____

Claim(s) objected to: _____

Claim(s) rejected: 1-12.

Claim(s) withdrawn from consideration: _____

/BASIL MA/ Examiner, Art Unit 2415	/JEFFREY M RUTKOWSKI/ Supervisory Patent Examiner, Art Unit 2415
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<i>Applicant-Initiated Interview Summary</i>	Application No. 15/538,182	Applicant(s) Strijkers et al.		
	Examiner Basil Ma	Art Unit 2415	AIA (First Inventor to File) Status Yes	Page 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	Title	Type
Basil Ma	Examiner	Telephonic
Tim Meagher	Attorney	

Date of Interview: 24 June 2021

Issues Discussed:

Proposed Amendment(s)

It appears the Invention is directed to giving preference to "premium" services at a node (eNB).

Some suggestions were proposed e.g. replacing predefined with premium.

Progress made but no agreement was reached.

/BASIL MA/ Examiner, Art Unit 2415	/JEFFREY M RUTKOWSKI/ Supervisory Patent Examiner, Art Unit 2415
<p>Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04</p> <p>Please further see: MPEP 713.04 Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b) 37 CFR § 1.2 Business to be transacted in writing</p>	

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

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

AFCP 2.0 Decision

Application No.

15/538,182

Applicant(s)

Strijkers et al.

Examiner

Basil Ma

Art Unit

2415

AIA (FITF) Status

Yes

This is in response to the After Final Consideration Pilot request filed 11 June 2021.

1. **Improper Request** – The AFCP 2.0 request is improper for the following reason(s) and the after final amendment submitted with the request will be treated under pre-pilot procedure.

- ☐ An AFCP 2.0 request form PTO/SB/434 (or equivalent document) was not submitted.
- ☐ A non-broadening amendment to at least one independent claim was not submitted.
- ☐ The request is not the first proper AFCP 2.0 request submitted in response to the most recent final rejection.
- ☐ Other: _____

2. Proper Request

A. After final amendment submitted with the request will not be treated under AFCP 2.0.

The after final amendment cannot be reviewed and a search conducted within the guidelines of the pilot program.

- ☐ The after final amendment will be treated under pre-pilot procedure.

B. Updated search and/or completed additional consideration.

The examiner performed an updated search and/or completed additional consideration of the after final amendment within the time authorized for the pilot program. The result(s) of the updated search and/or completed additional consideration are:

- ☐ 1. All of the rejections in the most recent final Office action are overcome and a Notice of Allowance is issued herewith.
- ☒ 2. The after final amendment would not overcome all of the rejections in the most recent final Office action. See attached interview summary for further details.
- ☐ 3. The after final amendment was reviewed, and it raises a new issue(s). See attached interview summary for further details.
- ☐ 4. The after final amendment raises new issues, but would overcome all of the rejections in the most recent final Office action. A decision on determining allowability could not be made within the guidelines of the pilot. See attached interview summary for further details, including any newly discovered prior art.
- ☐ 5. Other: _____

Examiner Note: Please attach an interview summary when necessary as described above.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Rudolf Strijkers

Application No.: 15/538,182

Filed: December 17, 2015

Confirmation No.: 3145

For: Handling Of Connection Setup Requests

AMENDMENT AFTER FINAL REJECTION UNDER 37 CFR § 1.116

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

Commissioner:

This Amendment After Final Rejection is being filed in response to the Final Office Action mailed from the U.S. Patent and Trademark Office on March 11, 2021 in the above-identified application. Reconsideration and further examination are requested.

A Certification and Request for Consideration under the After Final Consideration Pilot 2.0 (AFCP 2.0) is being filed concurrently herewith.

Please amend the application as follows:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Rudolf Strijkers

Application No.: 15/538,182

Filed: December 17, 2015

Confirmation No.: 3145

For: Handling Of Connection Setup Requests

AMENDMENT AFTER FINAL REJECTION UNDER 37 CFR § 1.116

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

Commissioner:

This Amendment After Final Rejection is being filed in response to the Final Office Action mailed from the U.S. Patent and Trademark Office on March 11, 2021 in the above-identified application. Reconsideration and further examination are requested.

A Certification and Request for Consideration under the After Final Consideration Pilot 2.0 (AFCP 2.0) is being filed concurrently herewith.

Please amend the application as follows:

Amendments to the Claims

Please amend Claims 1, 12, and 15.

The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1. (Currently Amended) A method for assisting in handling of connection setup requests in a telecommunications network, the method comprising:
 - intercepting, by a node, a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of the telecommunications network;
 - identifying, by the node, from the connection setup request, a service for which the connection setup is requested;
 - determining, by the node, that the identified service is not an emergency service;
 - determining, by the node, whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE, wherein the information regarding resource use comprises used resources for predefined services and for non-predefined services; and
 - passing, by the node, the connection setup request for further processing within the telecommunications network only upon positive determination.
2. (Original) The method according to claim 1, wherein the determination of whether the connection setup request is to be fulfilled is further based on one or more agreements with one or more service providers regarding resource capacity in an access network part of the telecommunications network.
3. (Original) The method according to claim 2, wherein the one or more agreements comprise reservation, at the NAP serving the UE, of a predefined resource capacity for connection setup requests for one or more predefined services.
4. (Original) The method according to claim 3, wherein the predefined resource capacity is set as a percentage of the total resource capacity of the NAP.

5. (Original) The method according to claim 3, wherein the predefined resource capacity is set as a predefined amount of the total resource capacity of the NAP, the predefined amount being less than the total resource capacity of the NAP.
6. (Previously Presented) The method according to claim 3, wherein the predefined resource capacity is dynamically adjusted.
7. (Previously Presented) The method according to claim 3, further comprising:
 - determining that the identified service is not one of the one or more predefined services and, optionally, determining that the identified service is not one of one or more additional predefined services; and
 - determining that the connection setup request is to be fulfilled if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more predefined services.
8. (Previously Presented) The method according to claim 1, further comprising providing an indication to the UE of whether the connection setup request was determined to be fulfilled.
9. (Previously Presented) A computer program product, stored on a computer-readable non-transitory storage medium, comprising software code portions configured for, when executed in a computer, carrying out method steps according to claim 1.
10. (Original) A data structure comprising at least:
 - an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;
 - an indication of an amount of resources currently used by the NAP for the one or more predefined services; and
 - an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services.
11. (Previously Presented) A non-transitory computer-readable storage medium storing the data structure according to claim 10.

12. (Currently Amended) A node comprising:
- a computer readable storage medium having computer readable program code embodied therewith, and
 - a processor coupled to the computer readable storage medium, wherein responsive to executing the computer readable program code, the processor is configured to perform executable operations comprising:
 - intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of a telecommunications network;
 - identifying, from the connection setup request, a service for which the connection setup is requested;
 - determining that the identified service is not an emergency service;
 - determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE, wherein the information regarding resource use comprises used resources for predefined services and for non-predefined services; and
 - passing the connection setup request for further processing within the telecommunications network only upon positive determination.
13. (Original) The node according to claim 12, wherein the node is a mobile management entity (MME) of the telecommunications network.
14. (Previously Presented) The node according to claim 12, wherein:
- the node is communicatively connected to a computer-readable storage medium storing a data structure comprising at least:
 - an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;
 - an indication of an amount of resources currently used by the NAP for the one or more predefined services;
 - an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services; and
 - the information regarding resource use within the NAP serving the UE comprises at least a portion of information stored on the computer-readable storage medium.

15. (Currently Amended) A system comprising:

~~the node according to claim 12, and~~

a node comprising:

a computer readable storage medium having computer readable program code embodied therewith, and

a processor coupled to the computer readable storage medium, wherein responsive to executing the computer readable program code, the processor configured to perform executable operations comprising:

intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of a telecommunications network;

identifying, from the connection setup request, a service for which the connection setup is requested;

determining that the identified service is not an emergency service;

determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE, wherein the information regarding resource use comprises used resources for predefined services and for non-predefined services; and

passing the connection setup request for further processing within the telecommunications network only upon positive determination; and

a computer-readable storage medium storing a data structure comprising at least:

an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;

an indication of an amount of resources currently used by the NAP for the one or more predefined services; and

an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services.

REMARKS**Amendments to the Claims**

Claims 1-15 are pending.

Claims 1 and 12 have been amended to include “wherein the information regarding resource use comprises used resources for predefined services and for non-predefined services.” Claim 15 has been amended to independent form by including the text of amended claim 12. Support for the amendment may be found on page 12, lines 8-14 of the application as filed.

The amendments are made to expedite prosecution of this application. Applicant is not conceding that the claims prior to amendment are not patentable. No inference should be made that Applicant is disclaiming any subject matter of the present application, and Applicant reserves the right to pursue the unamended claims or any other broader or narrower claims supported by the disclosure at a later date, including in one or more continuing applications. Cancellation of any claim herein is without prejudice to reinstatement in this or continuing application.

Entry of the amendment to the claims is respectfully requested.

Rejection Under 35 U.S.C. § 103*Claims 1-9 and 12-15*

Claims 1-9 and 12-15 were rejected under 35 U.S.C. § 103 as being unpatentable over Gupta (US2013/0201870) in view of Fong et al. (US 2014/0128029; hereafter Fong) and further in view of Kim et al. (US2015/0304937; hereafter Kim) and further in view of Budka et al. (US6577871; hereafter Budka). Applicant respectfully disagrees.

Amended claim 1 further details the information regarding resource use within a network access point (NAP) serving the UE to comprise “used resources for predefined services and for non-predefined services.” This detailed information allows the node to determine whether to pass a connection setup request for further processing within the telecommunications network based on available resources in the NAP that are not reserved for connection setup requests for an emergency service and for connection setup requests for predefined services.

Although the combination of Gupta, Fong, Kim and Budka may teach to reject some requests in case there is an overload situation in the network while always allowing requests from emergency services, it does not teach to differentiate based on used resources for

predefined and non-predefined services. In case of an overload situation, and if the requested service is not an emergency service, Gupta teaches to reject all Radio Resource Control (RRC) connection requests (Gupta, para. [0033]), Fong teaches to restrict access from mobile devices configured for extended access barring (EAB) while permitting access from other mobile devices (Fong, para. [0030]), Kim teaches to allow access in case an establishment cause field in the request comprises a cause value indicating signaling or indicating that it is caused by IP multimedia subsystem (IMS)-based service (Kim, Abstract), and Budka teaches to bar mobile units of one or more access classes (Budka, col. 5, lines 18-21). None of these references applies the fine-grained method to determine whether to fulfill the request based on used resources for predefined and for non-predefined services in the NAP. The combination of references teaches that in case of overload (if too many resources are used), all requests are barred except some having a specific indication in the request or coming from some devices having a certain access class.

Even if the references could be combined, which Applicant does not concede, the cited hypothetical combination is missing at least one element, namely, “determining, by the node, whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE, wherein the information regarding resource use comprises used resources for predefined services and for non-predefined services,” as recited, in part, in Applicant’s amended claim 1.

In light of the above, Applicant respectfully submits that amended claim 1 is novel and non-obvious over the cited hypothetical combination of art.

Independent claims 12 and 15 recite similar features as claim 1, and are patentable for at least the same reasons given for claim 1.

Applicant respectfully submits that claims 2-9 and 13-15 which depend from claims 1 and 12, respectively, include the same elements as the claim(s) from which they depend, and are novel and non-obvious for at least the same reasons set forth above in regard to claims 1 and 12.

Claims 10 and 11

Claims 10 and 11 were rejected under 35 U.S.C. 103 as being unpatentable over Gupta in view of Fong and further in view of Budka. Applicant respectfully disagrees.

Independent claim 10 recites a data structure that requires three indications in relation to a network access point (NAP).

Claim 10 recites “an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services.”

The Office noted at page 9 that Budka identifies premium “access priority classes.” However, such classes are not predefined services.

At best, Budka teaches to further process connection requests for all services requested by a device having access class 11.

In light of the above, Applicant respectfully submits that the Office fails to establish a *prima facie* case of obviousness with regard to Applicant’s claim 10. As such, Applicant respectfully submits that claim 10 is novel and non-obvious over the cited hypothetical combination of art.

Applicant respectfully submits that claim 11, which depends from claim 10, is novel and non-obvious for at least the same reasons set forth above in regard to claim 10.

Accordingly, Applicant respectfully requests withdrawal of the rejections of claims 1-15 under 35 U.S.C. § 103 and requests the claims be accepted for allowance.

Payment of Fees

Authorization is hereby granted to charge the fees due with this submission, including any extension of time fee, to Deposit Account No. 08-0380.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By /Timothy J. Meagher, Reg. No. 39302/

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Concord, MA 01742-9133

Date: 6/11/2021

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0		
Practitioner Docket No.:	Application No.:	Filing Date:
4965.1056-001	15/538,182	Dec 17, 2015
First Named Inventor:	Title:	
Rudolf Strijkers	Handling Of Connection Setup Requests	
<p>APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.</p> <ol style="list-style-type: none"> 1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (<i>e.g.</i>, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c). 2. The above-identified application contains an outstanding final rejection. 3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect. 4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection. 5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response. 6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web). 7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, <i>e.g.</i>, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.] 8. By filing this certification and request, applicant acknowledges the following: <ul style="list-style-type: none"> • Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0. • The examiner will verify that the AFCP 2.0 submission is compliant, <i>i.e.</i>, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions: <ul style="list-style-type: none"> ○ The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, <i>e.g.</i>, by mailing an advisory action. ○ If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview. <ul style="list-style-type: none"> ▪ The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate. ▪ If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116. 		
Signature	Date	
/Timothy J. Meagher, Reg. No. 39302/	6/11/2021	
Name (Print/Typed)	Practitioner Registration No.	
Timothy J. Meagher	39,302	
<p>Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.</p>		
<p><input checked="" type="checkbox"/> * Total of <u>1</u> forms are submitted.</p>		

Privacy Act Statement

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

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

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

Electronic Patent Application Fee Transmittal

Application Number:	15538182			
Filing Date:	20-Jun-2017			
Title of Invention:	Handling of Connection Setup Requests			
First Named Inventor/Applicant Name:	Rudolf Strijkers			
Filer:	Timothy J. Meagher/Charlene Caruso			
Attorney Docket Number:	4965.1056-001			
Filed as Large Entity				
Filing Fees for U.S. National Stage under 35 USC 371				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
INDEPENDENT CLAIMS IN EXCESS OF 3	1614	1	480	480
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

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

Electronic Acknowledgement Receipt

EFS ID:	42964033
Application Number:	15538182
International Application Number:	
Confirmation Number:	3145
Title of Invention:	Handling of Connection Setup Requests
First Named Inventor/Applicant Name:	Rudolf Strijkers
Customer Number:	21005
Filer:	Timothy J. Meagher/Charlene Caruso
Filer Authorized By:	Timothy J. Meagher
Attorney Docket Number:	4965.1056-001
Receipt Date:	11-JUN-2021
Filing Date:	20-JUN-2017
Time Stamp:	16:33:25
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 480
RAM confirmation Number	E20216AG33433784
Deposit Account	
Authorized User	

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

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		4965_1056_001_AAF.pdf	141528	yes	9
			0d3f02d04dc99ec9fd8a371cd9bfa475266582a3		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Response After Final Action		1	1	
	Claims		2	5	
	Applicant Arguments/Remarks Made in an Amendment		6	9	
Warnings:					
Information:					
2	After Final Consideration Program Request	4965_1056_001_AFCP_2_0.pdf	215158	no	2
			a0904bc677cef597b820d8a5b64b206a29083552		
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30862	no	2
			6f4eae6f8b83f3f0a5402dd372d4cd32c3afe444		
Warnings:					
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Total Files Size (in bytes):			387548		

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New Applications Under 35 U.S.C. 111

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

National Stage of an International Application under 35 U.S.C. 371

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

New International Application Filed with the USPTO as a Receiving Office

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/538,182		Filing Date 06/20/2017		<input type="checkbox"/> To be Mailed		
ENTITY: <input checked="" type="checkbox"/> LARGE <input type="checkbox"/> SMALL <input type="checkbox"/> MICRO										
APPLICATION AS FILED - PART I										
		(Column 1)	(Column 2)							
FOR		NUMBER FILED	NUMBER EXTRA	RATE (\$)		FEE (\$)				
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A	N/A						
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A	N/A	N/A						
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A	N/A						
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =	*	x \$80 =						
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =	*	x \$420 =						
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).								
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL						
APPLICATION AS AMENDED - PART II										
		(Column 1)		(Column 2)	(Column 3)					
AMENDMENT	06/11/2021	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0	x \$100 =		0		
	Independent (37 CFR 1.16(h))	* 4	Minus	*** 3	= 1	x \$480 =		480		
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))									
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE		480		
		(Column 1)		(Column 2)	(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =				
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =				
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))									
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE				
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						LIE				
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/PEGGY S YARBOROUGH/				
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".										
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001	3145
21005	7590	03/11/2021		
HAMILTON, BROOK, SMITH & REYNOLDS, P.C. 530 VIRGINIA ROAD P.O. BOX 9133 CONCORD, MA 01742-9133			EXAMINER MA, BASIL	
			ART UNIT	PAPER NUMBER
			2415	
			NOTIFICATION DATE	DELIVERY MODE
			03/11/2021	ELECTRONIC

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

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

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

docketing.department@hbsr.com

Notice of Pre-AIA or AIA Status

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

DETAILED ACTION

This communication is in response to Applicant's Remarks filed under 37 C.F.R. §1.111 in response to a non-final office action. **Claims 1-15** are pending.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. **Claims 1-9, 12-15** are rejected under 35 U.S.C. 103 as being unpatentable over Gupta (US 2013/0201870) in view of Fong et al. (US 2014/0128029 hereafter Fong) and further in view of Kim et al. (US 2015/0304937 hereafter Kim) and further in view of Budka et al. (US Patent 6,577,871 hereafter Budka).
2. For **claims 1 and 12**, Gupta discloses *handling of connection setup requests* (Figure 2 , Figure 3) *in a telecommunications network* (Figure 1), *comprising:*
intercepting a connection setup request ([0032] 206 network controller, e.g. eNB, may control establishment of RRC connections) *from a user equipment (UE)* (15 Figure 1) *to a control node* (e.g. 45 Figure 1 e.g. MME [0029]) *of a radio access network (RAN) part* (20 Figure 1) *of the telecommunications network* (Figure 1);

identifying, by the node (eNB), from the connection setup request (304 Figure 3), a service (e.g. low or normal priority for meter reading [0041]) for which the connection setup is requested

determining (based on network congestion [0025]) whether the connection setup request is to be fulfilled (connection setup message 308 Figure 3 [0035] or connection reject message 208 Figure 2 [0033]) based at least on information regarding resource use (congestion or overload [0025]) within a network access point (NAP) (e.g. eNB [0032]) serving the UE ([0039] UE attached to the eNB); and passing the connection setup request (eNB responds with connection setup message 308 Figure 3) for further processing (further handshaking with an adapted protocol [0035]) within the telecommunications network only upon positive determination (e.g. RAN 20 can support an RRC connection [0035]).

3. Gupta teaches the eNB rejecting (Figure 2) or accepting (Figure 3) a connection request based on an overload/congestion status mechanism (EAB [0025]) but does not disclosed communication between MME and eNB regarding overloaded conditions.

4. Fong in the same field of connecting UEs to a 3GPP network, further elaborates on the EAB mechanism by teaching *information regarding resource use* ([0033] prevent overloading the access network) sent (362 Figure 9 overload start) by a *control node* (MME 350 Figure 9) to a *network access point (NAP)* (310 Figure 9 e.g. eNB [0044]) *for determining whether the connection setup request is to be fulfilled* (overloaded [0101] Figure 9 or normal operation Figure 11 [0098]).

5. It would have been obvious for one of ordinary skill when the invention was filed to incorporate Fong's further elaboration on the communication between the MME and

the eNB for restricting access at the eNB to avoid overloading the access/core network [0030].

6. Fong teaches rejecting non-emergency calls [0086] during overload but does not teach *determining the identified service is not an emergency service*.

7. However, Kim, in the same field of establishing an RRC connection using EAB procedures [0211] discloses

intercepting, by a node, (eNodeB 200 Figure 8a) a connection setup request (e.g. 2a Figure 8a) from a user equipment (UE) to a control node (e.g. eNB) of a radio access network (RAN) part of the telecommunications network;

identifying, by a node, (eNB) from the connection setup request (2a Figure 8a), a service (2a Figure 8a MO-IMS service new cause [0222]) for which the connection setup is requested (2a Figure 8a);

determining, by a node, (eNB) that the identified service (e.g. table 4 ACB information [0222] differentiate ACB for connecting an service) is not an emergency service; ([0224] ACB identifies exceptions based on ACB)

determining, by a node, (eNB) whether the connection setup request (complete setup Figure 8b or reject Figure 8a) is to be fulfilled based at least on information regarding resource use (congestion control) Figure 8a, 8b [0141] within a network access point (NAP) (eNB Figure 8a, 8b) serving the UE; and

passing, by a node, (eNB) the connection setup request for further processing (towards MME e.g. 510 Figure 8b) within the telecommunications network only upon positive determination (7a Figure 8b radio bearer establishment).

8. It would have been obvious to one of ordinary skill in the art when the invention was filed to classify different type of services (e.g. table 4 Kim) including those that are not classified as an emergency service, where the classification allows traffic management to improve data transmission capability [0004].

9. Fong does not explicitly disclose access classes can be *predefined services*.

10. However, Budka, in the same field of processing loads using access class barring (Figures 5A, 5B, 5C [col2:28]) discloses *an indication of a resource capacity* (tables for idle/busy [col4:7]) *of a network access point (NAP)* (e.g. 113-1 Figure 1) *reserved for connection setup requests* ([0015 Fong][0025 Gupta]) *for one or more predefined services* (premium service assigned to access class 11 at discretion of GSM provider [col5:15]).

11. It would have been obvious to one of ordinary skill in the art to adopt Budka's teaching that access class can be both permanently assigned to a device or can be assigned at the discretion of the GSM service provider [col 5:15].

12. For **claim 2**, Fong discloses *wherein the determination of whether the connection setup request* (Figure 9 and Figure 11) *is to be fulfilled* (restrict access based on congestion [0033]) *is further based on one or more agreements* ([0050] barring factor) *with one or more service providers* (MME of the core network [0045]) *regarding resource capacity* (allow network operator to prevent overload [0030]) *in an access network* (radio access network [0030]) *part of the telecommunications network* (Figure 1).

13. For **claim 3**, Fong discloses *wherein the one or more agreements comprise reservation (barring factor [0050]), at the NAP (e.g. eNB) serving the UE, of a predefined resource capacity (e.g. 50% of UEs barred [0054]) for connection setup requests (e.g. 50% connections are allowed through [0054]) for one or more predefined services (e.g. category A,B,C [0054]).*
14. For **claim 4**, Fong discloses *wherein the predefined resource capacity (e.g. 50% [0054]) is set as a percentage of the total resource capacity of the NAP (barring factor can be a percentage that is barred from accessing the eNB [0054]).*
15. For **claim 5**, Fong discloses *wherein the predefined resource capacity (e.g. barring factor) is set as a predefined amount (a percentage [0054]) of the total resource capacity of the NAP, the predefined amount being less than the total resource capacity of the NAP (percentage [0054]).*
16. For **claim 6**, Fong discloses *wherein the predefined resource capacity (EAB configuration [0043]) is dynamically adjusted (dynamically modified [0043]).*
17. For **claim 7**, Fong and Gupta discloses *identifying from the connection setup request (e.g. 304 Figure 3 Gupta), a service (e.g. alarm with normal priority [0019 Gupta]) for which a connection setup is requested (504 Figure 5 Gupta); determining that the identified service (e.g. alarm) is not one of the one or more predefined services (not low priority 506 Figure 5 Gupta Yes path) and, optionally, determining that the identified service is not one of one or more additional predefined services; and determining that the connection setup request is to be fulfilled (Figure 3 Gupta) if, at the NAP serving the UE, there is sufficient unused resource capacity ([0035] able to support RRC connection [0035] not congested [0024]) that is not reserved (override low*

priority 512 Figure 5 Gupta) *for the connection setup requests for the one or more predefined services* (514 Figure 5 Gupta initiate communication with higher priority).

18. For **claim 8**, Gupta discloses *providing an indication* (Connection Setup Message 308 Figure 3 [0035]) *to the UE of whether the connection setup request was determined to be fulfilled*.

19. For **claim 9**, Gupta discloses a *computer program product* ([0014] software program executed on Figure 1), *preferably stored on a computer- readable non-transitory storage medium, comprising software code portions configured for, when executed in a computer, carrying out method steps according to claim 1*.

20. For **claim 13**, Fong discloses *wherein the node is a mobile management entity (MME) of the telecommunications network* (350 Figure 9 MME).

21. **Claims 10, 11** are rejected under 35 U.S.C. 103 as being unpatentable by Gupta in view of Fong and further in view of Budka.

22. For **claim 10**, Fong discloses *an indication* (EAB parameters Figure 3) *of a resource capacity* (barring factor value [0054]) *of a network access point (NAP) (eNB) reserved for connection setup requests* (Figure 8 connection request message) *for one or more predefined services* ([0031] e.g. access class); *an indication of an amount of resources* ([0061] category B devices given a barring factor of 50%) *currently used by the NAP for the one or more predefined services* (50% of category B devices allowed to transmit [0061]); *and an indication* ([0062] e.g. barring factor of category A devices) *of an amount of resources* (e.g. 100% or 50%) *currently used by the NAP for services that*

do not belong to the one or more predefined services (category A devices and category B devices are mutually exclusive [0058]).

23. Fong does not explicitly disclose access classes can be *predefined services*.

24. However, Budka, in the same field of processing loads using access class barring (Figures 5A, 5B, 5C [col2:28]) discloses *an indication of a resource capacity* (tables for idle/busy [col4:7]) *of a network access point (NAP)* (e.g. 113-1 Figure 1) *reserved for connection setup requests* ([0015 Fong][0025 Gupta]) *for one or more predefined services* (premium service assigned to access class 11 at discretion of GSM provider [col5:15]);

25. It would have been obvious to one of ordinary skill in the art to adopt Budka's teaching that access class can be both permanently assigned to a device or can be assigned at the discretion of the GSM service provider [col 5:15].

26. For **claim 11**, Fong discloses a *computer-readable storage medium, preferably non-transitory, storing the data structure according to claim 10* ([0129] e.g. flash drive).

27. For **claims 14, 15**, the rationale of the rejections is similar to **claim 10**.

Response to Arguments

28. On page 2 of the Remarks, Applicant notes that "*predefined services*" does not appear in **claims 1 and 12**.

29. In reply, it appears the Instant Application discloses mechanism for reserving bandwidth for *premium predefined services*. Applicant may wish to make this clear in

claims 1 and 12. Budka teaches a mechanism for assigning priority to ***premium*** class of traffic.

30. On page 2 of the Remarks, Applicant argues that none of the cited art teaches “*identifying, by the node, from the connection setup request, a service for which the connection setup is requested*”.

31. In reply, Gupta identifies an low and high priority electric meter reading service [0041] from an UE connection request. Kim teaches (e.g. in table 4) an low priority indicator which is used by the eNB to identify a Voice/Video/MMTEL call in an mobile originated call.

32. On page 3 of the Remarks, Applicant appears to argue that Budka does not teach one or more *predefined services*.

33. In reply, Budka [col5:15] identifies **premium** “access priority classes” which can be combined with Gupta’s higher priority electric meter reading service.

An interview may be helpful to expedite prosecution.

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 Basil Ma whose telephone number is (408)918-7571. The examiner can normally be reached on Monday-Thursday 8AM-6PM PST.

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


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffery Rutkowski can be reached on (571) 270-1215. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <https://ppair-my.uspto.gov/pair/PrivatePair>. 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.

/B.M./
Examiner, Art Unit 2415

/JEFFREY M RUTKOWSKI/
Supervisory Patent Examiner, Art Unit 2415

<i>Search Notes</i> 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner Basil Ma	Art Unit 2415

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
Inventor Search on PALM	05/07/2019	/BM/
CPC and Keyword Search on EAST	05/07/2019	/BM/
Update Search	01/24/2020	/BM/
Update Search	08/01/2020	/BM/
Update Search	03/01/2021	/BM/

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

/BASIL MA/ Examiner, Art Unit 2415	
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	10	(US-20170353980-\$ or US-20140016616-\$ or US-20130201870-\$ or US-20120039168-\$ or US-20110216761-\$ or US-20150373733-\$ or US-20140128029-\$ or US-20150304937-\$).did. or (US-6192248-\$ or US-6577871-\$).did.	US-PGPUB; USPAT	OR	OFF	2021/03/01 19:22
L2	5	l1 and high with priority	US-PGPUB; USPAT	OR	OFF	2021/03/01 19:23
L3	634	("extended access barring")	US-PGPUB; USPAT	OR	OFF	2021/03/01 19:26
L4	12	l3 and premium	US-PGPUB; USPAT	OR	OFF	2021/03/01 19:26
L5	336	l3 and video	US-PGPUB; USPAT	OR	OFF	2021/03/01 19:33
L6	42	l3 and video with priority	US-PGPUB; USPAT	OR	OFF	2021/03/01 19:34
L7	45	l3 and "class 11"	US-PGPUB; USPAT	OR	OFF	2021/03/01 19:38
L8	1	"class 11" with premium	US-PGPUB; USPAT	OR	OFF	2021/03/01 20:02
L9	3	l1 and high near priority	US-PGPUB; USPAT	OR	OFF	2021/03/01 20:05
L10	0	l1 and high near priority with video	US-PGPUB; USPAT	OR	OFF	2021/03/01 20:08
L11	1	l1 and high near priority with service	US-PGPUB; USPAT	OR	OFF	2021/03/01 20:08
L12	832	mmtel	US-PGPUB; USPAT	OR	OFF	2021/03/01 20:16

L13	337	mmtel and eNB	US- PGPUB; USPAT	OR	OFF	2021/03/01 20:16
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3/1/2021 8:31:39 PM

C:\Users\bma\Documents\EAST\Workspaces\posted\15538182-Dutch-connection-setup.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Rudolf Strijkers

Application No.: 15/538,182

Filed: December 17, 2015

Confirmation No.: 3145

For: Handling of Connection Setup Requests

REPLY

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

Commissioner:

This submission is being filed in response to the Office Action mailed from the U.S. Patent and Trademark Office on August 14, 2020 in the above-identified application. Reconsideration and further examination are requested.

An extension of time to respond to the Office Action is respectfully requested. A Petition for Extension of Time and the appropriate fee are being filed concurrently with this document.

REMARKS

Claims 1-15 are pending.

Rejection Under 35 U.S.C. § 103

Claims 1-9 and 12-15 have been rejected under 35 U.S.C. § 103 as being unpatentable over Gupta (US2013/0201870, hereinafter “Gupta”) in view of Fong *et al.* (US2014/0128029, hereinafter “Fong”), in view of Kim *et al.* (US2015/0304937, hereinafter “Kim”) and further in view of Budka *et al.* (US6577871, hereinafter “Budka”). Applicant respectfully disagrees.

The Office added the Budka reference, allegedly teaching that an access class can be both permanently assigned to a device or can be assigned at the discretion of the GSM provider and allegedly teaching that an indication of a resource capacity of a network access point may be reserved “for one or more predefined services.” The Office appears to interpret “premium service” in Budka as one or more predefined services.

First, Applicant notes that “predefined services” does not appear in claims 1 and 12.

Second, Budka teaches, in case of overload, deactivating mobile units which are assigned certain access classes. Budka also mentions that access class 11 can be assigned at the discretion of the GSM service provider to perhaps offer a premium service. However, also access class 11 is assigned to a mobile device, meaning that ALL services requested by the device will be handled the same way.

In case of an overload situation, mobile devices having assigned this access class 11 will maintain service while other classes are already barred. So, also the combination of Fong, Gupta, Kim and Budka does not teach to further process connection requests for services which are not an emergency service based on resource use within a NAP. *At best*, Budka teaches to further process connection requests for all services requested by a device having access class 11.

Moreover, the feature “identifying, by the node, from the connection setup request, a service for which the connection setup is requested” is not disclosed in any of the applied references. The Office points to Kim (2a Figure 8a; MO-IMS service new cause; [0222]) for this feature. The RRC connection request 2a sent from UE1 to eNodeB may indicate MO-signaling or MO-IMS service in the establishment cause field instead of MO-data, but this is not “identifying a service for which the connection setup is requested.” *At best*, Kim teaches identifying a service *cause* or a service *type*, but not a service.

To establish a *prima facie* case of obviousness, the Manual of Patent Examining Procedure (“MPEP”) requires a factual finding “that the prior art include each element claimed.” MPEP 2143(A)(1). “All words in a claim must be considered in judging the patentability of that against the prior art.” MPEP 2143.03.

Even if the references could be combined, which Applicant does not concede, the cited hypothetical combination is missing at least one element, namely, “identifying, by the node, from the connection setup request, a service for which the connection setup is requested,” as recited, in part, in Applicant’s claim 1.

In light of the above, Applicant respectfully submits that the Office fails to establish a *prima facie* case of obviousness with regard to Applicant’s claim 1. As such, Applicant respectfully submits that claim 1 is novel and non-obvious over the cited hypothetical combination of art.

Independent claim 12 recites similar features as claim 1, and is patentable for at least the same reasons given for claim 1.

Applicant respectfully submits that claims 2-9 and 13-15 which depend from claims 1 and 12, respectively, include the same elements as the claim(s) from which they depend, and are novel and non-obvious for at least the same reasons set forth above in regard to claims 1 and 12.

Claims 10 and 11 were rejected under 35 U.S.C. 103 as being unpatentable over Gupta in view of Fong and further in view of Budka. Applicant respectfully disagrees.

Independent claim 10 recites a data structure that requires three indications in relation to a network access point (NAP).

Claim 10 recites “an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services.”

At best, Budka teaches to further process connection requests for all services requested by a device having access class 11.

In light of the above, Applicant respectfully submits that the Office fails to establish a *prima facie* case of obviousness with regard to Applicant’s claim 10. As such, Applicant respectfully submits that claim 10 is novel and non-obvious over the cited hypothetical combination of art.

Applicant respectfully submits that claim 11, which depends from claim 10, is novel and non-obvious for at least the same reasons set forth above in regard to claim 10.

Accordingly, Applicant respectfully requests withdrawal of the rejections of claims 1-15 under 35 U.S.C. § 103 and requests the claims be accepted for allowance.

Payment of Fees

Authorization is hereby granted to charge the fees due with this submission, including any extension of time fee, to Deposit Account No. 08-0380.

CONCLUSION

In view of the above remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By /Timothy J. Meagher, Reg. No. 39302/

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Concord, MA 01742-9133

Date: 12/14/2020

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.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional) 4965.1056-001
Application Number 15/538,182	Filed 2015-12-17	
For Handling Of Connection Setup Requests		
Art Unit 2415	Examiner Basil Ma	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>	
<input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$220	\$110	\$55	\$ <u>220</u>
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$640	\$320	\$160	\$ _____
<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1,480	\$740	\$370	\$ _____
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$2,320	\$1,160	\$580	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$3,160	\$1,580	\$790	\$ _____

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to
Deposit Account Number 08-0380.

☒ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.

☒ attorney or agent of record. Registration number 39,302.

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

/Timothy J. Meagher, Reg. No. 39302/ 12/14/2020
Signature Date

Timothy J. Meagher 978-341-0036
Typed or printed name Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☒ * Total of 1 forms are submitted.

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

Privacy Act Statement

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

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

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

Electronic Patent Application Fee Transmittal

Application Number:	15538182			
Filing Date:	20-Jun-2017			
Title of Invention:	Handling of Connection Setup Requests			
First Named Inventor/Applicant Name:	Rudolf Strijkers			
Filer:	Timothy J. Meagher/Jennifer Torpey			
Attorney Docket Number:	4965.1056-001			
Filed as Large Entity				
Filing Fees for U.S. National Stage under 35 USC 371				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 1 month with \$0 paid	1251	1	220	220
Miscellaneous:				
Total in USD (\$)				220

Electronic Acknowledgement Receipt

EFS ID:	41370882
Application Number:	15538182
International Application Number:	
Confirmation Number:	3145
Title of Invention:	Handling of Connection Setup Requests
First Named Inventor/Applicant Name:	Rudolf Strijkers
Customer Number:	21005
Filer:	Timothy J. Meagher/Jennifer Torpey
Filer Authorized By:	Timothy J. Meagher
Attorney Docket Number:	4965.1056-001
Receipt Date:	14-DEC-2020
Filing Date:	20-JUN-2017
Time Stamp:	16:52:41
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 220
RAM confirmation Number	E2020BDG52578358
Deposit Account	
Authorized User	

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File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		49651056001_Amendment.pdf	93442	yes	4
			1319424f6509144e21e0d1e35d2e1bd42bd11b5b		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Applicant Arguments/Remarks Made in an Amendment		2	4	
Warnings:					
Information:					
2	Extension of Time	49651056001_EXT2.PDF	833951	no	2
			9b4036ac3b92fb98ffffdef73a892dc8511b973		
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30590	no	2
			0b6b4e828bd7234dcc0472d251bfd7476d1ccc53		
Warnings:					
Information:					
Total Files Size (in bytes):			957983		

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New Applications Under 35 U.S.C. 111

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

National Stage of an International Application under 35 U.S.C. 371

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

New International Application Filed with the USPTO as a Receiving Office

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

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

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/538,182		Filing Date 06/20/2017		<input type="checkbox"/> To be Mailed		
ENTITY: <input checked="" type="checkbox"/> LARGE <input type="checkbox"/> SMALL <input type="checkbox"/> MICRO										
APPLICATION AS FILED - PART I										
		(Column 1)	(Column 2)							
FOR		NUMBER FILED	NUMBER EXTRA	RATE (\$)		FEE (\$)				
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A	N/A						
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A	N/A	N/A						
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A	N/A						
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =	*	x \$80 =						
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =	*	x \$420 =						
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).								
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL						
APPLICATION AS AMENDED - PART II										
		(Column 1)	(Column 2)	(Column 3)						
AMENDMENT	12/14/2020	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0	x \$100 =		0		
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	x \$480 =		0		
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))									
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE		0		
		(Column 1)	(Column 2)	(Column 3)						
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)		
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =				
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =				
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))									
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE				
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						LIE				
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/LAMONT N MCLAUCHLIN/				
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".										
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001	3145
21005 7590 08/14/2020 HAMILTON, BROOK, SMITH & REYNOLDS, P.C. 530 VIRGINIA ROAD P.O. BOX 9133 CONCORD, MA 01742-9133			EXAMINER MA, BASIL	
			ART UNIT	PAPER NUMBER
			2415	
			NOTIFICATION DATE	DELIVERY MODE
			08/14/2020	ELECTRONIC

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

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

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

docketing.department@hbsr.com
helpdesk@hbsr.com

Office Action Summary

Application No.

15/538,182

Applicant(s)

Strijkers et al.

Examiner

Basil Ma

Art Unit

2415

AIA (FITF) Status

Yes

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

Period for Reply

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

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

Status

1) ☒ Responsive to communication(s) filed on 7/28/2020.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.

2a) ☐ This action is **FINAL**.

2b) ☒ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☒ Claim(s) 1-15 is/are pending in the application.

5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.

7) ☒ Claim(s) 1-15 is/are rejected.

8) ☐ Claim(s) ____ is/are objected to.

9) ☐ Claim(s) ____ are subject to restriction and/or election requirement

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

Application Papers

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

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

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

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

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

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

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

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

Attachment(s)

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

3) ☐ Interview Summary (PTO-413)

Paper No(s)/Mail Date ____.

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)

4) ☐ Other: ____.

Paper No(s)/Mail Date ____.

Notice of Pre-AIA or AIA Status

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

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 7/28/2020 has been entered.

Claim 1 has been amended.

Claims 1-15 are pending.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. **Claims 1-9, 12-15** are rejected under 35 U.S.C. 103 as being unpatentable over Gupta (US 2013/0201870) in view of Fong et al. (US 2014/0128029 hereafter Fong) and

further in view of Kim et al. (US 2015/0304937 hereafter Kim) and further in view of Budka et al. (US Patent 6,577,871 hereafter Budka).

2. For **claims 1 and 12**, Gupta discloses *handling of connection setup requests* (Figure 2 , Figure 3) *in a telecommunications network* (Figure 1), *comprising:*

intercepting a connection setup request ([0032] 206 network controller, e.g. eNB, may control establishment of RRC connections) *from a user equipment (UE)* (15 Figure 1) *to a control node* (e.g. 45 Figure 1 e.g. MME [0029]) *of a radio access network (RAN) part* (20 Figure 1) *of the telecommunications network* (Figure 1); *determining* (based on network congestion [0025]) *whether the connection setup request is to be fulfilled* (connection setup message 308 Figure 3 [0035] or connection reject message 208 Figure 2 [0033]) *based at least on information regarding resource use* (congestion or overload [0025]) *within a network access point (NAP)* (e.g. eNB [0032]) *serving the UE* ([0039] UE attached to the eNB); *and passing the connection setup request* (eNB responds with connection setup message 308 Figure 3) *for further processing* (further handshaking with an adapted protocol [0035]) *within the telecommunications network only upon positive determination* (e.g. RAN 20 can support an RRC connection [0035]).

3. Gupta teaches the eNB rejecting (Figure 2) or accepting (Figure 3) a connection request based on an overload/congestion status mechanism (EAB [0025]) but does not disclosed communication between MME and eNB regarding overloaded conditions.

4. Fong in the same field of connecting UEs to a 3GPP network, further elaborates on the EAB mechanism by teaching *information regarding resource use* ([0033] prevent overloading the access network) sent (362 Figure 9 overload start) by a *control node* (MME 350 Figure 9) to a *network access point (NAP)* (310 Figure 9 e.g. eNB [0044]) *for*

determining whether the connection setup request is to be fulfilled (overloaded [0101] Figure 9 or normal operation Figure 11 [0098]).

5. It would have been obvious for one of ordinary skill when the invention was filed to incorporate Fong's further elaboration on the communication between the MME and the eNB for restricting access at the eNB to avoid overloading the access/core network [0030].

6. Fong teaches rejecting non-emergency calls [0086] during overload but does not teach *determining the identified service is not an emergency service.*

7. However, Kim, in the same field of establishing an RRC connection using EAB procedures [0211] discloses

intercepting, by a node, (eNodeB 200 Figure 8a) a connection setup request (e.g. 2a Figure 8a) from a user equipment (UE) to a control node (e.g. eNB) of a radio access network (RAN) part of the telecommunications network;

identifying, by a node, (eNB) from the connection setup request (2a Figure 8a), a service (2a Figure 8a MO-IMS service new cause [0222]) for which the connection setup is requested (2a Figure 8a);

determining, by a node, (eNB) that the identified service (e.g. table 4 ACB information [0222] differentiate ACB for connecting an service) is not an emergency service; ([0224] ACB identifies exceptions based on ACB)

determining, by a node, (eNB) whether the connection setup request (complete setup Figure 8b or reject Figure 8a) is to be fulfilled based at least on information regarding resource use (congestion control) Figure 8a, 8b [0141] within a network access point (NAP) (eNB Figure 8a, 8b) serving the UE; and

passing, by a node, (eNB) the connection setup request for further processing (towards MME e.g. 510 Figure 8b) within the telecommunications network only upon positive determination (7a Figure 8b radio bearer establishment).

8. It would have been obvious to one of ordinary skill in the art when the invention was filed to classify different type of services (e.g. table 4 Kim) including those that are not classified as an emergency service, where the classification allows traffic management to improve data transmission capability [0004].

9. Fong does not explicitly disclose access classes can be *predefined services*.

10. However, Budka, in the same field of processing loads using access class barring (Figures 5A, 5B, 5C [col2:28]) discloses *an indication of a resource capacity (tables for idle/busy [col4:7]) of a network access point (NAP) (e.g. 113-1 Figure 1) reserved for connection setup requests ([0015 Fong][0025 Gupta]) for one or more predefined services (premium service assigned to access class 11 at discretion of GSM provider [col5:15]).*

11. It would have been obvious to one of ordinary skill in the art to adopt Budka's teaching that access class can be both permanently assigned to a device or can be assigned at the discretion of the GSM service provider [col 5:15].

12. For **claim 2**, Fong discloses *wherein the determination of whether the connection setup request (Figure 9 and Figure 11) is to be fulfilled (restrict access based on congestion [0033]) is further based on one or more agreements ([0050] barring factor) with one or more service providers (MME of the core network [0045]) regarding resource capacity (allow network operator to prevent overload [0030]) in an*

access network (radio access network [0030]) part of the telecommunications network (Figure 1).

13. For **claim 3**, Fong discloses *wherein the one or more agreements comprise reservation (barring factor [0050]), at the NAP (e.g. eNB) serving the UE, of a predefined resource capacity (e.g. 50% of UEs barred [0054]) for connection setup requests (e.g. 50% connections are allowed through [0054]) for one or more predefined services (e.g. category A,B,C [0054]).*

14. For **claim 4**, Fong discloses *wherein the predefined resource capacity (e.g. 50% [0054]) is set as a percentage of the total resource capacity of the NAP (barring factor can be a percentage that is barred from accessing the eNB [0054]).*

15. For **claim 5**, Fong discloses *wherein the predefined resource capacity (e.g. barring factor) is set as a predefined amount (a percentage [0054]) of the total resource capacity of the NAP, the predefined amount being less than the total resource capacity of the NAP (percentage [0054]).*

16. For **claim 6**, Fong discloses *wherein the predefined resource capacity (EAB configuration [0043]) is dynamically adjusted (dynamically modified [0043]).*

17. For **claim 7**, Fong and Gupta discloses *identifying from the connection setup request (e.g. 304 Figure 3 Gupta), a service (e.g. alarm with normal priority [0019 Gupta]) for which a connection setup is requested (504 Figure 5 Gupta); determining that the identified service (e.g. alarm) is not one of the one or more predefined services (not low priority 506 Figure 5 Gupta Yes path) and, optionally, determining that the identified service is not one of one or more additional predefined services; and determining that the connection setup request is to be fulfilled (Figure 3 Gupta) if, at the*

NAP serving the UE, there is sufficient unused resource capacity ([0035] able to support RRC connection [0035] not congested [0024]) that is not reserved (override low priority 512 Figure 5 Gupta) for the connection setup requests for the one or more predefined services (514 Figure 5 Gupta initiate communication with higher priority).

18. For **claim 8**, Gupta discloses *providing an indication (Connection Setup Message 308 Figure 3 [0035]) to the UE of whether the connection setup request was determined to be fulfilled.*

19. For **claim 9**, Gupta discloses a *computer program product ([0014] software program executed on Figure 1), preferably stored on a computer- readable non-transitory storage medium, comprising software code portions configured for, when executed in a computer, carrying out method steps according to claim 1.*

20. For **claim 13**, Fong discloses *wherein the node is a mobile management entity (MME) of the telecommunications network (350 Figure 9 MME).*

21. **Claims 10, 11** are rejected under 35 U.S.C. 103 as being unpatentable by Gupta in view of Fong and further in view of Budka.

22. For **claim 10**, Fong discloses *an indication (EAB parameters Figure 3) of a resource capacity (barring factor value [0054]) of a network access point (NAP) (eNB) reserved for connection setup requests (Figure 8 connection request message) for one or more predefined services ([0031] e.g. access class); an indication of an amount of resources ([0061] category B devices given a barring factor of 50%) currently used by the NAP for the one or more predefined services (50% of category B devices allowed to transmit [0061]); and an indication ([0062] e.g. barring factor of category A devices) of*

an amount of resources (e.g. 100% or 50%) currently used by the NAP for services that do not belong to the one or more predefined services (category A devices and category B devices are mutually exclusive [0058]).

23. Fong does not explicitly disclose access classes can be *predefined services*.

24. However, Budka, in the same field of processing loads using access class barring (Figures 5A, 5B, 5C [col2:28]) discloses *an indication of a resource capacity (tables for idle/busy [col4:7]) of a network access point (NAP) (e.g. 113-1 Figure 1) reserved for connection setup requests ([0015 Fong][0025 Gupta]) for one or more predefined services (premium service assigned to access class 11 at discretion of GSM provider [col5:15]);*

25. It would have been obvious to one of ordinary skill in the art to adopt Budka's teaching that access class can be both permanently assigned to a device or can be assigned at the discretion of the GSM service provider [col 5:15].

26. For **claim 11**, Fong discloses a *computer-readable storage medium, preferably non-transitory, storing the data structure according to claim 10 ([0129] e.g. flash drive).*

27. For **claims 14, 15**, the rationale of the rejections is similar to **claim 10**.

Response to Arguments

28. On page 6 and 7 of the Remarks, Applicant points to [0211 Kim] and table 3 (attach procedure) to argue that the determination that a service is not an emergency service is performed at the UE not at the *node*.

