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- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

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- with international search report (Art. 21(3))
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[Continued on next page]

(54) Title: INTERACTION BETWEEN ACCUMULATIVE POWER CONTROL AND MINIMUM/MAXIMUM TRANSMIT POWER IN LTE SYSTEMS

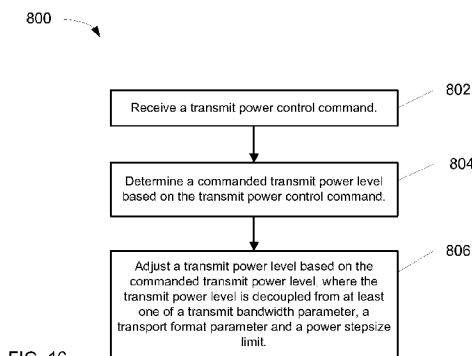


FIG. 16

(57) Abstract: Methods and apparatus in a wireless communication system are described for receiving and processing transmit power control commands, where, for example, the response to the transmit power control commands is conditionally decoupled from at least one of a transmit bandwidth parameter, a transport format parameter and a power stepsize limit. This Abstract is provided for the sole purpose of complying with the Abstract requirement rules that allow a reader to quickly ascertain the disclosed subject matter. Therefore, it is to be understood that it should not be used to interpret or limit the scope or the meaning of the claims.



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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		
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Electronic data base consulted during the international search (name of data base and, where practical, 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	US 2003/036403 A1 (SHIU DA-SHAN [US] ET AL) 20 February 2003 (2003-02-20)	1,9,12, 14,15, 20,28, 35,37, 41,44, 48-52
Y	paragraphs [0011], [0055], [0073], [0051], [0161], [0158], [0087], [0 55]	1-8,12, 16-19, 21-27, 29-32, 38-40, 42,43, 45-47
Y	----- WO 2008/115774 A1 (SKYWORKS SOLUTIONS INC [US]; AGAHI DARIOUSH [US]; GOVINDSWAMY ARUMUGAM) 25 September 2008 (2008-09-25) paragraph [0033] -----	2,21,38, 45
-/--		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.		
<input checked="" type="checkbox"/> 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	
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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1 478 104 A1 (UBINETICS LTD [GB]) 17 November 2004 (2004-11-17) paragraphs [0031] - [0033] -----	16,17, 29,30, 42,43
Y	EP 0 682 417 A2 (NIPPON TELEGRAPH & TELEPHONE [JP] NTT DOCOMO INC [JP]) 15 November 1995 (1995-11-15) abstract page 3, line 1 - page 5, line 20 -----	18,19, 31,32
Y	WO 2005/114866 A1 (QUALCOMM INC [US]; KASTURI NITIN [US]; SUBRAHMANYA PARVATHANATHAN [US]) 1 December 2005 (2005-12-01) abstract paragraph [0039] -----	3-6, 22-25
Y	WO 2006/112764 A1 (ERICSSON TELEFON AB L M [SE]; THURFJELL MAGNUS [SE]; HAEGGLUND FREDRIK) 26 October 2006 (2006-10-26) page 3, line 18 - line 25 abstract page 7, line 31 - page 8, line 24 page 14, line 14 - line 21 -----	3-6, 22-25
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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/062012

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>"LTE; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures (3GPP TS 36.213 version 8.7.0 Release 8)", TECHNICAL SPECIFICATION, EUROPEAN TELECOMMUNICATIONS STANDARDS INSTITUTE (ETSI), 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS ; FRANCE, no. V8.7.0, 1 June 2009 (2009-06-01), XP014044750, the whole document</p> <p style="text-align: center;">-----</p>	53-56
X	<p>ERICSSON ET AL: "Uplink Power Control for Carrier Aggregation", 3GPP DRAFT; R1-094274 UL PC FOR CARRIER AGGREGATION, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, no. Miyazaki; 20091012, 16 October 2009 (2009-10-16), XP050388737, [retrieved on 2009-10-05] the whole document</p> <p style="text-align: center;">-----</p>	57,58

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/062012

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1, 2, 16-21, 29-32, 37, 38, 42-45, 49-52

The subject-matter of the independent claims of the first group refers to a method for decoupling a transmit power level from different parameters, where the minimum and maximum power thresholds do not influence the transmit power level.

2. claims: 3-6, 22-25

The subject-matter of the independent claims of this second group refers to a method for constraining the power level between a minimum and maximum power thresholds.

3. claims: 7-11, 13, 26-28, 33, 34, 36, 39-41, 46-48

The subject-matter of the independent claims of this third group refers to a method where a bandwidth/transport format parameter is replaced by a predetermined parameter.

4. claims: 12, 35

The subject-matter of the independent claims of this fourth group refers to a method where differential transmit power control is used.

5. claim: 14

The subject-matter of the independent claims of this fifth group refers to a power control algorithm where the power level is based on the bandwidth of a SRS.

6. claim: 15

The subject-matter of the independent claims of this sixth group refers to a method for reporting power headroom based on a fixed or semi-persistent values.

7. claims: 53-56

The subject-matter of the independent claims of this seventh group refers to a method for selecting one of a plurality of control loops.

8. claims: 57, 58

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

The subject-matter of the independent claims of this eighth group refers to a method for selecting the minimum of the terminal specific maximum transmit power, the carrier specific maximum transmit power and the commanded transmit power level for each of the plurality of carriers.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2010/062012

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