29. In reply, Kim [0211] and table 3 attach procedure shows UE originating an call with establishment cause set to either EPS emergency attach or not. The eNodeB reads the EPS attach type to determine whether the attachment is an emergency call or not. Depending on the attachment type, the eNB sets the RRC establishment to be either MO-signaling or emergency call; therefore the **eNB(node)** is performing the determining based on the EPS attach type.

30. On page 7, Applicant argues access class in Fong [0031] does not identify a service class but the class of a device.

31. In reply, Applicant's arguments have been considered but are moot because the arguments do not apply to the references being used in the current rejection, in particular Budka.

32. On page 8, Applicant argues in regards to **claim 10**, that Fong reserves capacity for devices not predefined services.

33. In reply, Applicant's arguments have been considered but are moot because the arguments do not apply to the references being used in the current rejection, in particular Budka.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Basil Ma whose telephone number is (408)918-7571. The examiner can normally be reached on Monday-Thursday 8AM-6PM PST.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffery Rutkowski can be reached on (571) 270-1215. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <https://ppair-my.uspto.gov/pair/PrivatePair>. 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.

/B.M./
Examiner, Art Unit 2415

/JEFFREY M RUTKOWSKI/
Supervisory Patent Examiner, Art Unit 2415

Notice of References Cited	Application/Control No. 15/538,182		Applicant(s)/Patent Under Reexamination Strijkers et al.	
	Examiner Basil Ma		Art Unit 2415	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-6577871-B1	06-2003	Budka; Kenneth Carl	H04W24/00	455/449
	B					
	C					
	D					
	E					
	F					
	G					
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	I					
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FOREIGN PATENT DOCUMENTS

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NON-PATENT DOCUMENTS

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

<i>Search Notes</i> 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner Basil Ma	Art Unit 2415

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
Inventor Search on PALM	05/07/2019	/BM/
CPC and Keyword Search on EAST	05/07/2019	/BM/
Update Search	01/24/2020	/BM/
Update Search	08/01/2020	/BM/

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

/BASIL MA/ Examiner, Art Unit 2415	
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	"load" near factor and "extended access barring"	US-PGPUB; USPAT	OR	OFF	2020/08/01 15:42
L2	583	"connection request" with RRC and IMS with service and load	US-PGPUB; USPAT	OR	ON	2020/08/01 15:49
L3	52	"connection request" with RRC and IMS with service and load with (factor percentage)	US-PGPUB; USPAT	OR	ON	2020/08/01 15:49
L4	105	"connection request" with RRC and IMS with service with (traffic load resource)	US-PGPUB; USPAT	OR	ON	2020/08/01 15:53
L5	78	"connection request" with RRC and IMS with service same congestion	US-PGPUB; USPAT	OR	ON	2020/08/01 15:56
L6	6	"connection request" with "acb" near information	US-PGPUB; USPAT	OR	ON	2020/08/01 16:04
L7	6	"connection request" with "acb" with congestion	US-PGPUB; USPAT	OR	ON	2020/08/01 16:06
L8	106	"connection request" and "acb" with congestion	US-PGPUB; USPAT	OR	ON	2020/08/01 16:07
L9	1	"connection request" and "acb" with congestion and load with percentage	US-PGPUB; USPAT	OR	ON	2020/08/01 16:08
L10	12	"connection request" and "acb" same congestion and load with percentage	US-PGPUB; USPAT	OR	ON	2020/08/01 16:09
L11	14	"high priority" same EAB with category	US-PGPUB; USPAT	OR	ON	2020/08/01 16:23
L12	549	"access class barring" and emergency	US-PGPUB; USPAT	OR	ON	2020/08/01 16:30
L13	246	"access class barring" and emergency and capacity	US-PGPUB; USPAT	OR	ON	2020/08/01 16:31
L14	151	"access class barring" and emergency and capacity and "access class" same service	US-PGPUB; USPAT	OR	ON	2020/08/01 16:33
L15	1	"23225764".FMID.	US-PGPUB; USPAT; FPRS; JPO	OR	OFF	2020/08/01 16:34
L16	4	"access class barring" and premium near service	US-PGPUB; USPAT	OR	ON	2020/08/01 16:49

8/1/2020 4:51:54 PM

C:\Users\bma\Documents\EAST\Workspaces\posted\15538182-Dutch-connection-setup.wsp

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

Application Number	15538182	Filing Date	2015-12-17	Docket Number (if applicable)	4965.1056-001	Art Unit	2415
First Named Inventor	Rudolf Strijkers			Examiner Name	Basil Ma		

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

Petition for Extension of Time

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 080380

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

Signature of Registered U.S. Patent Practitioner			
Signature	Timothy J. Meagher, Reg. No. 39302/	Date (YYYY-MM-DD)	2020-07-28
Name	Timothy J. Meagher	Registration Number	39302

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether 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

First Named Inventor: Rudolf Strijkers

Application No.: 15/538,182

Filed: December 17, 2015

Confirmation No.: 3145

For: Handling of Connection Setup Requests

AMENDMENT

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

Commissioner:

This Amendment is being filed in response to the Final Office Action mailed from the U.S. Patent and Trademark Office on February 6, 2020 in the above-identified application.

Reconsideration and further examination are requested.

In lieu of filing a Notice of Appeal, a Request for Continued Examination (RCE) is being filed concurrently herewith.

An extension of time to respond to the Office Action is respectfully requested. A Petition for Extension of Time and the appropriate fee are being filed concurrently with this document.

Please amend the application as follows:

Amendments to the Claims

Please amend claim 1.

The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1. (Currently Amended) A method for assisting in handling of connection setup requests in a telecommunications network, the method comprising:
 - intercepting, by a node, a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of the telecommunications network;
 - identifying, by the node, from the connection setup request, a service for which the connection setup is requested;
 - determining, by the node, that the identified service is not an emergency service;
 - determining, by the node, whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE; and
 - passing, by the node, the connection setup request for further processing within the telecommunications network only upon positive determination.
2. (Original) The method according to claim 1, wherein the determination of whether the connection setup request is to be fulfilled is further based on one or more agreements with one or more service providers regarding resource capacity in an access network part of the telecommunications network.
3. (Original) The method according to claim 2, wherein the one or more agreements comprise reservation, at the NAP serving the UE, of a predefined resource capacity for connection setup requests for one or more predefined services.
4. (Original) The method according to claim 3, wherein the predefined resource capacity is set as a percentage of the total resource capacity of the NAP.
5. (Original) The method according to claim 3, wherein the predefined resource capacity is set as a predefined amount of the total resource capacity of the NAP, the predefined amount being less than the total resource capacity of the NAP.

6. (Previously Presented) The method according to claim 3, wherein the predefined resource capacity is dynamically adjusted.
7. (Previously Presented) The method according to claim 3, further comprising:
 - determining that the identified service is not one of the one or more predefined services and, optionally, determining that the identified service is not one of one or more additional predefined services; and
 - determining that the connection setup request is to be fulfilled if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more predefined services.
8. (Previously Presented) The method according to claim 1, further comprising providing an indication to the UE of whether the connection setup request was determined to be fulfilled.
9. (Previously Presented) A computer program product, stored on a computer-readable non-transitory storage medium, comprising software code portions configured for, when executed in a computer, carrying out method steps according to claim 1.
10. (Original) A data structure comprising at least:
 - an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;
 - an indication of an amount of resources currently used by the NAP for the one or more predefined services; and
 - an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services.
11. (Previously Presented) A non-transitory computer-readable storage medium storing the data structure according to claim 10.
12. (Previously Presented) A node comprising:
 - a computer readable storage medium having computer readable program code embodied therewith, and

a processor coupled to the computer readable storage medium, wherein responsive to executing the computer readable program code, the processor is configured to perform executable operations comprising:

intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of a telecommunications network;

identifying, from the connection setup request, a service for which the connection setup is requested;

determining that the identified service is not an emergency service;

determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE; and

passing the connection setup request for further processing within the telecommunications network only upon positive determination.

13. (Original) The node according to claim 12, wherein the node is a mobile management entity (MME) of the telecommunications network.

14. (Previously Presented) The node according to claim 12, wherein:

the node is communicatively connected to a computer-readable storage medium storing a data structure comprising at least:

an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;

an indication of an amount of resources currently used by the NAP for the one or more predefined services;

an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services; and

the information regarding resource use within the NAP serving the UE comprises at least a portion of information stored on the computer-readable storage medium.

15. (Previously Presented) A system comprising:

the node according to claim 12, and

a computer-readable storage medium storing a data structure comprising at least:

an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;

an indication of an amount of resources currently used by the NAP for the one or more predefined services; and

an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services.

REMARKS

Amendments to the Claims

Claim 1 is amended to recite “a node.” Support for the amendment is found at least at FIG. 2; page 4, lines 19-23; page 8, lines 29-31; and page 9, lines 28-34.

The amendments are made to expedite prosecution of this application. Applicant is not conceding that the claims prior to amendment are not patentable. No inference should be made that Applicant is disclaiming any subject matter of the present application, and Applicant reserves the right to pursue the unamended claims or any other broader or narrower claims supported by the disclosure at a later date, including in one or more continuing applications. Cancellation of any claim herein is without prejudice to reinstatement in this or continuing application.

Entry of the amendment to the claims is respectfully requested.

Rejections Under 35 U.S.C. § 103

Claims 1-15 were rejected under 35 U.S.C. 103 as being unpatentable based on Gupta (US2013/0201870) in view of Fong et al. (US2014/0128029 hereinafter Fong) and further in view of Kim et al. (US2015/0304937 hereinafter Kim). Applicant respectfully disagrees.

In the rejection, the Office acknowledged that Fong does not teach “determining the identified service is not an emergency service” and looked to Kim.

In Kim, the UE is disclosed as being capable of “determining that the service is not an emergency service.” See Kim, paragraph [0211]:

When a NAS connection establishment is requested, the establishment cause used by a UE's higher layer and NAS layer may be selected according to each procedure shown in the following table.

and Table 3:

TABLE 3

NAS procedure	Establishment cause	Type
Attach procedure	If an attach request message has an EPS attach type which is not set to an EPS emergency attach, an RRC establishment cause is set to MO-signaling.	Signaling initiated by a UE (originating signaling)
	If an attach request message has an EPS attach type which is set to an EPS emergency attach, an RRC establishment cause is set to an emergency call.	Emergency call

This contrasts with the feature being performed by a node as recited in claim 1 (amended) and claim 12. Thus, Kim does not teach or suggest “determining that the identified service is not an emergency service” being performed by the node.

The Office also indicated the view that Fong identifies services associated with the connection setup request, and referred to paragraph [0031]. However, paragraph [0031] discloses that devices can be members of access class 0-9, and in addition, that the mobile devices may be members of special categories (access classes 11-15). So, if a mobile device is class 12, this means that ALL calls from this mobile device will be treated in a special way. This does not identify the class of a service, but the class of a device.

The Office also referred to paragraph [0086] as allegedly disclosing “rejecting non-emergency data transfers,” but this is not what the paragraph discloses. Rather, it mentions “reject RRC connection establishments for non-emergency mobile originated data transfer” (emphasis added). So again, such disclosure in Fong is not related to the service but to the device.

To establish a *prima facie* case of obviousness, the Manual of Patent Examining Procedure (“MPEP”) requires a factual finding “that the prior art include each element claimed.” MPEP 2143(A)(1). “All words in a claim must be considered in judging the patentability of that against the prior art.” MPEP 2143.03.

Even if the references could be combined, which Applicant does not concede, the cited hypothetical combination is missing at least one element, namely, “identifying, by the node, from the connection setup request, a service for which the connection setup is requested;

determining, by the node, that the identified service is not an emergency service,” as recited, in part, in Applicant’s claim 1, as currently amended.

In light of the above, Applicant respectfully submits that the Office fails to establish a *prima facie* case of obviousness with regard to Applicant’s claim 1, as currently amended. As such, Applicant respectfully submits that claim 1, as currently amended, is novel and non-obvious over the cited hypothetical combination of art.

Independent claim 12 recites similar features as claim 1, and is patentable for at least the same reasons given for claim 1.

Applicant respectfully submits that claims 2-9 and 13-15 which depend from claims 1 and 12, respectively, include the same elements as the claim(s) from which they depend, and are novel and non-obvious for at least the same reasons set forth above in regard to amended claims 1 and 12.

Independent claim 10 recites a data structure that requires three indications in relation to a network access point (NAP).

Fong’s barring factor is not related to “an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services; an indication of an amount of resources currently used by the NAP for the one or more predefined services; and an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services,” as required by independent claim 10.

Claim 10 recites an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services, whereas Fong discloses a reserved capacity for devices. Thus, Fong teaches reserving capacity for all services requested by a device and not one or more predefined services.

In light of the above, Applicant respectfully submits that the Office fails to establish a *prima facie* case of obviousness with regard to Applicant’s claim 10. As such, Applicant respectfully submits that claim 10 is novel and non-obvious over the cited hypothetical combination of art.

Applicant respectfully submits that claim 11, which depends from claim 10, is novel and non-obvious for at least the same reasons set forth above in regard to claim 10.

Accordingly, Applicant respectfully requests withdrawal of the rejections of claims 1-15 under 35 U.S.C. § 103 and requests the claims be accepted for allowance.

Payment of Fees

Authorization is hereby granted to charge the fees due with this submission, including any extension of time fee, to Deposit Account No. 08-0380.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By/Timothy J. Meagher, Reg. No. 39302/
Timothy J. Meagher
Registration No. 39,302
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Concord, MA 01742-9133

Date: 7/28/2020

Electronic Patent Application Fee Transmittal

Application Number:	15538182			
Filing Date:	20-Jun-2017			
Title of Invention:	Handling of Connection Setup Requests			
First Named Inventor/Applicant Name:	Rudolf Strijkers			
Filer:	Timothy J. Meagher/Meredith Eschauzier			
Attorney Docket Number:	4965.1056-001			
Filed as Large Entity				
Filing Fees for U.S. National Stage under 35 USC 371				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension - 3 months with \$0 paid	1253	1	1400	1400
Miscellaneous:				
RCE- 1ST REQUEST	1801	1	1300	1300
Total in USD (\$)				2700

Electronic Acknowledgement Receipt

EFS ID:	40126151
Application Number:	15538182
International Application Number:	
Confirmation Number:	3145
Title of Invention:	Handling of Connection Setup Requests
First Named Inventor/Applicant Name:	Rudolf Strijkers
Customer Number:	21005
Filer:	Timothy J. Meagher/Meredith Eschauzier
Filer Authorized By:	Timothy J. Meagher
Attorney Docket Number:	4965.1056-001
Receipt Date:	28-JUL-2020
Filing Date:	20-JUN-2017
Time Stamp:	16:47:37
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 2700
RAM confirmation Number	E20207RG47540909
Deposit Account	
Authorized User	

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

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	49651056001_EXT.PDF	5782859	no	2
			0c7b8160e7a5f39cb95f2796c1c3fdc99e85c6ed		
Warnings:					
Information:					
2	Request for Continued Examination (RCE)	49651056001_RCE_updated.pdf	1328082	no	3
			87c2f36c0752ced6b5416b6bd3b365d36e05ff53		
Warnings:					
Information:					
3		49651056001_Amendment_updated.pdf	139427	yes	9
			fa8aae7039ef88ef0befa62d0a0e168272fe81ba		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Amendment Submitted/Entered with Filing of CPA/RCE		1	1	
	Claims		2	5	
	Applicant Arguments/Remarks Made in an Amendment		6	9	
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	32351	no	2
			f29ad4aeff5ecc01ab9cce7ebd2cf776f332546e		
Warnings:					
Information:					
Total Files Size (in bytes):			7282719		

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

New Applications Under 35 U.S.C. 111

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

National Stage of an International Application under 35 U.S.C. 371

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

New International Application Filed with the USPTO as a Receiving Office

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

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

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional) 4965.1056-001
Application Number 15/538,182	Filed 2015-12-17	
For Handling Of Connection Setup Requests		
Art Unit 2415	Examiner Basil Ma	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>	
<input type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ _____
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ _____
<input checked="" type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ 1400
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____

☐ Applicant asserts small entity status. See 37 CFR 1.27.
☐ Applicant certifies micro entity status. See 37 CFR 1.29.
 Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.
☐ A check in the amount of the fee is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☐ The Director has already been authorized to charge fees in this application to a Deposit Account.
☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to
 Deposit Account Number 080380.
☒ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.
☒ attorney or agent of record. Registration number 39,302.
☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Timothy J. Meagher, Reg. No. 39302/

Signature

7/28/2020

Date

Timothy J. Meagher

Typed or printed name

978-341-0036

Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☒ * Total of 1 forms are submitted.

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

Privacy Act Statement

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

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

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

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/538,182		Filing Date 06/20/2017		<input type="checkbox"/> To be Mailed	
ENTITY: <input checked="" type="checkbox"/> LARGE <input type="checkbox"/> SMALL <input type="checkbox"/> MICRO									
APPLICATION AS FILED - PART I									
		(Column 1)	(Column 2)						
FOR		NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)		
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A		N/A				
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A	N/A		N/A				
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A		N/A				
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 = *		x \$80 =					
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 = *		x \$420 =					
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).							
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))									
* If the difference in column 1 is less than zero, enter "0" in column 2.					TOTAL				
APPLICATION AS AMENDED - PART II									
		(Column 1)		(Column 2)	(Column 3)				
AMENDMENT	07/28/2020	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0	x \$100 =		0	
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	x \$460 =		0	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))								
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
						TOTAL ADD'L FEE		0	
		(Column 1)		(Column 2)	(Column 3)				
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =			
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =			
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))								
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))								
						TOTAL ADD'L FEE			
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						SLIE			
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/MONIQUE BENJAMIN/			
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".									
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.									

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001	3145
21005 7590 02/06/2020 HAMILTON, BROOK, SMITH & REYNOLDS, P.C. 530 VIRGINIA ROAD P.O. BOX 9133 CONCORD, MA 01742-9133			EXAMINER MA, BASIL	
			ART UNIT	PAPER NUMBER
			2415	
			NOTIFICATION DATE	DELIVERY MODE
			02/06/2020	ELECTRONIC

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

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

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

docketing.department@hbsr.com
helpdesk@hbsr.com

Office Action Summary

Application No.

15/538,182

Applicant(s)

Strijkers et al.

Examiner

Basil Ma

Art Unit

2415

AIA (FITF) Status

Yes

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

Period for Reply

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

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

Status

1) ☒ Responsive to communication(s) filed on 10/15/2019.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.

2a) ☒ This action is **FINAL**.

2b) ☐ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☒ Claim(s) 1-15 is/are pending in the application.

5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.

7) ☒ Claim(s) 1-15 is/are rejected.

8) ☐ Claim(s) ____ is/are objected to.

9) ☐ Claim(s) ____ are subject to restriction and/or election requirement

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

Application Papers

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

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

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

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

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

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

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

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

Attachment(s)

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

3) ☐ Interview Summary (PTO-413)

Paper No(s)/Mail Date ____.

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)

4) ☐ Other: ____.

Paper No(s)/Mail Date ____.

Notice of Pre-AIA or AIA Status

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

DETAILED ACTION

This communication is in response to Applicant's Remarks filed under 37 C.F.R. §1.111 in response to a non-final office action. **Claims 1, 7, 9, 11, 12 and 14** have been amended. The previous 112(b) rejection has been obviated by amendment. **Claims 1-15** are pending.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. **Claims 1-15** are rejected under 35 U.S.C. 103 as being unpatentable by Gupta (US 2013/0201870) in view of Fong et al. (US 2014/0128029 hereafter Fong) and further in view of Kim et al. (US 2015/0304937 hereafter **Kim**).
2. For **claims 1 and 12**, Gupta discloses *handling of connection setup requests* (Figure 2 , Figure 3) *in a telecommunications network* (Figure 1), *comprising: intercepting a connection setup request* ([0032] 206 network controller, e.g. eNB, may control establishment of RRC connections) *from a user equipment (UE)* (15 Figure 1) *to a control node* (e.g. 45 Figure 1 e.g. MME [0029]) *of a radio access network (RAN) part* (20 Figure 1) *of the telecommunications network* (Figure 1); *determining* (based on network congestion [0025]) *whether the connection setup request is to be fulfilled*

(connection setup message 308 Figure 3 [0035] or connection reject message 208 Figure 2 [0033]) *based at least on information regarding resource use* (congestion or overload [0025]) *within a network access point (NAP)* (e.g. eNB [0032]) *serving the UE* ([0039] UE attached to the eNB); *and passing the connection setup request* (eNB responds with connection setup message 308 Figure 3) *for further processing* (further handshaking with an adapted protocol [0035]) *within the telecommunications network only upon positive determination* (e.g. RAN 20 can support an RRC connection [0035]).

3. Gupta teaches the eNB rejecting (Figure 2) or accepting (Figure 3) a connection request based on an overload/congestion status mechanism (EAB [0025]) but does not disclosed communication between MME and eNB regarding overloaded conditions.

4. Fong in the same field of connecting UEs to a 3GPP network, further elaborates on the EAB mechanism by teaching *information regarding resource use* ([0033] prevent overloading the access network) sent (362 Figure 9 overload start) by a *control node* (MME 350 Figure 9) to *a network access point (NAP)* (310 Figure 9 e.g. eNB [0044]) *for determining whether the connection setup request is to be fulfilled* (overloaded [0101] Figure 9 or normal operation Figure 11 [0098]).

5. It would have been obvious for one of ordinary skill when the invention was filed to incorporate Fong's further elaboration on the communication between the MME and the eNB for restricting access at the eNB to avoid overloading the access/core network [0030].

6. Fong identifies services ([0031] access classes e.g. public utilities) associated with the connection setup request. ([abstract]) and "rejecting non-emergency data

transfers" [0086] but does not teach determining the identified service is not an emergency service.

7. However, Kim, in the same field of establishing an RRC connection using EAB procedures [0211] discloses *intercepting a connection setup request (e.g. 4a Figure 8a) from a user equipment (UE) to a control node (e.g. eNB) of a radio access network (RAN) part of the telecommunications network; identifying, from the connection setup request (2a Figure 8a), a service (2a Figure 8a MO-IMS service new cause [0222]) for which the connection setup is requested (2a Figure 8a); determining that the identified service (e.g. table 4 ACB information [0222]) is not an emergency service; (e.g. ac-BarringForMO-Signalling table 4 [0224]) determining whether the connection setup request (complete setup Figure 8b or reject Figure 8a) is to be fulfilled based at least on information regarding resource use (congestion control) Figure 8a, 8b [0141] within a network access point (NAP) (eNB Figure 8a, 8b) serving the UE; and passing the connection setup request for further processing (towards MME e.g. 510 Figure 8b) within the telecommunications network only upon positive determination (7a Figure 8b radio bearer establishment).*

8. It would have been obvious to one of ordinary skill in the art when the invention was filed to classify different type of services (e.g. table 4 Kim) including those that are not classified as an emergency service, where the classification allows traffic management to improve data transmission capability [0004].

9. For **claim 2**, Fong discloses *wherein the determination of whether the connection setup request (Figure 9 and Figure 11) is to be fulfilled (restrict access based on congestion [0033]) is further based on one or more agreements ([0050]*

barring factor) *with one or more service providers* (MME of the core network [0045]) *regarding resource capacity* (allow network operator to prevent overload [0030]) *in an access network* (radio access network [0030]) *part of the telecommunications network* (Figure 1).

10. For **claim 3**, Fong discloses *wherein the one or more agreements comprise reservation* (barring factor [0050]), *at the NAP* (e.g. eNB) *serving the UE, of a predefined resource capacity* (e.g. 50% of UEs barred [0054]) *for connection setup requests* (e.g. 50% connections are allowed through [0054]) *for one or more predefined services* (e.g. category A,B,C [0054]).

11. For **claim 4**, Fong discloses *wherein the predefined resource capacity* (e.g. 50% [0054]) *is set as a percentage of the total resource capacity of the NAP* (barring factor can be a percentage that is barred from accessing the eNB [0054]).

12. For **claim 5**, Fong discloses *wherein the predefined resource capacity* (e.g. barring factor) *is set as a predefined amount* (a percentage [0054]) *of the total resource capacity of the NAP, the predefined amount being less than the total resource capacity of the NAP* (percentage [0054]).

13. For **claim 6**, Fong discloses *wherein the predefined resource capacity* (EAB configuration [0043]) *is dynamically adjusted* (dynamically modified [0043]).

14. For **claim 7**, Fong and Gupta discloses *identifying from the connection setup request* (e.g. 304 Figure 3 Gupta), *a service* (e.g. alarm with normal priority [0019 Gupta]) *for which a connection setup is requested* (504 Figure 5 Gupta); *determining that the identified service* (e.g. alarm) *is not one of the one or more predefined services* (not low priority 506 Figure 5 Gupta Yes path) *and, optionally, determining that the*

identified service is not one of one or more additional predefined services; and determining that the connection setup request is to be fulfilled (Figure 3 Gupta) if, at the NAP serving the UE, there is sufficient unused resource capacity ([0035] able to support RRC connection [0035] not congested [0024]) that is not reserved (override low priority 512 Figure 5 Gupta) for the connection setup requests for the one or more predefined services (514 Figure 5 Gupta initiate communication with higher priority).

15. For **claim 8**, Gupta discloses *providing an indication (Connection Setup Message 308 Figure 3 [0035]) to the UE of whether the connection setup request was determined to be fulfilled.*

16. For **claim 9**, Gupta discloses a *computer program product ([0014] software program executed on Figure 1), preferably stored on a computer- readable non-transitory storage medium, comprising software code portions configured for, when executed in a computer, carrying out method steps according to claim 1.*

17. For **claim 10, 14, and 15**, Fong discloses *an indication (EAB parameters Figure 3) of a resource capacity (barring factor value [0054]) of a network access point (NAP) reserved for connection setup requests for one or more predefined services ([0060] Figure 5 category A mobile devices given lowest priority); an indication of an amount of resources ([0061] category B devices given a barring factor of 50%) currently used by the NAP for the one or more predefined services (50% of category B devices allowed to transmit [0061]); and an indication ([0062] e.g. barring factor of category A devices) of an amount of resources (e.g. 100% or 50%) currently used by the NAP for services that do not belong to the one or more predefined services (category A devices and category B devices are mutually exclusive [0058]).*

18. For **claim 11**, Fong discloses a *computer-readable storage medium, preferably non-transitory, storing the data structure according to claim 10* ([0129] e.g. flash drive).
19. For **claim 13**, Fong discloses *wherein the node is a mobile management entity (MME) of the telecommunications network* (350 Figure 9 MME).

Response to Arguments

Applicant's arguments have been considered but are moot because the arguments do not apply to any of the references, particularly **Kim**, being used in the current rejection.

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.

Application/Control Number: 15/538,182
Art Unit: 2415

Page 8

/B.M./
Examiner, Art Unit 2415

/JEFFREY M RUTKOWSKI/
Supervisory Patent Examiner, Art Unit 2415

Notice of References Cited	Application/Control No. 15/538,182		Applicant(s)/Patent Under Reexamination Strijkers et al.	
	Examiner Basil Ma		Art Unit 2415	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20150304937-A1	10-2015	Kim; Jaehyun	H04W48/14	370/230
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					


FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

<i>Search Notes</i> 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner Basil Ma	Art Unit 2415

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
Inventor Search on PALM	05/07/2019	/BM/
CPC and Keyword Search on EAST	05/07/2019	/BM/
Update Search	01/24/2020	/BM/

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

/BASIL MA/ Examiner, Art Unit 2415	
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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	("20170353980").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:21
S2	3	"52354693".FMI D.	US-PGPUB; USPAT; FPRS	OR	OFF	2019/04/15 15:21
S3	0	("2012130312").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:25
S4	1	("20120130312").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:25
S5	0	("wo2012130312").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:26
S6	0	("14008759").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:27
S7	1	("20140016616").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:27
S8	0	("2013201870").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:28
S9	1	("20130201870").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:28
S10	1	("6192248").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:29
S11	4	"23361117".FMI D.	US-PGPUB; USPAT; FPRS	OR	OFF	2019/04/15 15:29
S12	1	("20120039168").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:37

S13	0	("10504803").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/05/06 15:10
S14	0	("100504803").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/05/06 15:10
S15	2053	hollis.in.	US-PGPUB; USPAT	OR	OFF	2019/05/06 15:10
S16	14	S15 and ericsson.as.	US-PGPUB; USPAT	OR	OFF	2019/05/06 15:10
S17	12	"11004206".FMID.	US-PGPUB; USPAT; FPRS	OR	OFF	2019/05/06 15:11
S18	0	("14008759").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/05/06 15:13
S19	0	("140008759").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/05/06 15:13
S20	1	("20140016616").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/05/06 15:14
S21	103	h04w76/10.cpc. and "extended service request"	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:35
S22	35	S21 and "connection setup"	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:35
S23	35	S22 and resource	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:36
S24	2	S23 and percentage	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:36
S25	474	h04w76/10.cpc. and h04w76/20.cpc.	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:40
S26	14	S25 and percentage	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:40
S27	12	S26 and resource	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:41
S28	5	S25 and "extended service request"	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:43
S29	2	S25 and "extended service request" and percentage	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:44
S30	53	S25 and (percentage partial)	US-	OR	OFF	2019/05/06

			PGPUB; USPAT			21:45
S31	0	S25 and (percentage partial) near (capacity resource load)	US- PGPUB; USPAT	OR	OFF	2019/05/06 21:45
S32	53	S25 and (percentage partial)	US- PGPUB; USPAT	OR	OFF	2019/05/06 21:45
S33	27	S25 and (percentage partial) and setup	US- PGPUB; USPAT	OR	OFF	2019/05/06 21:46
S34	31	S25 and (percentage partial) and (setup rrc)	US- PGPUB; USPAT	OR	OFF	2019/05/06 21:47
S35	1461057	S34 nor S33	US- PGPUB; USPAT	OR	OFF	2019/05/06 21:48
S36	4	S34 not S33	US- PGPUB; USPAT	OR	OFF	2019/05/06 21:48
S37	474	h04w76/10.cpc. and h04w76/20.cpc.	US- PGPUB; USPAT	OR	OFF	2019/05/06 22:22
S38	1	S37 and "extended access barring"	US- PGPUB; USPAT	OR	OFF	2019/05/06 22:22
S39	0	("2018/0317202").URPN.	USPAT	OR	OFF	2019/05/06 22:22
S40	49	h04w76/\$.cpc. and "extended access barring"	USPAT	OR	OFF	2019/05/06 22:23
S41	474	S37	US- PGPUB; USPAT	OR	OFF	2019/05/06 22:24
S42	1	S38	US- PGPUB; USPAT	OR	OFF	2019/05/06 22:24
S43	1	S37 and "extended access barring"	US- PGPUB; USPAT	OR	OFF	2019/05/06 22:24
S44	145	h04w76/\$.cpc. and "extended access barring"	US- PGPUB; USPAT	OR	OFF	2019/05/06 22:25
S45	31	S44 and percentage	US- PGPUB; USPAT	OR	OFF	2019/05/06 22:27
S46	25	S44 and percentage and overload	US- PGPUB; USPAT	OR	OFF	2019/05/06 22:28
S47	8	(US-20170353980-\$ or US-20140016616-\$ or US-20130201870-\$ or US-20120039168-\$ or US-20110216761-\$ or US-20150373733-\$ or US-20140128029-\$).did. or (US-6192248-\$).did.	US- PGPUB; USPAT	OR	OFF	2019/05/07 14:05
S48	1	S47 and unused	US- PGPUB; USPAT	OR	OFF	2019/05/07 14:05
S49	8	(US-20170353980-\$ or US-20140016616-\$	US-	OR	OFF	2019/05/07

		or US-20130201870-\$ or US-20120039168-\$ or US-20110216761-\$ or US-20150373733-\$ or US-20140128029-\$.did. or (US-6192248-\$).did.	PGPUB; USPAT			15:48
S50	5	S49 and connection	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:48
S51	4	S50 and "base station"	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:50
S52	5	S50 and ("base station" enb)	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:50
S53	1	S50 and ("base station" enb) near between	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:51
S54	474	h04w76/10.cpc. and h04w76/20.cpc.	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:52
S55	97	S54 and ("base station" enb) near between	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:52
S56	3	S55 and percentage	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:53
S57	46	S55 and capacity	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:53
S58	18	S54 and ("base station" enb) near between near MME	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:57
S59	5	S49 and mme	US-PGPUB; USPAT	OR	OFF	2019/05/07 16:06
S60	0	S49 and "ts 36"	US-PGPUB; USPAT	OR	OFF	2019/05/07 16:10
S61	2	S49 and "ts"	US-PGPUB; USPAT	OR	OFF	2019/05/07 16:10
S62	4	S49 and percentage	US-PGPUB; USPAT	OR	OFF	2019/05/07 16:11
S63	2	S49 and EAB	US-PGPUB; USPAT	OR	OFF	2019/05/07 16:23
S64	8	(US-20170353980-\$ or US-20140016616-\$ or US-20130201870-\$ or US-20120039168-\$ or US-20110216761-\$ or US-20150373733-\$ or US-20140128029-\$.did. or (US-6192248-\$).did.	US-PGPUB; USPAT	OR	OFF	2019/05/07 20:21
S65	3	S64 and dynamic	US-PGPUB; USPAT	OR	OFF	2019/05/07 20:21
S66	8	(US-20170353980-\$ or US-20140016616-\$ or US-20130201870-\$ or US-20120039168-\$ or US-20110216761-\$ or US-20150373733-\$ or US-20140128029-\$.did.	US-PGPUB; USPAT	OR	OFF	2020/01/23 11:27

		or (US-6192248-\$).did.				
S67	6	S66 and emergency	US-PGPUB; USPAT	OR	OFF	2020/01/23 11:28
S68	1	S66 and "attach type"	US-PGPUB; USPAT	OR	OFF	2020/01/23 11:36
S69	3	S66 and "attach"	US-PGPUB; USPAT	OR	OFF	2020/01/23 11:36
S70	8	(US-20170353980-\$ or US-20140016616-\$ or US-20130201870-\$ or US-20120039168-\$ or US-20110216761-\$ or US-20150373733-\$ or US-20140128029-\$).did. or (US-6192248-\$).did.	US-PGPUB; USPAT	OR	OFF	2020/01/23 15:17
S71	3	S70 and "attach"	US-PGPUB; USPAT	OR	OFF	2020/01/23 15:17
S72	194	h04w76/\$.cpc. and "extended access barring"	US-PGPUB; USPAT	OR	OFF	2020/01/23 15:17
S73	122	S72 and emergency	US-PGPUB; USPAT	OR	OFF	2020/01/23 15:17
S74	4	S72 and emergency and "attach type"	US-PGPUB; USPAT	OR	OFF	2020/01/23 15:18
S75	8	(US-20170353980-\$ or US-20140016616-\$ or US-20130201870-\$ or US-20120039168-\$ or US-20110216761-\$ or US-20150373733-\$ or US-20140128029-\$).did. or (US-6192248-\$).did.	US-PGPUB; USPAT	OR	OFF	2020/01/24 07:24
S76	2	S75 and IMS	US-PGPUB; USPAT	OR	OFF	2020/01/24 07:24
S77	2	S75 and eab	US-PGPUB; USPAT	OR	OFF	2020/01/24 07:25
S78	9	(US-20170353980-\$ or US-20140016616-\$ or US-20130201870-\$ or US-20120039168-\$ or US-20110216761-\$ or US-20150373733-\$ or US-20140128029-\$ or US-20150304937-\$).did. or (US-6192248-\$).did.	US-PGPUB; USPAT	OR	OFF	2020/01/24 07:25
S79	3	S78 and eab	US-PGPUB; USPAT	OR	OFF	2020/01/24 07:26
S80	7	S78 and emergency	US-PGPUB; USPAT	OR	OFF	2020/01/24 07:26

1/ 24/ 2020 11:16:21 AM
C:\Users\bma\Documents\EAST\Workspaces\posted\15538182-Dutch-connection-setup.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: Rudolf Strijkers

Application No.: 15/538,182

Filed: December 17, 2015

Confirmation No.: 3145

For: Handling Of Connection Setup Requests

AMENDMENT

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

Commissioner:

This document is being filed in response to the Office Action mailed from the U.S. Patent and Trademark Office on May 16, 2019 in the above-identified application. Reconsideration and further examination are requested.

An extension of time to respond to the Office Action is respectfully requested. A Petition for Extension of Time and the appropriate fee are being filed concurrently with this document.

Please amend the application as follows:

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.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional) 4965.1056-001
Application Number 15/538,182	Filed 2015-12-17	
For Handling Of Connection Setup Requests		
Art Unit 2415	Examiner	

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	<u>Fee</u>	<u>Small Entity Fee</u>	<u>Micro Entity Fee</u>	
<input type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$200	\$100	\$50	\$ _____
<input checked="" type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$600	\$300	\$150	\$ <u>600</u>
<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1,400	\$700	\$350	\$ _____
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$2,200	\$1,100	\$550	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$3,000	\$1,500	\$750	\$ _____

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to
Deposit Account Number 080380.

☒ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.

☒ attorney or agent of record. Registration number 39,302.

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

/Timothy J. Meagher, Reg. No. 39302/ 10/15/2019

Signature Date

Timothy J. Meagher 978-341-0036

Typed or printed name Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☒ * Total of 1 forms are submitted.

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

Privacy Act Statement

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

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

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

Electronic Patent Application Fee Transmittal

Application Number:	15538182			
Filing Date:	20-Jun-2017			
Title of Invention:	Handling of Connection Setup Requests			
First Named Inventor/Applicant Name:	Rudolf Strijkers			
Filer:	Timothy J. Meagher/Jennifer Torpey			
Attorney Docket Number:	4965.1056-001			
Filed as Large Entity				
Filing Fees for U.S. National Stage under 35 USC 371				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

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

Electronic Acknowledgement Receipt

EFS ID:	37462653
Application Number:	15538182
International Application Number:	
Confirmation Number:	3145
Title of Invention:	Handling of Connection Setup Requests
First Named Inventor/Applicant Name:	Rudolf Strijkers
Customer Number:	21005
Filer:	Timothy J. Meagher/Claudia Fagan
Filer Authorized By:	Timothy J. Meagher
Attorney Docket Number:	4965.1056-001
Receipt Date:	15-OCT-2019
Filing Date:	20-JUN-2017
Time Stamp:	17:20:45
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 600
RAM confirmation Number	E20190EH21563643
Deposit Account	
Authorized User	

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

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		49651056001_Amendment.pdf	120671	yes	9
			7b3b284b472478fda4dd099ea2c7cfbe53a1ce6f		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Applicant Arguments/Remarks Made in an Amendment		6	9	
	Claims		2	5	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
Warnings:					
Information:					
2	Extension of Time	49651056001_EXT.PDF	5782497	no	2
			328b9f875f399a7929f845ba7dcdff2ca981354		
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30637	no	2
			eb0d481ac7d1a43e772c4b567c1dfcf7321354ec		
Warnings:					
Information:					
Total Files Size (in bytes):			5933805		

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.

REMARKS

Amendments to the Claims

Claims 1-15 are pending in the application. Claims 1, 7, 9, 11, 12, and 14 are being amended.

In particular, “preferably” has been removed from claims 9, 11, and 12. Claims 1 and 12 have been amended to include:

*identifying, from the connection setup request, a service for which
the connection setup is requested;
determining that the identified service is not an emergency service;*

Support may be found on page 3, lines 28-33 in combination with page 12, lines 19-21, and original claim 7.

The amendments are made to expedite prosecution of this application. Applicant is not conceding that the claims prior to amendment are not patentable. No inference should be made that Applicant is disclaiming any subject matter of the present application, and Applicant reserves the right to pursue the unamended claims or any other broader or narrower claims supported by the disclosure at a later date, including in one or more continuing applications. Cancellation of any claim herein is without prejudice to reinstatement in this or continuing application.

Claim Rejections – 35 U.S.C. § 112

Claims 9, 11, and 12 were rejected under 35 U.S.C. 112(b) or 35 U.S.C. § 112 (pre-AIA), second paragraph, as being indefinite.

The rejection has been addressed by amendment of claims 9, 11, and 12 to remove “preferably.” Reconsideration of the rejection is respectfully requested.

Claim Rejections – 35 U.S.C. § 103

Claims 1-15 were rejected under 35 U.S.C. § 103 as being unpatentable over US2013/0201870 to Gupta (hereinafter “Gupta”) in view of US2014/0128029 to Fong et al. (hereinafter “Fong”). Applicant respectfully disagrees.

Gupta does not disclose the added features of amended claim 1:

identifying, from the connection setup request, a service for which the connection setup is requested;
determining that the identified service is not an emergency service;

In Gupta the requests indicate a priority and the network is configured to treat requests according to the indicated priority in the request.

Fong also does not disclose these added features. Fong discloses a mobile device barring the mobile device from accessing the transmission station (e.g. para. [0074]) or the radio access network (RAN) may reject a radio resource control (RRC) connection request from a mobile device based on the extended access barring (EAB) configuration information and/or roaming category of the mobile device in an overload condition (see e.g. para. [0075]). Fong teaches several options for the transmission station related to emergency services in an overload action: rejecting RRC connection establishments for non-emergency mobile originated data transfer, or permitting RRC connection establishments for emergency sessions. In case of a mobile device's EAB configuration, the RRC connection establishment request comprises an establishmentCause IE which may indicate emergency. This may be used in the overload condition for determining whether the RRC connection establishments are related to emergency sessions. This is not the same as *"identifying, from the connection setup request, a service for which the connection setup is requested,"* since Fong only teaches how to determine whether a service is related to an emergency session, but not how to identify the service if it is not related to an emergency session.

Moreover, Fong also does not teach the last two features of claim 1 when it is determined that the identified service is not an emergency service. In the case where Fong determines the RRC connection establishment request is related to an emergency session, it will process the request immediately. If it determined it is not related to an emergency session, it will simply reject the request.

To establish a *prima facie* case of obviousness, the Manual of Patent Examining Procedure ("MPEP") requires a factual finding "that the prior art include each element claimed." MPEP 2143(A)(1). "All words in a claim must be considered in judging the patentability of that against the prior art." MPEP 2143.03.

Even if the references could be combined, which Applicant does not concede, the cited hypothetical combination is missing at least one element, namely, *"identifying, from the connection setup request, a service for which the connection setup is requested; determining that*

the identified service is not an emergency service,” as recited, in part, in Applicant’s claim 1, as currently amended.

In light of the above, Applicant respectfully submits that the Office fails to establish a *prima facie* case of obviousness with regard to Applicant’s claim 1, as currently amended. As such, Applicant respectfully submits that claim 1, as currently amended, is novel and non-obvious over the cited hypothetical combination of art.

Independent claim 12, as amended, recites similar features as claim 1, and is patentable for at least the same reasons given for claim 1.

Applicant respectfully submits that claims 2-9 and 13-15 which depend from claims 1 and 12, respectively, include the same elements as the claim(s) from which they depend, and are novel and non-obvious for at least the same reasons set forth above in regard to amended claims 1 and 12.

Independent claim 10 recites a data structure that requires three indications in relation to a network access point (NAP). Fong discloses a barring factor, which can be configured to control the percentage of mobile devices within a barring category that can be barred. The barring factor can include a percentage of mobile devices in a barring category or a maximum number of access attempts of mobile devices in the barring category.

Fong’s barring factor is not related to “an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services; an indication of an amount of resources currently used by the NAP for the one or more predefined services; and an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services,” as required by independent claim 10.

In light of the above, Applicant respectfully submits that the Office fails to establish a *prima facie* case of obviousness with regard to Applicant’s claim 10. As such, Applicant respectfully submits that claim 10 is novel and non-obvious over the cited hypothetical combination of art.

Applicant respectfully submits that claim 11, which depends from claim 10, is novel and non-obvious for at least the same reasons set forth above in regard to claim 10.

Accordingly, Applicant respectfully requests withdrawal of the rejections of claims 1-15 under 35 U.S.C. § 103 and requests the claims be accepted for allowance.

Payment of Fees

Authorization is hereby granted to charge the fees due with this submission, including any extension of time fee, to Deposit Account No. 08-0380.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By /Timothy J. Meagher, Reg. No. 39302/

Timothy J. Meagher

Registration No. 39,302

Telephone: (978) 341-0036

Facsimile: (978) 341-0136

Concord, MA 01742-9133

Date: 10/15/2019

Amendments to the Claims

Please amend claims 1, 7, 9, 11, 12, and 14.

The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1. (Currently Amended) A method for assisting in handling of connection setup requests in a telecommunications network, the method comprising:
 - intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of the telecommunications network;
 - identifying, from the connection setup request, a service for which the connection setup is requested;
 - determining that the identified service is not an emergency service;
 - determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE; and
 - passing the connection setup request for further processing within the telecommunications network only upon positive determination.
2. (Original) The method according to claim 1, wherein the determination of whether the connection setup request is to be fulfilled is further based on one or more agreements with one or more service providers regarding resource capacity in an access network part of the telecommunications network.
3. (Original) The method according to claim 2, wherein the one or more agreements comprise reservation, at the NAP serving the UE, of a predefined resource capacity for connection setup requests for one or more predefined services.
4. (Original) The method according to claim 3, wherein the predefined resource capacity is set as a percentage of the total resource capacity of the NAP.

5. (Original) The method according to claim 3, wherein the predefined resource capacity is set as a predefined amount of the total resource capacity of the NAP, the predefined amount being less than the total resource capacity of the NAP.
6. (Previously Presented) The method according to claim 3, wherein the predefined resource capacity is dynamically adjusted.
7. (Currently Amended) The method according to claim 3, further comprising:
 - ~~identifying, from the connection setup request, a service for which a connection setup is requested;~~
 - determining that the identified service is not one of the one or more predefined services and, optionally, determining that the identified service is not one of one or more additional predefined services; and
 - determining that the connection setup request is to be fulfilled if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more predefined services.
8. (Previously Presented) The method according to claim 1, further comprising providing an indication to the UE of whether the connection setup request was determined to be fulfilled.
9. (Currently Amended) A computer program product, ~~preferably~~ stored on a computer-readable non-transitory storage medium, comprising software code portions configured for, when executed in a computer, carrying out method steps according to claim 1.
10. (Original) A data structure comprising at least:
 - an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;
 - an indication of an amount of resources currently used by the NAP for the one or more predefined services; and
 - an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services.

11. (Currently Amended) A non-transitory computer-readable storage medium, ~~preferably non-transitory~~, storing the data structure according to claim 10.
12. (Currently Amended) A node comprising:
 - a computer readable storage medium having computer readable program code embodied therewith, and
 - a processor, ~~preferably a microprocessor~~, coupled to the computer readable storage medium, wherein responsive to executing the computer readable program code, the processor is configured to perform executable operations comprising:
 - intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of a telecommunications network;
 - identifying, from the connection setup request, a service for which the connection setup is requested;
 - determining that the identified service is not an emergency service;
 - determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE; and
 - passing the connection setup request for further processing within the telecommunications network only upon positive determination.
13. (Original) The node according to claim 12, wherein the node is a mobile management entity (MME) of the telecommunications network.
14. (Currently Amended) The node according to claim 12, wherein:
 - the node is communicatively connected to a computer-readable storage medium storing a data structure comprising at least:[,]
 - an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;
 - an indication of an amount of resources currently used by the NAP for the one or more predefined services;
 - an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services; and

the information regarding resource use within the NAP serving the UE comprises at least a portion of information stored on the computer-readable storage medium.

15. (Previously Presented) A system comprising:

the node according to claim 12, and

a computer-readable storage medium storing a data structure comprising at least:

an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;

an indication of an amount of resources currently used by the NAP for the one or more predefined services; and

an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services.

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

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 15/538,182		Filing Date 06/20/2017		<input type="checkbox"/> To be Mailed					
ENTITY: <input checked="" type="checkbox"/> LARGE <input type="checkbox"/> SMALL <input type="checkbox"/> MICRO													
APPLICATION AS FILED - PART I													
		(Column 1)	(Column 2)										
FOR		NUMBER FILED	NUMBER EXTRA		RATE (\$)		FEE (\$)						
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A	N/A		N/A								
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A	N/A		N/A								
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A	N/A		N/A								
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 = *		x \$80 =									
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 = *		x \$420 =									
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).											
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))													
* If the difference in column 1 is less than zero, enter "0" in column 2.					TOTAL								
APPLICATION AS AMENDED - PART II													
		(Column 1)	(Column 2)		(Column 3)								
AMENDMENT	10/15/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)						
	Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0	x \$100 =	0						
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	x \$460 =	0						
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))												
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))												
							TOTAL ADD'L FEE		0				
		(Column 1)	(Column 2)		(Column 3)								
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)						
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =							
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =							
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))												
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))												
							TOTAL ADD'L FEE						
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.							LIE						
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".							/PEARLIE A FENNEL/						
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".													
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.													

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001	3145
21005 7590 05/16/2019 HAMILTON, BROOK, SMITH & REYNOLDS, P.C. 530 VIRGINIA ROAD P.O. BOX 9133 CONCORD, MA 01742-9133			EXAMINER MA, BASIL	
			ART UNIT	PAPER NUMBER
			2415	
			NOTIFICATION DATE	DELIVERY MODE
			05/16/2019	ELECTRONIC

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

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

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

docketing.department@hbsr.com
helpdesk@hbsr.com

Notice of Pre-AIA or AIA Status

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

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

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

Claims 9, 11 and 12 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

For **claims 9, 11 and 12**, the phrase "***preferably***" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "preferably"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d). "***Preferably***" fails to point out what is included or excluded by the claim language. This claim is an omnibus type claim.

Claim Rejections - 35 USC § 103

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

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103 are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. **Claims 1-15** are rejected under 35 U.S.C. 103 as being unpatentable by Gupta (US 2013/0201870) in view of Fong et al. (US 2014/0128029 hereafter Fong).
2. For **claims 1 and 12**, Gupta discloses *handling of connection setup requests* (Figure 2 , Figure 3) *in a telecommunications network* (Figure 1), *comprising: intercepting a connection setup request* ([0032] 206 network controller, e.g. eNB, **may** control establishment of RRC connections) *from a user equipment (UE)* (15 Figure 1) *to a control node* (e.g. 45 Figure 1 e.g. MME [0029]) *of a radio access network (RAN) part* (20 Figure 1) *of the telecommunications network* (Figure 1); *determining* (based on network congestion [0025]) *whether the connection setup request is to be fulfilled* (connection setup message 308 Figure 3 [0035] or connection reject message 208

Figure 2 [0033]) *based at least on information regarding resource use* (congestion or overload [0025]) *within a network access point (NAP)* (e.g. eNB [0032]) *serving the UE* ([0039] UE attached to the eNB); *and passing the connection setup request* (eNB responds with connection setup message 308 Figure 3) *for further processing* (further handshaking with an adapted protocol [0035]) *within the telecommunications network only upon positive determination* (e.g. RAN 20 can support an RRC connection [0035]).

3. Gupta teaches the eNB rejecting (Figure 2) or accepting (Figure 3) a connection request based on an overload/congestion status mechanism (EAB [0025]) but does not disclosed communication between MME and eNB regarding overloaded conditions.

4. Fong in the same field of connecting UEs to a 3GPP network, further elaborates on the EAB mechanism by teaching *information regarding resource use* ([0033] prevent overloading the access network) sent (362 Figure 9 overload start) by a *control node* (MME 350 Figure 9) to *a network access point (NAP)* (310 Figure 9 e.g. eNB [0044]) *for determining whether the connection setup request is to be fulfilled* (overloaded [0101] Figure 9 or normal operation Figure 11 [0098]).

5. It would have been obvious for one of ordinary skill when the invention was filed to incorporate Fong's further elaboration on the communication between the MME and the eNB for restricting access at the eNB to avoid overloading the access/core network [0030].

6. For **claim 2**, Fong discloses *wherein the determination of whether the connection setup request* (Figure 9 and Figure 11) *is to be fulfilled* (restrict access based on congestion [0033]) *is further based on one or more agreements* ([0050] barring factor) *with one or more service providers* (MME of the core network [0045])

regarding resource capacity (allow network operator to prevent overload [0030]) in an access network (radio access network [0030]) part of the telecommunications network (Figure 1).

7. For **claim 3**, Fong discloses *wherein the one or more agreements comprise reservation (barring factor [0050]), at the NAP (e.g. eNB) serving the UE, of a predefined resource capacity (e.g. 50% of UEs barred [0054]) for connection setup requests (e.g. 50% connections are allowed through [0054]) for one or more predefined services (e.g. category A,B,C [0054]).*

8. For **claim 4**, Fong discloses *wherein the predefined resource capacity (e.g. 50% [0054]) is set as a percentage of the total resource capacity of the NAP (barring factor can be a percentage that is barred from accessing the eNB [0054]).*

9. For **claim 5**, Fong discloses *wherein the predefined resource capacity (e.g. barring factor) is set as a predefined amount (a percentage [0054]) of the total resource capacity of the NAP, the predefined amount being less than the total resource capacity of the NAP (percentage [0054]).*

10. For **claim 6**, Fong discloses *wherein the predefined resource capacity (EAB configuration [0043]) is dynamically adjusted (dynamically modified [0043]).*

11. For **claim 7**, Fong and Gupta discloses *identifying from the connection setup request (e.g. 304 Figure 3 Gupta), a service (e.g. alarm with normal priority [0019 Gupta]) for which a connection setup is requested (504 Figure 5 Gupta); determining that the identified service (e.g. alarm) is not one of the one or more predefined services (not low priority 506 Figure 5 Gupta Yes path) and, optionally, determining that the identified service is not one of one or more additional predefined services; and*

determining that the connection setup request is to be fulfilled (Figure 3 Gupta) if, at the NAP serving the UE, there is sufficient unused resource capacity ([0035] able to support RRC connection [0035] not congested [0024]) that is not reserved (override low priority 512 Figure 5 Gupta) for the connection setup requests for the one or more predefined services (514 Figure 5 Gupta initiate communication with higher priority).

12. For **claim 8**, Gupta discloses *providing an indication (Connection Setup Message 308 Figure 3 [0035]) to the UE of whether the connection setup request was determined to be fulfilled.*

13. For **claim 9**, Gupta discloses a *computer program product ([0014] software program executed on Figure 1), preferably stored on a computer- readable non-transitory storage medium, comprising software code portions configured for, when executed in a computer, carrying out method steps according to claim 1.*

14. For **claim 10, 14, and 15**, Fong discloses *an indication (EAB parameters Figure 3) of a resource capacity (barring factor value [0054]) of a network access point (NAP) reserved for connection setup requests for one or more predefined services ([0060] Figure 5 category A mobile devices given lowest priority); an indication of an amount of resources ([0061] category B devices given a barring factor of 50%) currently used by the NAP for the one or more predefined services (50% of category B devices allowed to transmit [0061]); and an indication ([0062] e.g. barring factor of category A devices) of an amount of resources (e.g. 100% or 50%) currently used by the NAP for services that do not belong to the one or more predefined services (category A devices and category B devices are mutually exclusive [0058]).*

15. For **claim 11**, Fong discloses a *computer-readable storage medium, preferably non-transitory, storing the data structure according to claim 10* ([0129] e.g. flash drive).
16. For **claim 13**, Fong discloses *wherein the node is a mobile management entity (MME) of the telecommunications network* (350 Figure 9 MME).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BASIL MA whose telephone number is (408)918-7571. The examiner can normally be reached on Monday-Thursday 8AM-6PM PST.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffery Rutkowski can be reached on (571) 270-1215. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Art Unit: 2415

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/B.M./

Examiner, Art Unit 2415

/JEFFREY M RUTKOWSKI/

Supervisory Patent Examiner, Art Unit 2415

Notice of References Cited	Application/Control No. 15/538,182		Applicant(s)/Patent Under Reexamination Strijkers et al.	
	Examiner BASIL MA		Art Unit 2415	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Code-Number-Kind Code	Country	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20130201870-A1		08-2013	Gupta; Vivek	H04W4/70	370/254
*	B	US-20140128029-A1		05-2014	Fong; Mo-Han	H04W48/12	455/411
	C						
	D						
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	K						
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FOREIGN PATENT DOCUMENTS

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	N						
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NON-PATENT DOCUMENTS


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*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.

U.S. Patent and Trademark Office
PTO-892 (Rev. 01-2001)

Notice of References Cited

Part of Paper No. 20190506

<i>Search Notes</i> 	Application/Control No. 15/538,182	Applicant(s)/Patent Under Reexamination Strijkers et al.
	Examiner BASIL MA	Art Unit 2415

CPC - Searched*		
Symbol	Date	Examiner

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

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

Search Notes		
Search Notes	Date	Examiner
Inventor Search on PALM	05/07/2019	/BM/
CPC and Keyword Search on EAST	05/07/2019	/BM/

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

/BASIL MA/ Examiner, Art Unit 2415	
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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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S3	0	("2012130312").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:25
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S5	0	("wo2012130312").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:26
S6	0	("14008759").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:27
S7	1	("20140016616").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:27
S8	0	("2013201870").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:28
S9	1	("20130201870").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:28
S10	1	("6192248").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:29
S11	4	"23361117".FMI D.	US-PGPUB; USPAT; FPRS	OR	OFF	2019/04/15 15:29
S12	1	("20120039168").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/04/15 15:37

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S14	0	("100504803").PN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/05/06 15:10
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S16	14	S15 and ericsson.as.	US-PGPUB; USPAT	OR	OFF	2019/05/06 15:10
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S22	35	S21 and "connection setup"	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:35
S23	35	S22 and resource	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:36
S24	2	S23 and percentage	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:36
S25	474	h04w76/10.cpc. and h04w76/20.cpc.	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:40
S26	14	S25 and percentage	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:40
S27	12	S26 and resource	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:41
S28	5	S25 and "extended service request"	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:43
S29	2	S25 and "extended service request" and percentage	US-PGPUB; USPAT	OR	OFF	2019/05/06 21:44
S30	53	S25 and (percentage partial)	US-	OR	OFF	2019/05/06

			PGPUB; USPAT			21:45
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S34	31	S25 and (percentage partial) and (setup rrc)	US- PGPUB; USPAT	OR	OFF	2019/05/06 21:47
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S42	1	S38	US- PGPUB; USPAT	OR	OFF	2019/05/06 22:24
S43	1	S37 and "extended access barring"	US- PGPUB; USPAT	OR	OFF	2019/05/06 22:24
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S48	1	S47 and unused	US- PGPUB; USPAT	OR	OFF	2019/05/07 14:05
S49	8	(US-20170353980-\$ or US-20140016616-\$	US-	OR	OFF	2019/05/07

		or US-20130201870-\$ or US-20120039168-\$ or US-20110216761-\$ or US-20150373733-\$ or US-20140128029-\$).did. or (US-6192248-\$).did.	PGPUB; USPAT			15:48
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S51	4	S50 and "base station"	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:50
S52	5	S50 and ("base station" enb)	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:50
S53	1	S50 and ("base station" enb) near between	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:51
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S55	97	S54 and ("base station" enb) near between	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:52
S56	3	S55 and percentage	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:53
S57	46	S55 and capacity	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:53
S58	18	S54 and ("base station" enb) near between near MME	US-PGPUB; USPAT	OR	OFF	2019/05/07 15:57
S59	5	S49 and mme	US-PGPUB; USPAT	OR	OFF	2019/05/07 16:06
S60	0	S49 and "ts 36"	US-PGPUB; USPAT	OR	OFF	2019/05/07 16:10
S61	2	S49 and "ts"	US-PGPUB; USPAT	OR	OFF	2019/05/07 16:10
S62	4	S49 and percentage	US-PGPUB; USPAT	OR	OFF	2019/05/07 16:11
S63	2	S49 and EAB	US-PGPUB; USPAT	OR	OFF	2019/05/07 16:23

5/ 7/ 2019 7:49:25 PM
C:\ Users\ bma\ Documents\ EAST\ Workspaces\ 15538182-Dutch-connection-setup.wsp

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION LISTING OF REFERENCES June 20, 2017 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 4965.1056-001		APPLICATION NO.	
	FIRST NAMED INVENTOR Rudolf Strijkers		FILING DATE	
	EXAMINER		CONFIRMATION NO.	GROUP

U.S. PATENT DOCUMENTS				
Examiner's Initials	Cite No.	DOCUMENT NUMBER Number-Kind Code (if known)	ISSUE DATE / PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE OR APPLICANT OF CITED DOCUMENT
	1.	6,192,248 B1	02-20-2001	Solondz
	2.	2012/0039168 A1	02-16-2012	He et al.
	3.	2013/0201870 A1	08-08-2013	Gupta
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Copies of issued U.S. Patents and Published U.S. Applications are not required and are not being provided. We are not listing separately prior U.S. Patent Office communications regarding the cited documents because the Examiner has access to any such actions through PAIR.

EXAMINER	/BASIL MA/	DATE CONSIDERED	04/15/2019
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Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION LISTING OF REFERENCES June 20, 2017 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 4965.1056-001		APPLICATION NO.	
	FIRST NAMED INVENTOR Rudolf Strijkers		FILING DATE	
	EXAMINER		CONFIRMATION NO.	GROUP

FOREIGN PATENT DOCUMENTS				
Examiner's Initials	Cite No.	DOCUMENT NUMBER Country Code-Number-Kind Code (if known)	DATE MM-DD-YYYY	NAME OF PATENTEE OR APPLICANT OF CITED DOCUMENT
	1.	WO 03/077580 A1	09-18-2003	Telefonaktiebolaget LM Ericsson
	2.	WO 2012/130312 A1	10-04-2012	Telefonaktiebolaget LM Ericsson
	3.			
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EXAMINER	/BASIL MA/	DATE CONSIDERED	04/15/2019
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CONSIDERED: /B.M./

Sheet 3 of 3

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION LISTING OF REFERENCES June 20, 2017 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 4965.1056-001	APPLICATION NO.	
	FIRST NAMED INVENTOR Rudolf Strijkers	FILING DATE	
	EXAMINER	CONFIRMATION NO.	GROUP

Examiner's Initials	Cite No.	OTHER DOCUMENTS <i>(Including Author, Title, Date, Pertinent Pages, Etc.)</i>
	1.	International Search Report and Written Opinion of International Searching Authority issued in International Application No. PCT/EP2015/080174, entitled "Handling of Connection Setup Requests," Date of Completion of Search: March 3, 2016.
	2.	Extended Search Report issued in European Application No. 14199719.7 entitled "Handling of Connection Setup Requests," Date of Mailing: July 6, 2015.
	3.	
	4.	
	5.	
	6.	
	7.	
	8.	
	9.	
	10.	

*Copies of any non-published U.S. Patent Applications are not being provided because the examiner has access to such documents through PAIR. We are not listing separately prior U.S. Patent Office communications regarding the cited documents because the Examiner has access to any such actions through PAIR.

EXAMINER /BASIL MA/	DATE CONSIDERED 04/15/2019
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	<u>15/538,182</u>
Title of Invention	Handling of Connection Setup Requests		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2:

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

Inventor Information:

Inventor 1 Remove				
Legal Name				
Prefix	Given Name	Middle Name	Family Name	Suffix
	Rudolf		Strijkers	
Residence Information (Select One) <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service				
City	Zurich	Country of Residence ⁱ	CH	
Mailing Address of Inventor:				
Address 1		Imfeldstrasse 103		
Address 2				
City	Zurich	State/Province		
Postal Code	8037	Country ⁱ	CH	
Inventor 2 Remove				
Legal Name				
Prefix	Given Name	Middle Name	Family Name	Suffix
	Shuang		Zhang	
Residence Information (Select One) <input type="radio"/> US Residency <input checked="" type="radio"/> Non US Residency <input type="radio"/> Active US Military Service				
City	Delft	Country of Residence ⁱ	NL	
Mailing Address of Inventor:				
Address 1		Hendrik Tollensstraat 400		
Address 2				
City	Delft	State/Province		
Postal Code	2624 BX	Country ⁱ	NL	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add				

Correspondence Information:

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	<u>15/538,182</u>
Title of Invention	Handling of Connection Setup Requests		

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

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

Customer Number	021005		
Email Address		<input type="button" value="Add Email"/>	<input type="button" value="Remove Email"/>

Application Information:

Title of the Invention	Handling of Connection Setup Requests		
Attorney Docket Number	4965.1056-001	Small Entity Status Claimed	<input type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	5	Suggested Figure for Publication (if any)	2

Filing By Reference:

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

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

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

Publication Information:

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

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

Representative Information:

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

Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	021005		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	<u>15/538,182</u>
Title of Invention	Handling of Connection Setup Requests		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

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

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	a 371 of international	PCT/EP2015/080174	2015-12-17

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Foreign Priority Information:

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

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Remove
14199719.7	EP	2014-12-22	Access Code ^j (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

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

This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

☐ NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	<u>15/538,182</u>
Title of Invention	Handling of Connection Setup Requests		

Authorization or Opt-Out of Authorization to Permit Access:

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

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

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

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

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

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

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

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

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

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

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	<u>15/538.182</u>
Title of Invention	Handling of Connection Setup Requests		

Applicant Information:

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

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

☒ Assignee
 ☐ Legal Representative under 35 U.S.C. 117
 ☐ Joint Inventor

☐ Person to whom the inventor is obligated to assign.
 ☐ Person who shows sufficient proprietary interest

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

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name

Mailing Address Information For Applicant:

Address 1	Maanplein 55 <u>Wilhelminakade 123</u>		
Address 2			
City	The Hague <u>Rotterdam</u>	State/Province	
Country	NL	Postal Code	2546-GK <u>3072 AP</u>
Phone Number		Fax Number	
Email Address			

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	<u>15/538,182</u>
Title of Invention	Handling of Connection Setup Requests		

Applicant 2			
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p> <p style="text-align: right;"><input type="button" value="Clear"/></p>			
<input checked="" type="radio"/> Assignee		<input type="radio"/> Legal Representative under 35 U.S.C. 117	
<input type="radio"/> Person to whom the inventor is obligated to assign.		<input type="radio"/> Person who shows sufficient proprietary interest	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor: <input type="text"/>			
If the Applicant is an Organization check here. <input checked="" type="checkbox"/>			
Organization Name	Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek TNO		
Mailing Address Information For Applicant:			
Address 1	Anna van Buerenplein 1		
Address 2			
City	's-Gravenhage	State/Province	
Country	NL	Postal Code	2595 DA
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button.			

Assignee Information including Non-Applicant Assignee Information:

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

Assignee 1
<p>Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.</p>
<p>If the Assignee or Non-Applicant Assignee is an Organization check here. <input type="checkbox"/></p>

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	15/538,182
Title of Invention	Handling of Connection Setup Requests		

Prefix	Given Name	Middle Name	Family Name	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		State/Province	
Country		Postal Code	
Phone Number		Fax Number	
Email Address			

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

Signature:

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

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

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

Signature	/Timothy J. Meagher, Reg. No. 39302/		Date (YYYY-MM-DD)	2018-07-11
First Name	Timothy J.	Last Name	Meagher	Registration Number
39302				

Additional Signature may be generated within this form by selecting the Add button.

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

Privacy Act Statement

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

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

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

Electronic Acknowledgement Receipt

EFS ID:	33151197
Application Number:	15538182
International Application Number:	
Confirmation Number:	3145
Title of Invention:	Handling of Connection Setup Requests
First Named Inventor/Applicant Name:	Rudolf Strijkers
Customer Number:	21005
Filer:	Timothy J. Meagher/Claudia Fagan
Filer Authorized By:	Timothy J. Meagher
Attorney Docket Number:	4965.1056-001
Receipt Date:	11-JUL-2018
Filing Date:	20-JUN-2017
Time Stamp:	18:25:57
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	49651056001_Corrected_ADS. PDF	476851 4e04dc605626a87614f013b2188b1834963 1036a	no	8

Warnings:

Information:	
This is not an USPTO supplied ADS fillable form	
Total Files Size (in bytes):	476851
<p>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.</p> <p><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.</p> <p><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.</p> <p><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.</p>	



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001

CONFIRMATION NO. 3145

PUBLICATION NOTICE



OC000000095943662

21005
HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

Title: Handling of Connection Setup Requests

Publication No. US-2017-0353980-A1

Publication Date: 12/07/2017

NOTICE OF PUBLICATION OF APPLICATION

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

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

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

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

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/538,182	06/20/2017	Rudolf Strijkers	4965.1056-001

21005
HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

CONFIRMATION NO. 3145
POA ACCEPTANCE LETTER



Date Mailed: 09/28/2017

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/25/2017.

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.

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

/dtdinh/

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

GENERAL POWER OF ATTORNEY BY APPLICANT

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

- ☒ I hereby appoint Practitioners associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

021005

OR

- ☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

Name	Registration Number	Name	Registration Number

Please recognize or change the correspondence address for the above-identified patent 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

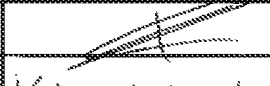
Telephone

Email

I am the Applicant and Assignee or Person to Whom the Inventor is Under an Obligation to Assign

A copy of this form, together with a transmittal letter (Form PTO/AIA/82A or equivalent) is required to be filed in each application in which this form is used. The transmittal letter may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Applicant for Patent

Signature		Date	28.04.2014
Name	K.M. Wuyt	Telephone	+31 70 3433955
Title	Corporate Intellectual Property Officer		
Company	Koninklijke KPN N.V.		

NOTE: See 37 CFR 1.4 for signature requirements and certifications.

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

GENERAL POWER OF ATTORNEY BY APPLICANT

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

- ☒ I hereby appoint Practitioners associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

021005

OR

- ☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A or equivalent):

Name	Registration Number	Name	Registration Number

Please recognize or change the correspondence address for the above-identified patent 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

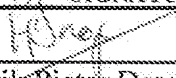
Telephone

Email

I am the Applicant and Assignee or Person to Whom the Inventor is Under an Obligation to Assign

A copy of this form, together with a transmittal letter (Form PTO/AIA/82A or equivalent) is required to be filed in each application in which this form is used. The transmittal letter may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Applicant for Patent

Signature		Date	11 April 2014
Name	Hendrik Pieter Drop	Telephone	+31 88 8668264
Title	Deputy Director Patents and Licensing TNO		
Company	Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO		

NOTE: See 37 CFR 1.4 for signature requirements and certifications.

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

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

Application Number	15/538,182		
Filing Date	December 17, 2015		
First Named Inventor	Rudolf Strijkers		
Title	Handling Of Connection Setup Requests		
Art Unit			
Examiner Name			
Attorney Docket Number	4965.1056-001		
SIGNATURE of Applicant or Patent Practitioner			
Signature	/Timothy J. Meagher, Reg. No. 39,302/	Date	9/25/2017
Name	Timothy J. Meagher	Telephone	(978) 341-0036
Registration Number	39,302		
NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications.			
<input checked="" type="checkbox"/> *Total of <u>2</u> forms are submitted.			

Electronic Acknowledgement Receipt

EFS ID:	30462938
Application Number:	15538182
International Application Number:	
Confirmation Number:	3145
Title of Invention:	Handling of Connection Setup Requests
First Named Inventor/Applicant Name:	Rudolf Strijkers
Customer Number:	21005
Filer:	Timothy J. Meagher/Meredith Eschauzier
Filer Authorized By:	Timothy J. Meagher
Attorney Docket Number:	4965.1056-001
Receipt Date:	25-SEP-2017
Filing Date:	20-JUN-2017
Time Stamp:	16:52:07
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	49651056001_Declaration_Strijkers.pdf	61241 1be071f798dcd990e81e2a061ca254289cf0dcd8	no	1

Warnings:

The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing

Information:

2	Oath or Declaration filed	49651056001_Declaration_Zhang.pdf	40911	no	1
			9c5294c451002f0dcc86cfa56611ac9c1e8f5c0		

Warnings:

The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing

Information:

3	Power of Attorney	49651056001_POA_KON.pdf	57631	no	1
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Warnings:

The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing

Information:

4	Power of Attorney	49651056001_POA_TNO.pdf	362931	no	1
			4d810a740cfd5d9aa3bc65b86bf9c548c5b6fc9d		

Warnings:

Information:

5	Transmittal Letter	49651056001_TransmittalPOA.pdf	93354	no	1
			6694daf7e8340f46e966101244f6aeaaabb136e48		

Warnings:

Information:

Total Files Size (in bytes):			616068		
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

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

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.

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)**

Title of Invention	Handling Of Connection Setup Requests
--------------------	---------------------------------------

As the below named inventor, I hereby declare that:

This declaration is directed to: ☐ The attached application, or
☒ United States application or PCT international application number 15/538,182 filed on December 17, 2015.

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

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

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

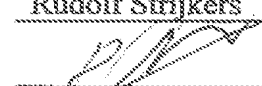
I hereby state that I have reviewed and understand the contents of the above-identified application, including the claims.

I acknowledge the duty to disclose to the Patent Office all information known to me 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.

WARNING:

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

LEGAL NAME OF INVENTOR

Inventor:	<u>Rudolf Strijkers</u>	Date	
Signature:		(Optional):	

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 (or equivalent) form for each additional inventor.

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

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

Title of Invention	Handling Of Connection Setup Requests
--------------------	---------------------------------------

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or☒ United States application or PCT international application number 15/538,182 filed on December 17, 2015.

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

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

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

I hereby state that I have reviewed and understand the contents of the above-identified application, including the claims.

I acknowledge the duty to disclose to the Patent Office all information known to me 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.

WARNING:

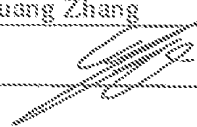
Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization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

LEGAL NAME OF INVENTOR

Inventor: Shuang Zhang

Date

(Optional): 7 Aug 2017

Signature: 

Note: An application data sheet (PTO SB-14 or equivalent) including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO AIA-01 (or equivalent) form for each additional inventor.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 15/538,182				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280			
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	480			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720			
TOTAL CLAIMS (37 CFR 1.16(j))	15	minus 20 = *				x 80 =	0.00			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3	minus 3 = *				x 420 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00			
			TOTAL			TOTAL	1480			
* If the difference in column 1 is less than zero, enter "0" in column 2.										
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=		x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=		x	=
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE			TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=		x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=		x	=
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE			TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.										



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

U.S. APPLICATION NUMBER NO.	FIRST NAMED INVENTOR	ATTY. DOCKET NO.
15/538,182	Rudolf Strijkers	4965.1056-001

21005
HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

INTERNATIONAL APPLICATION NO.	
PCT/EP2015/080174	
I.A. FILING DATE	PRIORITY DATE
12/17/2015	12/22/2014

CONFIRMATION NO. 3145
371 ACCEPTANCE LETTER



Date Mailed: 08/31/2017

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office, in its capacity as a Designated / Elected Office (37 CFR 1.495), has ACCEPTED the above identified international application for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above. A Filing Receipt will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE "FILING DATE or 371(c) DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1) and (c)(2) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN BELOW.** The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363)

06/20/2017
DATE OF RECEIPT OF 35 U.S.C.
371(c)(1) and (c)(2) REQUIREMENTS

The following items have been received:

- Copy of the International Application filed on 06/20/2017
- Copy of the International Search Report filed on 06/20/2017
- Preliminary Amendments filed on 06/20/2017
- Information Disclosure Statements filed on 06/20/2017
- U.S. Basic National Fees filed on 06/20/2017
- Authorize Access to Search Results filed on 06/20/2017
- Priority Documents filed on 06/20/2017
- Authorization to Permit Access filed on 06/20/2017
- Application Data Sheet (37 CFR 1.76) filed on 06/20/2017

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.495(c).

- Properly executed inventor's oath or declaration for the following inventor(s) has not been submitted: **Rudolf Strijkers and Shuang Zhang**

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

CHERRIE M HAYWOOD

Telephone: (703) 756-1144



UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
15/538,182	06/20/2017		1620	4965.1056-001	15	3

CONFIRMATION NO. 3145

FILING RECEIPT

21005

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133



0000000093742960

Date Mailed: 08/31/2017

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

Inventor(s)

Rudolf Strijkers, Zurich, SWITZERLAND;
Shuang Zhang, Delft, NETHERLANDS;

Applicant(s)

KONINKLIJKE KPN N.V., The Hague, NETHERLANDS;
Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek TNO,
s-Gravenhage, NETHERLANDS;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/EP2015/080174 12/17/2015

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)
EUROPEAN PATENT OFFICE (EPO) 14199719.7 12/22/2014

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

If Required, Foreign Filing License Granted: 08/28/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/538,182**

Projected Publication Date: 12/07/2017

Non-Publication Request: No

Early Publication Request: No

Title

Handling of Connection Setup Requests

Preliminary Class

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

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

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

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

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

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

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

GRANTED

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

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

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

NOT GRANTED

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

SelectUSA

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

<div>MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET</div> <div>Substitute for Form PTO-1360 (For use with Form PTO/SB/06)</div>							<div>Application Number</div> <div>15538182</div>		<div>Filing Date</div>	
							<div>Applicant(s) Rudolf Strijkers</div>			
							<div>* May be used for additional claims or amendments</div>			
CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT			*	*	*
	Indep	Depend	Indep	Depend	Indep	Depend				
1	1		1							
2		1		1						
3		1		1						
4		1		1						
5		1		1						
6		3		1						
7		(1)		1						
8		(1)		1						
9		(1)		1						
10	1		1							
11		1		1						
12	1		1							
13		1		1						
14		(1)		1						
15		(1)		1						
16										
17										
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Total Indep	3		3		0					
Total Depend	14	↙	12	↙	0	↙				
Total Claims	17		15		0					
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HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371		ATTORNEY'S DOCKET NUMBER 4965.1056-001 U.S. APPLICATION NO. (If known, see 37 CFR 1.5)
INTERNATIONAL APPLICATION NO. PCT/EP2015/080174	INTERNATIONAL FILING DATE December 17, 2015	PRIORITY DATE CLAIMED December 22, 2014
TITLE OF INVENTION Handling Of Connection Setup Requests		
FIRST NAMED INVENTOR Rudolf Strijkers		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
<ol style="list-style-type: none"> 1. <input type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). NOTE: The express request under 35 U.S.C. 371(f) will not be effective unless the requirements under 35 U.S.C. 371(c)(1), (2), and (4) for payment of the basic national fee, copy of the International Application and English translation thereof (if required). 2. <input type="checkbox"/> A copy of the International Application (35 U.S.C. 371(c)(2)), is attached hereto (not required if the International Application was previously communicated by the International Bureau or was filed in the United States Receiving Office (RO/US)). 3. <input type="checkbox"/> An English language translation of the International Application (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> a. <input type="checkbox"/> is attached hereto. b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4). 4. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)) <ol style="list-style-type: none"> a. <input type="checkbox"/> is attached hereto. b. <input type="checkbox"/> was previously filed in the international phase under PCT Rule 4.17(iv). 		
Items 5 to 8 below concern amendments made in the international phase.		
<u>PCT Article 19 and 34 amendments</u>		
<ol style="list-style-type: none"> 5. <input type="checkbox"/> Amendments to the claims under PCT Article 19 are attached (not required if communicated by the International Bureau) (35 U.S.C. 371(c)(3)). 6. <input type="checkbox"/> English translation of the PCT Article 19 amendment is attached (35 U.S.C. 371(c)(3)). 7. <input type="checkbox"/> English translation of annexes (Article 19 and/or 34 amendments only) of the International Preliminary Examination Report is attached (35 U.S.C. 371(c)(5)). 		
<u>Cancellation of amendments made in the international phase</u>		
<ol style="list-style-type: none"> 8a. <input type="checkbox"/> Do not enter the amendment made in the international phase under PCT Article 19. 8b. <input type="checkbox"/> Do not enter the amendment made in the international phase under PCT Article 34. 		
NOTE: A proper amendment made in English under Article 19 or 34 will be entered in the U.S. national phase application absent a clear instruction from applicant not to enter the amendment(s).		
The following items 9 to 17 concern a document(s) or information included.		
<ol style="list-style-type: none"> 9. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. 10. <input checked="" type="checkbox"/> A preliminary amendment. 11. <input checked="" type="checkbox"/> An Application Data Sheet under 37 CFR 1.76. 12. <input type="checkbox"/> A substitute specification. NOTE: A substitute specification cannot include claims. See 37 CFR 1.125(b). 13. <input type="checkbox"/> A power of attorney and/or change of address letter. 14. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.3 and 37 CFR 1.821-1.825. 15. <input type="checkbox"/> Assignment papers (<i>cover sheet and document(s)</i>). Name of Assignee: _____ 16. <input type="checkbox"/> 37 CFR 3.73(c) Statement (<i>when there is an Assignee</i>). 		

U.S. APPLICATION NO. (if known - see 37 CFR 1.5)		INTERNATIONAL APPLICATION NO. PCT/EP2015/080174		ATTORNEY'S DOCKET NUMBER 4965.1056-001	
17. <input checked="" type="checkbox"/> Other items or information: 1 st page copy of WO 2016/102290 A1					
The following fees have been submitted				CALCULATIONS PTO USE ONLY	
18. <input checked="" type="checkbox"/> Basic national fee (37 CFR 1.492(a)).....				\$280	\$280
19. <input checked="" type="checkbox"/> Examination fee (37 CFR 1.492(c))					
If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4)				\$0	
All other situations				\$720	\$720
20. <input checked="" type="checkbox"/> Search fee (37 CFR 1.492(b))					
If the written opinion of the ISA/US or the International preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4)				\$0	
Search fee (37 CFR 1.445(a)(2)) has been paid on the international application to the USPTO as an International Searching Authority				\$120	
International Search Report prepared by an ISA other than the US and provided to the Office or previously communicated to the US by the IB				\$480	
All other situations				\$600	\$480
TOTAL OF 18, 19, and 20 =					\$1480
<input type="checkbox"/> Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing in compliance with 37 CFR 1.821(c) or (e) in an electronic medium or computer program listing in an electronic medium) (37 CFR 1.492(j)). Fee for each additional 50 sheets of paper or fraction thereof					
Total Sheets	Extra sheets	Number of each additional 50 or fraction thereof (round up to a whole number)		RATE	
24	- 100 =			x \$400	\$
Surcharge of \$140 for furnishing any of the search fee, examination fee, or the oath or declaration after the date of commencement of the national stage (37 CFR 1.492(h)).					\$140
CLAIMS	NUMBER FILED		NUMBER EXTRA	RATE	
Total claims	15	- 20 =		x \$80	\$
Independent claims	3	- 3 =		x \$420	\$
MULTIPLE DEPENDENT CLAIM(S) (if applicable)				+ \$780	\$
TOTAL OF ABOVE CALCULATIONS =					\$1620
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. Fees above are reduced by 50%.					\$
<input type="checkbox"/> Applicant claims micro entity status. See 37 CFR 1.29. Fees above are reduced by 75%.					\$
SUBTOTAL =					\$1620
Processing fee of \$140 for furnishing the English translation later than 30 months from the earliest claimed priority date (37 CFR 1.492(i)).				+	\$
TOTAL NATIONAL FEE =					\$1620
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property if filed by mail. \$0 if electronically filed.				+	\$
TOTAL FEES ENCLOSED =					\$1620
				Amount to be refunded:	\$
				Amount to be charged:	\$

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)		INTERNATIONAL APPLICATION NO. PCT/EP2015/080174		ATTORNEY'S DOCKET NUMBER 4965.1056-001	
<p>a. <input checked="" type="checkbox"/> Please charge my Deposit Account No. 08-0380 in the amount of \$1,620.00 to cover the above fees.</p> <p>b. <input checked="" type="checkbox"/> The Director is hereby authorized to charge any deficiency or credit any overpayment in the fees that may be due in this matter to Deposit Account No. 08-0380.</p> <p>c. <input checked="" type="checkbox"/> The Director is hereby authorized to charge the basic filing fee to Deposit Account No. 08-0380.</p> <p>NOTE: Where an appropriate time limit under 37 CFR 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the International Application to pending status.</p> <p>Correspondence Address <input checked="" type="checkbox"/> The address associated with Customer Number: <u>021005</u> or <input type="checkbox"/> Correspondence address below</p>					
Name					
Address					
City		State		Zip Code	
Country			Telephone		
Email					

Signature	/Timothy J. Meagher, Reg. No. 39,302/	Date	6/20/2017
Name (Print/Type)	Timothy J. Meagher	Registration No. (Attorney/Agent)	39,302

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	Handling Of Connection Setup Requests			
First Named Inventor/Applicant Name:	Rudolf Strijkers			
Filer:	Timothy J. Meagher/Jennifer Torpey			
Attorney Docket Number:	4965.1056-001			
Filed as Large Entity				
Filing Fees for U.S. National Stage under 35 USC 371				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
NATIONAL STAGE FEE	1631	1	280	280
NATL STAGE SEARCH FEE - REPORT PROVIDED	1642	1	480	480
NATIONAL STAGE EXAM - ALL OTHER CASES	1633	1	720	720
Pages:				
Claims:				
Miscellaneous-Filing:				
OATH/DECL > 30 MOS FROM 371 COMMENCEMENT	1617	1	140	140
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1620

Electronic Acknowledgement Receipt

EFS ID:	29555149
Application Number:	15538182
International Application Number:	PCT/EP2015/080174
Confirmation Number:	3145
Title of Invention:	Handling Of Connection Setup Requests
First Named Inventor/Applicant Name:	Rudolf Strijkers
Customer Number:	21005
Filer:	Timothy J. Meagher/Jennifer Torpey
Filer Authorized By:	Timothy J. Meagher
Attorney Docket Number:	4965.1056-001
Receipt Date:	20-JUN-2017
Filing Date:	
Time Stamp:	20:05:31
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 1620
RAM confirmation Number	062117INTEFSW00006473080380
Deposit Account	
Authorized User	

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

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	49651056001_ADS.pdf	1823317	no	8
			194a4de6de97dc74e0a96ad42063687cc36dd22e		
Warnings:					
Information:					
2	Transmittal Letter	49651056001_Transmittal_IDS.pdf	71391	no	3
			05a7e41e90b79e2f3fe7fe27ea62f88c1d9dcafd		
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	49651056001_1449.pdf	114666	no	3
			0fac353c0900727820be0c3f43f089f39ab7f133		
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
4	Other Reference-Patent/App/Search documents	EP_Search_Report.pdf	320571	no	14
			cb14fd514a3e0e48e280cae681320bd67855a406		
Warnings:					
Information:					
5	Other Reference-Patent/App/Search documents	ISR.pdf	478698	no	16
			d7d7385b18cc7acad95bb842b4226235eb89fb5bb		
Warnings:					
The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing					
Information:					
6	Foreign Reference	WO_2012_130312.pdf	2134861	no	31
			1747ede8dc157ab2cc60a607f1ac833b539ed74f		

ERICSSON EXHIBIT 1002, Page 292

Warnings:					
Information:					
7	Foreign Reference	WO_2003_077580.pdf	1082890	no	28
			cf60b49065aee554a57e00d7279d51265bfc2d80		
Warnings:					
Information:					
8	Miscellaneous Incoming Letter	1st_Page_Copy_WO_2016_102290.pdf	64296	no	1
			52d01f155dd20dc1327df7a70db4dc603b91f65b		
Warnings:					
Information:					
9		49651056001_Pre_Amendment.pdf	102887	yes	7
			0c4ca29fc57a515b71fe34aaa29a70156508922c		
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Abstract		7	7	
	Claims		3	6	
	Specification		2	2	
	Preliminary Amendment		1	1	
Warnings:					
Information:					
10	Transmittal of New Application	49651056001_Trans_Application.pdf	125588	no	3
			4ee8cb8936dd9c201c1252bb5e18e15b1582b967		
Warnings:					
Information:					
11	Fee Worksheet (SB06)	fee-info.pdf	37271	no	2
			87c0f57cac819154899f55c920b8be94c80d78e9		
Warnings:					
Information:					
Total Files Size (in bytes):			6356436		

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

New Applications Under 35 U.S.C. 111

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

National Stage of an International Application under 35 U.S.C. 371

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

New International Application Filed with the USPTO as a Receiving Office

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

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	
Title of Invention	Handling of Connection Setup Requests		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2:

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

Inventor Information:

Inventor	1				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Rudolf		Strijkers		
Residence Information (Select One) US Residency <input checked="" type="radio"/> Non US Residency Active US Military Service					
City	Zurich	Country of Residence ⁱ		CH	

Mailing Address of Inventor:

Address 1	Imfeldstrasse 103				
Address 2					
City	Zurich	State/Province			
Postal Code	8037	Country ⁱ	CH		

Inventor	2				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Shuang		Zhang		
Residence Information (Select One) US Residency <input checked="" type="radio"/> Non US Residency Active US Military Service					
City	Delft	Country of Residence ⁱ		NL	

Mailing Address of Inventor:

Address 1	Hendrik Tollensstraat 400				
Address 2					
City	Delft	State/Province			
Postal Code	2624 BX	Country ⁱ	NL		

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

Add

Correspondence Information:

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	
Title of Invention	Handling of Connection Setup Requests		

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

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

Customer Number	021005		
Email Address		<input type="button" value="Add Email"/>	<input type="button" value="Remove Email"/>

Application Information:

Title of the Invention	Handling of Connection Setup Requests		
Attorney Docket Number	4965.1056-001	Small Entity Status Claimed	<input type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	5	Suggested Figure for Publication (if any)	2

Filing By Reference:

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

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

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

Publication Information:

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

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

Representative Information:

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

Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	021005		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	
Title of Invention	Handling of Connection Setup Requests		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

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

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	a 371 of international	PCT/EP2015/080174	2015-12-17
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

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

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ^j (if applicable)
14199719.7	EP	2014-12-22	
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			Add

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

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	
Title of Invention	Handling of Connection Setup Requests		

Authorization or Opt-Out of Authorization to Permit Access:

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

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

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

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

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

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

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

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

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

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

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

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	
Title of Invention	Handling of Connection Setup Requests		

Applicant Information:

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

Applicant	1	Remove
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p> <p style="text-align: right;">Clear</p>		
<input checked="" type="radio"/> Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:		
<div style="border: 1px solid black; height: 20px; width: 100%;"></div>		
Name of the Deceased or Legally Incapacitated Inventor: <div style="border: 1px solid black; height: 20px; width: 100%;"></div>		
If the Applicant is an Organization check here. <input checked="" type="checkbox"/>		
Organization Name	KONINKLIJKE KPN N.V.	
Mailing Address Information For Applicant:		
Address 1	Maanplein 55	
Address 2		
City	The Hague	State/Province
Country	NL	Postal Code
Phone Number		Fax Number
Email Address		
Additional Applicant Data may be generated within this form by selecting the Add button. Add		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	
Title of Invention	Handling of Connection Setup Requests		

Applicant	2	<input type="button" value="Remove"/>
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p> <p align="right"><input type="button" value="Clear"/></p>		
<input checked="" type="radio"/> Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.		Person who shows sufficient proprietary interest
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:		
<div style="border: 1px solid black; height: 20px; width: 100%;"></div>		
Name of the Deceased or Legally Incapacitated Inventor: <div style="border: 1px solid black; height: 20px; width: 100%;"></div>		
If the Applicant is an Organization check here. <input checked="" type="checkbox"/>		
Organization Name	Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek TNO	
Mailing Address Information For Applicant:		
Address 1	Anna van Buerenplein 1	
Address 2		
City	s-Gravenhage	State/Province
Country	NL	Postal Code
Phone Number		Fax Number
Email Address		
Additional Applicant Data may be generated within this form by selecting the Add button. <input type="button" value="Add"/>		

Assignee Information including Non-Applicant Assignee Information:

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

Assignee	1	<input type="button" value="Remove"/>
<p>Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.</p>		
If the Assignee or Non-Applicant Assignee is an Organization check here. <input type="checkbox"/>		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	4965.1056-001
		Application Number	
Title of Invention	Handling of Connection Setup Requests		

Prefix	Given Name	Middle Name	Family Name	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		State/Province	
Country ⁱ		Postal Code	
Phone Number		Fax Number	
Email Address			

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

Signature:

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

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

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

Signature	/Timothy J. Meagher, Reg. No. 39302/		Date (YYYY-MM-DD)	2017-06-20
First Name	Timothy J.	Last Name	Meagher	Registration Number
			39302	

Additional Signature may be generated within this form by selecting the Add button.

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

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 RECEIVING OFFICE (RO/US)
Designated/Elected Office (DO/EO/US)

U.S. National Stage of
International Application No.: PCT/EP2015/080174

International Filing Date: December 17, 2015

Earliest Priority Date: December 22, 2014

Inventors: Rudolf Strijkers and Shuang Zhang

Title: Handling Of Connection Setup Requests

Attorney's Docket No.: 4965.1056-001

TRANSMITTAL LETTER FOR
INFORMATION DISCLOSURE STATEMENT

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

Commissioner:

This Information Disclosure Statement is submitted:

- ☒ under 37 CFR 1.97(b), or
(Within any one of the following time periods: three months of filing national application (other than a CPA) or date of entry of the national stage in an international application; or before the mailing date of a first office action on the merits; or before the mailing of a first office action after the filing of a Request for Continued Examination).
- ☐ under 37 CFR 1.97(c) together with either:
☐ a Statement under 37 CFR 1.97(e), as checked below, or
☐ a \$180.00 fee under 37 CFR 1.17(p), or
(After the 37 CFR 1.97(b) time period, but before any of a final action, notice of allowance, or an action that closes prosecution, whichever occurs first)
- ☐ under 37 CFR 1.97(d) together with:
☐ a Statement under 37 CFR 1.97(e), as checked below, and
☐ a \$180.00 fee under 37 CFR 1.17(p), or
(Filed after final action, notice of allowance, or an action that otherwise closes prosecution, but on or before payment of the issue fee)
- ☐ under 37 CFR 1.97(i):
Applicant requests that the IDS and cited reference(s) be placed in the application file.
(Filed after payment of issue fee)

No aspect of this submission constitutes a disclaimer of claim scope.

Statement Under 37 CFR 1.97(e)

- ☐ Each item of information contained in this 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 this Information Disclosure Statement; or
- ☐ No item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned, 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 this Information Disclosure Statement.

Statement Under 37 CFR 1.704(d) (Patent Term Adjustment)

Applies to original applications (other than design) filed on or after May 29, 2000

- ☐ (1) A paper containing only an information disclosure statement in compliance with §§ 1.97 and 1.98 will not be considered a failure to engage in reasonable efforts to conclude prosecution (processing or examination) of the application under paragraphs (c)(6), (c)(8), (c)(9), or (c)(10) of this section if it is accompanied by a statement that each item of information contained in the information disclosure statement:
- ☐ (i) Was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office, and this communication was not received by any individual designated in §1.56(c) more than thirty days prior to the filing of the information disclosure statement; or
- ☐ (ii) Is a communication that was issued by a patent office in a counterpart foreign or international application or by the Office, and this communication was not received by any individual designated in §1.56(c) more than thirty days prior to the filing of the information disclosure statement.
- ☒ Enclosed herewith is a Listing of References. Copies of the cited references are enclosed except as indicated below or in the attached Listing of References.
- ☐ Copies of the cited references submitted with an Information Disclosure Statement in prior application, U.S. Application No. [], to which priority under 35 U.S.C. 120 is claimed, are not required under 37 CFR 1.98(d)(1) and (2) and are thus not provided.
- ☒ The listed references were cited in the enclosed Search Report in counterpart foreign application PCT/EP2015/080174, which is listed in the attached Listing of References.

- ☐ The "concise explanation" requirement (non-English references) for reference(s) [] under 37 CFR 1.98(a)(3) is satisfied by:
- ☐ the explanation provided on the attached sheet.
 - ☐ the explanation provided in the Specification.
 - ☐ submission of the enclosed International Search Report.
 - ☐ submission of the enclosed English-language version of a foreign Search Report and/or foreign Office Action.
 - ☐ the enclosed English language abstract.

Method of payment:

- ☐ Please charge Deposit Account 08-0380 in the amount of \$[].
- ☒ Please charge any deficiency in fees and credit any overpayment to Deposit Account 08-0380.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By /Timothy J. Meagher, Reg. No. 39,302/

Timothy J. Meagher

Registration No.: 39,302

Telephone: (978) 341-0036

Facsimile: (978) 341-0136

Concord, MA 01742-9133

Dated: 6/20/2017

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION LISTING OF REFERENCES June 20, 2017 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 4965.1056-001		APPLICATION NO.	
	FIRST NAMED INVENTOR Rudolf Strijkers		FILING DATE	
	EXAMINER	CONFIRMATION NO.	GROUP	

U.S. PATENT DOCUMENTS				
Examiner's Initials	Cite No.	DOCUMENT NUMBER Number-Kind Code (if known)	ISSUE DATE / PUBLICATION DATE MM-DD-YYYY	NAME OF PATENTEE OR APPLICANT OF CITED DOCUMENT
	1.	6,192,248 B1	02-20-2001	Solondz
	2.	2012/0039168 A1	02-16-2012	He et al.
	3.	2013/0201870 A1	08-08-2013	Gupta
	4.			
	5.			
	6.			
	7.			
	8.			
	9.			
	10.			
	11.			
	12.			
	13.			
	14.			
	15.			
	16.			
	17.			
	18.			

Copies of issued U.S. Patents and Published U.S. Applications are not required and are not being provided. We are not listing separately prior U.S. Patent Office communications regarding the cited documents because the Examiner has access to any such actions through PAIR.

EXAMINER	DATE CONSIDERED
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Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION LISTING OF REFERENCES June 20, 2017 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 4965.1056-001	APPLICATION NO.	
	FIRST NAMED INVENTOR Rudolf Strijkers	FILING DATE	
	EXAMINER	CONFIRMATION NO.	GROUP

FOREIGN PATENT DOCUMENTS				
Examiner's Initials	Cite No.	DOCUMENT NUMBER Country Code-Number-Kind Code (if known)	DATE MM-DD-YYYY	NAME OF PATENTEE OR APPLICANT OF CITED DOCUMENT
	1.	WO 03/077580 A1	09-18-2003	Telefonaktiebolaget LM Ericsson
	2.	WO 2012/130312 A1	10-04-2012	Telefonaktiebolaget LM Ericsson
	3.			
	4.			
	5.			
	6.			
	7.			
	8.			
	9.			
	10.			

EXAMINER	DATE CONSIDERED
----------	-----------------

Substitute for form 1449B/PTO INFORMATION DISCLOSURE STATEMENT IN AN APPLICATION LISTING OF REFERENCES June 20, 2017 (Use several sheets if necessary)	ATTORNEY DOCKET NO. 4965.1056-001		APPLICATION NO.	
	FIRST NAMED INVENTOR Rudolf Strijkers		FILING DATE	
	EXAMINER	CONFIRMATION NO.	GROUP	

Examiner's Initials	Cite No.	OTHER DOCUMENTS <i>(Including Author, Title, Date, Pertinent Pages, Etc.)</i>
	1.	International Search Report and Written Opinion of International Searching Authority issued in International Application No. PCT/EP2015/080174, entitled "Handling of Connection Setup Requests," Date of Completion of Search: March 3, 2016.
	2.	Extended Search Report issued in European Application No. 14199719.7 entitled "Handling of Connection Setup Requests," Date of Mailing: July 6, 2015.
	3.	
	4.	
	5.	
	6.	
	7.	
	8.	
	9.	
	10.	

***Copies of any non-published U.S. Patent Applications are not being provided because the examiner has access to such documents through PAIR. We are not listing separately prior U.S. Patent Office communications regarding the cited documents because the Examiner has access to any such actions through PAIR.**

EXAMINER	DATE CONSIDERED
----------	-----------------

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference P2066PC00	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/EP2015/080174	International filing date (day/month/year) 17 December 2015 (17-12-2015)	(Earliest) Priority Date (day/month/year) 22 December 2014 (22-12-2014)
Applicant KONINKLUKE KPN N.V.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the language, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, see Box No. I.

2. ☐ Certain claims were found unsearchable (See Box No. II)

3. ☐ Unity of invention is lacking (see Box No. III)

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant
☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☒ the text is approved as submitted by the applicant
☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the drawings,

a. the figure of the drawings to be published with the abstract is Figure No. 2

- ☒ as suggested by the applicant
☐ as selected by this Authority, because the applicant failed to suggest a figure
☐ as selected by this Authority, because this figure better characterizes the invention

b. ☐ none of the figures is to be published with the abstract

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

Wuyts, Koenraad Maria
Royal KPN N.V.
P.O. Box 95321
2509 CH The Hague
PAYS-BAS

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing (day/month/year)		11 March 2016 (11-03-2016)
Applicant's or agent's file reference P2066PC00	FOR FURTHER ACTION	See paragraphs 1 and 4 below
International application No. PCT/EP2015/080174	International filing date (day/month/year)	17 December 2015 (17-12-2015)
Applicant KONINKLIJKE KPN N.V.		

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 18:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.

How? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70

For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 - 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ With regard to any protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.


4. Reminders

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

Shortly after the expiration of 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).

Within 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices. In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

Within 19 months from the priority date, the applicant may request that a supplementary international search be carried out by a different International Searching Authority that offers this service (Rule 45bis.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the International Searching Authority  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel: (+31-70) 340-2040 Fax: (+31-70) 340-3016	Authorized officer GOTTAR, Chantal Tel: +49 (0)89 2399-3203
--	---

Form PCT/ISA/220 (July 2014)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP2015/080174

A. CLASSIFICATION OF SUBJECT MATTER

INV. H04W76/02 H04W28/16 H04W28/26 H04W76/00
 ADD.

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)

H04W

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 practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2012/130312 A1 (ERICSSON TELEFON AB L M [SE]; WASS MIKAEL [SE]) 4 October 2012 (2012-10-04)	1,2,9, 12-14
Y	abstract page 4 - page 5 page 10 - page 11 page 14 figures 5-7 ----- -/-	3-7

☒ 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 application or patent 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

"S" document member of the same patent family

Date of the actual completion of the international search

3 March 2016

Date of mailing of the international search report

11/03/2016

Name and mailing address of the ISA/

European Patent Office, P.B. 5518 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040,
 Fax: (+31-70) 340-3016

Authorized officer

del Sorbo, Filomena

INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP2015/080174

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2013/201870 A1 (GUPTA VIVEK [US]) 8 August 2013 (2013-08-08) paragraph [0005] - paragraph [0010] paragraph [0018] paragraph [0024] paragraph [0029] paragraph [0032] - paragraph [0033] paragraph [0034] paragraph [0038] figure 2 figure 7 -----	1,2,8,9, 12-14
X	US 6 192 248 B1 (SOLODZ MAX A [US]) 20 February 2001 (2001-02-20) abstract figures 1-4 column 1 column 2, line 25 - line 40 column 2, line 57 - line 67 column 3, line 1 - line 35 column 4, line 40 - line 67 -----	1-3,7, 9-12,14, 15
Y	US 2012/039168 A1 (HE JIANGMING [CN] ET AL) 16 February 2012 (2012-02-16)	3-7
A	abstract figure 1 paragraph [0007] - paragraph [0009] -----	1,2,8-15
A	WO 03/077580 A1 (ERICSSON TELEFON AB L M [SE]; HOLLIS MARK [AU]; HODGES PHILIP [AU]; RY) 18 September 2003 (2003-09-18) page 2 - page 3 abstract page 2 - page 5 -----	1-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2015/080174

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2012130312 A1	04-10-2012	CN 103444255 A EP 2692195 A1 US 2014016616 A1 WO 2012130312 A1	11-12-2013 05-02-2014 16-01-2014 04-10-2012
US 2013201870 A1	08-08-2013	AU 2013217503 A1 BE 1020827 A5 CA 2861483 A1 CN 103259619 A CN 104094566 A EP 2813039 A1 ES 2453444 A2 FI 20135108 A FR 2986934 A1 HK 1199335 A1 HK 1200990 A1 JP 2015509352 A KR 20140116470 A NL 2010249 A SE 1300093 A1 SE 1451223 A1 TW 201347479 A US 2013201870 A1 US 2013336218 A1 WO 2013119583 A1	14-08-2014 06-05-2014 15-08-2013 21-08-2013 08-10-2014 17-12-2014 07-04-2014 07-08-2013 16-08-2013 26-06-2015 14-08-2015 26-03-2015 02-10-2014 08-08-2013 12-09-2013 13-10-2014 16-11-2013 08-08-2013 19-12-2013 15-08-2013
US 6192248 B1	20-02-2001	EP 0717579 A2 JP H08237724 A US 5615249 A US 6192248 B1	19-06-1996 13-09-1996 25-03-1997 20-02-2001
US 2012039168 A1	16-02-2012	NONE	
WO 03077580 A1	18-09-2003	AT 300849 T AU 2002235903 A1 CN 1620835 A DE 60205280 D1 DE 60205280 T2 EP 1474943 A1 ES 2246386 T3 US 2005181782 A1 WO 03077580 A1	15-08-2005 22-09-2003 25-05-2005 01-09-2005 24-05-2006 10-11-2004 16-02-2006 18-08-2005 18-09-2003

Reference is made to the following documents:

- D1 WO 2012/130312 A1 (ERICSSON TELEFON AB L M [SE]; WASS MIKAEL [SE]) 4 October 2012 (2012-10-04)
- D2 US 2013/201870 A1 (GUPTA VIVEK [US]) 8 August 2013 (2013-08-08)
- D3 US 6 192 248 B1 (SOLONDZ MAX A [US]) 20 February 2001 (2001-02-20)
- D4 US 2012/039168 A1 (HE JIAMING [CN] ET AL) 16 February 2012 (2012-02-16)
- D5 WO 03/077580 A1 (ERICSSON TELEFON AB L M [SE]; HOLLIS MARK [AU]; HODGES PHILIP [AU]; RY) 18 September 2003 (2003-09-18)

Item V:

- 1 Document **D1**, which is considered to be the most relevant prior art, discloses (the references in parentheses correspond to the passages of **D1**), according to all the features of **independent claim 1**, a method for assisting in handling of connection set-up requests in a telecommunications network, the method comprising:
 - intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of the telecommunications network (see page 4, lines 5-7: "*The user entity is at least being adapted for transmitting a SR, inserting a low priority indication in and transmitting an extended service request, ESR*" and see page 4, lines 31-35: "*a method for a mobility management entity node being adapted for handling (624), or rejecting / discarding (623) a service request, SR, as well as being adapted for handling or rejecting / discarding an extended service request, ESR.*");
 - determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE (see page 5, lines 1-2: "*The method comprises the steps of monitoring a load level of the mobility management entity node or the load level in a network in which the mobility management entity node resides and performing one decision*"); and
 - passing the connection setup request for further processing within the

telecommunications network only upon positive determination (see page 5, lines 2-8: "and performing one decision of: -if the load level is below a first threshold - handling at least incoming SR's and ES 's with or without a low priority indication, - if the load level is larger or equal to the first threshold but lower or equal to a second threshold - rejecting / discarding ESR's with a low priority indication while handling ESR's without a low priority indication and handling SR's.>").

The subject-matter of claim 1 is accordingly **not new**, Article 33(2) PCT.

- 1.1 It should further be noted that claim 1 has a so general formulation that also documents D2 and D3 disclose all the features of claim 1:

a method for assisting in handling of connection set-up requests in a telecommunications network, the method comprising: a control node of a RAN intercepting a connection setup request from a user equipment (UE), determining whether the connection setup request is to be fulfilled based on information regarding resource use within a network access point (NAP) serving the UE; and passing the connection setup request only upon positive determination (see D2, figure 2 and paragraphs [0032] - [0033]: "the UE 15 may send an RRC connection request message 204 to a network controller 206. The RRC connection request message 204 may be a request by the UE 15 for allocation of radio resources so that the UE 15 may exchange data with the RAN 20. The network controller 206 may control establishment and/or maintenance of RRC connections between the UE 15 and the RAN 20. [...] If the RAN 20 is congested and is not be able to support an RRC connection associated with the RRC connection request message 204, the network controller 206 may respond with an RRC connection reject message 208 to reject the RRC connection request message 204. In this case an RRC connection between the UE 15 and the RAN 20 may not be established"); (see also D3, figure 2, steps 208, 210 and 220 and column 4, lines 47-67: "In step 208, the base station 108 located in cell 104 receives this call establishment request. As will be appreciated to one of ordinary skill in the art, each base station 108 has a finite number of channels, or resources, over which telephone calls may be established. [...] In step 208, the base station 108 analyzes its resources to determine whether it has a free channel to service the call establishment request.

As indicated by decision step 210, if the base station 108 has a free channel to service the call establishment request, then step 220 is performed. In step 220, a call is established between the wireless terminal 106 and the public network subscriber in a well known manner.")

The subject-matter of claim 1 is accordingly **not new**, Article 33(2) PCT, also with respect to the disclosure of documents D2 and D3.

- 1.2 Furthermore, it is pointed out that even if the claims were interpreted in a different manner based on minor differences between the features of claim 1 and those features disclosed in document D1 (or D2, or D3), the subject-matter of claim 1 would still not involve an inventive step (Article 33(3) PCT), as D1 (or D2 or D3) discloses the same object and the same solution as the present application, i.e. to *handle connection setup requests guaranteeing that the so called "premium services" will receive precedence over other services*.

- 1.3 The same reasoning as presented above for claim 1 applies to **independent claims 9 and 12** which define respectively the software (claim 9) and the node (claim 12) for carrying out the method defined in claim 1 .

Therefore, the subject-matter of **claims 9 and 12** is **neither new**, Article 33(2) PCT, **nor does it involve an inventive step**, Article 33(3) PCT.

- 1.4 The subject-matter of **independent claims 10 and 11**, defining the storage medium and the data structure, is **not novel** in the sense of Article 33(2) PCT, since D3 discloses storage medium containing a data structure comprising at least one of:
- an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;
 - an indication of an amount of resources currently used by the NAP for the one or more predefined services; and
 - an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services (see column 4, lines 7-18. *"Each base station, such as base station 108, includes a database 110. This database 110 includes a list (or table) having an entry for each of the telephone calls which are currently active in the cell 104. The entries store information that identifies the service levels (also called level-of-services) respectively associated with the wireless terminals in the cell 104 that are involved in the active telephone calls. The base station 108 may also*

include a database of user profiles. The user profiles are associated with particular users via unique user identification numbers assigned to each user.").

- 2 **Dependent claims 2-8 and 13-15** do not contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the Article 33(3) PCT with respect to inventive step, for the reason that the subject-matter of said claims either is in principle directly derivable from the above cited documents, or concerns simple embodiments without inventive merits in themselves, as detailed in the following:
- 2.1 The subject-matter of **claim 2** defining that the determination of whether the connection setup request is to be fulfilled is further based on one or more agreements with one or more service providers, is anticipated in **D1** (see figure 6 and page 5, lines 3-8: the decision whether handling or not a service request depends also on priority levels of the required services), as well **D2** (see paragraphs [0034], [0038]), **D3** (see figure 2, step 214 and 216, and column 1, lines 44-56), **D4** (see abstract and figure 1) and **D5** (see page 2, lines 15-17)
- 2.2 The subject-matter of **claim 3** defining that the one or more agreements comprise reservation, at the NAP serving the UE, of a predefined resource capacity for connection setup requests for one or more predefined services, is anticipated in **D3** (see column 3, lines 17-34), as well in **D4** (see paragraph [0007]: *"the base station system has always reserved a maximum bandwidth for every business flow"*), and **D5** (see page 2, lines 18-25).
- 2.3 The subject-matter of **claims 4 and 5**, defining the predefined resource capacity as a percentage of the total resource capacity of the NAP or as a predefined amount of the total resource capacity of the NAP, said predefined value being less than the total resource capacity of the NAP, is disclosed in **D4** (see " $\sum b_{l,max}$ ", the bandwidth of business flow and " b_{total} ", the total bandwidth of the base station).
- 2.4 The subject-matter of **claim 6** defining the predefined resource capacity being dynamically adjusted, is also derivable from **D4** (the method disclosed in **D4** takes also into account the occupied bandwidth of currently admitted business flow, which obviously is variable in time).

- 2.5 The subject-matter of **claim 7** defining the method further comprising: identifying, from the connection setup request, a service for which a connection setup is requested and determining that the connection setup request is to be fulfilled according to the available capacity at the NAP, taking into account the reserved capacity for the different predefined services, is anticipated in **D3** (see figure 3, steps 314 and 316), as well in **D4** (see figure 1 and paragraph [0007]: "*Also, the bandwidth threshold of the base station system is set, when the total reserved bandwidth of the base station system exceeds the bandwidth threshold, the base station system will refuse to admit the low priority business and only admit the high priority business.*") and **D5** (see page 2, lines 17-24: "*The preferential treatment can especially include access to reserved network resources, e. g. only the highest priority connections are given access to the resources reserved for highest priority connections while the second priority connections are given only access to resources reserved for the second priority connections, excluding the resources reserved for the highest priority connections. Further priority levels are possible, connections for each level having only access to resources reserved for the same or a lower level.*").
- 2.6 The subject-matter of **claim 8** defining an indication to the UE of whether the connection setup request was determined to be fulfilled, is anticipated in **D2** (see e.g. figure 2, message 208).
- 2.7 The subject-matter of **claim 13** defining the node being a mobile management entity (MME) of the telecommunications network, is disclosed in both **D1** (see page 4, line 32) and **D2** (see paragraph [0029] and [0032]).
- 2.8 The subject-matter of **claim 14** defining the node to be communicatively connected to a computer-readable storage medium and the information regarding used resource to comprise at least a portion of information stored on the computer-readable storage medium, is anticipated in **D1** (see figure 5) as well in **D2** (see figure 7) and **D3** (see figure 1).
- 2.9 As the subject-matter of **claim 15** is a combination of the subject-matter of claims 11 and 12, **claim 15** is not novel having regards to the objections raised in paragraphs 5.1 and 5.5 above.

Item VII:

If the applicant opts to enter the **PCT-II phase** (examination phase) or a national/ regional phase, the following points must also be taken into consideration:

- 1 To meet the requirements of Rule 6.3 (b) PCT, any independent claim should be **correctly** cast in the **two-part form**, with those features which in combination are part of the nearest prior art (e.g. the WO document corresponding to D1) being placed in the preamble.
- 2 To meet the requirement of Rule 5.1 (a) (ii) PCT, the WO document corresponding to D1, D2 and D3 which represent a relevant state of the art with regard to the presently claimed invention, should be identified in the opening part of the description and the relevant background art disclosed therein should be briefly discussed.
- 3 The opening part of the description, including the statement of the object/ solution, should be **brought into conformity** with the wording of any new or amended independent claim(s), Rule 5.1 (a) (iii) PCT.

Item VIII:

If the applicant opts to enter the **PCT-II phase** (examination phase) or a national/ regional phase, the following points must also be taken into consideration:

- 1 **Claim 1** is not supported by the description as required by Article 6 PCT (cf. PCT Guidelines, 5.43), as its scope is broader than justified by the description and drawings. The invention is directed i.a. to a method for allocating different kind of services (premium vs standard ones) based on the availability of resources (see e.g. page 1, lines 29 and 30). Claim 1, however, merely claims a fairly standard resource allocation without any reference to the different type of services and the particular method for allocating them resources based on the available one.

As a consequence, claim 1 does not contain all the features necessary to the definition of the invention, contrary to the requirements of Article 6 PCT. To overcome this objection, the wording of the claim 1 should be revised by including the above essential feature into said claim (i.e. allocation of resources for different types of services based on the available ones).

- 2 Claim 1 is furthermore unclear (Article 6 PCT), since it lacks to define in which device/entity in the system the defined steps are performed.
- 2.1 Although it might be clear from the description (see page 2, lines 10-15) that all steps of the method are performed by the same entity (i.e. a functional network component) within or associated with a telecommunication network, claims should clearly define the scope of protection sought.
- 2.2 However, the formulation of claim 1 suggests that any entity (even not within the telecommunication network) could perform the method contrarily at what disclosed in the application.
- 2.3 As a consequence, the definition in claim 1 is not allowable as it results in the skilled person being presented with information which is broader than justified by the description, and which is not supported in and not directly and unambiguously derivable from that previously presented in the application (see PCT Guidelines, 5.43).
- 3 Independent claim 10 is unclear (Article 6 PCT), since it defines a data structure, which does not fall under any of the allowed categories of claim i.e. physical entity (apparatus, product) and activity (process, method); (see PCT Guidelines 5.12).
- 4 Moreover the independent claims 1 and 10 of the present application are not defined with corresponding features. In fact, it is noted that several features of the independent claim 10 are not claimed in the independent claim 1 (e.g. resource capacity of a network access point reserved for connection setup request for one or more predefined services) and vice versa.
- Thus, doubt is introduced as to which features the Applicant considers to be essential to the definition of the invention and resulting in the lack of clarity (Article 6 PCT) regarding the desired scope of protection.
- In order to overcome these objections, all of the independent claims of the present application should be adapted with each other by being provided with the same or corresponding technical features.
- 5 The formulation of Claim 7 leaves unclear when the defined steps should be performed, whereas the description suggests that the three steps defined in claim 7 should be performed after the first step of claim 1 (see description,

page 3, lines 28-34, and page 12, lines 1-15). Moreover from the description it is not clear whether the steps of claim 7 should substitute the second step of claim 1. Therefore Claim 7 does not meet the requirements of Article 6 PCT.

6 According to Rule 6.2(b) PCT, the use of parentheses in the claims is intended for placing reference signs, which are however considered as having no limiting effect.

6.1 Since the acronyms "UE", "RAN", "NAP" and "MME" are used in the wording of the claims to reference to the corresponding features, it appears convenient to introduce these acronyms in claims 1 and 12 without using parentheses.

6.2 In view of the description (see page 13, line 5-15, and figure 5), it appears that all the references in claim 12 are incorrect, since the reference sign 200 does clearly not correspond to a node but to the network of figure 2. The applicant should therefore revise and correct them.

7 The present application does not fulfil the requirements of Article 6 PCT, since the description contains in page 11, line 18 - 24, as well as in page 12, line 15 - 21, and in page 13, line 1 - 5, embodiments which do not fall under the filed claims (cf. PCT Guidelines 5.29).

The Applicant is kindly requested to revise and, if required, amend the application in order to ensure that all embodiments fall under the filed claims or to describe the embodiments not covered by the claims as examples, so that the application fulfil the requirements of Article 6 PCT.

8 The reference on page 7, line 32 of the description ("*included in the present application by reference*") should have been avoided as the application should be self-contained; such referenced document is not regarded as part of the disclosure unless it contains matter essential to the invention, in which case the subject-matter in question would have to be incorporated into the description (PCT Guidelines, 4.26).

9 The reference to the "*spirit of the present invention*" (page 15, line 7) is contrary to the requirements to Article 6 PCT, since it suggests that the extent of protection may be expanded in some vague and not precisely defined way.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
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FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/EP2015/080174

International filing date (day/month/year)
17.12.2015

Priority date (day/month/year)
22.12.2014

International Patent Classification (IPC) or both national classification and IPC
INV. H04W76/02 H04W28/16 H04W28/26 H04W76/00

Applicant
KONINKLIJKE KPN N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:



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Date of completion of
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PCT/ISA/210

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/EP2015/080174

Box No. I Basis of the opinion

1. With regard to the language, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43b/s.1(a))
3. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. ☐ forming part of the international application as filed:
 - ☐ in the form of an Annex C/ST.25 text file.
 - ☐ on paper or in the form of an image file.
 - b. ☐ furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
 - ☐ in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - ☐ on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/EP2015/080174

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>4-6</u>
	No: Claims	<u>1-3, 7-15</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-15</u>
Industrial applicability (IA)	Yes: Claims	<u>1-15</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

(51) International Patent Classification:
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(SE).(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,
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, LY, MA, MD, ME,
MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG,
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kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,
ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).**Declarations under Rule 4.17:**

— of inventorship (Rule 4.17(iv))

[Continued on next page]

(54) Title: LOW PRIORITY INDICATION IN EXTENDED SERVICE REQUEST FOR ENHANCED OVERLOAD HANDLING

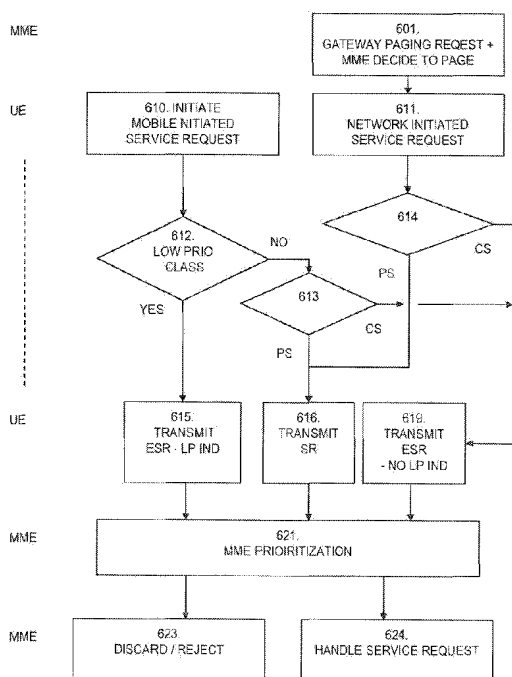


FIG. 6

(57) Abstract: There is provided user entity and a method for a user entity UE I adapted for interacting with a mobility management entity node MMEI, such as being paged 601 by said mobility management entity node MMEI. There is provided a method for a user entity (UEI) adapted for interacting with a mobility management entity node (MMEI), wherein the user entity is adapted to initiate a mobile initiated service request, SR (610) and being adapted to respond to a network initiated SR (611) corresponding to a paging (601) by said mobility management entity node (MMEI). The user entity is at least being adapted for transmitting a SR (618), inserting a low priority indication (LPIND) in and transmitting an extended service request, ESR, (615), or transmitting an ESR without inserting a low priority indication (619). The method comprises the steps of - if the user entity initiates a mobile initiated SR (610) and if the user entity belongs to a low priority class, the user entity responds to the mobility management entity node by transmitting an ESR (615) comprising a low priority indication (LPIND), - if a network initiated SR (611) is responded to, obviating or preventing transmitting an ESR (615) with a low priority indication (LPIND), disregarding whether the user entity belongs to or does not belong to a low priority class. The mobility management entity node and method perform prioritization of SR and ESR.



Published:

— *with international search report (Art. 21(3))*

**LOW PRIORITY INDICATION IN EXTENDED SERVICE
REQUEST FOR ENHANCED OVERLOAD HANDLING**

Technical field

5 This invention relates to mobile communication networks and methods for using such networks. More particularly, the invention relates to apparatuses and methods involving use of service request signalling and extended service request signalling.

10 Background

Fig. 1 shows a prior art non-roaming network architecture in which communication for a mobile terminal, or user entity, UE, may be carried through various 3GPP access and network technologies. There is shown a GERAN (GSM EDGE Radio Access Network, ~referred to as 2G) access interface (comprising a BSS (Base Station Subsystem (not shown)), a UTRAN (UMTS Terrestrial Access Network, ~referred to as 3G) interface (comprising a NodeB base station (not shown)) and an E-UTRAN (referred to as LTE (Long Term Evolution)) interface (comprising an eNodeB base station (not shown)).

20 On the core network side, the GERAN and the UTRAN access networks both have interfaces to a SGSN (Serving GPRS Support Node). The MME (Mobility Management Entity) is the key control node for the LTE access-network. It is responsible for idle mode UE (User Equipment) tracking and paging procedures including retransmissions. The MME is involved in the bearer activation/ deactivation process and is also responsible for choosing the SGW (Serving Gateway) for a UE at the initial attach and at time of intra-LTE handover involving Core Network (CN) node relocation.

Other known nodes shown in fig. 1 - corresponding to TS23.401 V.10.2.1 - 2011-01 - FIG. 4.2.1-1 - are HSS (Home Subscriber Server), PCEF/ PGW (Packet Data network (PDN) Gateway) and PCRF (Policy Charging and Rules Function), the later nodes having connection to an operator's IP services, IMS (IP Multimedia Subsystem), PSS (Packet Switch Streaming), etc.

30 Control plane signaling concerning the user entity is transmitted over the S1-MME interface while user plane signaling concerning the user entity is transmitted over the S1-U user plane. Moreover, there are provided known interfaces S3, S10, S11, S4, S6a, S12, S5, Gx, SGI and Rx.

For a user entity having LTE access capabilities at least the following options noted in table 1 exist:

attachment	state	PS/ CS/ paging options
non-attached	-	-
attached	ECM-IDLE	no PS/ no CS, page possible
attached	ECM- CONNECTED	PS; CS; combined CS and PS

5 table 1

When a user entity in ECM-IDLE mode needs network service, such as packet switched (PS), circuit switched (CS) or combined CS and PS network service, the Service Request procedure is used according to 3GPP TS 23.410 V10.2.1 (2011-01) - 5.3.4.1 and
 10 3GPP TS 24.301 V10.1.0 (2010-12). This procedure is initiated by the user entity, as shown in fig. 2 - corresponding to TS23.401 V10.2.1 FIGURE 5.3.4.1-1: UE triggered service request procedure. Alternatively, a service request can be requested by the network with a paging message, as shown in fig. 3 - corresponding to TS23.401 V10.2.1 FIGURE 5.3.4.3-1: Network triggered service request procedure.

15

The user entity can request service by transmitting either a Service Request signal or an Extended Service Request signal. The former is used for normal service requests and the latter is mainly used for service requests related to CSFB (Circuit Switched Fall Back).

20

Therefore, it is provided that a low priority indication may be included in an extended service request NAS (Non-Access Stratum) message, for among others, devices which may have a lower priority. Thereby, the network can chose to discard or reject service requests from user entities which may not need a speedy handling of service. Change requests (CR) to 24.301: "3GPP TSG-CT WG1 Meeting #70, C1-111521, Salt Lake City, Utah (USA), 21-25 February 2011", describes a low priority as an actual information
 25 element to the extended service request, and "C1-111521 3GPP TSG-CT WG1 Meeting #69, C1-110095 Ljubljana (Slovenia), 24 – 28 January 2011" describes an enhancement to the Extended Service Request so it can be used for other services than CSFB (Circuit Switched Fall Back), i.e. PS services.

30

The implication of the above options is that the network may check for a low priority indicator when receiving a NAS message from the user entity. If a low priority indicator is set, this may be taken into account by the network to decide on further handling of the message.

As mentioned above, if a user entity needs to change state from IDLE to be serviced by the network it shall initiate a service request procedure. The initial message sent to the network may be selected based on the priority of the request. If a user entity request, e.g. by configuration, is associated with a low priority class, the user entity may send an Extended Service Request NAS message with a low priority indicator being set. If the MME receives an Extended Service Request NAS message with a low priority indicator, the request can be treated with lower priority than NAS messages without a low priority indicator in a network overload or congestion situation.

In the future, Machine-to-machine (M2M) devices are expected to outnumber usual handheld devices. These M2M devices are expected to mainly demand a low quality of service (QoS) class or other forms of a low priority. In particular, many M2M devices will not need a low latency. The expected high numbers of such devices may lead to congestion in the network. Therefore, among others, such devices could make use of the extended service request with the low priority indicator being set.

Summary of the invention

However, even if such low priority indications are used for user entities, e.g. for M2M devices in a network, it is a problem that in high load situations there will still be a high level of unnecessary signalling. In overload situations, when the network sends a paging it would be followed by a user entity transmitting an Extended Service Request message that will subsequently be discarded by the network. It is noted that the basic Service Request signal known from fig. 2 cannot be "extended" so as to comprise the above indication, as the timing properties associated with such an "extended" basic service request would exceed the timing requirements defined for the radio layer. It is therefore an object of the invention to enable a more efficient utilization of network resources.

Accordingly, there is provided a method for a user entity adapted for interacting with a mobility management entity node, wherein the user entity is adapted to initiate a mobile initiated service request, SR and being adapted to respond to a network initiated SR corresponding to a paging by said mobility management entity node.

- 5 The user entity is at least being adapted for transmitting a SR, inserting a low priority indication in and transmitting an extended service request, ESR, or transmitting an ESR without inserting a low priority indication. The method comprises the steps of
- if the user entity initiates a mobile initiated SR and if the user entity belongs to a low priority class, the user entity responds to the mobility management entity node by trans-
 - 10 mitting an ESR comprising a low priority indication,
 - if a network initiated SR is responded to, obviating or preventing transmitting an ESR with a low priority indication, disregarding whether the user entity belongs to or does not belong to a low priority class.

- 15 According to the invention, there is also provided a user entity, comprising processing means and an interface unit, the user entity being adapted for interacting with a mobility management entity node, such as being paged by said mobility management entity node.

The user entity is adapted to initiate a mobile initiated service request, SR and being
20 adapted to respond to a network initiated SR corresponding to a paging by said mobility management entity node.

- The user entity is moreover at least being adapted for transmitting a SR, inserting a low priority indication in and transmitting an extended service request, ESR, or transmitting an ESR without inserting a low priority indication, wherein
- 25 - if the user entity initiates a mobile initiated SR and if the user entity belongs to a low priority class, the user entity responds to the mobility management entity node by transmitting an ESR comprising a low priority indication,
 - if a network initiated SR is responded to, obviating or preventing transmitting an ESR with a low priority indication, disregarding whether the user entity belongs to or does not
 - 30 belong to a low priority class.

According to another aspect of the invention there is provided a method for a mobility management entity node being adapted for handling (624), or rejecting / discarding (623) a service request, SR, as well as being adapted for handling or rejecting / discarding an
35 extended service request, ESR. The method comprises the steps of monitoring a load

level of the mobility management entity node or the load level in a network in which the mobility management entity node resides and performing one decision of

- if the load level is below a first threshold - handling at least incoming SR's and ESR's with or without a low priority indication,

- 5 - if the load level is larger or equal to the first threshold but lower or equal to a second threshold - rejecting / discarding ESR's with a low priority indication while handling ESR's without a low priority indication and handling SR's.

10 Further, according to the invention there is also provided a mobility management entity node comprising processing means and an interface unit, the mobility management entity node being adapted for handling, or rejecting / discarding a service request, SR, as well as being adapted for handling or rejecting / discarding an extended service request, ESR.

15 The mobility management entity node being adapted for monitoring a load level of the mobility management entity node or the load level in a network in which the mobility management entity node resides and performing one decision of

- if the load level is below a first threshold - handling at least incoming SR's and ESR's with or without a low priority indication,

- 20 - if the load level is larger or equal to the first threshold but lower or equal to a second threshold - rejecting / discarding ESR's with a low priority indication while handling ESR's without a low priority indication and handling SR's.

25 It is observed that in order to support prioritization of requests initiated by a non-low-priority user (e.g. a normal user entity) vs. a low priority user entity, it would be necessary to extend the service request messages from such devices. According to the invention, it is reckoned that the known format for the Service Request message has no available bits to indicate a priority, whereas the known extended Service Request message can be extended so as to comprise a priority indication.

30 According to the invention, it is further observed that that, if a low priority device (contrary to the invention) would always or predominantly initiate the service request using an Extended Service Request message with a low priority indication - also being the case when the service is initiated by the network via paging - the low priority device would of be subject to a lower priority when such Extended Service Request message is
35 received by the network. However, in a high load situation there would be an unnecessary additional signalling if the network transmits a paging followed by an Extended Ser-

vice Request message from the user entity that will be discarded by the network. According to the invention, when a Service Request - following a paging - is transmitted by a low priority device, it will be less likely prone to have its request rejected/discarded in the mobility management entity node under overload handling.

5

Further advantages of the invention will appear from the following detailed description of the invention.

Brief description of the drawings

- Fig. 1 shows basic elements of a prior art EPC network and signalling,
- 5 fig. 2 shows a known user entity triggered service request procedure,
- fig. 3 shows a known network initiated service request procedure,
- fig. 4 shows a user entity according to an embodiment of the invention,
- 10 fig. 5 shows a mobility management entity node according to an embodiment of the invention,
- fig. 6 shows a preferred embodiment of a method for a user entity according to the invention, and
- 15 fig. 7 shows a preferred embodiment of a method for a mobility management node according to the invention.
- 20

Detailed description of preferred embodiments of the invention

As explained in connection with the prior art, the "basic" Service Request message cannot - without departing from the standard excerpts mentioned above - be extended with
5 a low priority indicator, as there are no free bits to use in the message. The maximum message length has been set by E-UTRAN to be able to guarantee the high timing requirements on a Service Request. This is due to maximum message length constraints put on NAS by lower protocol layers. The Extended Service Request was introduced for less time critical Service Requests that needed more information included in the mes-
10 sage itself, such as CSFB (Circuit Switch Fail Back).

Referring to fig. 6, an embodiment for a method for a user entity shall be explained in the following.

15 In step 601, a gateway is transmitting a paging request and the mobility management entity node is subsequently deciding to page a user entity using signalling according to the known procedure shown in fig. 3, reference 3a.

When receiving the page signal (4a, 4b in fig. 3), the user entity in question performs its
20 share (5 in fig. 3) of a network initiated service request 611.

Alternatively, the user entity by its own motion, initiates a mobile initiated service request, 610, as illustrated in the NAS service request 1 of fig. 2.

25 Following step 610, if the user entity is configured as a low priority class, or in other respects is commanded to belong to a low priority class, in step 612, the user entity issues an extended service request with a low priority indication, LP_IND, 615.

If, on the other hand, the user entity is not configured as a low priority device, step 612,
30 the user entity method goes to step 613.

According to the invention - if a network initiated SR 611 is responded to, the user entity is obviating or preventing transmitting an ESR 615 with a low priority indication LP_IND, disregarding whether the user entity belongs to or does not belong to a low priority class.
35

In step 613 it is investigated whether the SR is a request for packet switched, PS, or circuit switched, CS, service. If CS, the method goes to step 619, if PS, the method goes to step 616.

- 5 The same investigation is made under step 614, which follows from the network initiated service request 611, in which step 614 it is investigated whether the SR, respectively, is a request for packet switched, PS, or circuit switched, CS, service. If CS, the method goes to step 619, if PS, the method goes to step 616.
- 10 Hence, the method further comprises the steps
- if a network initiated SR 611 for PS service is responded with, issuing a SR 616, and
 - if a network initiated SR 611 for CS service is responded with, issuing an ESR 619 with no low priority indication.
- 15 Following step 612, if the user entity does not belong to a low priority class, it is seen that the method further comprises, according to step 613, the steps of
- if the user entity initiates a mobile initiated SR 610 for PS service, the user entity transmitting a SR 616,
 - if the user entity initiates a mobile initiated SR 610 for CS service, the user entity
- 20 transmitting an ESR 619 without a low priority indication LP_IND.

Accordingly, there is provided a method for a user entity UE_I adapted for interacting with a mobility management entity node MME_I, wherein the user entity is adapted to initiate a mobile initiated service request, SR 610 and being adapted to respond to a

25 network initiated SR 611 corresponding to a paging 601 by said mobility management entity node MME_I.

- The user entity is at least being adapted for transmitting a SR 616, inserting a low priority indication LP_IND in and transmitting an extended service request, ESR, 615, or transmitting an ESR without inserting a low priority indication 619. The method comprises the steps of
- 30 - if the user entity initiates a mobile initiated SR 610 and if the user entity belongs to a low priority class, the user entity responds to the mobility management entity node by transmitting an ESR 615 comprising a low priority indication LP_IND,
- if a network initiated SR 611 is responded to, obviating or preventing transmitting an
- 35 ESR 615 with a low priority indication LP_IND, disregarding whether the user entity belongs to or does not belong to a low priority class.

According to a further embodiment of the invention, the user entity is an E-UTRAN, evolved UMTS Terrestrial Radio Access Network, user entity and the service requests and extended service requests are Non-Access Stratum (NAS) service requests.

5 It should be understood that the low priority indication does not necessarily indicate a low QoS class, but according to one embodiment, at least a low priority class in NAS signalling terms, i.e. messages which are more likely to be subject to delay/reject/discard on a NAS level. It is alternatively envisioned that the priority class can be changed over time according an order of the network. In such a case, the user entity could perform the
10 investigation under step 612.

Advantageously, the user entity could be pre-configured as belonging to a low priority class before being put into operation. For instance, the user entity may be preconfigured and sold as low priority device.

15 It should also be understand that step 612 may not necessarily be investigated by the user entity but rather reflect its behaviour according to which priority class it has been designated.

20 In fig. 7 an embodiment for a method for a mobility management entity node according to the invention is shown.

The mobility management entity node, MME_I, performs prioritization, depending on the status in the network such as non-congested, congested or overload situations. For each
25 service request - or each extended service request - of each individual user entity, the mobility management entity node performs decisions 621 so as to discard or reject the service request or the extended service request 623 or to handle the service request or the extended service request 624, that is, accept the latter request.

30 Fig. 7 shows an initiating 823 of monitoring in the mobility management entity node or the network according to an embodiment of the invention.

In step 824, the load CL in the network, or more specifically in the mobility management entity node, such as the load CTRL_U2_CL in the processor CTRL_U2 in fig. 4 is within
35 at least the following three ranges with regard to at least a first lower threshold T1 and a second higher threshold T2:

CL < T1: go to step 831

T1 <= CL <= T2: go to step 830

T2 <= CL: go to step 832

5

In step 831, the mobility management entity node handles SR's, and ESR's with or without low priority indications.

In step 830, the mobility management entity node rejects / discards ESR with a low priority indication 615, but handle SR's 616 and handle ESR's with no low priority indications.

10 In step 832, the mobility management entity node rejects SR's and ESR's with or without low priority indications.

The steps 831, 830 and 832 correspond to a decision made by the mobility management entity node. This decision may for instance be valid for a decision period, as illustrated in step 820.

15 It is understood that more decisions and finer intervals may be provided in further embodiments of the invention.

In other words, there is provided a method for a mobility management entity node being adapted for handling 624, or rejecting / discarding 623 a service request, SR, as well as being adapted for handling 624 or rejecting / discarding 623 an extended service request, ESR. The method comprises the steps of monitoring 823 a load level CL of the mobility management entity node MME_1 or the load level in a network in which the mobility management entity node resides and performing one decision 831, 832, 830 of

20 - if the load level CL is below a first threshold T1 - handling at least incoming SR's and ESR's with or without a low priority indication 831,

25 - if the load level CL is larger or equal to the first threshold T1 but lower or equal to a second threshold T2 - rejecting / discarding 623 ESR's with a low priority indication LP_IND while handling ESR's without a low priority indication and handling SR's 830.

30 The monitoring 823 of the load level could be implemented by monitoring at least one parameter relating to the load level CL of the management entity node MME_1 or the network.

35 It is understood that the mobility management entity node can take action directly on the reception of service requests and extended service requests.

It is seen that the mobility management entity node can handle important requests in case of network congestion. If the mobility management entity node receives a request from a gateway node to bring a user entity into service from IDLE mode, the mobility management entity node can decide 601, based on its load and congestion situation, if a
5 paging message shall be sent to the user entity to initiate a service request procedure. If the mobility management entity node evaluates the load situation in combination with the knowledge that this is a low priority request, the paging can be rejected by the mobility management entity node.

If a paging request is received by a user entity configured for low priority or for a low priority service, the user entity shall initiate the service request procedure by sending a
10 Service Request message 616 in case of PS and as an extended service request with no low priority indication 619, in case of CS, to the network. As these messages do not contain any low priority indication, they will be handled with normal priority by the mobility management entity node and is less likely to be discarded or rejected in a high load
15 situation.

This behaviour will imply that user entity requests initiated by the network will not be subject to low priority handling when received by the network and also fulfil timing requirements in the radio layer. Thus, in a moderate load situation, c.f. the "congested" state
20 step 830, the network/ mobility management entity can discard/reject low priority requests initiated by user entities 615, e.g. at a signalling flood by low priority devices, and can handle the network initiated requests for service by limiting the paging requests transmitted to the user entities.

25 Apparatuses

In fig. 4, a user entity, UE_1 is shown comprising a control unit, CTRL_1, an internal memory, MEM_1, an interface unit, INT_1, providing a LTE-Uu interface is shown. An internal bus B1 provides communication between the units and the memory. The control
30 unit and memory constitute processing means which is adapted to carry out the method shown according to fig. 6. The processing means could alternatively be implemented by a FPGA (Field Programmable Gate Array) (Not shown). The processing means is adapted to transmit and receive signals on a logical level, whereas the interface means provides signals complying with physical requirements.

According to the invention, there is also provided a user entity, UE_I comprising processing means CTRL_1; MEM_1 and an interface unit INT_1, the user entity UE_I being adapted for interacting with a mobility management entity node MME_I, such as being paged 601 by said mobility management entity node MME_I.

- 5 The user entity is adapted to initiate a mobile initiated service request, SR 610 and being adapted to respond to a network initiated SR 611 corresponding to a paging 601 by said mobility management entity node MME_I.

The user entity is moreover at least being adapted for transmitting a SR 616, inserting a low priority indication LP_IND in and transmitting an extended service request, ESR,
10 615, or transmitting an ESR without inserting a low priority indication 619, wherein
- if the user entity initiates a mobile initiated SR 610 and if the user entity belongs to a low priority class, the user entity responds to the mobility management entity node by transmitting an ESR 615 comprising a low priority indication LP_IND,
- if a network initiated SR 611 is responded to, obviating or preventing transmitting an
15 ESR 615 with a low priority indication LP_IND, disregarding whether the user entity belongs to or does not belong to a low priority class.

In other words it is provided that

- if a network initiated SR 611 for packet switched, PS, service is responded with, the
20 user entity is issuing a SR 616, and
- if a network initiated SR 611 for circuit switched, CS, service is responded with, the user entity is issuing a ESR 619 with no low priority indication.

It is further provided that if the user entity does not belong to a low priority class

- 25 - if the user entity initiates a mobile initiated SR 610 for a packet switched, PS, service, the user entity is transmitting a SR 616,
- if the user entity initiates a mobile initiated SR 610 for a circuit switched, CS, service, the user entity is transmitting an ESR 619 without a low priority indication LP_IND.

- 30 The user entity could using the method above could be constituted by a M2M device. However, the method could also be implemented in regular handheld devices: For instance, it is envisioned that a low price segment of user entities could be associated a low priority class. Operators could for instance offer pre-configured low priority class user entities for a given market segment.

35

In fig. 5, a mobility management entity node, MME_I, according to the invention is shown, comprising a control unit, CTRL_U2, comprising one or more processors, a memory MEM_2 and an interface unit INT_U2 providing at least a S1-MME; a S3; a S6a and a SGs interface. An internal bus B2 is also provided. The control unit and memory
5 constitute processing means which is adapted to carry out the method shown according to fig. 7. The processing means could alternatively be implemented by a FPGA (Field Programmable Gate Array) (Not shown). The processing means is adapted to transmit and receive signals on a logical level, while the interface means transfers signals complying with physical requirements.

10 Hence, according to the invention there is also provided a mobility management entity node MME_I comprising processing means CTRL_U2; MEM_2 and an interface unit INT_U2, the mobility management entity node being adapted for handling 624, or rejecting / discarding 623 a service request, SR, as well as being adapted for handling 624 or
15 rejecting / discarding 623 an extended service request, ESR.

The mobility management entity node being adapted for monitoring 823 a load level CL of the mobility management entity node MME_1 or the load level in a network in which the mobility management entity node resides and performing one decision 831, 832, 830 of

20 - if the load level CL is below a first threshold T1 - handling at least incoming SR's and ESR's with or without a low priority indication 831,
- if the load level CL is larger or equal to the first threshold T1 but lower or equal to a second threshold T2 - rejecting / discarding 623 ESR's with a low priority indication LP_IND while handling ESR's without a low priority indication and handling SR's 830.

25 In a further embodiment - if the load level CL is above the second threshold T2, the mobility management entity node is rejecting / discarding all ESR's with or without a low priority indication and all SR's 832.

30 The monitoring 823 of the load level could involve that management entity node is adapted to monitor at least one parameter relating to the load level CL of the management entity node MME_1 or the network.

35 For instance, the load level could relate to the processor activity in CTRL_U2 in the MME_I. For instance, the first threshold T1 could amount to 70% of the full load and the second threshold T2 could amount to 90% of a full load of the processor capability.

In conclusion the invention caters for that the user entity initiated requests for service with low priority will be subject to lower prioritization handling in the network.

- 5 Network initiated requests for service will enjoy a normal prioritization handling in the network. Network initiated requests for service will be handled with timing properties fulfilling requirements in the Radio Layer.

10 The priority of a user entity response to a paging request will be predictable from a network point of view. Responses to paging will always have normal priority, i.e. if the mobility management entity node pages a user entity, the mobility management entity node will "know" that user entity responds without low priority and the response will not be rejected/ discarded before any other normal priority messages.

- 15 There is no need in the network to correlate a paging request with a received Service Request message to let a low priority response to a paging be treated with different priority from what is indicated.

20 In a wider sense, the invention provides for that the network can control which low priority user entities should be serviced, by selectively sending paging requests to such user entities, which again will result in a normal priority service request. Since the mobility management entity node is in control of the paging procedure handling, it can handle a Service Request and if the mobility management entity node "wants" the user entity back to Connected mode, the mobility management entity node can page the user entity. If
25 the mobility management entity node is overloaded, the mobility management entity node can reject the request from the GW directly.

30

Claims

1. Method for a user entity (UE_I) adapted for interacting with a mobility management entity node (MME_I), wherein the user entity is adapted to initiate a mobile initiated service request, SR (610) and being adapted to respond to a network initiated SR (611) corresponding to a paging (601) by said mobility management entity node (MME_I),
- 5
- the user entity at least being adapted for transmitting a SR (616), inserting a low priority indication (LP_IND) in and transmitting an extended service request, ESR, (615), or transmitting an ESR without inserting a low priority indication (619),
- 10
- wherein the method comprises the steps
- if the user entity initiates a mobile initiated SR (610) and if the user entity belongs to a low priority class, the user entity responds to the mobility management entity node by transmitting an ESR (615) comprising a low priority indication (LP_IND),
- 15
- if a network initiated SR (611) is responded to, obviating or preventing transmitting an ESR (615) with a low priority indication (LP_IND), disregarding whether the user entity belongs to or does not belong to a low priority class.
- 20
2. Method according to claim 1, wherein, the method further comprises the steps
- if a network initiated SR (611) for a packet switched, PS, service is responded with, issuing a SR (616), and
- 25
- if a network initiated SR (611) for a circuit switched, CS, service is responded with, issuing a ESR (619) with no low priority indication.
3. Method according to claim 1 or 2, wherein if the user entity does not belong to a low priority class, the method further comprises the steps
- 30
- if the user entity initiates a mobile initiated SR (610) for a packet switched, PS, service, the user entity transmitting a SR (616),
- if the user entity initiates a mobile initiated SR (610) for a circuit switched, CS, service, the user entity transmitting an ESR (619) without a low priority indication (LP_IND).
- 35

4. Method according to any preceding claim, wherein the user entity is an E-UTRAN, evolved UMTS Terrestrial Radio Access Network, user entity and the service requests and extended service requests are Non-Access Stratum (NAS) service requests.
5. Method according to any preceding claim, wherein the user entity is pre-configured as belonging to a low priority class.
6. A method for a mobility management entity node (MME_1) being adapted for handling (624), or rejecting / discarding (623) a service request, SR, as well as being adapted for handling (624) or rejecting / discarding (623) an extended service request, ESR, the method comprising the steps of
- monitoring (823) a load level (CL) of the mobility management entity node (MME_1) or the load level in a network in which the mobility management entity node resides and performing one decision (831, 832, 830) of
- if the load level (CL) is below a first threshold (T1) - handling at least incoming SR's and ESR's with or without a low priority indication (831),
- if the load level (CL) is larger or equal to the first threshold (T1) but lower or equal to a second threshold (T2) - rejecting / discarding (623) ESR's with a low priority indication (LP_IND) while handling ESR's without a low priority indication and handling SR's (830).
7. A method for a mobility management entity node (MME_1) according to claim 6 wherein the method comprises further the step
- if the load level (CL) is above the second threshold (T2), rejecting / discarding all ESR's with or without a low priority indication and all SR's (832).

8. Method according to claim 6 or 7, wherein said one decision (831, 832, 830) is performed during a decision period (820).
- 5 9. Method according to any of claims 6 - 8, wherein the step of monitoring (823) of the load level involves the monitoring of at least one parameter relating to the load level (CL) in the mobility management entity node (MME_1) or in the network.
- 10 10. A user entity, (UE_I) comprising processing means (CTRL_1; MEM_1) and an interface unit (INT_1), the user entity (UE_I) being adapted for interacting with a mobility management entity node (MME_I), such as being paged (601) by said mobility management entity node (MME_I), and wherein
- 15 the user entity is adapted to initiate a mobile initiated service request, SR (610) and being adapted to respond to a network initiated SR (611) corresponding to a paging (601) by said mobility management entity node (MME_I),
- 20 the user entity at least being adapted for transmitting a SR (616), inserting a low priority indication (LP_IND) in and transmitting an extended service request, ESR, (615), or transmitting an ESR without inserting a low priority indication (619), wherein
- 25 - if the user entity initiates a mobile initiated SR (610) and if the user entity belongs to a low priority class, the user entity responds to the mobility management entity node by transmitting an ESR (615) comprising a low priority indication (LP_IND),
- 30 - if a network initiated SR (611) is responded to, obviating or preventing transmitting an ESR (615) with a low priority indication (LP_IND), disregarding whether the user entity belongs to or does not belong to a low priority class.

11. User entity, (UE_I) according to claim 10, wherein
- if a network initiated SR (611) for packet switched, PS, service is responded with, issuing a SR (616), and
 - if a network initiated SR (611) for circuit switched, CS, service is responded with, issuing a ESR (619) with no low priority indication.
12. User entity, (UE_I) according to claim 10 or 11, wherein if the user entity does not belong to a low priority class
- if the user entity initiates a mobile initiated SR (610) for a packet switched, PS, service, the user entity transmitting a SR (616),
 - if the user entity initiates a mobile initiated SR (610) for a circuit switched, CS, service, the user entity transmitting an ESR (619) without a low priority indication (LP_IND).
13. User entity, (UE_I) according to any of claims 10 - 12, wherein the user entity is an E-UTRAN, evolved UMTS Terrestrial Radio Access Network, user entity and the service requests and extended service requests are Non-Access Stratum (NAS) service requests.
14. User entity, (UE_I) according to any of claims 10 -13, wherein the user entity is pre-configured as belonging to a low priority class.

15. A mobility management entity node (MME_1) comprising processing means (CTRL_1; MEM_1) and an interface unit (INT_U2), the mobility management entity node being adapted for handling (624), or rejecting / discarding (623) a service request, SR, as well as being adapted for handling (624) or rejecting / discarding (623) an extended service request, ESR, the mobility management entity node being adapted for
- monitoring (823) a load level (CL) of the mobility management entity node (MME_1) or the load level in a network in which the mobility management entity node resides and performing one decision (831, 832, 830) of
- if the load level (CL) is below a first threshold (T1) - handling at least incoming SR's and ESR's with or without a low priority indication (831),
 - if the load level (CL) is larger or equal to the first threshold (T1) but lower or equal to a second threshold (T2) - rejecting / discarding (623) ESR's with a low priority indication (LP_IND) while handling ESR's without a low priority indication and handling SR's (830).
16. Mobility management entity node (MME_1) according to claim 15 wherein
- if the load level (CL) is above the second threshold (T2), rejecting / discarding all ESR's with or without a low priority indication and all SR's (832).
17. Mobility management entity node (MME_1) according to claim 15 or 16, wherein said one decision (831, 832, 830) is performed during a decision period (820).
18. Mobility management entity node (MME_1) according to any of claims 15 - 17, wherein the monitoring (823) of the load level involves the monitoring of at least one parameter relating to the load level (CL) in the mobility management entity node (MME_1) or in the network.

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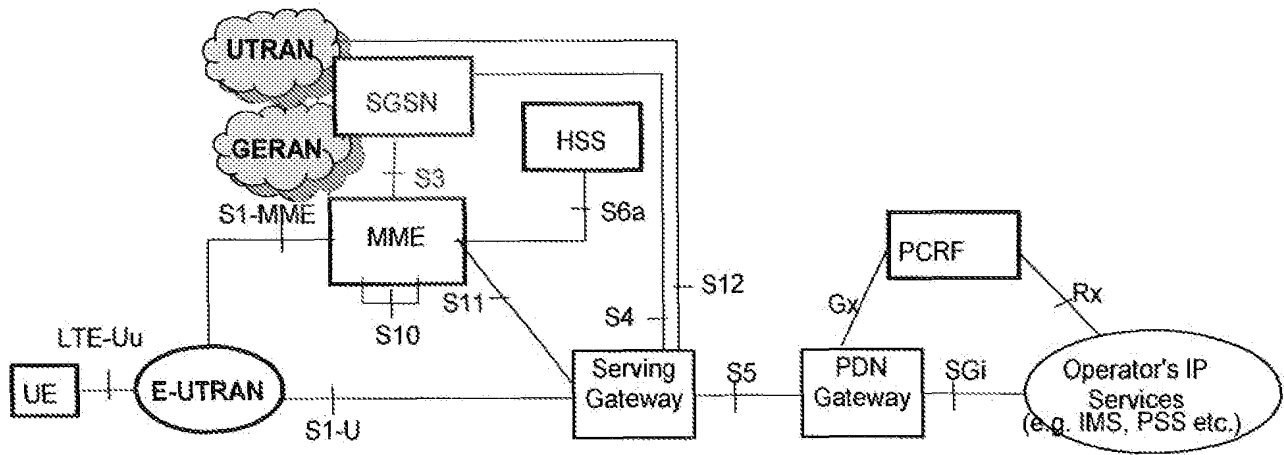


FIG. 1 - TS23.401 V.10.2.1 - 2011-01 - FIG. 4.2.1-1 - PRIOR ART

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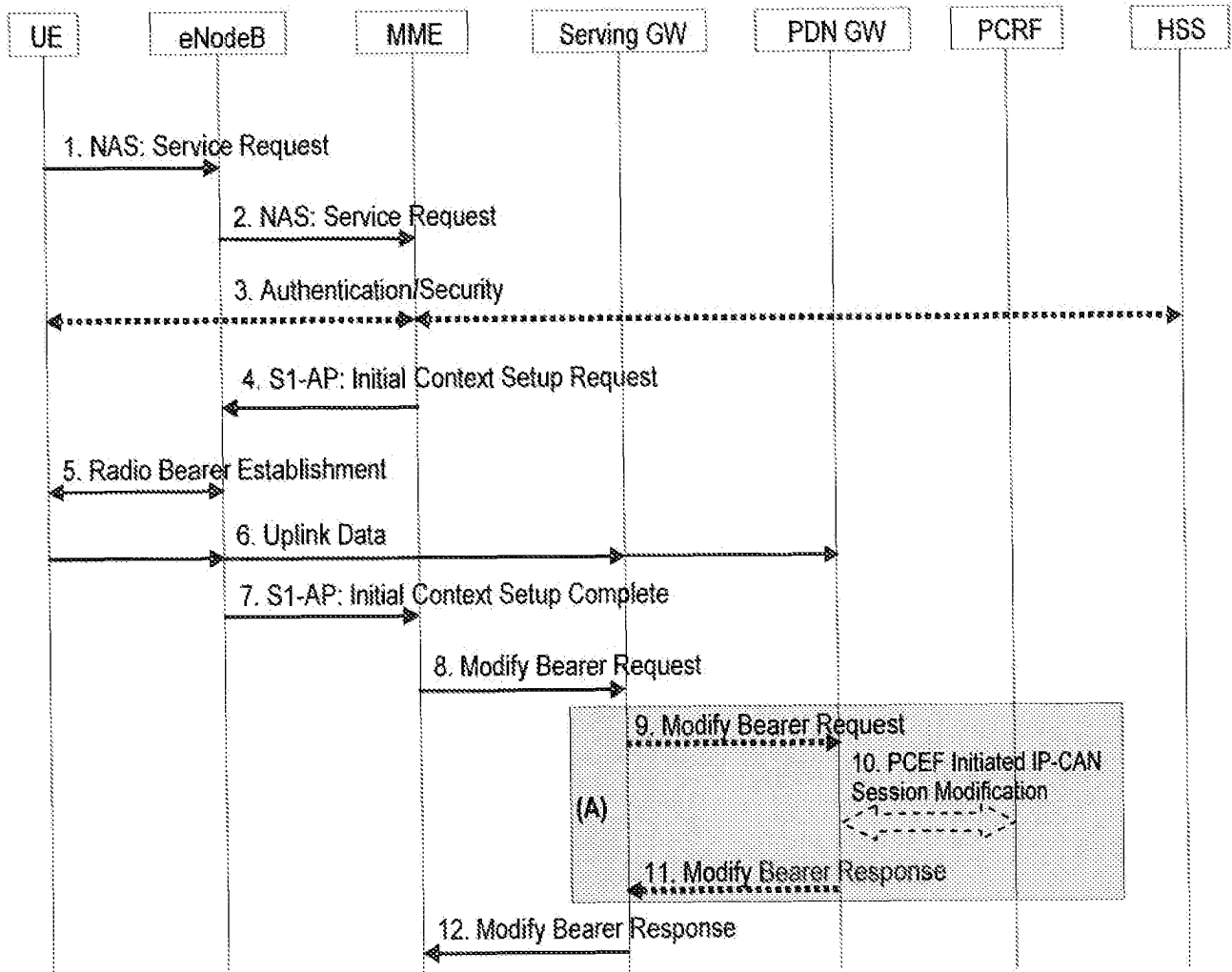


FIG. 2 - CORRESPONDING TO TS23.401 V10.2.1 FIGURE 5.3.4.1-1: UE TRIGGERED SERVICE REQUEST PROCEDURE

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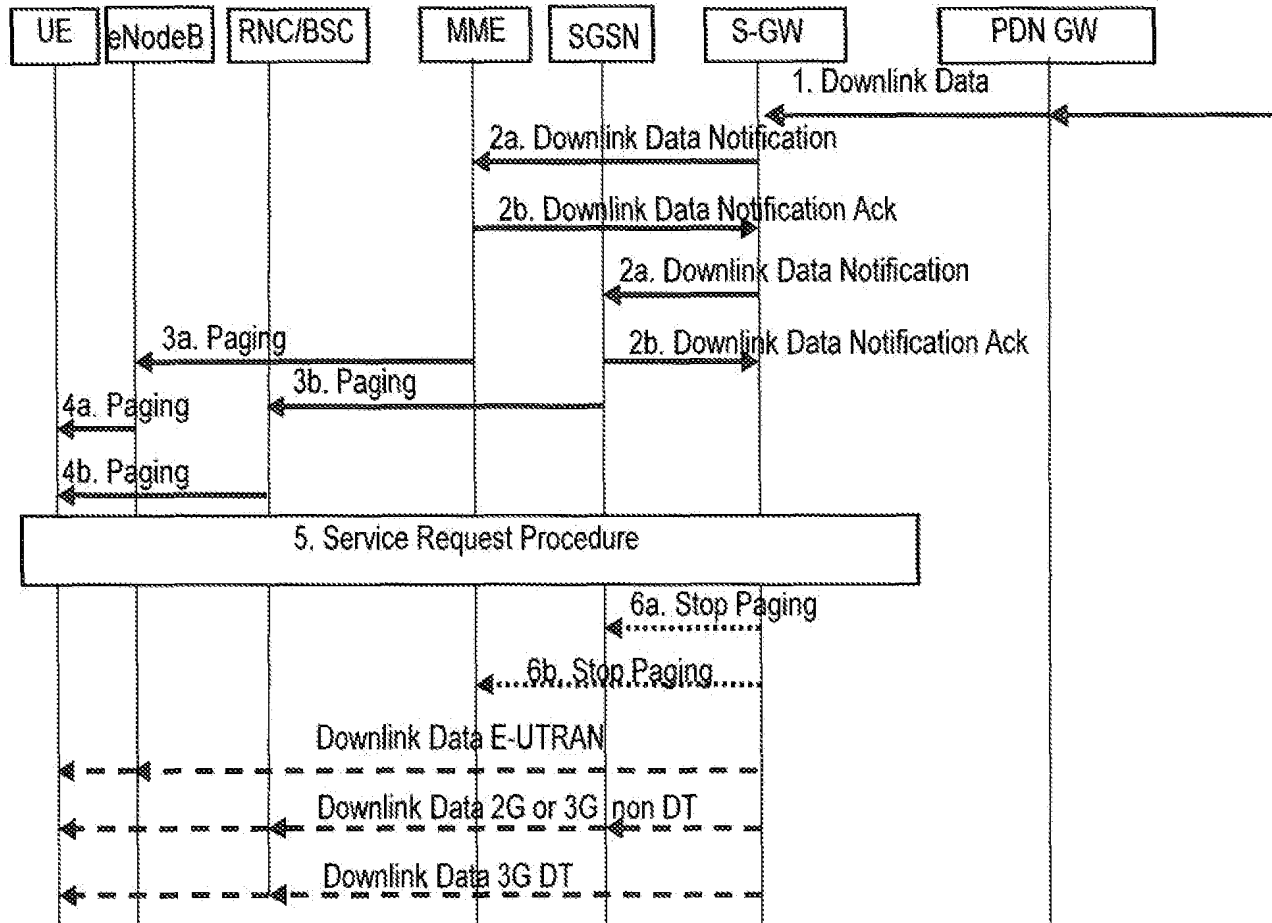


FIG. 3 - CORRESPONDING TO TS23.401 V10.2.1 FIGURE 5.3.4.3-1: NETWORK TRIGGERED SERVICE REQUEST PROCEDURE - PRIOR ART

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FIG. 4

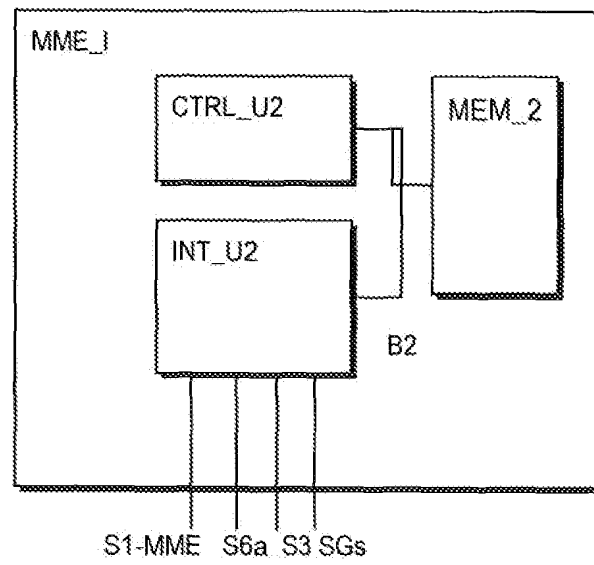
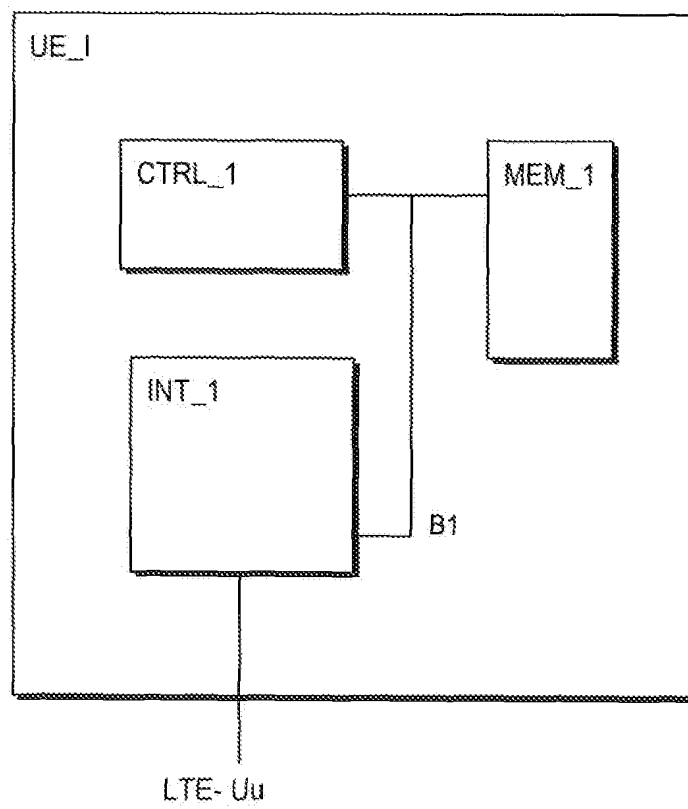


FIG. 5



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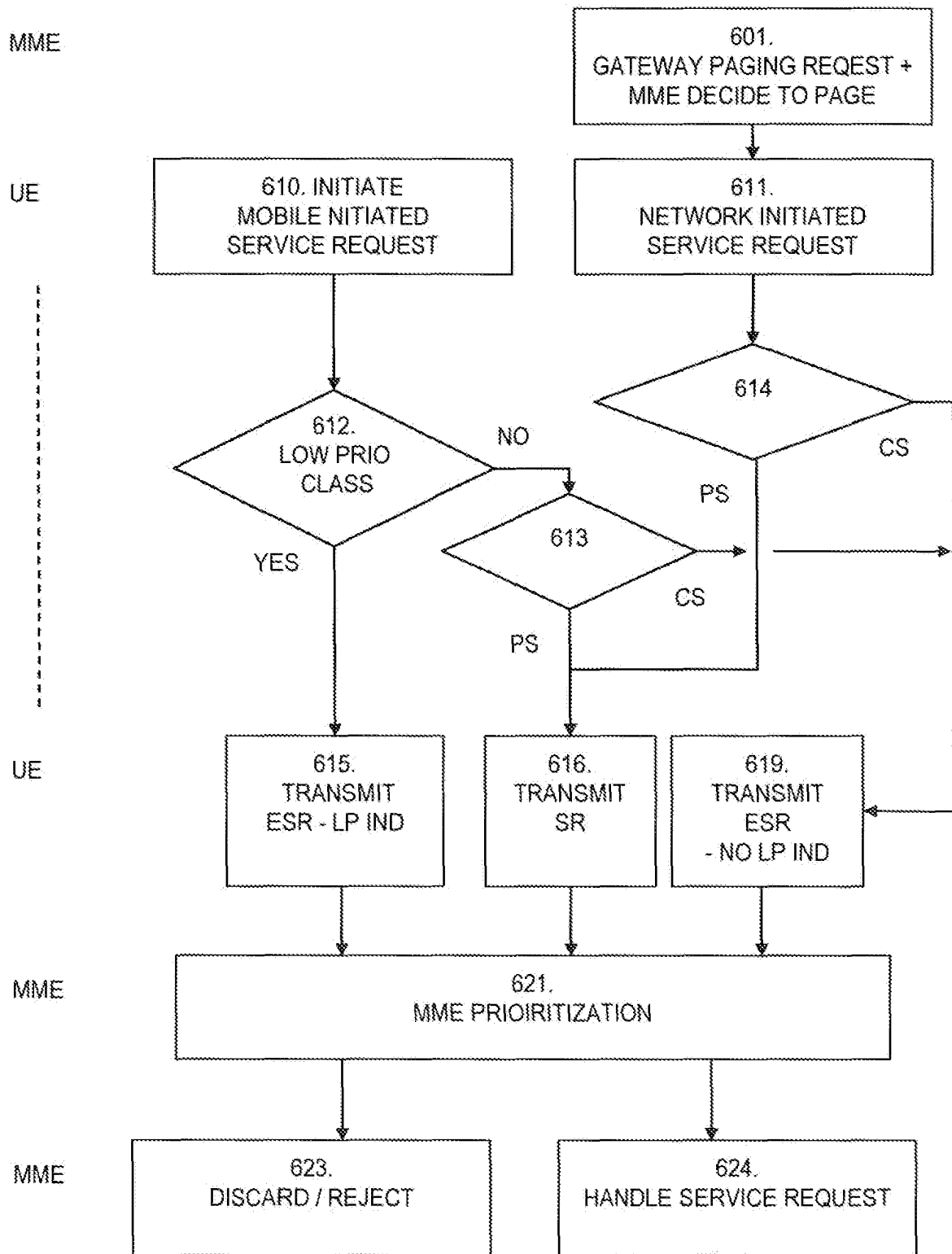


FIG. 6

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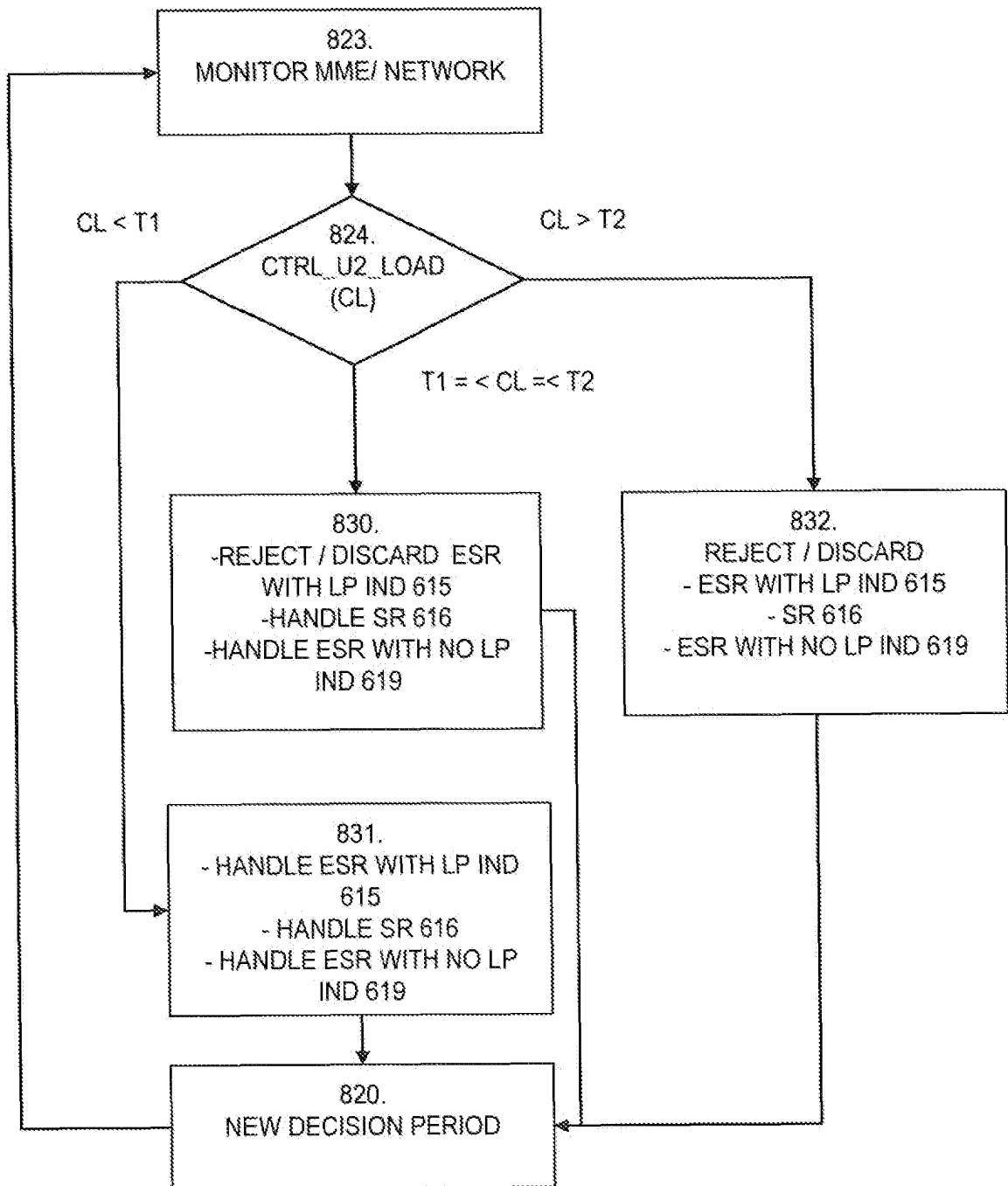


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2011/055010

A. CLASSIFICATION OF SUBJECT MATTER
 INV. H04W76/02
 ADD.

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)

H04W

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

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

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>3GPP TSG CT WG1: "NAS signalling low priority indicator in the Paging Response message", 3GPP DRAFT; C1-111501, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. CT WG1, no. Salt Lake City; 20110221, 28 February 2011 (2011-02-28), XP050480830, [retrieved on 2011-02-28] see overall description</p> <p style="text-align: center;">----- -/--</p>	1-18



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2011/055010

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>NOKIA SIEMENS NETWORKS ET AL: "Low priority indicator CT1", 3GPP DRAFT; S2-105495-LOWPRIORITYINDICATOR-DISC, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. SA WG2, no. Jacksonville; 20101115, 19 November 2010 (2010-11-19), XP050470174, [retrieved on 2010-11-19] Analysis of stage 2 requirement -----</p>	1-18
A	<p>ERICSSON ET AL: "Normative NIMTC text for low priority access", 3GPP DRAFT; S2-104034, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. SA WG2, no. Brunstad; 20100903, 3 September 2010 (2010-09-03), XP050459080, [retrieved on 2010-09-03] 4.3.X.Z -----</p>	6
X	<p>ZTE: "Adding New EMM Cause Value for NIMTC Overload Control", 3GPP DRAFT; C1-104809 ADDING A NEW EMM CAUSE VALUE FOR MTC OVERLOAD CONTROL 24.301, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. CT WG1, no. Jacksonville; 20101115, 8 November 2010 (2010-11-08), XP050479075, [retrieved on 2010-11-08] section: reason for change -----</p>	6
A	<p>ZTE: "Enhancements for CN Overload control", 3GPP DRAFT; R3-103353 ENHANCEMENTS FOR CN OVERLOAD CONTROL-V1, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. RAN WG3, no. Jacksonville, USA; 20101115, 9 November 2010 (2010-11-09), XP050496692, [retrieved on 2010-11-09] chapters 1 and 2 ----- -/--</p>	6

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2011/055010

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>ALCATEL-LUCENT: "NIMTC distinction of overload versus congestion", 3GPP DRAFT; S2-105387 23060 MTC OLOAD CONGESTION, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. SA WG2, no. Jacksonville; 20101115, 9 November 2010 (2010-11-09), XP050522792, [retrieved on 2010-11-09] page 2, paragraph 3</p> <p>-----</p>	5
A	<p>ALCATEL-LUCENT: "NIMTC - MME/SGSN overload control by DL MTC traffic throttling", 3GPP DRAFT; S2-102488, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. SA WG2, no. Kyoto; 20100510, 4 May 2010 (2010-05-04), XP050434634, [retrieved on 2010-05-04] the whole document</p> <p>-----</p>	1,6,10, 15
A	<p>ERICSSON ET AL: "Mobility management congestion control and back-off timer", 3GPP DRAFT; C1-111522 MM-BACKOFF 24301, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. CT WG1, no. Salt Lake City; 20110221, 28 February 2011 (2011-02-28), XP050480850, [retrieved on 2011-02-28] chapter 5.3.x</p> <p>-----</p>	9,18
A	<p>ALCATEL-LUCENT: "NIMTC S-GW and P-GW overload controls", 3GPP DRAFT; S2-105388 23401 MTC SGW PGW OLOAD, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, vol. SA WG2, no. Jacksonville; 20101115, 9 November 2010 (2010-11-09), XP050467821, [retrieved on 2010-11-09] reason for change</p> <p>-----</p>	1,6,10, 15

Method and node for establishing priority connections in
telecommunication networks

5 Technical field of the invention

The present invention relates to a method according to the preamble of claim 1. Devices and software programs embodying the invention are also described.

10

Background of the invention

Both for mobile telecommunication networks, e.g. UMTS (Universal Mobile Telecommunication System) or GSM (Global System for Mobile communication) networks, and for fixed networks, the Bearer Independent Call Control (BICC) protocol is used to control the set-up and establishment of connections, e.g. telephone calls, independent of the underlying bearer technology for handling the payload of the connections.

20 BICC Capability Set 3 is introducing a priority service as specified in ITU-T Recommendation I.255.4, *Integrated Services Digital Network (ISDN) General Structure and Service Capabilities, Priority Service*. When congestion is encountered, priority connections shall be given preferential treatment within the network for the priority service. Such preferential treatment can especially include the functions of an extended waiting time before time-out of network units handling the connection and/or waiting for a line on the route to become free.

25 The priority of a connection can be indicated by a corresponding field in the initial message for the connection set-up, e.g. an initial address message (IAM).

30

2

For example, some or all bits of an octet in the IAM can be designated for this purpose.

Under normal conditions when the network is not congested and the nodes
5 have the necessary resources to complete all connections, the connection
establishment is processed without special treatments. At least one node
processing, i.e. controlling or handling the connection attributes a timer to it,
which ensures that resources reserved for said connection are released should
the set-up fail. A node controlling the connection can be for example an MSC
10 (Mobile Services Switching Center) or a transit-switching node (TSN)
connecting a mobile network to a fixed network. The bearer can either be
handled in the same node or in a separate bearer node, e.g. in a media
gateway (MGW), which is at least partly controlled by the controlling node.

15 In case of network congestion when the nodes do not have sufficient resources
to complete all incoming connection establishment requests, the nodes can give
preferential treatments based on the priority level. The preferential treatment
can especially include access to reserved network resources, e.g. only the
highest priority connections are given access to the resources reserved for
20 highest priority connections while the second priority connections are given only
access to resources reserved for the second priority connections, excluding the
resources reserved for the highest priority connections. Further priority levels
are possible, connections for each level having only access to resources
reserved for the same or a lower level.

25 Allocation of reserved network resources to specific priority levels is
implementation specific. If a node cannot complete a high priority connection
establishment request even after application of the preferential treatment, it
clears the connection.

30

3

Nodes with interaction to the served user, especially the originating control or bearer node in a connection, can receive the connection priority information from the user. The originating node then forwards the information to further nodes in the connection. For example in BICC, when an outgoing protocol entity instance of a bearer node receives the connection priority information along with a request for a new connection from a nodal function, the connection priority parameter is included in the ERQ message (Establish Request). If a connection priority parameter is received in an ERQ message by an incoming protocol entity, the incoming protocol entity instance passes the connection priority information to the nodal function along with the request for a new connection.

The priority information can be used in the nodes in different ways. For example, when the nodal functions select a route at the originating endpoint of the bearer, priority information can be used to select a route that has sufficient resources to the succeeding bearer node or directly to the terminating user. For bearer nodes without interaction to the originating user of a connection, the nodal functions can also check the availability of resources in the incoming bearer path. The connection priority information can further be used to allocate internal resources of the bearer node to establish an internal path for the connection from the incoming bearer path through the bearer node to the outgoing bearer path, either to a subsequent bearer node or to the terminating user of the connection.

The above specifications for a telecommunication network allow to handle connections with the corresponding priority in all nodes. However, this does often not ensure a successful establishment of priority connections. Especially, it is possible that different nodes use different mechanisms for ensuring connection priority, especially if nodes in different parts of a network are updated at different times, e.g. by different operators. In this case it is possible that a connection is queued in a first node, i.e. waiting for free resources to become available in said or another node, while a timer for said connection

expires in a still further node. Even if each node handles the connection with priority, it is therefore still possible that a connection is not successfully established. It is also possible that the user requesting the connection terminates the request if the establishment takes an excessive time due to
5 queuing.

Summary and description of the invention

10 It is an object of the present invention to obviate the above disadvantages and provide a method, a communication system and a node, which allow a safe establishment of priority connections.

According to the invention, the method described in claim 1 is performed.

15 Furthermore, the invention is embodied in a communication network, a node and a software program as described in claims 9 to 11. Advantageous embodiments are described in the further claims.

An advantageous method for establishing a priority connection in a
20 telecommunication network with a plurality of nodes for processing the connection is described. The processing can be a handling or a controlling of the connection. The nodes can accordingly be control nodes or bearer nodes or nodes handling both control signaling and bearer establishment. The nodes comprise resources, which can be attributed for handling or controlling the
25 connection. For each connection request, resources are attributed in the node. The resources can for example comprise circuitry to process the connection, allocated memory or processing intervals or software identifiers like addresses.

At least one timer in the node supervises the connection establishment. It is
30 possible that more than one timer is attributed to a connection, e.g. for supervising different aspects of the establishment of said connection relating to

the control signaling and the bearer establishment. An expiry of any of said timers releases the resources attributed to the connection.

For every timer, an expiry value is specified to avoid the blocking of resources if the request for connection establishment fails. When a first of said nodes receives a request to set up a priority connection, the first node selects a first of said timers according to an expiry value specified for priority connections, generally being different from the expiry value of the corresponding timer for regular connections. In a preferable embodiment of the method, the period for timer expiry is increased compared to a regular connection, i.e. a later timer expiry is specified for a priority connection. It is possible, that different timers attributed to a priority connection have different expiry values.

The first node sends an indication of the connection priority and a queuing indication to a further node controlling the connection. The queuing indication is a notification that at least one special expiry value was selected for this connection. The queuing indication can be for example an indication, that a queuing of priority call attempts can be accommodated by the preceding nodes, a flag that at least one timer was extended, or an information specifying which timers were selected, optionally including also an indication of the amended expiry value. The further node checks whether an indication of a connection priority and a queuing indication is received. The further node selects, according to the result of the check, at least one further of said timers according to an expiry value specified for priority connections, i.e. the expiry value for priority connections is selected if a queuing indication and a priority indication is received. For both the first and the further node it is possible, that the selection of the timers and corresponding expiry values depends on the value of the connection priority indication.

The proposed method enables to extend network timers without the danger of an unintended release of the connection. The method is easy to implement and

can flexibly be adapted to different queuing requirements. The method is especially suitable for use within a BICC network.

- In a preferable embodiment, the request is the initial message to set up a connection and said initial message comprises a data field indicating a priority class for the connection. The initial message is for example an IAM. The data field or specified values or selected bits of the data field can be used to indicate different levels of connection priority, e.g. an emergency call.
- 5
- 10 Said plurality of nodes can comprise control nodes controlling the connection, e.g. an MSC server, and bearer nodes adapted to establish a bearer for the connection, e.g. an MGW. It is, however, also possible that a node both controls the connection and establishes bearers like a customary MSC.
- 15 It is correspondingly possible that the first and the further node both control the connection, that both nodes handle the bearer for the connection or that one node controls the connection while the other node handles the bearer. Therefore different queuing indications in the control level, in the bearer level and between both levels for the connection can be distinguished. In an
- 20 advantageous embodiment, the queuing indication is contained in a group comprising a first queuing indication for messages between nodes controlling the connection, a second queuing indication for messages between nodes handling the connection and a third queuing indication for a message between a node handling the connection and a node controlling the connection. It is either
- 25 possible to amend existing messages in the used protocols to comprise these indications or to define new messages for this purpose.

- In order to avoid a premature release of the connection by the user, the further node replies to the queuing indication with a connection progress notification.
- 30 The connection progress notification can be forwarded by the nodes processing the connection in the direction of the party requesting the priority connection. It

is possible that the sending of this message is delayed by a specified period of time. Especially, the connection progress notification can initiate the sending of a tone or an announcement to the party requesting the priority connection.

- 5 Often different nodes will handle or control a connection, wherein some of the nodes are adapted to the queuing of connections while others of the nodes are not. In this case, the further node sends a first request to set up the connection and the indication of the connection priority and the queuing indication to a third node processing the connection, preferably all in a single message. The third
10 node then rejects the queuing indication as unsupported to the further node. The further node waits for a confirmation of a bearer establishment for said connection and sends a further request to set up the connection and a further indication of the connection priority to the third node, if a release message is received from the third node for said connection. In this way, an establishment
15 of priority connections can also be ensured if a node in the connection is not adapted to the queuing of connections.

- In the proposed method, it is possible to specify an infinite expiry time for a priority connection. In this case, the selection of the first or the further timer can
20 be a decision that no timer for releasing the resources is attributed to a priority connection. It is of course also possible to use extended timers for supervising one aspect of priority connections while supervising a different aspect only for regular connections, i.e. to attribute a reduced number of, optionally extended, timers to priority connections. If an infinite expiry time is specified, preferably a
25 mechanism to detect and release unsuccessful connection establishment requests is implemented in the communication system to avoid the blocking of resources.

- 30 A preferable node for processing connections in a telecommunication network with a plurality of nodes comprises resources, which can be attributed for

processing the connection and at least one timer for supervising the connection establishment. An expiry of the timer initiates a release of the resources attributed to the connection. The node comprises also interfaces to receive a request to set up a priority connection and to send messages to further nodes, i.e. transmission and reception units for sending and receiving messages. The node comprises a processing system which is adapted to select the at least one timer according to an expiry value specified for priority connections. The node is also adapted to send an indication of the connection priority and a queuing indication being indicative of the timer selection to a further node processing the connection.

The proposed method can also be embodied in a program unit adapted for execution in the processing system of a node for processing connections in a telecommunication network with a plurality of nodes. The program unit comprises code for attributing resources to the connection for processing the connection and at least one timer for supervising the connection establishment. An expiry of the timer initiates a release of the resources attributed to the connection. The program unit is adapted to select the at least one timer according to an expiry value specified for priority connections. The program unit is also adapted to send an indication of the connection priority and a queuing indication for the timer selection to a further node processing the connection. The steps performed by the processing unit can be executed by function calls to an operating system or commands to hardware units in the node.

The program unit as well as the node can perform any steps relating to the respective node in the method described above. A program unit according to the invention is for example stored on a data carrier or loadable into the operating system of a node, e.g. as a sequence of signals.

The foregoing and other objects, features and advantages of the present invention will become more apparent in the following detailed description of preferred embodiments as illustrated in the accompanying drawings.

5

Brief description of the drawings

Fig. 1 shows the consequence of queuing priority connection requests in the state of the art

10 Fig. 2 shows a first embodiment for extending network timers for priority connections

Fig. 3 shows a successful queuing of a priority connection at the control layer with extended network timers and subscriber notification according to the invention

15 Fig. 4 shows a successful queuing of priority connections at the bearer layer with extended network timers and subscriber notification according to the invention

Fig. 5 shows a successful queuing of priority connection when inter-working with a subsequent node or network that does not support queuing

20

Detailed description of preferred embodiments of the invention

According to ITU_T specifications different timers are used for the supervision
25 of a connection establishment. All timers ensure, that resources reserved for a connection during the set-up and establishment are released in case of a failed connection attempt. Timer t1, also denoted Timer_ERQ, ensures that a reply to a bearer establishment request is received. A typical time-out value is 5-30 seconds. The timer t1 is started when an ERQ message is sent and stopped at
30 the receipt of an ECF (Establish Confirm) message. If timer t1 expires, all resources and the connection are released and a release message (REL) is

sent. Timer t1 is the bearer establishment supervision timer for the Q.2630.1 bearer control protocol as defined in ITU-T Recommendation Q. 2630.1 (12/99), *AAL Type 2 Signaling Protocol (Capability Set 1)*. Other bearer control protocols have similar supervision timers that can initiate premature connection release.

- 5 Throughout the text these timers are generically referred to as “bearer establishment supervision timers”.

A timer denoted T7 ensures that the network has enough routing information to route the connection to the called party. A typical time-out value is 20-30
10 seconds. Timer T7 is started in the control level when the latest address message is sent and stopped when the condition for normal release of address and routing information is met, e.g. the receipt of a message ACM (Address Complete Message) or CON (Connect). At expiry, a release procedure for the resources attributed to the connection is initiated.

15

In the connection control level, a timer denoted T8 ensures the supervision of the bearer path establishment. A typical time-out value is 10-15 seconds. Timer T8 is started when the CSF (Call Service Function) at a Serving Node (SN) receives an IAM indicating that a continuity message (COT) is to be expected
20 and stopped at receipt of the COT. At expiry, a release procedure for the reserved resources is initiated.

In the following, AAL2 (ATM Adaptation Layer Type 2) bearer technology utilizing Q.2630.2 (ITU-T Recommendation Q. 2630.2 (12/2000), *AAL Type 2
25 Signaling Protocol (Capability Set 2)*) as bearer control protocol is used as an example for a connection bearer. However, it should be noted that any other suitable bearer protocol, e.g. the Internet Protocol IP, can be used and also a different bearer control protocol compared to the examples.

30 The upper parts of all figures indicate nodes for processing the connection while the lower part of the figures shows examples of messaging sequences between

the nodes. Corresponding reference signs in different figures relate to corresponding features. All figures in this specification show gateway serving nodes 1, 2 (GSN) comprising both connection control entities designated CSF and bearer handling units denoted BCF (Bearer Control Function). However, it is also possible that control and bearer handling entities are implemented in different nodes.

In a BICC network, several network timers need to be extended in order to allow a priority handling of connections by queuing. Figure 1 shows the consequence of not extending the network timers while queuing a priority connection establishment request. In figure 1, a connection is set up between two control nodes 1, 2 starting with an initial address message (IAM) comprising a priority indication. It is possible that the first node 1 receives an IAM from a preceding node in the connection as indicated on the left side of figure 1.

Corresponding timers T7 and T8 are started in the control level at times ST7, ST8, respectively. Both nodes 1,2 send also ADD requests to the bearer layer to initiate the bearer establishment. In the bearer level, establishment requests indicating also a priority connection are used to initiate the bearer establishment. A congestion CG is encountered at an intermediate AAL2 bearer switching node 3 with a Bearer Control Function (BCF) designated BCF-R. If the connection establishment request is queued waiting for resources to become free in BCF-R, the timer t1 in BCF-G (z) of node 2 will expire at time TO1 and the connection will be cleared by a corresponding notification message for BNC (Backbone Network Connection) release to the control level in node 2 and a subsequent release message (REL) to all preceding nodes controlling the connection. This is obviously an undesirable result for a connection that has high priority. If either timer BICC T7 or BICC T8 expired instead of timer t1 because they may be set to shorter timeout values, the result would be the same, i.e. the connection is released.

Several approaches can be taken to avoid that network timeouts occur. Either the BICC T7, T8 and bearer establishment supervision timers are not started for priority connections. Alternatively, the expiry values of BICC T7, T8 and bearer establishment supervision timers are extended or the timers are replaced by
5 timers having longer time periods for priority connections. The proposed method can use either alternative or both if several timers are selected. When timers are inhibited, the connection establishment is not being time supervised and hanging resources must be avoided by an appropriate procedure. Therefore, extended timers are generally preferable.

10

If queuing is supported in the originating node, then the timers are extended or inhibited and a queuing indication is set. In all further nodes that support queuing, the corresponding timers should also be extended or inhibited. This is shown in figure 2. Here, in the first node 1, an extended timer is started at time
15 SE7 instead of timer T7. The priority indication in the IAM is used to indicate that the connection is to be treated with priority. The connection can be given priority in a number of ways that do not involve queuing. One is the reservation of special resources that can only be used by high priority connections. Another way of providing a priority service is connection preemption, i.e. clearing of
20 lower priority connections. Neither of these techniques requires the extension of timers. Even if some nodes in a network do not implement queuing, a connection can be handled with priority using these other techniques while the queuing indication is needed to determine if a priority connection can be
25 queued.

25

For this reason, there needs to be also an indication that timers have been extended or inhibited. This indication tells subsequent nodes involved in the connection establishment that queuing of priority connections can be
30 accommodated.

30

When node 2 in figure 2 receives both the priority indication and the queuing indication in the IAM, it starts an extended timer at time SE8 before sending the ADD request to the BCF for establishing the bearer. The ADD request is used to add a termination, i.e. a further source or sink of payload, to a context, i.e. to the group of all terminations associated with a connection. The ADD request may also be used to modify default properties or capabilities or initiate new properties on the termination being added. Details are described in specification ITU-T Recommendation H.248 (06/00), *Gateway control protocol*, Section 7.2.1. The ADD Response is used to indicate successful or unsuccessful completion of the addition of a termination to a context.

The changes required for the extension or inhibition of network timers and the queuing indication need to be introduced into all bearer control protocols that are to support the queuing of bearer establishment requests and especially into the BICC protocol. Either new or a modified messages in the bearer control protocols can indicate that a connection request has been queued. Also the protocol used between the bearer level and the connection level must be updated with a new event to notify the connection level that queuing of the bearer establishment request has occurred.

20

With these enhancements, a BICC network is able to tolerate queuing of priority connection attempts without premature release. However, subscriber behavior must also be taken into account. If the calling subscriber does not receive any progress information within a reasonable time during the connection establishment, i.e. if there is an excessive post-dialing delay, the calling subscriber might get impatient and hang up. Figure 2 exemplifies this case by message Sub originating from the subscriber and triggering a release of the connection by a sequence of REL messages to all nodes controlling the connection.

30

The calling subscriber is expecting to receive a connection-progress notification. This can be for example a tone, an announcement or a message. When a node decides to queue a priority connection, a mechanism is required to trigger the sending of this connection progress information. In BICC networks, connection
5 progress information can be sent using out-of-band signaling between the controlling nodes. In order to know when to send this information, the control layer needs an information whether the establishment attempt is being queued.

If the control layer queues the establishment request as in figure 3, then it
10 generates a connection in progress notification or a queuing initiated APM (Application Transport Mechanism) for initiating, e.g., a call-in-progress tone to the user requesting the connection when node 2 queues the connection establishment request. This can be the case if a resource congestion CG' is encountered already in the control layer. If the resource congestion is ended at
15 time CGE', the bearer establishment, using extended timers t1 started at times SE1, SE1', is initiated by an ADD message and the IAM with queuing and priority parameters is forwarded to the subsequent control node in the connection. After receiving the notification of the established bearers, a COT message is sent to the subsequent control node to indicate the successful
20 bearer establishment for the bearers up to control node 2. After receiving the Address Complete Message (ACM) from the subsequent control node in the connection, node 2 sends a message APM to the preceding control node to switch the call-in-progress tone off, followed by the customary ACM to preceding node 1 as well as any further preceding control nodes.

25

It is also possible that the bearer layer queues the establishment request as shown in figure 4, e.g. if a resource congestion CG is encountered at node 3. Then a second queuing indication 5 is required to be passed from the place of
30 congestion CG through the bearer network and then a third queuing indication 6 from the bearer level to the control level when the connection establishment

request is queued. This indication from the bearer level, that queuing is performed, needs to be mapped by the connection layer to the connection in progress notification or queuing initiated APM. The further messages IAM, ADD, ERQ, APM and ACM correspond to those as described with respect to figure 3.

5

Instead of mapping the indication 6 that queuing has occurred to a tone in node 2, a corresponding indication can be passed backwards toward the calling party. This indication can then be either passed to the terminal of the user or mapped to a tone or announcement by any of the preceding nodes that have the capability to do so. Also, a notification does not need to be sent immediately when the connection is first queued, but instead it can be delayed by a defined time, e.g. X seconds after the queuing is performed. Of course, the latter alternatives are possible for any congestion, e.g. for a congestion encountered on the control level as described with respect to figure 3.

15

Figure 5 shows the situation in which nodes adapted to the proposed method are inter-working with control nodes according to the state of the art. Queuing is not supported in a third node 4 and the third node 4 does not recognize the queuing indicator. Correspondingly, the third node 4 rejects the queuing indication as being unsupported with message CFN (confusion) and starts an ordinary timer T8 at time ST8'. The further node 2 stores in a memory that the queuing indication is unsupported in the subsequent third node 4. The call establishment is queued in the further node 2 until the bearer has been established up to the bearer control nodal function (BCF-N) in the further node 2 or under it's control as described above. The call establishment is then continued toward the third node 4 with an initial address message comprising the priority indication but no queuing indication. The IAM is sent if the timer T8 expires prematurely in the third node 4 and an according release message is received in node 2. If no release message REL is received by further node 2, a further IAM is not sent.

The above embodiments admirably achieve the objects of the invention.
However, it will be appreciated that departures can be made by those skilled in
5 the art without departing from the scope of the invention which is limited only by
the claims.

Claims

1. Method for establishing a priority connection in a telecommunication network
5 with a plurality of nodes (1 - 4) for processing the connection, wherein the nodes (1 - 4) comprise resources which can be attributed for processing the connection and a timer for supervising the connection establishment, an expiry of the timer releasing the resources attributed to the connection, wherein a first of said nodes (1 - 4) receives a request to set up a priority
10 connection, characterized in that the first node (1) selects a first of said timers according to an expiry value specified for priority connections, the first node (1) sends an indication of the connection priority and a queuing indication for the timer selection to a further node (2) processing the
15 connection, and the further node (2) checks whether an indication of a connection priority and a queuing indication is received and selects, according to the result of the check, a further of said timers according to an expiry value specified for priority connections.
20
2. Method according to claim 1, wherein the request is the initial message to set up a connection and said initial message comprises a data field indicating a priority class for the connection.
- 25 3. Method according to claim 1 or 2, wherein said plurality of nodes (1 - 4) comprises control nodes controlling the connection and bearer nodes (3) adapted to establish a bearer for the connection.
4. Method according to claim 3, wherein the queuing indication is contained in
30 a group comprising a first queuing indication for messages between nodes controlling the connection, a second queuing indication (5) for messages

between nodes handling the connection and a third queuing indication (6) for a message between a node handling the connection and a node controlling the connection.

- 5 5. Method according to any preceding claim, wherein the further node replies to the queuing indication with a connection progress notification.
6. Method according to claim 5, wherein the connection progress notification initiates the sending of a tone to the party requesting the priority connection.
- 10 7. Method according to any preceding claim, wherein the further node (2) sends a first request to set up the connection and the indication of the connection priority and the queuing indication to a third node (4) processing the connection, the third node (4) rejects the queuing indication as
- 15 unsupported to the further node (2), and the further node (2) waits for a confirmation of a bearer establishment for said connection and sends a further request to set up the connection and a further indication of the connection priority to the third node (4), if a release message is received from the third node (4) for said connection.
- 20 8. Method according to any preceding claim, wherein an infinite expiry time is specified for a priority connection and wherein the selection of the first or the further timer is a decision that no timer or a reduced number of timers is attributed to a priority connection for releasing the resources.
- 25 9. Communication network adapted to perform a method according to any preceding claim.
- 30 10. Node for processing connections in a telecommunication network with a plurality of nodes, wherein the node (1, 2) comprises resources which can be attributed for processing the connection and at least one timer for

supervising the connection establishment, an expiry of the timer releasing the resources attributed to the connection, and interfaces to receive a request to set up a priority connection and to send messages to further nodes (1 - 4), characterized in that

- 5 the node (1, 2) is adapted to select the at least one timer according to an expiry value specified for priority connections,
the node (1, 2) is adapted to send an indication of the connection priority and a queuing indication for the timer selection to a further node (1 - 4) processing the connection.

10

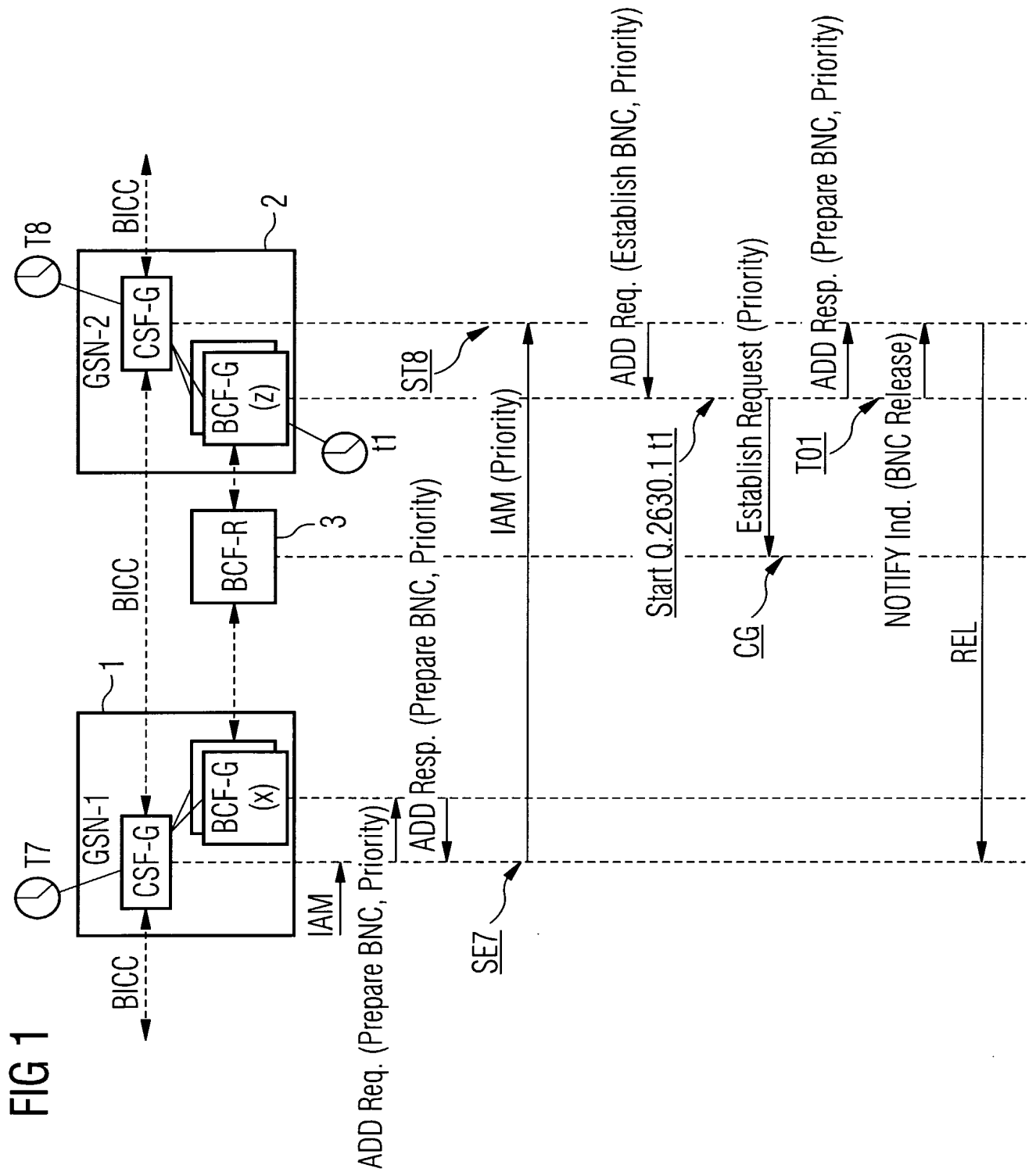
11. Program unit adapted for execution in a node for processing connections in a telecommunication network with a plurality of nodes (1 – 4), and comprising code for attributing resources to the connection for processing the connection and at least one timer for supervising the connection

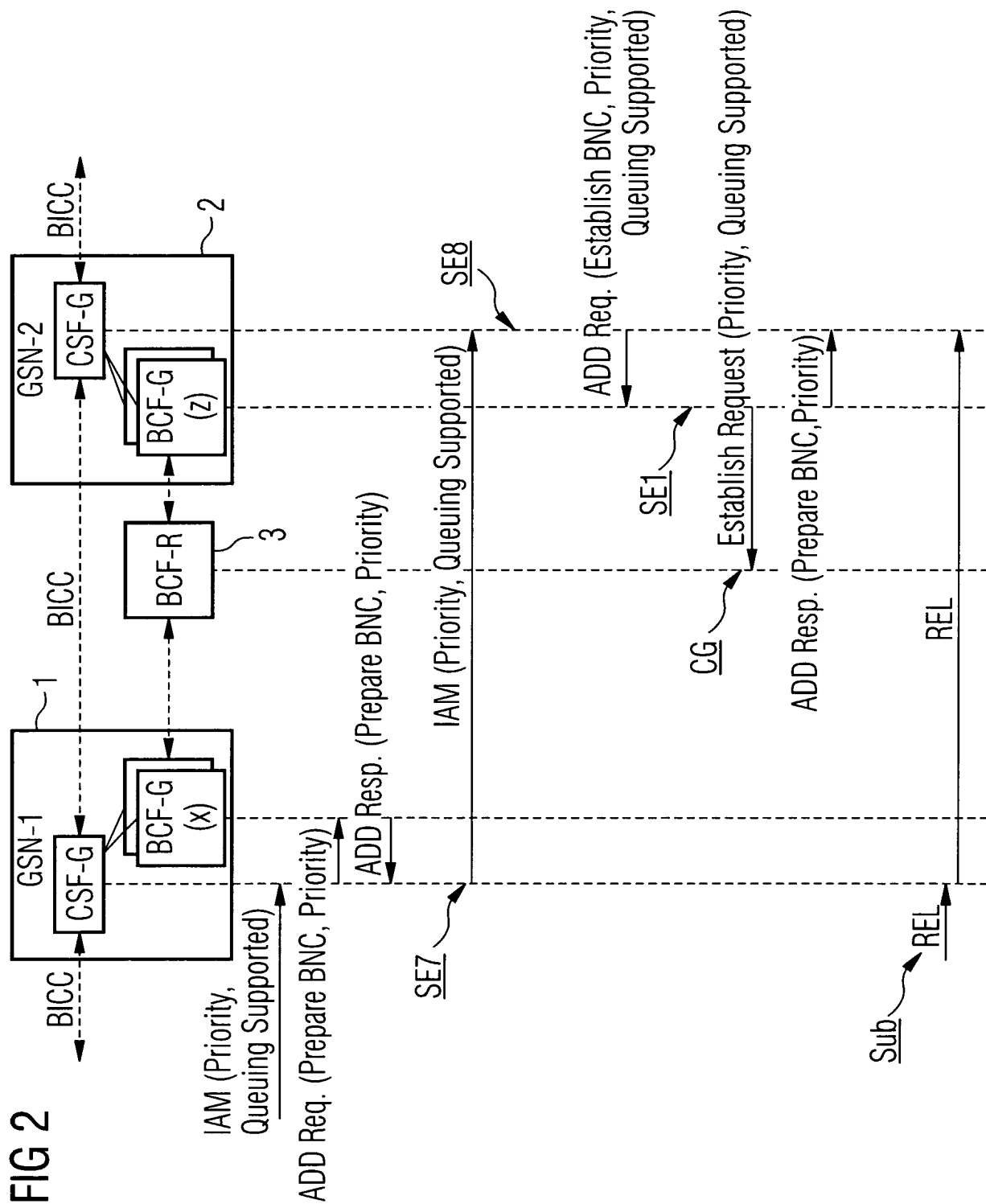
15 establishment, an expiry of the timer releasing the resources attributed to the connection, characterized in that

- the program unit is adapted to select the at least one timer according to an expiry value specified for priority connections,
the program unit is adapted to send an indication of the connection priority
20 and a queuing indication for the timer selection to a further node processing the connection.

12. Program unit according to claim 11 wherein the program unit is stored on a storage medium.

25





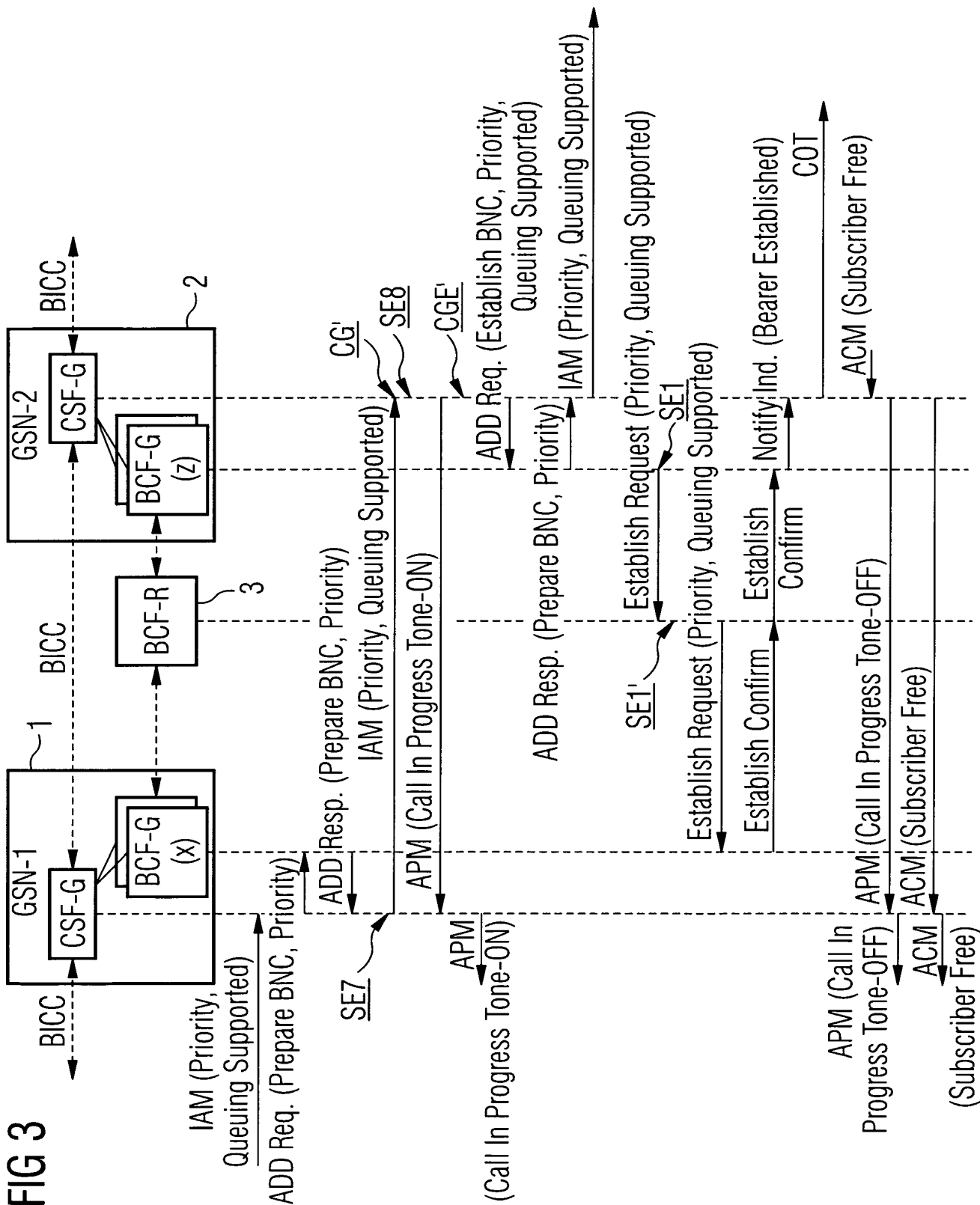
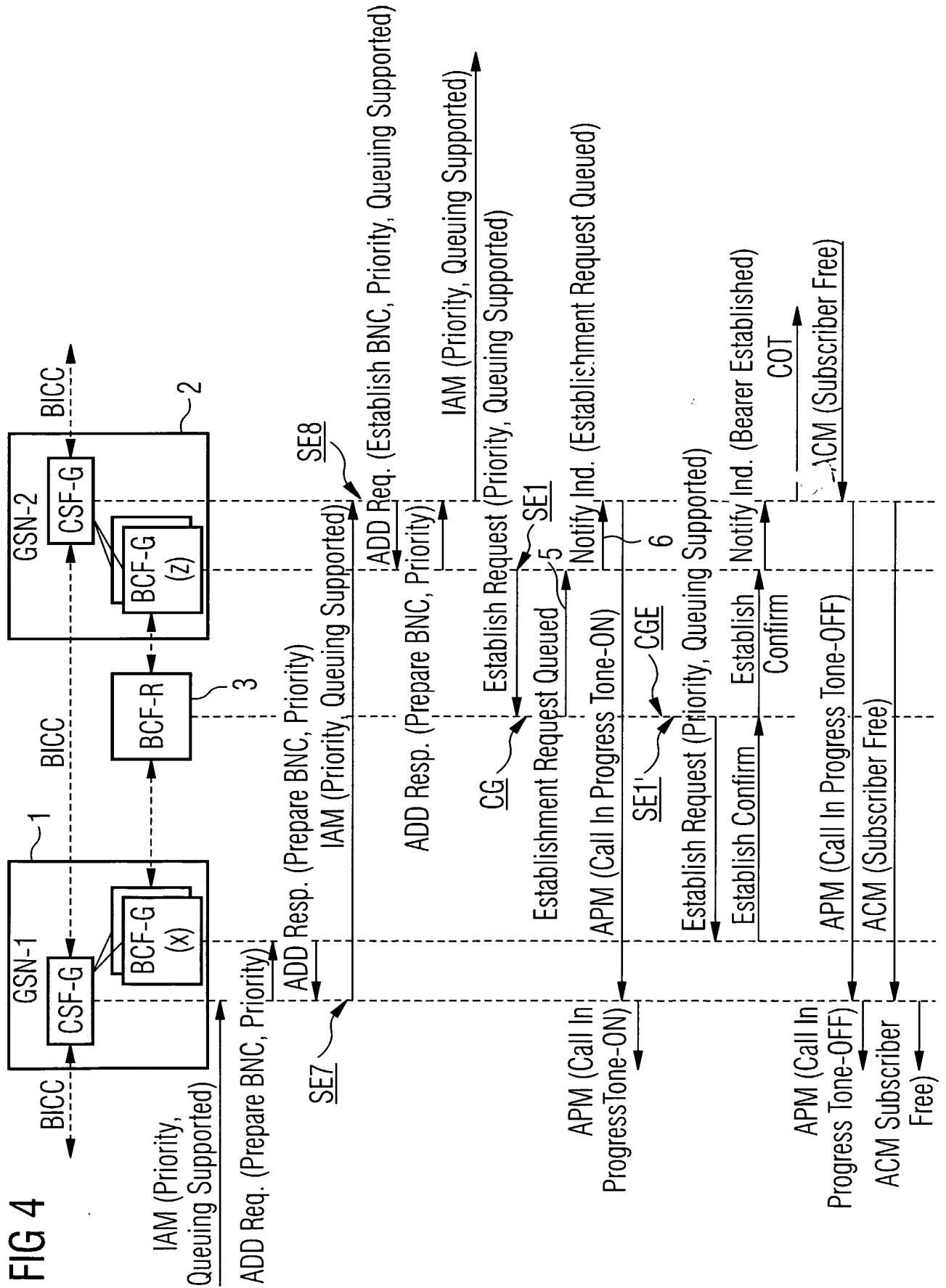
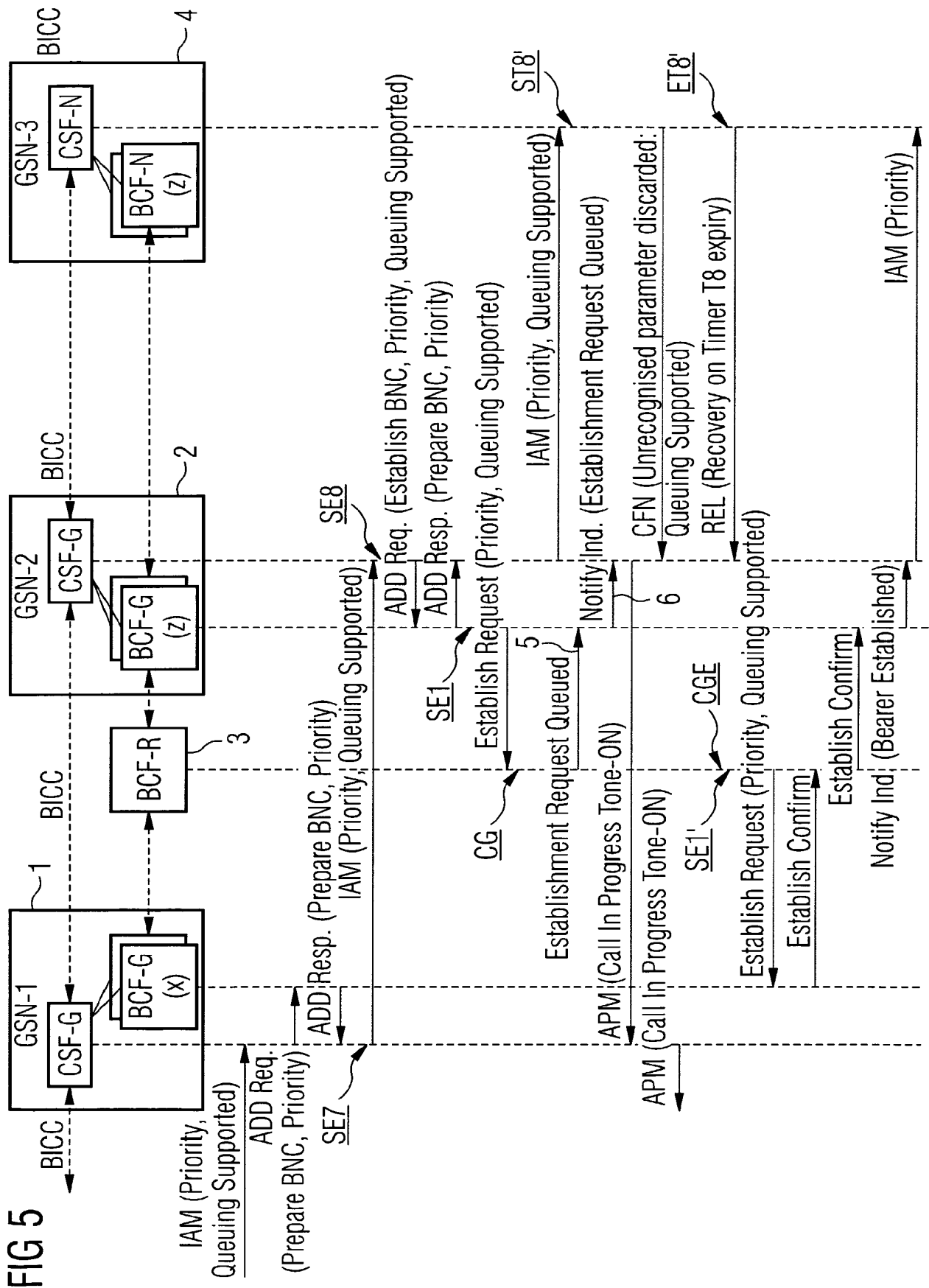


FIG 4





INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 02/01613

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 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)

IPC 7 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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	RAMASWAMI R ET AL: "DISTRIBUTED NETWORK CONTROL FOR OPTICAL NETWORKS" IEEE / ACM TRANSACTIONS ON NETWORKING, IEEE INC. NEW YORK, US, vol. 5, no. 6, 1 December 1997 (1997-12-01), pages 936-942, XP000734419 ISSN: 1063-6692 page 938, right-hand column, line 33 -page 939, left-hand column, line 23 ----	1-12
A	WO 96 31015 A (MOTOROLA INC) 3 October 1996 (1996-10-03) page 3, line 30 -page 4, line 16 ----	1-12
A	US 5 488 609 A (HLUCHYJ MICHAEL G ET AL) 30 January 1996 (1996-01-30) column 4, line 7-51 ----- -/-	1-12



Further documents are listed in the continuation of box C.



Patent family members are listed in 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.
- *Z* document member of the same patent family

Date of the actual completion of the international search

10 October 2002

Date of mailing of the international search report

17/10/2002

Name and mailing address of the ISA

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Weinmiller, J

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 02/01613

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>ZHANG L: "WHY TCP TIMERS DON'T WORK WELL" COMPUTER COMMUNICATIONS REVIEW, ASSOCIATION FOR COMPUTING MACHINERY. NEW YORK, US, vol. 16, no. 3, 5 August 1986 (1986-08-05), pages 397-405, XP000743153 ISSN: 0146-4833 page 402, left-hand column, line 24 -page 403, left-hand column, line 27 -----</p>	1-12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 02/01613

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9631015	A	03-10-1996	CA 2189861 A1	03-10-1996
			EP 0763287 A1	19-03-1997
			FI 964385 A	30-10-1996
			JP 10501669 T	10-02-1998
			KR 247146 B1	01-04-2000
			WO 9631015 A1	03-10-1996
			US 5862485 A	19-01-1999
<hr/>				
US 5488609	A	30-01-1996	AU 671040 B2	08-08-1996
			AU 7557994 A	10-04-1995
			CA 2148486 A1	30-03-1995
			EP 0680680 A1	08-11-1995
			WO 9508882 A1	30-03-1995
<hr/>				



(51) International Patent Classification:

H04W 76/02 (2009.01) H04W 28/26 (2009.01)
H04W 28/16 (2009.01) H04W 76/00 (2009.01)

(21) International Application Number:

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(22) International Filing Date:

17 December 2015 (17.12.2015)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

14199719.7 22 December 2014 (22.12.2014) EP

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(74) Agent: **WUYTS, Koenraad**; P.O. Box 95321, 2509 CH The Hague (NL).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

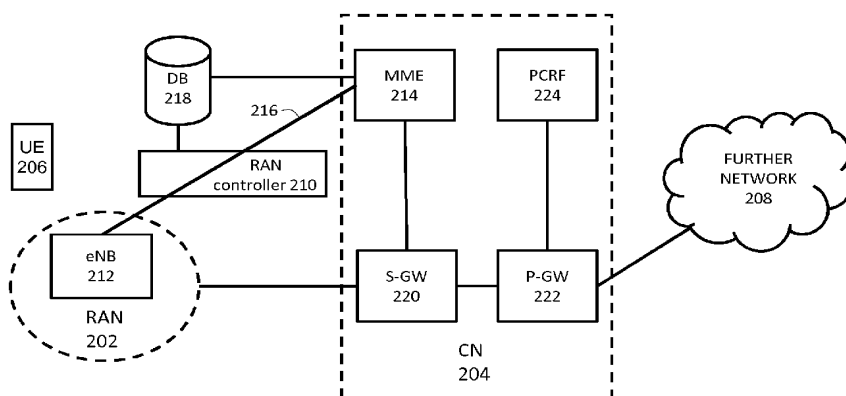
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: HANDLING OF CONNECTION SETUP REQUESTS

FIG. 2



200

(57) Abstract: A software-implemented method for assisting in handling of connection setup requests in a telecommunications network is disclosed. The method includes intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network part of the telecommunications network, determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point serving the UE, and passing the connection setup request for further processing within the telecommunications network only upon positive determination.

REMARKS

Amendments to the Claims

Claim 1-15 are pending. Please amend Claims 6, 7, 8, 9, 12, 14, and 15 are amended to remove multiple dependencies.

Information Disclosure Statement

An Information Disclosure Statement (IDS) is being filed concurrently herewith. Entry of the IDS is respectfully requested.

Payment of Fees

Authorization is hereby granted to charge the fees due with this submission, including any extension of time fee, to Deposit Account No. 08-0380.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

By /Timothy J. Meagher, Reg. No. 39,302/
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Concord, MA 01742-9133

Date: 6/20/2017

Amendments to the Claims

Please amend Claims 6, 7, 8, 9, 12, 14, and 15. The Claim Listing below will replace all prior versions of the claims in the application:

Claim Listing

1. (Original) A method for assisting in handling of connection setup requests in a telecommunications network, the method comprising:
 - intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of the telecommunications network;
 - determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE; and
 - passing the connection setup request for further processing within the telecommunications network only upon positive determination.
2. (Original) The method according to claim 1, wherein the determination of whether the connection setup request is to be fulfilled is further based on one or more agreements with one or more service providers regarding resource capacity in an access network part of the telecommunications network.
3. (Original) The method according to claim 2, wherein the one or more agreements comprise reservation, at the NAP serving the UE, of a predefined resource capacity for connection setup requests for one or more predefined services.
4. (Original) The method according to claim 3, wherein the predefined resource capacity is set as a percentage of the total resource capacity of the NAP.
5. (Original) The method according to claim 3, wherein the predefined resource capacity is set as a predefined amount of the total resource capacity of the NAP, the predefined amount being less than the total resource capacity of the NAP.
6. (Currently Amended) The method according to ~~any one of claim~~[[s]] 3[[-5]], wherein the predefined resource capacity is dynamically adjusted.

7. (Currently Amended) The method according to ~~any one of claim[[s]] 3[[-6]]~~, further comprising:
 - identifying, from the connection setup request, a service for which a connection setup is requested;
 - determining that the identified service is not one of the one or more predefined services and, optionally, determining that the identified service is not one of one or more additional predefined services; and
 - determining that the connection setup request is to be fulfilled if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more predefined services.
8. (Currently Amended) The method according to ~~any one of the preceding claim[[s]] 1~~, further comprising providing an indication to the UE of whether the connection setup request was determined to be fulfilled.
9. (Currently Amended) A computer program product, preferably stored on a computer-readable non-transitory storage medium, comprising software code portions configured for, when executed in a computer, carrying out method steps according to ~~any one of the claim[[s]] 1[[-8]]~~.
10. (Original) A data structure comprising at least:
 - an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;
 - an indication of an amount of resources currently used by the NAP for the one or more predefined services; and
 - an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services.
11. (Original) A computer-readable storage medium, preferably non-transitory, storing the data structure according to claim 10.
12. (Currently Amended) A node ~~(200)~~ comprising:

a computer readable storage medium (204) having computer readable program code embodied therewith, and

a processor (202), preferably a microprocessor, coupled to the computer readable storage medium, wherein responsive to executing the computer readable program code, the processor is configured to perform executable operations comprising:

intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of a telecommunications network;

determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE; and

passing the connection setup request for further processing within the telecommunications network only upon positive determination.

13. (Original) The node according to claim 12, wherein the node is a mobile management entity (MME) of the telecommunications network.

14. (Currently Amended) The node according to claim[[s]] 12 [[or 13]], wherein:

the node is communicatively connected to ~~the~~ a computer-readable storage medium storing a data structure comprising at least: according to claim 11, and

an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;

an indication of an amount of resources currently used by the NAP for the one or more predefined services;

an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services; and

the information regarding resource use within the NAP serving the UE comprises at least a portion of information stored on the computer-readable storage medium.

15. (Currently Amended) A system comprising:

the node according to ~~any one of~~ claim[[s]] 12[[-14]], and

~~the~~ a computer-readable storage medium storing a data structure comprising at least:

an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;

an indication of an amount of resources currently used by the NAP for the one or more predefined services; and

an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services.

~~according to claim 11.~~

Amendments to the Specification

Please add the following “Related Applications” paragraph after the Title at page 1, line 1:

This application is the U.S. National Stage of International Application No. PCT/EP2015/080174, filed December 17, 2015, which designates the U.S., published in English, and claims priority under 35 U.S.C. §§ 119 or 365(c) to European Application No. 14199719.7, filed December 22, 2014. The entire teachings of the above applications are incorporated herein by reference.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

U.S. National Stage of:

International Application No.: PCT/EP2015/080174

International Filing Date: December 17, 2015

Earliest Priority Date: December 22, 2014

Inventors: Rudolf Strijkers and Shuang Zhang

Title: Handling Of Connection Setup Requests

Attorney's Docket No.: 4965.1056-001

PRELIMINARY AMENDMENT

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

Commissioner:

Please amend the application as follows:

Bescheinigung

Die angehefteten
Unterlagen stimmen mit der
als ursprünglich eingereicht
geltenden Fassung der auf
dem nächsten Blatt
bezeichneten europäischen
Patentanmeldung überein.

Certificate

The attached documents are
exact copies of the text in
which the European patent
application described on the
following page is deemed to
have been filed.

Attestation

Les documents joints à la
présente attestation sont
conformes au texte,
considéré comme
initialement déposé, de la
demande de brevet
européen qui est spécifiée à
la page suivante.

Patentanmeldung Nr.

Patent application No.

Demande de brevet n°

14199719.7 / EP14199719

The organization code and number of your priority application, to be used for filing abroad under the Paris Convention, is EP14199719.

Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office

Le Président de l'Office européen des brevets
p.o.



V. Joseph

Anmeldung Nr:
Application no.: 14199719.7
Demande no.:

Anmeldetag:
Date of filing: 22.12.14
Date de dépôt:

Anmelder / Applicant(s) / Demandeur(s):

Koninklijke KPN N.V.
Maanplein 55
2516 CK The Hague/NL

Nederlandse Organisatie voor Toegepast
-Natuurwetenschappelijk Onderzoek TNO
Schoemakerstraat 97
2628 VK Delft/NL

Bezeichnung der Erfindung / Title of the invention / Titre de l'invention:
(Falls die Bezeichnung der Erfindung nicht angegeben ist, oder falls die Anmeldung in einer Nicht-Amtssprache des EPA eingereicht wurde, siehe Beschreibung bezüglich ursprünglicher Bezeichnung.
If no title is shown, or if the application has been filed in a non-EPO language, please refer to the description for the original title.
Si aucun titre n'est indiqué, ou si la demande a été déposée dans une langue autre qu'une langue officielle de l'OEB, se référer à la description pour le titre original.)

Handling of connection setup requests

In Anspruch genommene Priorität(en) / Priority(Priorities) claimed / Priorité(s) revendiquée(s)
Staat/Tag/Aktenzeichen / State/Date/File no. / Pays/Date/Numéro de dépôt:

Am Anmeldetag benannte Vertragsstaaten / Contracting States designated at date of filing / Etats contractants désignées lors du dépôt:

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL
PT RO RS SE SI SK SM TR

Handling of connection setup requests

FIELD OF INVENTION

The disclosure generally relates to the field of telecommunications networks. In particular, though not necessarily, the disclosure relates to methods, systems, and computer program products for handling, or assisting in handling, of connection setup requests in such networks.

BACKGROUND

Currently, in deployed Long-Term Evolution (LTE) telecommunications networks, whether a connection setup request requesting establishment of a dedicated connection setup for a particular service can be fulfilled is decided by a telecommunications network in a two-step process. In a first step, the network determines whether a subscriber has the right to use the requested service. In a second step, the network determines whether resources are available within the network to fulfil the request. The first step implies that each connection setup request is extensively processed by various nodes within the network, such as e.g. a serving gateway (SGW), a packet gateway (PCG) and a policy and charging rules function (PCRF), all of them located within the core network (CN) part of an LTE network. The second step implies that the eNB serving the terminal, which, for the terminal, is a point of radio access to the telecommunications network, checks whether it has the radio resources to fulfil the request. This is not necessarily the most efficient approach because it is the radio access network (RAN) part of a telecommunications network, in particular the eNB serving the terminal, that typically presents problems in that the RAN part of the network does not have the resources to fulfil the request, which only becomes apparent in the second step.

Furthermore, it would be desirable for network operators to be able to offer to subscribers certain application services, such as e.g., video streaming, gaming, or augmented reality, as premium services. Network operators would then owe it to their subscribers to make sure that premium services receive greater attention and effort from the network than non-premium services, which becomes prominent in case there are not enough resources to fulfil connection setup requests for all of the requested services. However, as telecommunications networks currently make decisions in a process described above, there are no guarantees that a premium service will receive precedence over other services at a specific moment in time. When a connection setup request sent by a subscriber's terminal is 'approved' by participating elements in the CN part of the LTE network, with PCRF being the most critical element as it contains user profile and lists of things that the terminal may and may not do, then it is up to eNB to decide on the request based on whether it has resources to serve this approved request. It may happen that eNB does not have resources to serve such a request, in which case the request is simply denied/discarded.

One way to account for different priorities of requests is to use different Quality of Signal (QoS) parameters in the network which determine which requests are served first. While QoS

parameters may indicate that certain traffic has priority over other types of traffic, when the network is loaded (i.e. it has limited or not at all resources remaining for serving additional requests), the use of QoS parameters has no significant impact and does not give guarantees that premium services will be provided.

5 Similar problems are encountered in telecommunications networks implementing radio access technologies (RATs) other than LTE.

What is needed in the art is an approach to handling connection setup requests that can improve on or eliminate at least some of these drawbacks.

10 SUMMARY

To reduce or eliminate at least some of the problems discussed above, according to one aspect of an embodiment of the present invention, a software-implemented method for an entity (i.e. a functional network component) within or associated with a telecommunications network to assist in handling of connection setup requests is disclosed. The method includes intercepting a connection
15 setup request from (i.e., sent by) a user equipment (UE) to (i.e., destined for) a control node of a RAN part of the telecommunications network. Such a control node could be e.g. a mobile management entity (MME) in an LTE network or an analogous entity in networks of other RATs. The method also includes determining whether the intercepted connection setup request is to be fulfilled (i.e., validating, or approving, the request) based at least on information regarding resource use within a network
20 access point (NAP) serving the UE. Such a NAP could be e.g. an eNB in an LTE network or an analogous entity in networks of other RATs. The method further includes passing the intercepted connection setup request for further processing within the telecommunications network only upon positive determination. Upon negative determination, the intercepted connection setup request is not passed for further processing within the telecommunications network. In such a case, the request may
25 e.g. be ignored, discarded, or stored for processing at a later point in time (when a repeated determination of whether the request is to be fulfilled is positive).

As used herein, the term "UE" is used to describe any device or a terminal, preferably mobile, not necessarily operated by a human user (e.g. a machine-type communication device), that may need to connect to the telecommunications network and transfer data. Such devices or terminals
30 are also sometimes referred to as "Mobile Stations" (MSs), "terminals", "cellular devices", or simply as "users".

Although, in the following, embodiments of the present invention will be explained with reference to an LTE network, the teachings described herein are equally applicable to other types of RAT, as well as to networks other than those defined by 3d Generation Partnership Project (3GPP),
35 e.g. WiMAX or CDMA2000.

Embodiments of the present invention are based on the insight that RAN part of a telecommunications network is the part most prone to congestion and that, therefore, filtering of which

connection setup requests may go through and which requests may not go through can already be done at the MME level, prior to evaluating in the CN part (by the PCRF) whether a subscriber has a right to use a particular requested service. In this manner, if e.g. a UE requests connection setup for a particular service but the network will not be able to fulfil the request because there are no available
5 resources at the eNB serving the UE, a decision on that can be made already when an incoming connection setup request from the UE, via the serving eNB, to the MME is intercepted. When the decision is negative (i.e. there are no resources available at that time), the connection setup request is put on hold for re-evaluation later or discarded, which effectively prevents further processing of this request within the network (i.e. the request is not passed from the MME to the SGW, then from the
10 SGW to the PGW, and is not checked at the PCRF).

In an embodiment, the determination of whether the intercepted connection setup request is to be fulfilled may further be based on one or more agreements with one or more service providers regarding resource capacity in an access network part, e.g. in RAN part, of the telecommunications network. Such an embodiment allows a network operator to ensure that service
15 providers get resources within the telecommunications network in accordance with their respective agreements or lack thereof, which, in turn, allows labeling and treating certain services as “premium services”. In one further embodiment, the one or more agreements may include reservation, at the NAP serving the UE, of a predefined resource capacity for connection setup requests for one or more predefined services. Such an embodiment allows allocating a particular amount of resources
20 exclusively for the premium services. In one embodiment, the predefined resource capacity may be set as a percentage of the total resource capacity of the NAP, which allows defining the amount of resources reserved for the premium services as a percentage of the total amount of resources. In another embodiment, the predefined resource capacity may be set as a predefined amount of the total resource capacity of the NAP, the predefined amount being less than the total resource capacity of the
25 NAP, which allows defining the amount of resources reserved for the premium services in absolute value terms. In yet another embodiment, the predefined resource capacity may be dynamically adjusted.

In an embodiment, the method may further include steps of identifying, from the intercepted connection setup request, a service for which a connection setup is requested, confirming
30 that the identified service is not one of the one or more predefined services, and establishing that the intercepted connection setup request is to be fulfilled if, and preferably only if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more predefined services. In this manner, connection requests for non-premium services are only validated when the serving NAP has sufficient resource capacity for fulfilling the request that
35 has not been assigned for the premium services. On the other hand, connection requests for premium services may be validated even when the serving NAP does not have sufficient resource capacity that has not been assigned for the premium services as long as the NAP has sufficient resource capacity

that has been assigned for the premium services. A method of this embodiment may also, optionally, include the step of confirming that the identified service is not one of one or more additional predefined services, such as e.g. emergency calls. Such a further embodiment may be advantageous in that it would still allow the requests for some additional predefined services such as emergency calls to go through as long as requests for premium services can go through.

In an embodiment, the method may further include the step of providing an indication to the UE of whether the intercepted connection setup request was determined to be fulfilled. In case of a positive determination, such an indication could be implicit in that the UE may just be able to set up the desired connection. In case of a negative determination, such an embodiment provides a possibility for the network to inform the UE that the intercepted connection setup request has been or will be discarded, ignored, or put on hold.

According to another aspect of the present invention, a data structure is disclosed. The data structure includes at least an indication of a resource capacity of a NAP reserved for connection setup requests for one or more predefined services, an indication of an amount of resources currently used by the NAP for the one or more predefined services, and an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services. Such a data structure could be stored, e.g. in a database form, on/in a, preferably non-transitory, computer-readable storage medium.

Yet another aspect of the present invention relates to a node comprising a computer readable storage medium having computer readable program code embodied therewith, and a processor, preferably a microprocessor, coupled to the computer readable storage medium, where responsive to executing the computer readable program code, the processor is configured to perform executable operations carrying out one or more of the method steps described herein. In an embodiment, such a node could be an MME of the telecommunications network. In an embodiment, such a node could be communicatively connected to the computer-readable storage medium and/or the database described above, and the information regarding resource use within the NAP serving the UE could comprise at least a portion of information stored in the computer-readable storage medium and/or the database.

The disclosure may also relate to a computer program or a suite of computer programs, preferably implemented on computer-readable non-transitory storage medium. The computer program may comprise software code portions configured for, when run on a computer, executing the method steps according to any of the methods described in the present disclosure.

Another aspect of the present invention relates to a system comprising the earlier described node and computer-readable, preferably non-transitory, storage medium.

Since embodiments of the method described herein are performed on the side of the RAN part of a telecommunications network in terms of deciding whether or not to fulfill the request based on the capacity in the RAN, a functional network component performing embodiments of the

method described herein will be referred to in the following as a "RAN Controller". As will be appreciated by one skilled in the art, aspects of the present invention, in particular the functionality of the RAN controller described herein, may be embodied as a system, a method or a computer program product. Accordingly, aspects of the present invention may take the form of an entirely hardware
5 embodiment, an entirely software embodiment (including firmware, resident software, micro-code, etc.) or an embodiment combining software and hardware aspects that may all generally be referred to herein as a "circuit," "module" or "system." Functions described in this disclosure may be implemented as an algorithm executed by a processor, e.g. a microprocessor, of a computer. Furthermore, aspects of the present invention may take the form of a computer program product
10 embodied in one or more computer readable medium(s) having computer readable program code embodied, e.g., stored, thereon.

Any combination of one or more computer readable medium(s) may be utilized. The computer readable medium may be a computer readable signal medium or a computer readable storage medium. A computer readable storage medium may be, for example, but not limited to, an
15 electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, or device, or any suitable combination of the foregoing. More specific examples of a computer readable storage medium may include, but are not limited to, the following: an electrical connection having one or more wires, a portable computer diskette, a hard disk, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory (EPROM or Flash memory), an
20 optical fiber, a portable compact disc read-only memory (CD-ROM), an optical storage device, a magnetic storage device, or any suitable combination of the foregoing. In the context of the present invention, a computer readable storage medium may be any tangible medium that can contain, or store, a program for use by or in connection with an instruction execution system, apparatus, or device.

25 A computer readable signal medium may include a propagated data signal with computer readable program code embodied therein, for example, in baseband or as part of a carrier wave. Such a propagated signal may take any of a variety of forms, including, but not limited to, electro-magnetic, optical, or any suitable combination thereof. A computer readable signal medium may be any computer readable medium that is not a computer readable storage medium and that can
30 communicate, propagate, or transport a program for use by or in connection with an instruction execution system, apparatus, or device.

Program code embodied on a computer readable medium may be transmitted using any appropriate medium, including but not limited to wireless, wireline, optical fiber, cable, RF, etc., or any suitable combination of the foregoing. Computer program code for carrying out operations for
35 aspects of the present invention may be written in any combination of one or more programming languages, including an object oriented programming language such as Java(TM), Smalltalk, C++ or the like and conventional procedural programming languages, such as the "C" programming language

or similar programming languages. The program code may execute entirely on the user's computer, partly on the user's computer, as a stand-alone software package, partly on the user's computer and partly on a remote computer, or entirely on the remote computer or server. In the latter scenario, the remote computer may be connected to the user's computer through any type of network, including a local area network (LAN) or a wide area network (WAN), or the connection may be made to an external computer (for example, through the Internet using an Internet Service Provider).

Aspects of the present invention are described below with reference to flowchart illustrations and/or block diagrams of methods, apparatus (systems), and computer program products according to embodiments of the present invention. It will be understood that each block of the flowchart illustrations and/or block diagrams, and combinations of blocks in the flowchart illustrations and/or block diagrams, can be implemented by computer program instructions. These computer program instructions may be provided to a processor, in particular a microprocessor or a central processing unit (CPU), of a general purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions, which execute via the processor of the computer, other programmable data processing apparatus, or other devices create means for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

These computer program instructions may also be stored in a computer readable medium that can direct a computer, other programmable data processing apparatus, or other devices to function in a particular manner, such that the instructions stored in the computer readable medium produce an article of manufacture including instructions which implement the function/act specified in the flowchart and/or block diagram block or blocks.

The computer program instructions may also be loaded onto a computer, other programmable data processing apparatus, or other devices to cause a series of operational steps to be performed on the computer, other programmable apparatus or other devices to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide processes for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

The flowchart and block diagrams in the figures illustrate the architecture, functionality, and operation of possible implementations of systems, methods and computer program products according to various embodiments of the present invention. In this regard, each block in the flowchart or block diagrams may represent a module, segment, or portion of code, which comprises one or more executable instructions for implementing the specified logical function(s). It should also be noted that, in some alternative implementations, the functions noted in the blocks may occur out of the order noted in the figures. For example, two blocks shown in succession may, in fact, be executed substantially concurrently, or the blocks may sometimes be executed in the reverse order, depending upon the functionality involved. It will also be noted that each block of the block diagrams and/or

flowchart illustrations, and combinations of blocks in the block diagrams and/or flowchart illustrations, can be implemented by special purpose hardware-based systems that perform the specified functions or acts, or combinations of special purpose hardware and computer instructions.

The disclosure will further be illustrated with reference to the attached drawings, which schematically show embodiments according to the disclosure. It will be understood that the disclosure is not in any way restricted to these specific embodiments. Moreover, combinations of any of the embodiments and limitations are envisioned by the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

Aspects of the invention will be explained in greater detail by reference to exemplary embodiments shown in the drawings, in which:

FIG. 1 shows a schematic illustration of a telecommunications system;

FIG. 2 provides a schematic illustration of a telecommunications network comprising a RAN controller for assisting in handling of connection setup requests, according to one embodiment of the present invention;

FIG. 3 provides a flow diagram of method steps for the RAN controller to assist in handling of connection setup requests, according to one embodiment of the present invention;

FIG. 4 provides a schematic illustration of a database that could be used in combination with the RAN controller to assist in handling of connection setup requests, according to one embodiment of the present invention; and

FIG. 5 shows a block diagram illustrating an exemplary data processing system that may be used to carry out methods described herein, according to one embodiment of the present invention.

DETAILED DESCRIPTION

FIG. 1 shows a schematic illustration of a telecommunications system 100. The telecommunications system 100 comprises a radio access network 102 (also indicated as E-UTRAN or (UT)RAN in FIG. 1) and a core network 104 containing various elements or nodes as described in further detail below.

In the telecommunications system of FIG. 1, three generations of networks are schematically depicted together for purposes of brevity. A more detailed description of the architecture and overview can be found in 3GPP TS 23.002 which is included in the present application by reference in its entirety.

The lower branch of FIG. 1 represents a GPRS or UMTS telecommunications network.

For a GSM/GPRS telecommunications network (i.e., a 2G/2.5G telecommunications network), a radio access network 102 comprises a plurality of base stations (BTSs) and one or more Base Station Controllers (BSCs), not shown individually in FIG. 1. The core network 104 comprises a

Gateway GPRS Support Node (GGSN), a Serving GPRS Support Node (SGSN, for GPRS) or Mobile Switching Centre (MSC, for GSM, not shown in FIG. 1), and a Home Location Register (HLR) combined with an Authentication Centre (AuC). The HLR contains subscription information for mobile devices 106 (sometimes referred to as "user equipment" (UE) or user devices) and the AuC contains a shared secret key K to be used for authentication and key agreement (AKA) procedures.

For a UMTS radio access network (UTRAN) (i.e., a 3G telecommunications network), the radio access network 102 comprises a Radio Network Controller (RNC) connected to a plurality of NodeBs, also not shown. In the core network 104, the GGSN and the SGSN/MSC are conventionally connected to the HLR/AuC that contains subscription information and shared secret keys K of the mobile devices 106.

The upper branch in FIG. 1 represents a next generation telecommunications network, commonly indicated as Long Term Evolution (LTE) system or Evolved Packet System (EPS) (i.e., a 4G telecommunications network). In such a network, the radio access network 102, indicated as E-UTRAN, comprises evolved NodeBs (eNodeBs or eNBs) providing wireless access for the mobile devices 106. The core network 104 comprises a PDN Gateway (P-GW) and a Serving Gateway (S-GW). The E-UTRAN of the EPS is connected to the S-GW via a packet network. The S-GW is connected to a Home Subscriber Server HSS and a Mobility Management Entity MME for signalling purposes. The HSS includes a subscription profile repository SPR and is combined with an Authentication Centre (AuC) that stores a shared secret key K for AKA procedures. Further information of the general architecture of an EPS network can be found in 3GPP TS 23.401.

For GPRS, UMTS and LTE telecommunications network, the core network 104 is generally connected, using e.g. a gateway (e.g. the P-GW), to a further network 108 which could be any external packet switched network such as e.g. Internet or a dedicated network to provide connectivity between different operators.

Of course, architectures other than defined by 3GPP, e.g. WiMAX and/or CDMA2000, can also be used within the context of the present disclosure and this does not preclude future architectures such as 5G.

FIG. 2 provides a schematic illustration of a telecommunications network 200 comprising a RAN controller 210 for assisting in handling of connection setup requests, according to one embodiment of the present invention. The network 200 illustrates elements of an LTE telecommunications network, however, as previously described herein, the teachings are applicable to other RATs as well by substituting the LTE elements of the network 200 with analogous elements of other RATs (e.g. substituting eNB with a base station, MME - with SGSN, etc. for (UT)RAN).

Similar to the telecommunications networks illustrated in FIG. 1, the network 200 comprises a RAN part 202 and a CN part 204 (indicated with dashed lines), analogous to the RAN part 102 and the CN part 104 of FIG. 1. A UE 206 is also illustrated in FIG. 2, similar to the UE 106 of FIG. 1. The UE 206 may connect to the network 200. The telecommunications network 200 may also

connect to a further network 208, such as e.g. a packet network such as Internet. The further network 208 is analogous to the further network 108 shown in FIG. 1.

FIG. 2 further illustrates the RAN controller 210, which may be viewed as a logical entity configured to intercept connection setup requests between an eNB 212 and an MME 214 over a communication path 216 between these two entities. The eNB 212 receives such communications requests from UEs that it serves, such as e.g. the UE 206. As described in greater detail below, the RAN controller 210 is configured to validate the intercepted requests (i.e. to determine whether or not the requests are to be fulfilled). In order to validate the intercepted requests, the RAN controller 210 may access information stored in a database 218. The MME 214 may also be communicatively connected with the database 218, e.g. in order to supply and update information stored in the database.

Those requests that are validated by the RAN controller 210 and are determined by the RAN controller 210 to be fulfilled are passed for further processing within the CN part 204 of the telecommunications network 200, namely the requests are passed from the MME 214 to a S-GW 220, to a P-GW 222, and to a PCRF 224.

Persons skilled in the art will recognize that while the various elements are shown in FIG. 2 as separate elements, in other embodiments their functionality could be implemented in lesser number of individual elements or distributed over a larger number of components.

FIG. 3 provides a flow diagram 300 of method steps for the RAN controller 210 to assist in handling of connection setup requests, according to one embodiment of the present invention. The method 300 could be performed by any kind of a data processing system that includes at least a processor configured to carry out the method steps 300. An example of such a data processing system is illustrated in FIG. 5. While the method 300 is described in conjunction with FIG. 2 and, in particular, with reference to an LTE network, persons skilled in the art will recognize that any system configured to perform the method steps, in any order, in any type of a telecommunications network, is within the scope of the present invention.

The method 300 may begin with step 302, where the RAN controller 210 intercepts a connection request from the UE 206, via the NAP serving the UE (i.e., in this example - the eNB 212), to the control node of the RAN part of the telecommunications network (the control node being in this example the MME 214). In one embodiment, the RAN controller 210 is able to intercept the request because it is implemented as a part of the MME 214 and is configured to intercept and process the request before the conventional processing of the request by the MME 214 and further nodes within the CN part 204 begins. For example, the UE 206 that wants to attach to the network will send an ATTACH REQUEST, e.g. in accordance with 3GPP 24.301, section 8.2.4, which will be passed from the eNB 212 to the MME 214, where the RAN controller 210 could intercept the request.

In step 304, the RAN controller 210 analyzes the intercepted request in order to validate it, i.e. to determine whether the request is to be fulfilled.

First, the RAN controller 210 may determine or estimate the amount of capacity being requested, in terms of the resource use within the serving NAP. In one embodiment, the RAN controller 210 may extract this information from the Traffic Flow Template (TFT) (e.g. in accordance with section 9.9.4.16 in 3GPP 24.301 and section 10.5.6.12 in 3GPP 24.008) included within the intercepted request, specifying uplink and downlink packet filters that will be used for the connection setup. Since these values will be enforced by network, they can be used in estimating the capacity that serving NAP will be providing.

Next, the RAN controller 210 will determine whether the serving NAP is able to provide the requested capacity. In order to do that, the RAN controller 210 has access to the database 218. The database 218 is configured to store the actual (i.e., current) information on the load of the serving NAP. In an embodiment, information stored in the database 218 may be tracked per NAP, possibly per cell within each NAP, for every NAP connected to the MME. By determining whether the amount of requested capacity is less than the amount of total unused capacity in the serving NAP, the RAN controller is able to establish whether or not to pass the intercepted request for further processing by the CN part 204.

In a preferred embodiment, further checks are implemented, allowing finer granularity in differentiating between requests. In particular, the database 218 may store the actual information on the load of the serving NAP specified as the current load of the serving NAP caused by services of different categories – e.g. caused by one or more predefined services (referred to hereafter as “premium services”), and the current load of the serving NAP caused by other, i.e. non-premium, services. In an embodiment where there is a number of different premium services, the database 218 may store load on a per-premium service basis (i.e., for each premium service there may be a separate counter which tracks its load). In an alternative or additional embodiment where there is a number of different premium services, the database 218 may be configured to store load on a per-OTT service provider basis (i.e., for each OTT service provider there may be a counter which tracks the load of the requests for the OTT).

One way to use the load information stored in the database 218 for premium vs non-premium services comprises defining conditions for the RAN controller 210 to apply in deciding whether to fulfil a request. In an embodiment, the information defining the conditions could also be stored in the database 218. Alternatively, this information could be stored within the RAN controller 210 itself.

For example, in an embodiment, information defining the conditions could include the total expected capacity of a NAP, e.g. as provided by an operator and one or more limits of how much of this total capacity a particular premium service may consume, e.g. also defined by an operator in view of the agreements between the operator and the provider of the premium service. In various embodiments, such limits could be defined as a percentage of the total NAP capacity or as an absolute amount of the resources of a given NAP, which cannot be larger than the totally available

capacity of that NAP. Such limits could be defined for every premium service an operator may or intends to provide, in accordance with respective agreements with the premium service providers, as long as the total sum of resources which is intended for premium services on a given NAP does not exceed the total NAP capacity. Similarly to how, as described above, load information could be stored

5 in the database 218 on a per-premium service basis and/or on a per-Over-The-Top (OTT) service provider basis, conditions may be defined on a per-premium service basis and/or on a per-OTT service provider basis as well.

In an embodiment, conditions applied to one or more premium services or non-premium services may be dynamically adjusted. In one example, the amount of resources reserved for

10 the premium services could be dynamically adjusted based on a schedule (i.e. adjusted depending on the time of the day, day in the week, etc.). In another example, the amount of resources reserved for the premium services could be dynamically adjusted when triggered by one or more of predefined events (e.g. in case of a natural disaster happening, a football game lasting longer than expected, etc.).

As a person skilled in the art will recognize, there are many ways to fill/maintain information in the database 218, all of which are within the scope of the present invention. For example, in one embodiment, the NAP(s) may be configured to provide information regarding resource usage to the database 218. In another embodiment, information within the database 218 may be kept current by an entity, e.g. the RAN controller 210 or the MME 214, tracking amount of

20 resources that have been fulfilled. In such an embodiment, the entity doing the tracking may be configured to also take into account changes to connection setup, e.g. by obtaining indications of modify connection setup requests that have been approved. When a UE then sends a connection setup release message, information in the database 218 is updated accordingly. This kind of "bookkeeping" may be performed for both premium and non-premium services.

An exemplary illustration of the database 218 is provided in FIG. 4, the database shown as a database 400. As shown in FIG. 4, part 402 of the database 400 could maintain data about NAPs 404 or different cells therein, tracking areas 406, active users 408 and Physical Resource Blocks (PRB) information per NAP, and other data relevant for the decision process carried out by the RAN controller 210. As also shown in FIG. 4, part 410 of the database 400 could maintain data about

30 the active connections 412, e.g. the active EPS bearers in the EPS. From this data, the net capacity of a specific NAP/cell in the EPS can be calculated. In addition, part 414 of the database 400 could maintain data about resource reservations for specific services according to operator agreements.

In an embodiment, the RAN controller 210 may determine whether the intercepted request is a request for the premium services or not based on the TFT described above.

In another embodiment, an operator may choose to provide premium services via a separate Access Point Name (APN), as e.g. described in 3GPP 24.008, section 10.5.6.1, or via a separate LLC Service Access Point, as e.g. described in 3GPP 24.008, section 10.5.6.9. In such an

embodiment, the RAN controller 210 can determine whether the intercepted request is a request for the premium services or not by identifying the APN name or LLC Service Access Point name within the intercepted request.

Once the RAN controller 210 determined the category of the intercepted request in one of the manners described above, it will evaluate the request, which, in an exemplary embodiment could be done in the following manner. The RAN controller 210 would access the database 218 regarding the current load of the serving NAP for non-premium services and/or the current load of the NAP for premium services. The RAN controller 210 may then be configured to fulfil the request if the current load of the serving NAP for non-premium services is such that there is sufficient unused capacity to fulfil the request, independent of whether the request is for premium or non-premium services. If, however, the current load of the serving NAP for non-premium services is such that there is not sufficient unused capacity to fulfil the request, the RAN controller 210 will only fulfil the request if the request is for one of the premium services and the current load of the serving NAP for premium services is such that there is sufficient unused capacity to fulfil the request.

In a further embodiment, there may be yet another category of requests, such as e.g. emergency requests, which are treated differently from requests of other categories. For example, the RAN controller could determine whether the request is an emergency request or not from the intercepted ATTACH REQUEST sent by the UE, based on Evolved Packet System (EPS) attach type parameter within the request. If the request is an emergency request, the RAN controller 210 may be configured to always fulfil the intercepted request for passing through to be further processed in the CN part 204.

In step 306, if the RAN controller 210 determined in step 304 that the request is to be fulfilled, then the RAN controller 210 passes the request for being processed further in the CN part 204 of the telecommunications network as is known in prior art. In particular, the request may be passed from the MME 214 to the S-GW 220 and to the P-GW 222 to reach the PCRF 224 which will determine whether the user and/or the device have the necessary rights for the request to be fulfilled. If, however, the outcome of the validation in step 304 was negative, the RAN controller 210 does not pass the request to the CN part 204. In this case, the RAN controller 210 may e.g. discard the request, ignore the request, or store it for further re-evaluation at some later point in time. In an embodiment, the request may fail when one of timers associated with fulfilling the request, as known in the art, expire.

In an embodiment, the method may also include a step of providing an indication, either explicit or implicit, to the UE 206 of whether the connection setup request was determined to be fulfilled. When the request was determined to be fulfilled, such indication may be implicit in that the requested connection will be established. When the request was not determined to be fulfilled, the RAN controller 210 may be configured to provide an indication of that, possibly with further indication as to what the RAN controller 210 will do with the request (e.g., discard, ignore, or store for further re-evaluation), to the UE 206.

In an embodiment, in step 308, the RAN controller 210 may, optionally, update the database 218 with the data from the intercepted request. Such an embodiment may be particularly advantageous when the request has been or about to be fulfilled and when the information on resource usage is kept current in the database 218 by means of bookkeeping described above.

5 FIG. 5 depicts a block diagram illustrating an exemplary data processing system that may be used in a network as described with reference to FIG. 2, in particular as the RAN controller 210.

As shown in FIG. 5, the data processing system 500 may include at least one processor 502 coupled to memory elements 504 through a system bus 506. As such, the data
10 processing system may store program code within memory elements 504. Further, the processor 502 may execute the program code accessed from the memory elements 504 via a system bus 506. In one aspect, the data processing system may be implemented as a computer that is suitable for storing and/or executing program code. It should be appreciated, however, that the data processing system 500 may be implemented in the form of any system including a processor and a memory that is
15 capable of performing the functions described within this specification.

The memory elements 504 may include one or more physical memory devices such as, for example, local memory 508 and one or more bulk storage devices 510. The local memory may refer to random access memory or other non-persistent memory device(s) generally used during actual execution of the program code. A bulk storage device may be implemented as a hard drive or
20 other persistent data storage device. The processing system 500 may also include one or more cache memories (not shown) that provide temporary storage of at least some program code in order to reduce the number of times program code must be retrieved from the bulk storage device 510 during execution.

Input/output (I/O) devices depicted as an input device 512 and an output device 514
25 optionally can be coupled to the data processing system. Examples of input devices may include, but are not limited to, a keyboard, a pointing device such as a mouse, or the like. Examples of output devices may include, but are not limited to, a monitor or a display, speakers, or the like. Input and/or output devices may be coupled to the data processing system either directly or through intervening I/O controllers.

30 In an embodiment, the input and the output devices may be implemented as a combined input/output device (illustrated in FIG. 5 with a dashed line surrounding the input device 512 and the output device 514). An example of such a combined device is a touch sensitive display, also sometimes referred to as a "touch screen display" or simply "touch screen". In such an embodiment, input to the device may be provided by a movement of a physical object, such as e.g. a stylus or a
35 finger of a user, on or near the touch screen display.

A network adapter 516 may also be coupled to the data processing system to enable it to become coupled to other systems, computer systems, remote network devices, and/or remote

storage devices through intervening private or public networks. The network adapter may comprise a data receiver for receiving data that is transmitted by said systems, devices and/or networks to the data processing system 500, and a data transmitter for transmitting data from the data processing system 500 to said systems, devices and/or networks. Modems, cable modems, and Ethernet cards are examples of different types of network adapter that may be used with the data processing system 500.

As pictured in FIG. 5, the memory elements 504 may store an application 518. In various embodiments, the application 518 may be stored in the local memory 508, the one or more bulk storage devices 510, or apart from the local memory and the bulk storage devices. It should be appreciated that the data processing system 500 may further execute an operating system (not shown in FIG. 5) that can facilitate execution of the application 518. The application 518, being implemented in the form of executable program code, can be executed by the data processing system 500, e.g., by the processor 502. Responsive to executing the application, the data processing system 500 may be configured to perform one or more operations or method steps described herein.

Persons skilled in the art will recognize that while the elements 502-518 are shown in FIG. 5 as separate elements, in other embodiments their functionality could be implemented in lesser number of individual elements or distributed over a larger number of components.

Various embodiments of the invention may be implemented as a program product for use with a computer system, where the program(s) of the program product define functions of the embodiments (including the methods described herein). In one embodiment, the program(s) can be contained on a variety of non-transitory computer-readable storage media, where, as used herein, the expression "non-transitory computer readable storage media" comprises all computer-readable media, with the sole exception being a transitory, propagating signal. In another embodiment, the program(s) can be contained on a variety of transitory computer-readable storage media. Illustrative computer-readable storage media include, but are not limited to: (i) non-writable storage media (e.g., read-only memory devices within a computer such as CD-ROM disks readable by a CD-ROM drive, ROM chips or any type of solid-state non-volatile semiconductor memory) on which information is permanently stored; and (ii) writable storage media (e.g., flash memory, floppy disks within a diskette drive or hard-disk drive or any type of solid-state random-access semiconductor memory) on which alterable information is stored. The computer program may be run on the processor 502 described herein.

The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the invention. As used herein, the singular forms "a," "an," and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

The corresponding structures, materials, acts, and equivalents of all means or step plus function elements in the claims below are intended to include any structure, material, or act for performing the function in combination with other claimed elements as specifically claimed. The description of embodiments of the present invention has been presented for purposes of illustration, but is not intended to be exhaustive or limited to the implementations in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art without departing from the scope and spirit of the present invention. The embodiments were chosen and described in order to best explain the principles and some practical applications of the present invention, and to enable others of ordinary skill in the art to understand the present invention for various embodiments with various modifications as are suited to the particular use contemplated.

CLAIMS

1. A method for assisting in handling of connection setup requests in a telecommunications network, the method comprising:
 - intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of the telecommunications network;
 - determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE; and
 - passing the connection setup request for further processing within the telecommunications network only upon positive determination.

2. The method according to claim 1, wherein the determination of whether the connection setup request is to be fulfilled is further based on one or more agreements with one or more service providers regarding resource capacity in an access network part of the telecommunications network.

3. The method according to claim 2, wherein the one or more agreements comprise reservation, at the NAP serving the UE, of a predefined resource capacity for connection setup requests for one or more predefined services.

4. The method according to claim 3, wherein the predefined resource capacity is set as a percentage of the total resource capacity of the NAP.

5. The method according to claim 3, wherein the predefined resource capacity is set as a predefined amount of the total resource capacity of the NAP, the predefined amount being less than the total resource capacity of the NAP.

6. The method according to any one of claims 3-5, wherein the predefined resource capacity is dynamically adjusted.

7. The method according to any one of claims 3-6, further comprising:
 - identifying, from the connection setup request, a service for which a connection setup is requested;
 - determining that the identified service is not one of the one or more predefined services and, optionally, determining that the identified service is not one of one or more additional predefined services; and
 - determining that the connection setup request is to be fulfilled if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup

requests for the one or more predefined services.

8. The method according to any one of the preceding claims, further comprising providing an indication to the UE of whether the connection setup request was determined to be fulfilled.

5

9. A computer program product, preferably stored on a computer-readable non-transitory storage medium, comprising software code portions configured for, when executed in a computer, carrying out method steps according to any one of the claims 1-8.

10 10. A data structure comprising at least:

an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;

an indication of an amount of resources currently used by the NAP for the one or more predefined services; and

15 an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services.

11. A computer-readable storage medium, preferably non-transitory, storing the data structure according to claim 10.

20

12. A node (200) comprising:

a computer readable storage medium (204) having computer readable program code embodied therewith, and

25 a processor (202), preferably a microprocessor, coupled to the computer readable storage medium, wherein responsive to executing the computer readable program code, the processor is configured to perform executable operations comprising:

intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of a telecommunications network;

30 determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE; and

passing the connection setup request for further processing within the telecommunications network only upon positive determination.

35 13. The node according to claim 12, wherein the node is a mobile management entity (MME) of the telecommunications network.

14. The node according to claims 12 or 13, wherein:

the node is communicatively connected to the computer-readable storage medium according to claim 11, and

5 the information regarding resource use within the NAP serving the UE comprises at least a portion of information stored on the computer-readable storage medium.

15. A system comprising:

the node according to any one of claims 12-14, and

the computer-readable storage medium according to claim 11.

10

ABSTRACT

A software-implemented method for assisting in handling of connection setup requests in a telecommunications network is disclosed. The method includes intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network part of the telecommunications network, determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point serving the UE, and passing the connection setup request for further processing within the telecommunications network only upon positive determination.

10 + FIG. 2

15

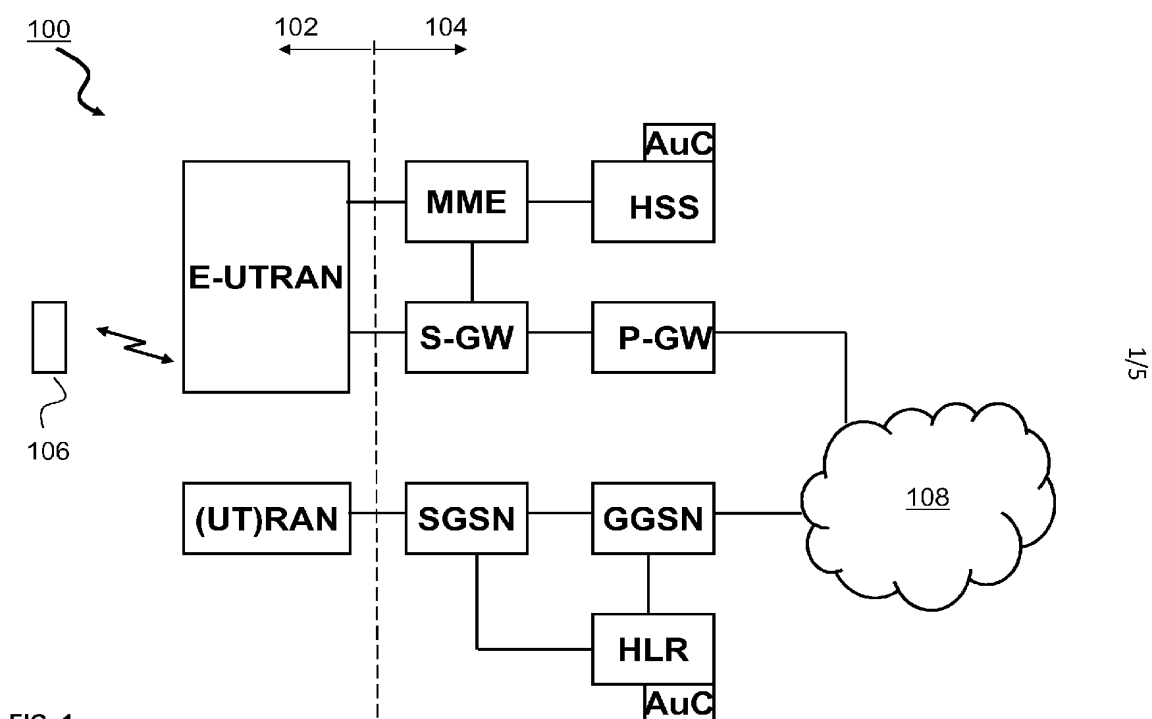


FIG. 1

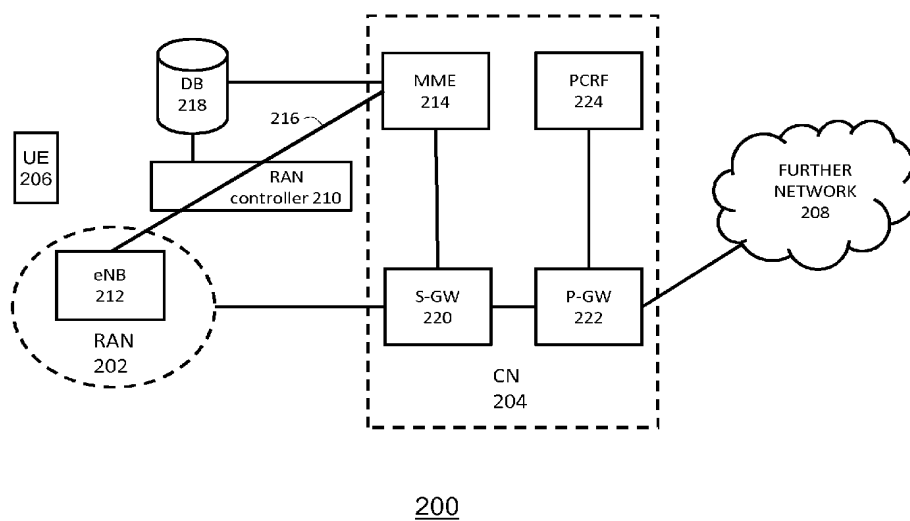


FIG. 2

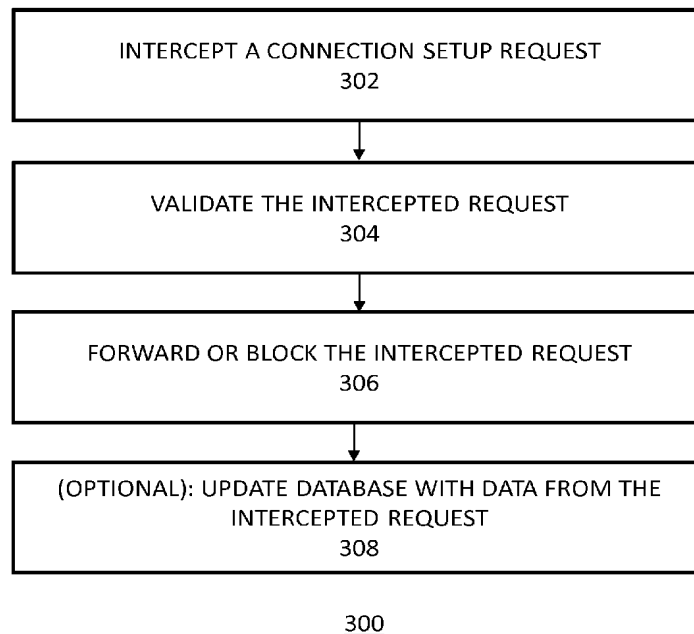


FIG. 3

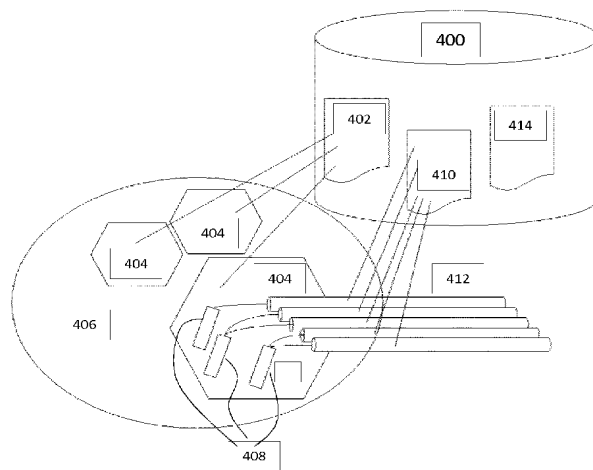
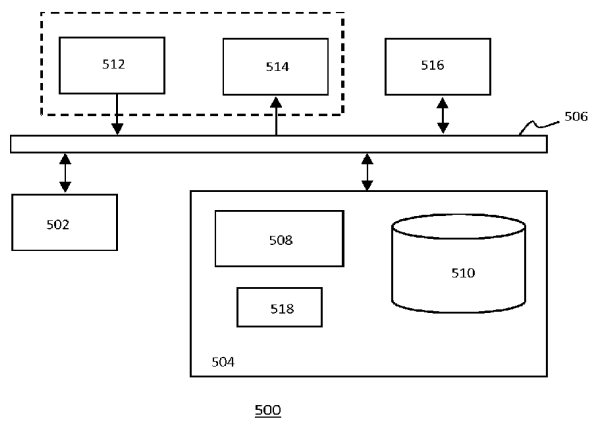


FIG. 4



5/5

FIG. 5

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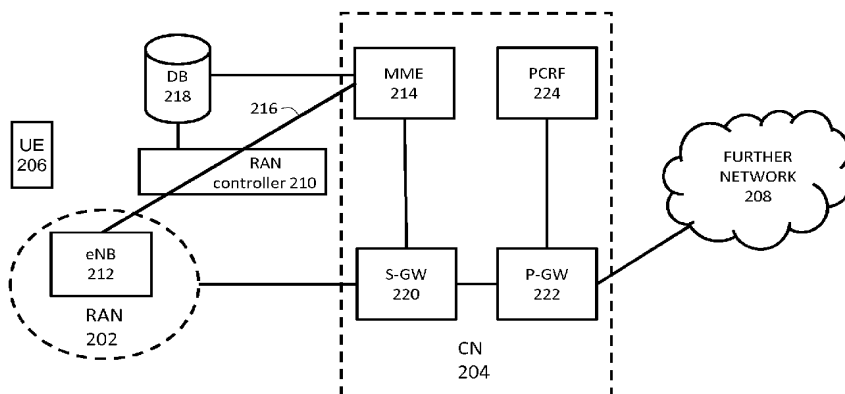
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(54) Title: HANDLING OF CONNECTION SETUP REQUESTS

FIG. 2



200

(57) Abstract: A software-implemented method for assisting in handling of connection setup requests in a telecommunications network is disclosed. The method includes intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network part of the telecommunications network, determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point serving the UE, and passing the connection setup request for further processing within the telecommunications network only upon positive determination.

HANDLING OF CONNECTION SETUP REQUESTS

FIELD OF INVENTION

The disclosure generally relates to the field of telecommunications networks. In particular, though not necessarily, the disclosure relates to methods, systems, and computer program products for handling, or assisting in handling, of connection setup requests in such networks.

BACKGROUND

Currently, in deployed Long-Term Evolution (LTE) telecommunications networks, whether a connection setup request requesting establishment of a dedicated connection setup for a particular service can be fulfilled is decided by a telecommunications network in a two-step process. In a first step, the network determines whether a subscriber has the right to use the requested service. In a second step, the network determines whether resources are available within the network to fulfil the request. The first step implies that each connection setup request is extensively processed by various nodes within the network, such as e.g. a serving gateway (SGW), a packet gateway (PCG) and a policy and charging rules function (PCRF), all of them located within the core network (CN) part of an LTE network. The second step implies that the eNB serving the terminal, which, for the terminal, is a point of radio access to the telecommunications network, checks whether it has the radio resources to fulfil the request. This is not necessarily the most efficient approach because it is the radio access network (RAN) part of a telecommunications network, in particular the eNB serving the terminal, that typically presents problems in that the RAN part of the network does not have the resources to fulfil the request, which only becomes apparent in the second step.

Furthermore, it would be desirable for network operators to be able to offer to subscribers certain application services, such as e.g., video streaming, gaming, or augmented reality, as premium services. Network operators would then owe it to their subscribers to make sure that premium services receive greater attention and effort from the network than non-premium services, which becomes prominent in case there are not enough resources to fulfil connection setup requests for all of the requested services. However, as telecommunications networks currently make decisions in a process described above, there are no guarantees that a premium service will receive precedence over other services at a specific moment in time. When a connection setup request sent by a subscriber's terminal is 'approved' by participating elements in the CN part of the LTE network, with PCRF being the most critical element as it contains user profile and lists of things that the terminal may and may not do, then it is up to eNB to decide on the request based on whether it has resources to serve this approved request. It may happen that eNB does not have resources to serve such a request, in which case the request is simply denied/discarded.

One way to account for different priorities of requests is to use different Quality of Signal (QoS) parameters in the network which determine which requests are served first. While QoS

parameters may indicate that certain traffic has priority over other types of traffic, when the network is loaded (i.e. it has limited or not at all resources remaining for serving additional requests), the use of QoS parameters has no significant impact and does not give guarantees that premium services will be provided.

5 Similar problems are encountered in telecommunications networks implementing radio access technologies (RATs) other than LTE.

What is needed in the art is an approach to handling connection setup requests that can improve on or eliminate at least some of these drawbacks.

10 SUMMARY

To reduce or eliminate at least some of the problems discussed above, according to one aspect of an embodiment of the present invention, a software-implemented method for an entity (i.e. a functional network component) within or associated with a telecommunications network to assist in handling of connection setup requests is disclosed. The method includes intercepting a connection
15 setup request from (i.e., sent by) a user equipment (UE) to (i.e., destined for) a control node of a RAN part of the telecommunications network. Such a control node could be e.g. a mobile management entity (MME) in an LTE network or an analogous entity in networks of other RATs. The method also includes determining whether the intercepted connection setup request is to be fulfilled (i.e., validating, or approving, the request) based at least on information regarding resource use within a network
20 access point (NAP) serving the UE. Such a NAP could be e.g. an eNB in an LTE network or an analogous entity in networks of other RATs. The method further includes passing the intercepted connection setup request for further processing within the telecommunications network only upon positive determination. Upon negative determination, the intercepted connection setup request is not passed for further processing within the telecommunications network. In such a case, the request may
25 e.g. be ignored, discarded, or stored for processing at a later point in time (when a repeated determination of whether the request is to be fulfilled is positive).

As used herein, the term "UE" is used to describe any device or a terminal, preferably mobile, not necessarily operated by a human user (e.g. a machine-type communication device), that may need to connect to the telecommunications network and transfer data. Such devices or terminals
30 are also sometimes referred to as "Mobile Stations" (MSs), "terminals", "cellular devices", or simply as "users".

Although, in the following, embodiments of the present invention will be explained with reference to an LTE network, the teachings described herein are equally applicable to other types of RAT, as well as to networks other than those defined by 3d Generation Partnership Project (3GPP),
35 e.g. WiMAX or CDMA2000.

Embodiments of the present invention are based on the insight that RAN part of a telecommunications network is the part most prone to congestion and that, therefore, filtering of which

connection setup requests may go through and which requests may not go through can already be done at the MME level, prior to evaluating in the CN part (by the PCRF) whether a subscriber has a right to use a particular requested service. In this manner, if e.g. a UE requests connection setup for a particular service but the network will not be able to fulfil the request because there are no available
5 resources at the eNB serving the UE, a decision on that can be made already when an incoming connection setup request from the UE, via the serving eNB, to the MME is intercepted. When the decision is negative (i.e. there are no resources available at that time), the connection setup request is put on hold for re-evaluation later or discarded, which effectively prevents further processing of this request within the network (i.e. the request is not passed from the MME to the SGW, then from the
10 SGW to the PGW, and is not checked at the PCRF).

In an embodiment, the determination of whether the intercepted connection setup request is to be fulfilled may further be based on one or more agreements with one or more service providers regarding resource capacity in an access network part, e.g. in RAN part, of the telecommunications network. Such an embodiment allows a network operator to ensure that service
15 providers get resources within the telecommunications network in accordance with their respective agreements or lack thereof, which, in turn, allows labeling and treating certain services as "premium services". In one further embodiment, the one or more agreements may include reservation, at the NAP serving the UE, of a predefined resource capacity for connection setup requests for one or more predefined services. Such an embodiment allows allocating a particular amount of resources
20 exclusively for the premium services. In one embodiment, the predefined resource capacity may be set as a percentage of the total resource capacity of the NAP, which allows defining the amount of resources reserved for the premium services as a percentage of the total amount of resources. In another embodiment, the predefined resource capacity may be set as a predefined amount of the total resource capacity of the NAP, the predefined amount being less than the total resource capacity of the
25 NAP, which allows defining the amount of resources reserved for the premium services in absolute value terms. In yet another embodiment, the predefined resource capacity may be dynamically adjusted.

In an embodiment, the method may further include steps of identifying, from the intercepted connection setup request, a service for which a connection setup is requested, confirming
30 that the identified service is not one of the one or more predefined services, and establishing that the intercepted connection setup request is to be fulfilled if, and preferably only if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup requests for the one or more predefined services. In this manner, connection requests for non-premium services are only validated when the serving NAP has sufficient resource capacity for fulfilling the request that
35 has not been assigned for the premium services. On the other hand, connection requests for premium services may be validated even when the serving NAP does not have sufficient resource capacity that has not been assigned for the premium services as long as the NAP has sufficient resource capacity

that has been assigned for the premium services. A method of this embodiment may also, optionally, include the step of confirming that the identified service is not one of one or more additional predefined services, such as e.g. emergency calls. Such a further embodiment may be advantageous in that it would still allow the requests for some additional predefined services such as emergency calls to go
5 through as long as requests for premium services can go through.

In an embodiment, the method may further include the step of providing an indication to the UE of whether the intercepted connection setup request was determined to be fulfilled. In case of a positive determination, such an indication could be implicit in that the UE may just be able to set up the desired connection. In case of a negative determination, such an embodiment provides a
10 possibility for the network to inform the UE that the intercepted connection setup request has been or will be discarded, ignored, or put on hold.

According to another aspect of the present invention, a data structure is disclosed. The data structure includes at least an indication of a resource capacity of a NAP reserved for connection setup requests for one or more predefined services, an indication of an amount of
15 resources currently used by the NAP for the one or more predefined services, and an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services. Such a data structure could be stored, e.g. in a database form, on/in a, preferably non-transitory, computer-readable storage medium.

Yet another aspect of the present invention relates to a node comprising a computer
20 readable storage medium having computer readable program code embodied therewith, and a processor, preferably a microprocessor, coupled to the computer readable storage medium, where responsive to executing the computer readable program code, the processor is configured to perform executable operations carrying out one or more of the method steps described herein. In an embodiment, such a node could be an MME of the telecommunications network. In an embodiment,
25 such a node could be communicatively connected to the computer-readable storage medium and/or the database described above, and the information regarding resource use within the NAP serving the UE could comprise at least a portion of information stored in the computer-readable storage medium and/or the database.

The disclosure may also relate to a computer program or a suite of computer
30 programs, preferably implemented on computer-readable non-transitory storage medium. The computer program may comprise software code portions configured for, when run on a computer, executing the method steps according to any of the methods described in the present disclosure.

Another aspect of the present invention relates to a system comprising the earlier described node and computer-readable, preferably non-transitory, storage medium.

35 Since embodiments of the method described herein are performed on the side of the RAN part of a telecommunications network in terms of deciding whether or not to fulfill the request based on the capacity in the RAN, a functional network component performing embodiments of the

method described herein will be referred to in the following as a "RAN Controller". As will be appreciated by one skilled in the art, aspects of the present invention, in particular the functionality of the RAN controller described herein, may be embodied as a system, a method or a computer program product. Accordingly, aspects of the present invention may take the form of an entirely hardware
5 embodiment, an entirely software embodiment (including firmware, resident software, micro-code, etc.) or an embodiment combining software and hardware aspects that may all generally be referred to herein as a "circuit," "module" or "system." Functions described in this disclosure may be implemented as an algorithm executed by a processor, e.g. a microprocessor, of a computer. Furthermore, aspects of the present invention may take the form of a computer program product
10 embodied in one or more computer readable medium(s) having computer readable program code embodied, e.g., stored, thereon.

Any combination of one or more computer readable medium(s) may be utilized. The computer readable medium may be a computer readable signal medium or a computer readable storage medium. A computer readable storage medium may be, for example, but not limited to, an
15 electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, or device, or any suitable combination of the foregoing. More specific examples of a computer readable storage medium may include, but are not limited to, the following: an electrical connection having one or more wires, a portable computer diskette, a hard disk, a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory (EPROM or Flash memory), an
20 optical fiber, a portable compact disc read-only memory (CD-ROM), an optical storage device, a magnetic storage device, or any suitable combination of the foregoing. In the context of the present invention, a computer readable storage medium may be any tangible medium that can contain, or store, a program for use by or in connection with an instruction execution system, apparatus, or device.

25 A computer readable signal medium may include a propagated data signal with computer readable program code embodied therein, for example, in baseband or as part of a carrier wave. Such a propagated signal may take any of a variety of forms, including, but not limited to, electro-magnetic, optical, or any suitable combination thereof. A computer readable signal medium may be any computer readable medium that is not a computer readable storage medium and that can
30 communicate, propagate, or transport a program for use by or in connection with an instruction execution system, apparatus, or device.

Program code embodied on a computer readable medium may be transmitted using any appropriate medium, including but not limited to wireless, wireline, optical fiber, cable, RF, etc., or any suitable combination of the foregoing. Computer program code for carrying out operations for
35 aspects of the present invention may be written in any combination of one or more programming languages, including an object oriented programming language such as Java(TM), Smalltalk, C++ or the like and conventional procedural programming languages, such as the "C" programming language

or similar programming languages. The program code may execute entirely on the user's computer, partly on the user's computer, as a stand-alone software package, partly on the user's computer and partly on a remote computer, or entirely on the remote computer or server. In the latter scenario, the remote computer may be connected to the user's computer through any type of network, including a
5 local area network (LAN) or a wide area network (WAN), or the connection may be made to an external computer (for example, through the Internet using an Internet Service Provider).

Aspects of the present invention are described below with reference to flowchart illustrations and/or block diagrams of methods, apparatus (systems), and computer program products according to embodiments of the present invention. It will be understood that each block of the
10 flowchart illustrations and/or block diagrams, and combinations of blocks in the flowchart illustrations and/or block diagrams, can be implemented by computer program instructions. These computer program instructions may be provided to a processor, in particular a microprocessor or a central processing unit (CPU), of a general purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions, which
15 execute via the processor of the computer, other programmable data processing apparatus, or other devices create means for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

These computer program instructions may also be stored in a computer readable medium that can direct a computer, other programmable data processing apparatus, or other devices
20 to function in a particular manner, such that the instructions stored in the computer readable medium produce an article of manufacture including instructions which implement the function/act specified in the flowchart and/or block diagram block or blocks.

The computer program instructions may also be loaded onto a computer, other programmable data processing apparatus, or other devices to cause a series of operational steps to
25 be performed on the computer, other programmable apparatus or other devices to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide processes for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks.

The flowchart and block diagrams in the figures illustrate the architecture, functionality,
30 and operation of possible implementations of systems, methods and computer program products according to various embodiments of the present invention. In this regard, each block in the flowchart or block diagrams may represent a module, segment, or portion of code, which comprises one or more executable instructions for implementing the specified logical function(s). It should also be noted that, in some alternative implementations, the functions noted in the blocks may occur out of the order
35 noted in the figures. For example, two blocks shown in succession may, in fact, be executed substantially concurrently, or the blocks may sometimes be executed in the reverse order, depending upon the functionality involved. It will also be noted that each block of the block diagrams and/or

flowchart illustrations, and combinations of blocks in the block diagrams and/or flowchart illustrations, can be implemented by special purpose hardware-based systems that perform the specified functions or acts, or combinations of special purpose hardware and computer instructions.

The disclosure will further be illustrated with reference to the attached drawings, which schematically show embodiments according to the disclosure. It will be understood that the disclosure is not in any way restricted to these specific embodiments. Moreover, combinations of any of the embodiments and limitations are envisioned by the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

Aspects of the invention will be explained in greater detail by reference to exemplary embodiments shown in the drawings, in which:

FIG. 1 shows a schematic illustration of a telecommunications system;

FIG. 2 provides a schematic illustration of a telecommunications network comprising a RAN controller for assisting in handling of connection setup requests, according to one embodiment of the present invention;

FIG. 3 provides a flow diagram of method steps for the RAN controller to assist in handling of connection setup requests, according to one embodiment of the present invention;

FIG. 4 provides a schematic illustration of a database that could be used in combination with the RAN controller to assist in handling of connection setup requests, according to one embodiment of the present invention; and

FIG. 5 shows a block diagram illustrating an exemplary data processing system that may be used to carry out methods described herein, according to one embodiment of the present invention.

DETAILED DESCRIPTION

FIG. 1 shows a schematic illustration of a telecommunications system 100. The telecommunications system 100 comprises a radio access network 102 (also indicated as E-UTRAN or (UT)RAN in FIG. 1) and a core network 104 containing various elements or nodes as described in further detail below.

In the telecommunications system of FIG. 1, three generations of networks are schematically depicted together for purposes of brevity. A more detailed description of the architecture and overview can be found in 3GPP TS 23.002 which is included in the present application by reference in its entirety.

The lower branch of FIG. 1 represents a GPRS or UMTS telecommunications network.

For a GSM/GPRS telecommunications network (i.e., a 2G/2.5G telecommunications network), a radio access network 102 comprises a plurality of base stations (BTSs) and one or more Base Station Controllers (BSCs), not shown individually in FIG. 1. The core network 104 comprises a

Gateway GPRS Support Node (GGSN), a Serving GPRS Support Node (SGSN, for GPRS) or Mobile Switching Centre (MSC, for GSM, not shown in FIG. 1), and a Home Location Register (HLR) combined with an Authentication Centre (AuC). The HLR contains subscription information for mobile devices 106 (sometimes referred to as "user equipment" (UE) or user devices) and the AuC contains a shared secret key K to be used for authentication and key agreement (AKA) procedures.

For a UMTS radio access network (UTRAN) (i.e., a 3G telecommunications network), the radio access network 102 comprises a Radio Network Controller (RNC) connected to a plurality of NodeBs, also not shown. In the core network 104, the GGSN and the SGSN/MSC are conventionally connected to the HLR/AuC that contains subscription information and shared secret keys K of the mobile devices 106.

The upper branch in FIG. 1 represents a next generation telecommunications network, commonly indicated as Long Term Evolution (LTE) system or Evolved Packet System (EPS) (i.e., a 4G telecommunications network). In such a network, the radio access network 102, indicated as E-UTRAN, comprises evolved NodeBs (eNodeBs or eNBs) providing wireless access for the mobile devices 106. The core network 104 comprises a PDN Gateway (P-GW) and a Serving Gateway (S-GW). The E-UTRAN of the EPS is connected to the S-GW via a packet network. The S-GW is connected to a Home Subscriber Server HSS and a Mobility Management Entity MME for signalling purposes. The HSS includes a subscription profile repository SPR and is combined with an Authentication Centre (AuC) that stores a shared secret key K for AKA procedures. Further information of the general architecture of an EPS network can be found in 3GPP TS 23.401.

For GPRS, UMTS and LTE telecommunications network, the core network 104 is generally connected, using e.g. a gateway (e.g. the P-GW), to a further network 108 which could be any external packet switched network such as e.g. Internet or a dedicated network to provide connectivity between different operators.

Of course, architectures other than defined by 3GPP, e.g. WiMAX and/or CDMA2000, can also be used within the context of the present disclosure and this does not preclude future architectures such as 5G.

FIG. 2 provides a schematic illustration of a telecommunications network 200 comprising a RAN controller 210 for assisting in handling of connection setup requests, according to one embodiment of the present invention. The network 200 illustrates elements of an LTE telecommunications network, however, as previously described herein, the teachings are applicable to other RATs as well by substituting the LTE elements of the network 200 with analogous elements of other RATs (e.g. substituting eNB with a base station, MME - with SGSN, etc. for (UT)RAN).

Similar to the telecommunications networks illustrated in FIG. 1, the network 200 comprises a RAN part 202 and a CN part 204 (indicated with dashed lines), analogous to the RAN part 102 and the CN part 104 of FIG. 1. A UE 206 is also illustrated in FIG. 2, similar to the UE 106 of FIG. 1. The UE 206 may connect to the network 200. The telecommunications network 200 may also

connect to a further network 208, such as e.g. a packet network such as Internet. The further network 208 is analogous to the further network 108 shown in FIG. 1.

FIG. 2 further illustrates the RAN controller 210, which may be viewed as a logical entity configured to intercept connection setup requests between an eNB 212 and an MME 214 over a communication path 216 between these two entities. The eNB 212 receives such communications requests from UEs that it serves, such as e.g. the UE 206. As described in greater detail below, the RAN controller 210 is configured to validate the intercepted requests (i.e. to determine whether or not the requests are to be fulfilled). In order to validate the intercepted requests, the RAN controller 210 may access information stored in a database 218. The MME 214 may also be communicatively connected with the database 218, e.g. in order to supply and update information stored in the database.

Those requests that are validated by the RAN controller 210 and are determined by the RAN controller 210 to be fulfilled are passed for further processing within the CN part 204 of the telecommunications network 200, namely the requests are passed from the MME 214 to a S-GW 220, to a P-GW 222, and to a PCRF 224.

Persons skilled in the art will recognize that while the various elements are shown in FIG. 2 as separate elements, in other embodiments their functionality could be implemented in lesser number of individual elements or distributed over a larger number of components.

FIG. 3 provides a flow diagram 300 of method steps for the RAN controller 210 to assist in handling of connection setup requests, according to one embodiment of the present invention. The method 300 could be performed by any kind of a data processing system that includes at least a processor configured to carry out the method steps 300. An example of such a data processing system is illustrated in FIG. 5. While the method 300 is described in conjunction with FIG. 2 and, in particular, with reference to an LTE network, persons skilled in the art will recognize that any system configured to perform the method steps, in any order, in any type of a telecommunications network, is within the scope of the present invention.

The method 300 may begin with step 302, where the RAN controller 210 intercepts a connection request from the UE 206, via the NAP serving the UE (i.e., in this example - the eNB 212), to the control node of the RAN part of the telecommunications network (the control node being in this example the MME 214). In one embodiment, the RAN controller 210 is able to intercept the request because it is implemented as a part of the MME 214 and is configured to intercept and process the request before the conventional processing of the request by the MME 214 and further nodes within the CN part 204 begins. For example, the UE 206 that wants to attach to the network will send an ATTACH REQUEST, e.g. in accordance with 3GPP 24.301, section 8.2.4, which will be passed from the eNB 212 to the MME 214, where the RAN controller 210 could intercept the request.

In step 304, the RAN controller 210 analyzes the intercepted request in order to validate it, i.e. to determine whether the request is to be fulfilled.

First, the RAN controller 210 may determine or estimate the amount of capacity being requested, in terms of the resource use within the serving NAP. In one embodiment, the RAN controller 210 may extract this information from the Traffic Flow Template (TFT) (e.g. in accordance with section 9.9.4.16 in 3GPP 24.301 and section 10.5.6.12 in 3GPP 24.008) included within the intercepted request, specifying uplink and downlink packet filters that will be used for the connection setup. Since these values will be enforced by network, they can be used in estimating the capacity that serving NAP will be providing.

Next, the RAN controller 210 will determine whether the serving NAP is able to provide the requested capacity. In order to do that, the RAN controller 210 has access to the database 218. The database 218 is configured to store the actual (i.e., current) information on the load of the serving NAP. In an embodiment, information stored in the database 218 may be tracked per NAP, possibly per cell within each NAP, for every NAP connected to the MME. By determining whether the amount of requested capacity is less than the amount of total unused capacity in the serving NAP, the RAN controller is able to establish whether or not to pass the intercepted request for further processing by the CN part 204.

In a preferred embodiment, further checks are implemented, allowing finer granularity in differentiating between requests. In particular, the database 218 may store the actual information on the load of the serving NAP specified as the current load of the serving NAP caused by services of different categories – e.g. caused by one or more predefined services (referred to hereafter as “premium services”), and the current load of the serving NAP caused by other, i.e. non-premium, services. In an embodiment where there is a number of different premium services, the database 218 may store load on a per-premium service basis (i.e., for each premium service there may be a separate counter which tracks its load). In an alternative or additional embodiment where there is a number of different premium services, the database 218 may be configured to store load on a per-OTT service provider basis (i.e., for each OTT service provider there may be a counter which tracks the load of the requests for the OTT).

One way to use the load information stored in the database 218 for premium vs non-premium services comprises defining conditions for the RAN controller 210 to apply in deciding whether to fulfil a request. In an embodiment, the information defining the conditions could also be stored in the database 218. Alternatively, this information could be stored within the RAN controller 210 itself.

For example, in an embodiment, information defining the conditions could include the total expected capacity of a NAP, e.g. as provided by an operator and one or more limits of how much of this total capacity a particular premium service may consume, e.g. also defined by an operator in view of the agreements between the operator and the provider of the premium service. In various embodiments, such limits could be defined as a percentage of the total NAP capacity or as an absolute amount of the resources of a given NAP, which cannot be larger than the totally available

capacity of that NAP. Such limits could be defined for every premium service an operator may or intends to provide, in accordance with respective agreements with the premium service providers, as long as the total sum of resources which is intended for premium services on a given NAP does not exceed the total NAP capacity. Similarly to how, as described above, load information could be stored
5 in the database 218 on a per-premium service basis and/or on a per-Over-The-Top (OTT) service provider basis, conditions may be defined on a per-premium service basis and/or on a per-OTT service provider basis as well.

In an embodiment, conditions applied to one or more premium services or non-premium services may be dynamically adjusted. In one example, the amount of resources reserved for
10 the premium services could be dynamically adjusted based on a schedule (i.e. adjusted depending on the time of the day, day in the week, etc.). In another example, the amount of resources reserved for the premium services could be dynamically adjusted when triggered by one or more of predefined events (e.g. in case of a natural disaster happening, a football game lasting longer than expected, etc.).

As a person skilled in the art will recognize, there are many ways to fill/maintain information in the database 218, all of which are within the scope of the present invention. For example, in one embodiment, the NAP(s) may be configured to provide information regarding resource usage to the database 218. In another embodiment, information within the database 218 may be kept current by an entity, e.g. the RAN controller 210 or the MME 214, tracking amount of
20 resources that have been fulfilled. In such an embodiment, the entity doing the tracking may be configured to also take into account changes to connection setup, e.g. by obtaining indications of modify connection setup requests that have been approved. When a UE then sends a connection setup release message, information in the database 218 is updated accordingly. This kind of "bookkeeping" may be performed for both premium and non-premium services.

An exemplary illustration of the database 218 is provided in FIG. 4, the database shown as a database 400. As shown in FIG. 4, part 402 of the database 400 could maintain data about NAPs 404 or different cells therein, tracking areas 406, active users 408 and Physical Resource Blocks (PRB) information per NAP, and other data relevant for the decision process carried out by the RAN controller 210. As also shown in FIG. 4, part 410 of the database 400 could maintain data about
30 the active connections 412, e.g. the active EPS bearers in the EPS. From this data, the net capacity of a specific NAP/cell in the EPS can be calculated. In addition, part 414 of the database 400 could maintain data about resource reservations for specific services according to operator agreements.

In an embodiment, the RAN controller 210 may determine whether the intercepted request is a request for the premium services or not based on the TFT described above.

In another embodiment, an operator may choose to provide premium services via a separate Access Point Name (APN), as e.g. described in 3GPP 24.008, section 10.5.6.1, or via a separate LLC Service Access Point, as e.g. described in 3GPP 24.008, section 10.5.6.9. In such an

embodiment, the RAN controller 210 can determine whether the intercepted request is a request for the premium services or not by identifying the APN name or LLC Service Access Point name within the intercepted request.

Once the RAN controller 210 determined the category of the intercepted request in one of the manners described above, it will evaluate the request, which, in an exemplary embodiment could be done in the following manner. The RAN controller 210 would access the database 218 regarding the current load of the serving NAP for non-premium services and/or the current load of the NAP for premium services. The RAN controller 210 may then be configured to fulfil the request if the current load of the serving NAP for non-premium services is such that there is sufficient unused capacity to fulfil the request, independent of whether the request is for premium or non-premium services. If, however, the current load of the serving NAP for non-premium services is such that there is not sufficient unused capacity to fulfil the request, the RAN controller 210 will only fulfil the request if the request is for one of the premium services and the current load of the serving NAP for premium services is such that there is sufficient unused capacity to fulfil the request.

In a further embodiment, there may be yet another category of requests, such as e.g. emergency requests, which are treated differently from requests of other categories. For example, the RAN controller could determine whether the request is an emergency request or not from the intercepted ATTACH REQUEST sent by the UE, based on Evolved Packet System (EPS) attach type parameter within the request. If the request is an emergency request, the RAN controller 210 may be configured to always fulfil the intercepted request for passing through to be further processed in the CN part 204.

In step 306, if the RAN controller 210 determined in step 304 that the request is to be fulfilled, then the RAN controller 210 passes the request for being processed further in the CN part 204 of the telecommunications network as is known in prior art. In particular, the request may be passed from the MME 214 to the S-GW 220 and to the P-GW 222 to reach the PCRF 224 which will determine whether the user and/or the device have the necessary rights for the request to be fulfilled. If, however, the outcome of the validation in step 304 was negative, the RAN controller 210 does not pass the request to the CN part 204. In this case, the RAN controller 210 may e.g. discard the request, ignore the request, or store it for further re-evaluation at some later point in time. In an embodiment, the request may fail when one of timers associated with fulfilling the request, as known in the art, expire.

In an embodiment, the method may also include a step of providing an indication, either explicit or implicit, to the UE 206 of whether the connection setup request was determined to be fulfilled. When the request was determined to be fulfilled, such indication may be implicit in that the requested connection will be established. When the request was not determined to be fulfilled, the RAN controller 210 may be configured to provide an indication of that, possibly with further indication as to what the RAN controller 210 will do with the request (e.g., discard, ignore, or store for further re-evaluation), to the UE 206.

In an embodiment, in step 308, the RAN controller 210 may, optionally, update the database 218 with the data from the intercepted request. Such an embodiment may be particularly advantageous when the request has been or about to be fulfilled and when the information on resource usage is kept current in the database 218 by means of bookkeeping described above.

5 FIG. 5 depicts a block diagram illustrating an exemplary data processing system that may be used in a network as described with reference to FIG. 2, in particular as the RAN controller 210.

As shown in FIG. 5, the data processing system 500 may include at least one processor 502 coupled to memory elements 504 through a system bus 506. As such, the data
10 processing system may store program code within memory elements 504. Further, the processor 502 may execute the program code accessed from the memory elements 504 via a system bus 506. In one aspect, the data processing system may be implemented as a computer that is suitable for storing and/or executing program code. It should be appreciated, however, that the data processing system 500 may be implemented in the form of any system including a processor and a memory that is
15 capable of performing the functions described within this specification.

The memory elements 504 may include one or more physical memory devices such as, for example, local memory 508 and one or more bulk storage devices 510. The local memory may refer to random access memory or other non-persistent memory device(s) generally used during actual execution of the program code. A bulk storage device may be implemented as a hard drive or
20 other persistent data storage device. The processing system 500 may also include one or more cache memories (not shown) that provide temporary storage of at least some program code in order to reduce the number of times program code must be retrieved from the bulk storage device 510 during execution.

Input/output (I/O) devices depicted as an input device 512 and an output device 514
25 optionally can be coupled to the data processing system. Examples of input devices may include, but are not limited to, a keyboard, a pointing device such as a mouse, or the like. Examples of output devices may include, but are not limited to, a monitor or a display, speakers, or the like. Input and/or output devices may be coupled to the data processing system either directly or through intervening I/O controllers.

30 In an embodiment, the input and the output devices may be implemented as a combined input/output device (illustrated in FIG. 5 with a dashed line surrounding the input device 512 and the output device 514). An example of such a combined device is a touch sensitive display, also sometimes referred to as a "touch screen display" or simply "touch screen". In such an embodiment, input to the device may be provided by a movement of a physical object, such as e.g. a stylus or a
35 finger of a user, on or near the touch screen display.

A network adapter 516 may also be coupled to the data processing system to enable it to become coupled to other systems, computer systems, remote network devices, and/or remote

storage devices through intervening private or public networks. The network adapter may comprise a data receiver for receiving data that is transmitted by said systems, devices and/or networks to the data processing system 500, and a data transmitter for transmitting data from the data processing system 500 to said systems, devices and/or networks. Modems, cable modems, and Ethernet cards are examples of different types of network adapter that may be used with the data processing system 500.

As pictured in FIG. 5, the memory elements 504 may store an application 518. In various embodiments, the application 518 may be stored in the local memory 508, the one or more bulk storage devices 510, or apart from the local memory and the bulk storage devices. It should be appreciated that the data processing system 500 may further execute an operating system (not shown in FIG. 5) that can facilitate execution of the application 518. The application 518, being implemented in the form of executable program code, can be executed by the data processing system 500, e.g., by the processor 502. Responsive to executing the application, the data processing system 500 may be configured to perform one or more operations or method steps described herein.

Persons skilled in the art will recognize that while the elements 502-518 are shown in FIG. 5 as separate elements, in other embodiments their functionality could be implemented in lesser number of individual elements or distributed over a larger number of components.

Various embodiments of the invention may be implemented as a program product for use with a computer system, where the program(s) of the program product define functions of the embodiments (including the methods described herein). In one embodiment, the program(s) can be contained on a variety of non-transitory computer-readable storage media, where, as used herein, the expression "non-transitory computer readable storage media" comprises all computer-readable media, with the sole exception being a transitory, propagating signal. In another embodiment, the program(s) can be contained on a variety of transitory computer-readable storage media. Illustrative computer-readable storage media include, but are not limited to: (i) non-writable storage media (e.g., read-only memory devices within a computer such as CD-ROM disks readable by a CD-ROM drive, ROM chips or any type of solid-state non-volatile semiconductor memory) on which information is permanently stored; and (ii) writable storage media (e.g., flash memory, floppy disks within a diskette drive or hard-disk drive or any type of solid-state random-access semiconductor memory) on which alterable information is stored. The computer program may be run on the processor 502 described herein.

The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the invention. As used herein, the singular forms "a," "an," and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

The corresponding structures, materials, acts, and equivalents of all means or step plus function elements in the claims below are intended to include any structure, material, or act for performing the function in combination with other claimed elements as specifically claimed. The description of embodiments of the present invention has been presented for purposes of illustration, but is not intended to be exhaustive or limited to the implementations in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art without departing from the scope and spirit of the present invention. The embodiments were chosen and described in order to best explain the principles and some practical applications of the present invention, and to enable others of ordinary skill in the art to understand the present invention for various embodiments with various modifications as are suited to the particular use contemplated.

CLAIMS

1. A method for assisting in handling of connection setup requests in a telecommunications network, the method comprising:
- 5 intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of the telecommunications network;
- determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE; and
- 10 passing the connection setup request for further processing within the telecommunications network only upon positive determination.
2. The method according to claim 1, wherein the determination of whether the connection setup request is to be fulfilled is further based on one or more agreements with one or more service providers regarding resource capacity in an access network part of the telecommunications network.
- 15 3. The method according to claim 2, wherein the one or more agreements comprise reservation, at the NAP serving the UE, of a predefined resource capacity for connection setup requests for one or more predefined services.
- 20 4. The method according to claim 3, wherein the predefined resource capacity is set as a percentage of the total resource capacity of the NAP.
5. The method according to claim 3, wherein the predefined resource capacity is set as a predefined amount of the total resource capacity of the NAP, the predefined amount being less than
- 25 the total resource capacity of the NAP.
6. The method according to any one of claims 3-5, wherein the predefined resource capacity is dynamically adjusted.
- 30 7. The method according to any one of claims 3-6, further comprising:
- identifying, from the connection setup request, a service for which a connection setup is requested;
- determining that the identified service is not one of the one or more predefined services and, optionally, determining that the identified service is not one of one or more additional
- 35 predefined services; and
- determining that the connection setup request is to be fulfilled if, at the NAP serving the UE, there is sufficient unused resource capacity that is not reserved for the connection setup

requests for the one or more predefined services.

8. The method according to any one of the preceding claims, further comprising providing an indication to the UE of whether the connection setup request was determined to be fulfilled.

9. A computer program product, preferably stored on a computer-readable non-transitory storage medium, comprising software code portions configured for, when executed in a computer, carrying out method steps according to any one of the claims 1-8.

10. A data structure comprising at least:

an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;

an indication of an amount of resources currently used by the NAP for the one or more predefined services; and

an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services.

11. A computer-readable storage medium, preferably non-transitory, storing the data structure according to claim 10.

12. A node (200) comprising:

a computer readable storage medium (204) having computer readable program code embodied therewith, and

a processor (202), preferably a microprocessor, coupled to the computer readable storage medium, wherein responsive to executing the computer readable program code, the processor is configured to perform executable operations comprising:

intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of a telecommunications network;

determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE; and

passing the connection setup request for further processing within the telecommunications network only upon positive determination.

13. The node according to claim 12, wherein the node is a mobile management entity (MME) of the telecommunications network.

14. The node according to claims 12 or 13, wherein:

the node is communicatively connected to the computer-readable storage medium according to claim 11, and

5 the information regarding resource use within the NAP serving the UE comprises at least a portion of information stored on the computer-readable storage medium.

15. A system comprising:

the node according to any one of claims 12-14, and

the computer-readable storage medium according to claim 11.

10

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference P2066PC00	FOR FURTHER ACTION	See item 4 below
International application No. PCT/EP2015/080174	International filing date (<i>day/month/year</i>) 17 December 2015 (17.12.2015)	Priority date (<i>day/month/year</i>) 22 December 2014 (22.12.2014)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant KONINKLIJKE KPN N.V.		

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	This REPORT consists of a total of 12 sheets, including this cover sheet. In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 80%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
<input checked="" type="checkbox"/>	Box No. I	Basis of the report																							
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<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application																							
<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).																								

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report 27 June 2017 (27.06.2017)
Facsimile No. +41 22 338 82 70	Authorized officer <div style="text-align: center; font-weight: bold; font-size: 1.2em;">Nora Lindner</div>
e-mail: pct.team5@wipo.int	

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43*bis*.1)

To: see form PCT/ISA/220		Date of mailing (day/month/year) see form PCT/ISA/210 (second sheet)
Applicant's or agent's file reference see form PCT/ISA/220		FOR FURTHER ACTION See paragraph 2 below
International application No. PCT/EP2015/080174	International filing date (day/month/year) 17.12.2015	Priority date (day/month/year) 22.12.2014
International Patent Classification (IPC) or both national classification and IPC INV. H04W76/02 H04W28/16 H04W28/26 H04W76/00		
Applicant KONINKLIJKE KPN N.V.		

1. This opinion contains indications relating to the following items:


- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Fax: +49 89 2399 - 4465	Date of completion of this opinion see form PCT/ISA/210	Authorized Officer del Sorbo, Filomena Telephone No. +49 89 2399-0
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Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed.
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))
3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. ☐ forming part of the international application as filed:
 - ☐ in the form of an Annex C/ST.25 text file.
 - ☐ on paper or in the form of an image file.
 - b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
 - ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).
 - ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>4-6</u>
	No: Claims	<u>1-3, 7-15</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-15</u>
Industrial applicability (IA)	Yes: Claims	<u>1-15</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following documents:

- D1 WO 2012/130312 A1 (ERICSSON TELEFON AB L M [SE]; WASS MIKAEL [SE]) 4 October 2012 (2012-10-04)
- D2 US 2013/201870 A1 (GUPTA VIVEK [US]) 8 August 2013 (2013-08-08)
- D3 US 6 192 248 B1 (SOLONDZ MAX A [US]) 20 February 2001 (2001-02-20)
- D4 US 2012/039168 A1 (HE JIAMING [CN] ET AL) 16 February 2012 (2012-02-16)
- D5 WO 03/077580 A1 (ERICSSON TELEFON AB L M [SE]; HOLLIS MARK [AU]; HODGES PHILIP [AU]; RY) 18 September 2003 (2003-09-18)

Item V:

- 1 Document **D1**, which is considered to be the most relevant prior art, discloses (the references in parentheses correspond to the passages of **D1**), according to all the features of **independent claim 1**, a method for assisting in handling of connection set-up requests in a telecommunications network, the method comprising:
- intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network (RAN) part of the telecommunications network (see page 4, lines 5-7: "*The user entity is at least being adapted for transmitting a SR, inserting a low priority indication in and transmitting an extended service request, ESR*" and see page 4, lines 31-35: "*a method for a mobility management entity node being adapted for handling (624), or rejecting / discarding (623) a service request, SR, as well as being adapted for handling or rejecting / discarding an extended service request, ESR.*");
 - determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point (NAP) serving the UE (see page 5, lines 1-2: "*The method comprises the steps of monitoring a load level of the mobility management entity node or the load level in a network in which the mobility management entity node resides and performing one decision*"); and
 - passing the connection setup request for further processing within the

telecommunications network only upon positive determination (see page 5, lines 2-8: "*and performing one decision of: -if the load level is below a first threshold - handling at least incoming SR's and ES 's with or without a low priority indication, - if the load level is larger or equal to the first threshold but lower or equal to a second threshold - rejecting / discarding ESR's with a low priority indication while handling ESR's without a low priority indication and handling SR's.*").

The subject-matter of claim 1 is accordingly **not new**, Article 33(2) PCT.

- 1.1 It should further be noted that claim 1 has a so general formulation that also documents **D2 and D3** disclose all the features of claim 1:

a method for assisting in handling of connection set-up requests in a telecommunications network, the method comprising: a control node of a RAN intercepting a connection setup request from a user equipment (UE), determining whether the connection setup request is to be fulfilled based on information regarding resource use within a network access point (NAP) serving the UE; and passing the connection setup request only upon positive determination (see **D2**, figure 2 and paragraphs [0032] - [0033]: "*the UE 15 may send an RRC connection request message 204 to a network controller 206. The RRC connection request message 204 may be a request by the UE 15 for allocation of radio resources so that the UE 15 may exchange data with the RAN 20. The network controller 206 may control establishment and/or maintenance of RRC connections between the UE 15 and the RAN 20. [...] If the RAN 20 is congested and is not be able to support an RRC connection associated with the RRC connection request message 204, the network controller 206 may respond with an RRC connection reject message 208 to reject the RRC connection request message 204. In this case an RRC connection between the UE 15 and the RAN 20 may not be established*"; (see also **D3**, figure 2, steps 208, 210 and 220 and column 4, lines 47-67: "*In step 208, the base station 108 located in cell 104 receives this call establishment request. As will be appreciated to one of ordinary skill in the art, each base station 108 has a finite number of channels, or resources, over which telephone calls may be established. [...] In step 208, the base station 108 analyzes its resources to determine whether it has a free channel to service the call establishment request.*").

As indicated by decision step 210, if the base station 108 has a free channel to service the call establishment request, then step 220 is performed. In step 220, a call is established between the wireless terminal 106 and the public network subscriber in a well known manner.")

The subject-matter of claim 1 is accordingly **not new**, Article 33(2) PCT, also with respect to the disclosure of documents D2 and D3.

- 1.2 Furthermore, it is pointed out that even if the claims were interpreted in a different manner based on minor differences between the features of claim 1 and those features disclosed in document **D1** (or D2, or D3), the subject-matter of claim 1 would still not involve an inventive step (Article 33(3) PCT), as D1 (or D2 or D3) discloses the same object and the same solution as the present application, i.e. to *handle connection setup requests guaranteeing that the so called "premium services" will receive precedence over other services*.

- 1.3 The same reasoning as presented above for **claim 1** applies to **independent claims 9 and 12** which define respectively the software (claim 9) and the node (claim 12) for carrying out the method defined in **claim 1** .

Therefore, the subject-matter of **claims 9 and 12** is **neither new**, Article 33(2) PCT, **nor does it involve an inventive step**, Article 33(3) PCT.

- 1.4 The subject-matter of **independent claims 10 and 11**, defining the storage medium and the data structure, is **not novel** in the sense of Article 33(2) PCT, since **D3** discloses storage medium containing a data structure comprising at least one of:
- an indication of a resource capacity of a network access point (NAP) reserved for connection setup requests for one or more predefined services;
 - an indication of an amount of resources currently used by the NAP for the one or more predefined services; and
 - an indication of an amount of resources currently used by the NAP for services that do not belong to the one or more predefined services (see column 4, lines 7-18. *"Each base station, such as base station 108, includes a database 110. This database 110 includes a list (or table) having an entry for each of the telephone calls which are currently active in the cell 104. The entries store information that identifies the service levels (also called level-of-services) respectively associated with the wireless terminals in the cell 104 that are involved in the active telephone calls. The base station 108 may also*

include a database of user profiles. The user profiles are associated with particular users via unique user identification numbers assigned to each user."

- 2 **Dependent claims 2-8 and 13-15** do not contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the Article 33(3) PCT with respect to inventive step, for the reason that the subject-matter of said claims either is in principle directly derivable from the above cited documents, or concerns simple embodiments without inventive merits in themselves, as detailed in the following:
- 2.1 The subject-matter of **claim 2** defining that the determination of whether the connection setup request is to be fulfilled is further based on one or more agreements with one or more service providers, is anticipated in **D1** (see figure 6 and page 5, lines 3-8: the decision whether handling or not a service request depends also on priority levels of the required services), as well **D2** (see paragraphs [0034], [0038]), **D3** (see figure 2, step 214 and 216, and column 1, lines 44-56), **D4** (see abstract and figure 1) and **D5** (see page 2, lines 15-17)
- 2.2 The subject-matter of **claim 3** defining that the one or more agreements comprise reservation, at the NAP serving the UE, of a predefined resource capacity for connection setup requests for one or more predefined services, is anticipated in **D3** (see column 3, lines 17-34), as well in **D4** (see paragraph [0007]: *"the base station system has always reserved a maximum bandwidth for every business flow"*), and **D5** (see page 2, lines 18-25).
- 2.3 The subject-matter of **claims 4 and 5**, defining the predefined resource capacity as a percentage of the total resource capacity of the NAP or as a predefined amount of the total resource capacity of the NAP, said predefined value being less than the total resource capacity of the NAP, is disclosed in **D4** (see " $\sum b_{i,max}$ ", the bandwidth of business flow and " b_{total} ", the total bandwidth of the base station).
- 2.4 The subject-matter of **claim 6** defining the predefined resource capacity being dynamically adjusted, is also derivable from **D4** (the method disclosed in D4 takes also into account the occupied bandwidth of currently admitted business flow, which obviously is variable in time).

- 2.5 The subject-matter of **claim 7** defining the method further comprising: identifying, from the connection setup request, a service for which a connection setup is requested and determining that the connection setup request is to be fulfilled according to the available capacity at the NAP, taking into account the reserved capacity for the different predefined services, is anticipated in **D3** (see figure 3, steps 314 and 316), as well in **D4** (see figure 1 and paragraph [0007]: "*Also, the bandwidth threshold of the base station system is set, when the total reserved bandwidth of the base station system exceeds the bandwidth threshold, the base station system will refuse to admit the low priority business and only admit the high priority business.*") and **D5** (see page 2, lines 17-24: "*The preferential treatment can especially include access to reserved network resources, e. g. only the highest priority connections are given access to the resources reserved for highest priority connections while the second priority connections are given only access to resources reserved for the second priority connections, excluding the resources reserved for the highest priority connections. Further priority levels are possible, connections for each level having only access to resources reserved for the same or a lower level.*").
- 2.6 The subject-matter of **claim 8** defining an indication to the UE of whether the connection setup request was determined to be fulfilled, is anticipated in **D2** (see e.g. figure 2, message 208).
- 2.7 The subject-matter of **claim 13** defining the node being a mobile management entity (MME) of the telecommunications network, is disclosed in both **D1** (see page 4, line 32) and **D2** (see paragraph [0029] and [0032]).
- 2.8 The subject-matter of **claim 14** defining the node to be communicatively connected to a computer-readable storage medium and the information regarding used resource to comprise at least a portion of information stored on the computer-readable storage medium, is anticipated in **D1** (see figure 5) as well in **D2** (see figure 7) and **D3** (see figure 1).
- 2.9 As the subject-matter of **claim 15** is a combination of the subject-matter of claims 11 and 12, **claim 15** is not novel having regards to the objections raised in paragraphs 5.1 and 5.5 above.

Item VII:

If the applicant opts to enter the **PCT-II phase** (examination phase) or a national/ regional phase, the following points must also be taken into consideration:

- 1 To meet the requirements of Rule 6.3 (b) PCT, any independent claim should be **correctly** cast in the **two-part form**, with those features which in combination are part of the nearest prior art (e.g. the WO document corresponding to **D1**) being placed in the preamble.
- 2 To meet the requirement of Rule 5.1 (a) (ii) PCT, the WO document corresponding to D1, D2 and D3 which represent a relevant state of the art with regard to the presently claimed invention, should be identified in the opening part of the description and the relevant background art disclosed therein should be briefly discussed.
- 3 The opening part of the description, including the statement of the object/ solution, should be **brought into conformity** with the wording of any new or amended independent claim(s), Rule 5.1 (a) (iii) PCT.

Item VIII:

If the applicant opts to enter the **PCT-II phase** (examination phase) or a national/ regional phase, the following points must also be taken into consideration:

- 1 **Claim 1** is not supported by the description as required by Article 6 PCT (cf. PCT Guidelines, 5.43), as its scope is broader than justified by the description and drawings. The invention is directed i.a. to a method for allocating different kind of services (premium vs standard ones) based on the availability of resources (see e.g. page 1, lines 29 and 30). Claim 1, however, merely claims a fairly standard resource allocation without any reference to the different type of services and the particular method for allocating them resources based on the available one.

As a consequence, claim 1 does not contain all the features necessary to the definition of the invention, contrary to the requirements of Article 6 PCT. To overcome this objection, the wording of the claim 1 should be revised by including the above essential feature into said claim (i.e. allocation of resources for different types of services based on the available ones).

- 2 **Claim 1** is furthermore unclear (Article 6 PCT), since it lacks to define in which device/entity in the system the defined steps are performed.
- 2.1 Although it might be clear from the description (see page 2, lines 10-15) that all steps of the method are performed by the same entity (i.e. a functional network component) within or associated with a telecommunication network, claims should clearly define the scope of protection sought.
- 2.2 However, the formulation of claim 1 suggests that any entity (even not within the telecommunication network) could perform the method contrarily at what disclosed in the application.
- 2.3 As a consequence, the definition in claim 1 is not allowable as it results in the skilled person being presented with information which is broader than justified by the description ,and which is not supported in and not directly and unambiguously derivable from that previously presented in the application (see PCT Guidelines, 5.43).
- 3 **Independent claim 10** is unclear (Article 6 PCT), since it defines a data structure, which does not fall under any of the allowed categories of claim i.e. physical entity (apparatus, product) and activity (process, method); (see PCT Guidelines 5.12).
- 4 Moreover the **independent claims 1 and 10** of the present application are not defined with corresponding features. In fact, it is noted that several features of the independent claim 10 are not claimed in the independent claim 1 (e.g. resource capacity of a network access point reserved for connection setup request for one or more predefined services) and vice versa.
- Thus, doubt is introduced as to which features the Applicant considers to be essential to the definition of the invention and resulting in the **lack of clarity** (Article 6 PCT) regarding the desired scope of protection.
- In order to overcome these objections, all of the independent claims of the present application should be adapted with each other by being provided with the same or corresponding technical features.
- 5 The formulation of **Claim 7** leaves unclear when the defined steps should be performed, whereas the description suggests that the three steps defined in claim 7 should be performed after the first step of claim 1 (see description,

page 3, lines 28-34, and page 12, lines 1-15). Moreover from the description it is not clear whether the steps of claim 7 should substitute the second step of claim 1. Therefore Claim 7 does not meet the requirements of Article 6 PCT.

- 6 According to Rule 6.2(b) PCT, the use of parentheses in the claims is intended for placing reference signs, which are however considered as having no limiting effect.
- 6.1 Since the acronyms "UE", "RAN", "NAP" and "MME" are used in the wording of the claims to reference to the corresponding features, it appears convenient to introduce these acronyms in claims 1 and 12 without using parentheses.
- 6.2 In view of the description (see page 13, line 5-15, and figure 5), it appears that all the references in **claim 12** are incorrect, since the reference sign 200 does clearly not correspond to a node but to the network of figure 2. The applicant should therefore revise and correct them.
- 7 The present application does not fulfil the requirements of Article 6 PCT, since the description contains in page 11, line 18 - 24, as well as in page 12, line 15 - 21, and in page 13, line 1 - 5, embodiments which do not fall under the filed claims (cf. PCT Guidelines 5.29).
- The Applicant is kindly requested to revise and, if required, amend the application in order to ensure that all embodiments fall under the filed claims or to describe the embodiments not covered by the claims as examples, so that the application fulfil the requirements of Article 6 PCT.
- 8 The reference on page 7, line 32 of the description ("*included in the present application by reference*") should have been avoided as the application should be self-contained; such referenced document is not regarded as part of the disclosure unless it contains matter essential to the invention, in which case the subject-matter in question would have to be incorporated into the description (PCT Guidelines, 4.26).
- 9 The reference to the "*spirit of the present invention*" (page 15, line 7) is contrary to the requirements to Article 6 PCT, since it suggests that the extent of protection may be expanded in some vague and not precisely defined way.

PCT REQUEST

Print Out (Original in Electronic Form)

0	For receiving Office use only	
0-1	International Application No.	PCT/EP2015/080174
0-2	International Filing Date	17 DEC 2015 (17.12.2015)
0-3	Name of receiving Office and "PCT International Application"	RO/EP
0-4	Form PCT/RO/101 PCT Request	
0-4-1	Prepared Using	PCT Online Filing Version 3.5.000.244e MT/FOP 20141031/0.20.5.20
0-5	Petition The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	European Patent Office (EPO) (RO/EP)
0-7	Applicant's or agent's file reference	P2066PC00
I	Title of Invention	HANDLING OF CONNECTION SETUP REQUESTS
II	Applicant	
II-1	This person is	Applicant only
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II-7	State of residence	NL
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II-9	Facsimile No.	+31 70 385 54 37
II-10	e-mail	dienieke.vandertoorn-dejager@kpn.com
II-10(a)	E-mail authorization The receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority are authorized to use this e-mail address, if the Office or Authority so wishes, to send notifications issued in respect of this international application:	exclusively in electronic form (no paper notifications will be sent)

PCT REQUEST

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III-1	Applicant and/or inventor	
III-1-1	This person is	Applicant only
III-1-2	Applicant for	All designated States
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III-1-7	State of residence	NL
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IV-1	Agent or common representative; or address for correspondence	
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IV-1-2	Address	P.O. Box 95321 2509 CH The Hague Netherlands
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IV-1-5	e-mail	dienieke.vandertoorn-dejager@kpn.com
IV-1-5(a))	E-mail authorization The receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority are authorized to use this e-mail address, if the Office or Authority so wishes, to send notifications issued in respect of this international application:	exclusively in electronic form (no paper notifications will be sent)

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V	DESIGNATIONS	
V-1	The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.	
VI-1	Priority claim of earlier regional application	
VI-1-1	Filing date	22 December 2014 (22.12.2014)
VI-1-2	Number	14199719.7
VI-1-3	Regional Office	EP
VI-2	Priority document request The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s):	VI-1
VI-3	Incorporation by reference : where an element of the international application referred to in Article 11(1)(iii)(d) or (e) or a part of the description, claims or drawings referred to in Rule 20.5(a) is not otherwise contained in this international application but is completely contained in an earlier application whose priority is claimed on the date on which one or more elements referred to in Article 11(1)(iii) were first received by the receiving Office, that element or part is, subject to confirmation under Rule 20.6, incorporated by reference in this international application for the purposes of Rule 20.6.	
VII-1	International Searching Authority Chosen	European Patent Office (EPO) (ISA/EP)
VII-2	Request to use results of earlier search; reference to that search	
VII-2-1	Filing date	22 December 2014 (22.12.2014)
VII-2-2	Application Number	141997197
VII-2-3	Country (or regional Office)	EP
VII-2-5	Documents are available to the ISA in a form and manner acceptable to it and therefore do not need to be submitted by the applicant to the ISA (Rule 12bis.1(f)):	A copy of the results of the earlier search A copy of the earlier application A copy of any document cited in the results of the earlier search

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VIII	Declarations	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	—	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	—	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	—	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	—	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	—	
IX	Check list	Number of sheets	Electronic file(s) attached
IX-1	Request (including declaration sheets)	5	✓
IX-2	Description	15	✓
IX-3	Claims	3	✓
IX-4	Abstract	1	✓
IX-5	Drawings	5	✓
IX-7	TOTAL	29	
	Accompanying Items	Paper document(s) attached	Electronic file(s) attached
IX-8	Fee calculation sheet	—	✓
IX-20	Figure of the drawings which should accompany the abstract	2	
IX-21	Language of filing of the international application	English	
X-1	Signature of applicant, agent or common representative	(PKCS7 Digital Signature)	
X-1-1	Name (LAST, First)	WUYTS, Koenraad	
X-1-3	Capacity (if such capacity is not obvious from reading the request)	(Representative)	

PCT REQUEST

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FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	17 DEC 2015 (17.12.2015)
10-2	Drawings:	
10-2-1	Received	✓
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP
10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
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TITLE: HANDLING OF CONNECTION SETUP REQUESTS

APPLICANT: KONINKLIJKE KPN N.V.

IPC CLASSIFICATION: H04W76/02, H04W28/16, H04W28/26, H04W76/00

EXAMINER: del Sorbo, Filomena

CONSULTED DATABASES: DOSYS, EPODOC, WPI

CLASSIFICATION SYMBOLS DEFINING EXTENT OF THE SEARCH:

IPC:

CPC: H04W76/02, H04W76/00, H04W28/16, H04W28/26, 3GPP

FI/F-TERMS:

KEYWORDS OR OTHER ELEMENTS FEATURING THE INVENTION:

Method for assisting in handling of connection setup requests in a telecommunications network. The method includes intercepting a connection setup request from a user equipment (UE) to a control node of a radio access network part of the telecommunications network, determining whether the connection setup request is to be fulfilled based at least on information regarding resource use within a network access point serving the UE, and passing the connection setup request for further processing within the telecommunications network only upon positive determination.

Further embodiments deal with the differentiated treatment for connection set-up requests of predefined services.

Resource reservation for said predefined services.

CONNECTION SET-UP ASSISTED BY MME

PREMIUM, OTT SERVICES

RESOURCE RESERVATION

ADMISSION CONTROL

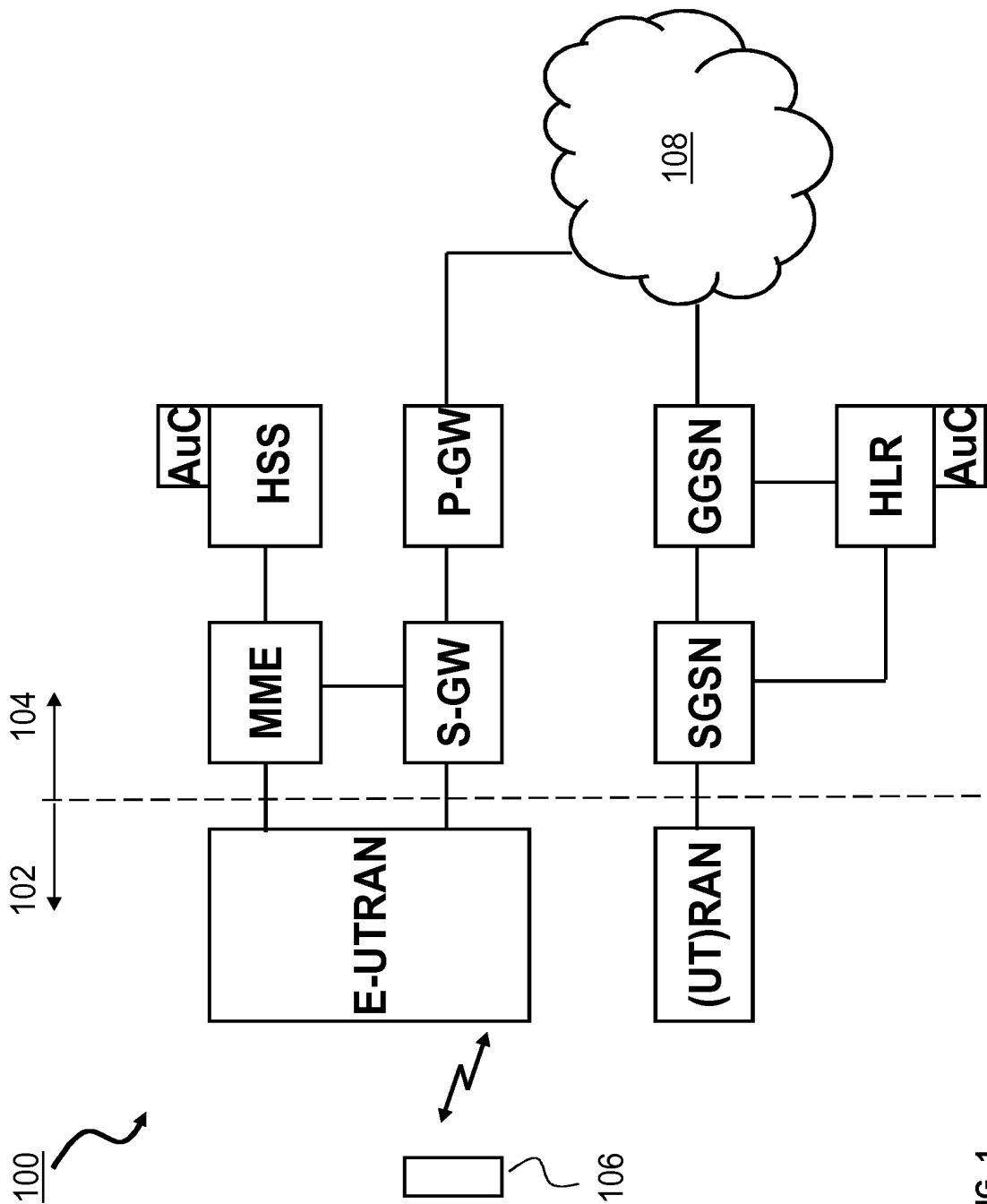


FIG. 1

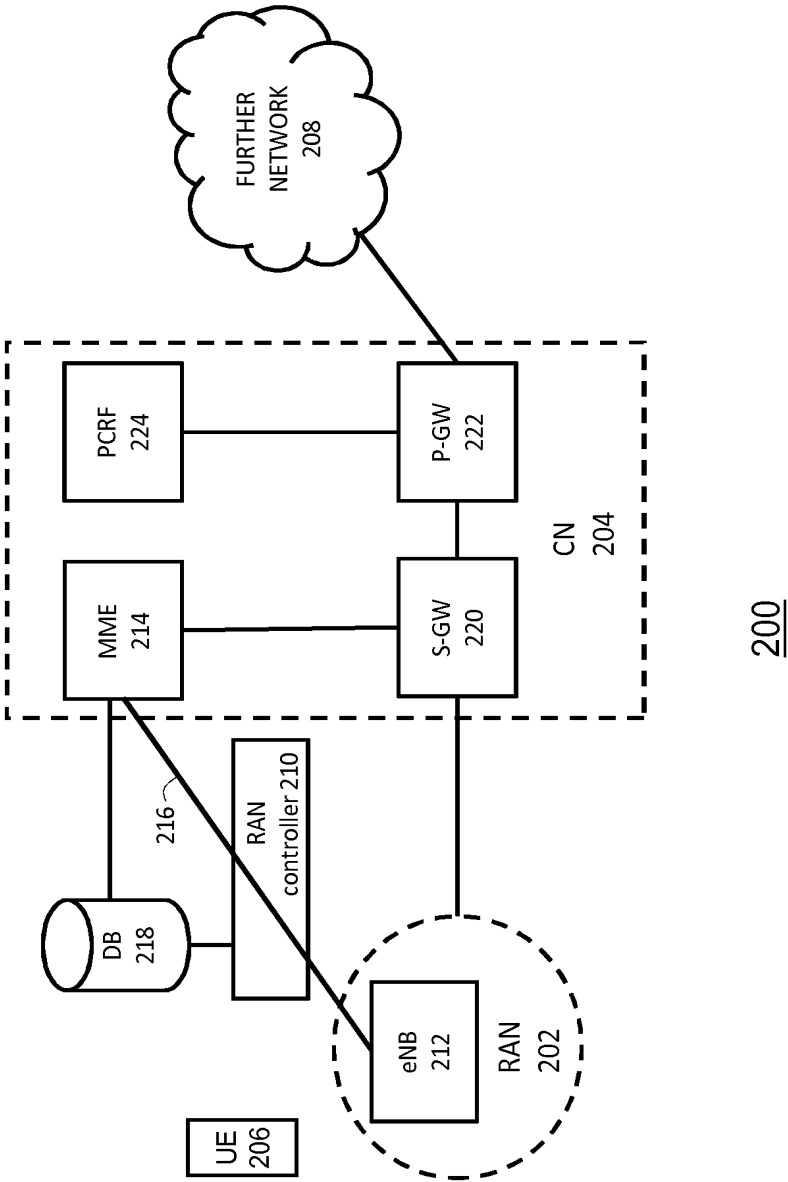


FIG. 2

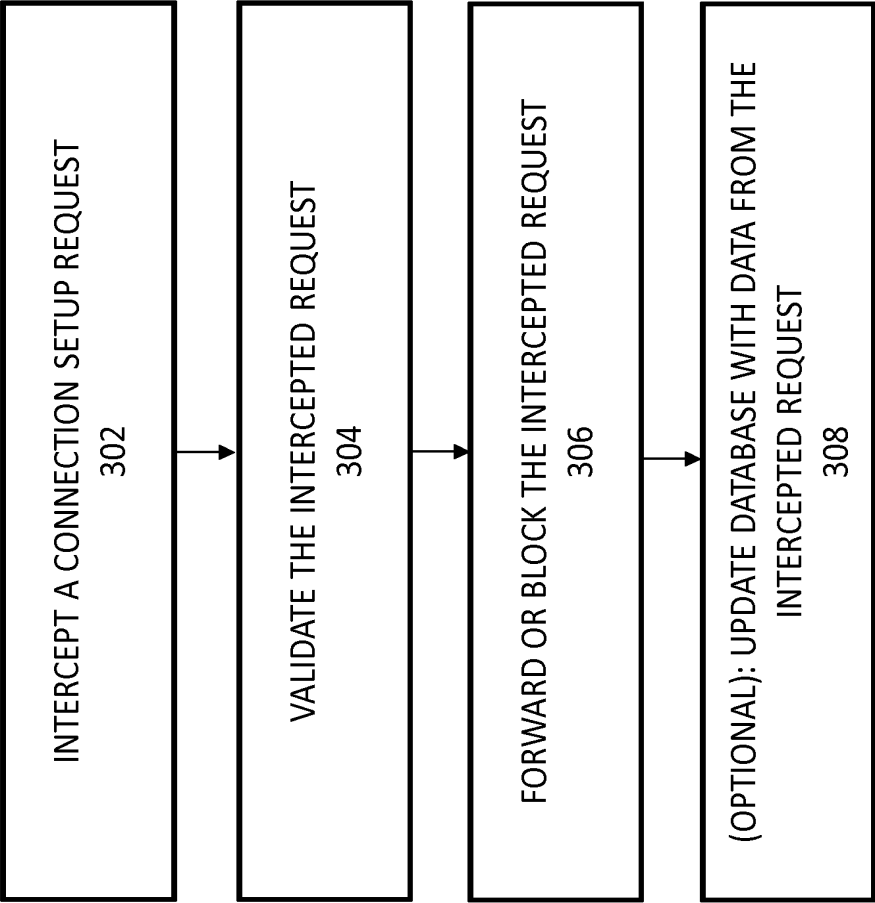


FIG. 3

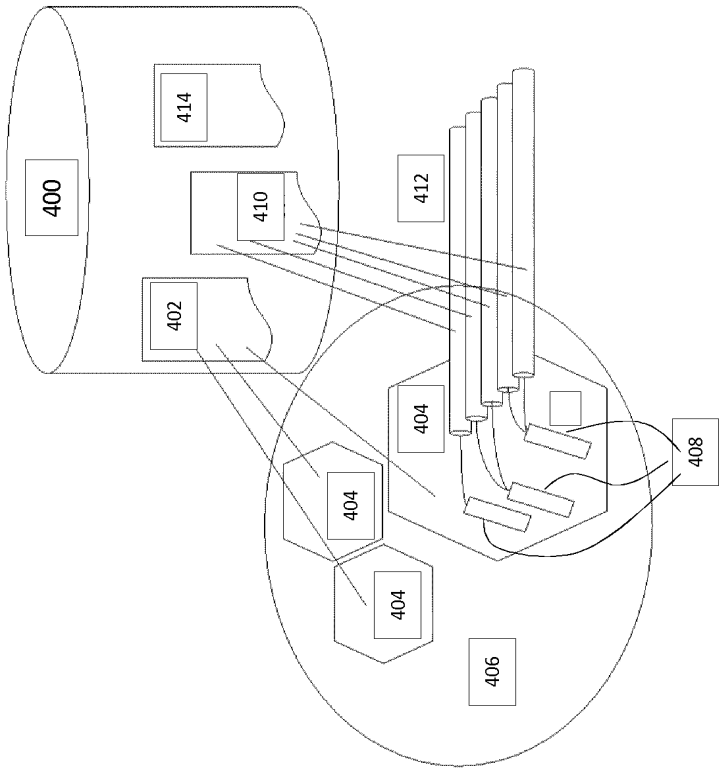


FIG. 4

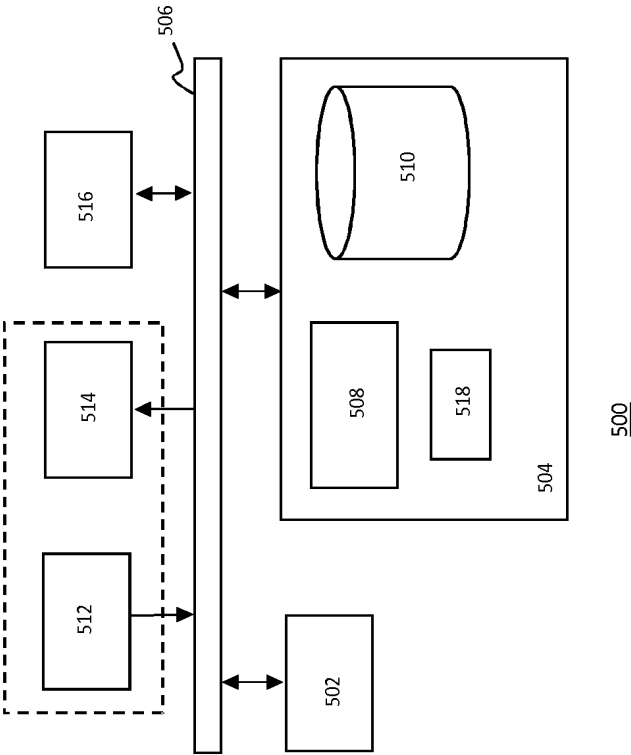


FIG. 5