### (19) World Intellectual Property Organization

International Bureau



# 

(43) International Publication Date 26 August 2004 (26.08.2004)

PCT

# (10) International Publication Number WO 2004/073205 A3

(51) International Patent Classification<sup>7</sup>: H04B 7/005

(21) International Application Number:

PCT/IB2004/000375

(22) International Filing Date: 16 February 2004 (16.02.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/447,432 14 February 2003 (14.02.2003) US 60/479,551 18 June 2003 (18.06.2003) US 10/779,518 13 February 2004 (13.02.2004) US

- (71) Applicant (for all designated States except US): TELE-FONAKTIEBOLAGET LM ERICSSON (PUBL) [SE/SE]; Telefonplan, S-126 25 Stockholm (SE).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): TSAI, Shiau-He Shawn [KP/US]; 7335 Calle Cristobal, #156, San Diego, CA 92126 (US). OH, Seong-Jun [KR/US]; 3883 Crestone Place, San Diego, CA 92130 (US). SOONG, Anthony [CA/US]; 1967 Eldorado Drive, Superior, CO 80027 (US). YOON, Young [CA/US]; 7215 Calabria Court, #79, San Diego, CA 92122 (US).

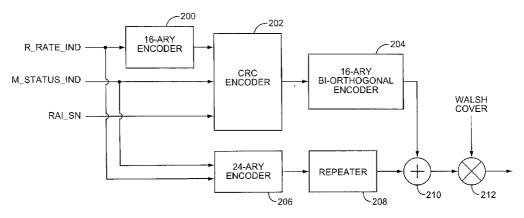
- (74) Common Representative: TELEFONAKTIEBO-LAGET LM ERICSSON (PUBL); C/o David E. Bennett, Coats & Bennett, P.L.L.C., Post Office Box 5, Raleigh, NC 27602 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

#### **Declarations under Rule 4.17:**

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations

[Continued on next page]

#### (54) Title: POWER CONTROL FOR REVERSE PACKET DATA CHANNEL IN CDMA SYSTEMS



(57) Abstract: A method of reverse link power control for a reverse packet data channel in a wireless communication system allows a mobile station to autonomously change its data transmission rate. The mobile station transmits packet data over a reverse packet data channel having a data rate variant transmit power level that varies based on a transmit data rate on the packet data channel. The mobile station further transmits control signals over a reverse control channel associated with the reverse packet data channel. The transmit power level of he reverse control channel is such that the transmit power level does not vary with the transmit data rate on the packet data channel. The radio base station measures the strength of the received signals on the reverse control channel, compares the measured strength to a power control set point, and generates a power control signal responsive to the comparison of the control signal of the control signal to the power control set point.



- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for all designations
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU,

- IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

#### **Published:**

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

# (88) Date of publication of the international search report: 27 January 2005

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

International Application No PCT/IB2004/000375

A. CLASSIFICATION OF SUBJECT MATTER I PC 7 H04B7/005

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

#### B. FIELDS SEARCHED

 $\begin{array}{ccc} \mbox{Minimum documentation searched} & \mbox{(classification system followed by classification symbols)} \\ \mbox{IPC 7} & \mbox{H04B} & \mbox{H04Q} \\ \end{array}$ 

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-In	ternal, WPI Data		
C. DOCUME	ENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the	e relevant passages	Relevant to claim No.
X	WO 00/74289 A (SAMSUNG ELECTRONICS CO LTD) 7 December 2000 (2000-12-07)		1-4,29, 38,47, 52,55, 57,60,61
	abstract; figures 1A,3 page 3, line 30 - page 4, line page 8, line 38 - page 9, line page 6, line 27 - page 8, line		
А	US 5 812 938 A (GILHOUSEN KLEI 22 September 1998 (1998-09-22) column 4, line 13 - line 27 claim 1; figure 3	N S ET AL)	1,9,12, 17,23,55
		-/	
X Furth	her documents are listed in the continuation of box C.	Patent family members are listed i	n annex.
"A" docume consid "E" earlier of filing d "L" docume which citation "O" docume other r "P" docume	ent which may throw doubts on priority claim(s) or is cited to establish the publication date of another n or other special reason (as specified) ent referring to an oral disclosure, use, exhibition or	"T" later document published after the inte or priority date and not in conflict with cited to understand the principle or the invention "X" document of particular relevance; the cannot be considered novel or cannot involve an inventive step when the do "Y" document of particular relevance; the cannot be considered to involve an indocument is combined with one or moments, such combination being obvious in the art. "&" document member of the same patent	laimed invention be considered to cument is taken alone laimed invention ventive step when the tre other such docu- us to a person skilled
Date of the	actual completion of the international search	Date of mailing of the international sea	rch report
2	December 2004		0 9. 12. 04
Name and n	nailing address of the ISA European Patent Office, P.B. 5818 Patentiaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  LOPEZ DE ECHAZARE	RETA

International Application No PCT/IB2004/000375

C.(Continua	tion) DOCUMENTS CONSIDERED TO BE RELEVANT	
	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	W0 01/37443 A (SAMSUNG ELECTRONICS CO LTD) 25 May 2001 (2001-05-25) abstract paragraph [0012] - paragraph [0018] paragraph [0054] - paragraph [0056] paragraph [0065] - paragraph [0066];	29,38
	paragraph [0065] - paragraph [0066]; figure 6B	



Box 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 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
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 fee, this Authority did not invite payment of any additional fee.
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.  X  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: 1-28,47-63

A method of controlling a reverse link power of a mobile station in a wireless communication network, the method comprising:

- \* receiving a control signal from the mobile station that includes one or more codewords repeated at a desired power control rate;
- \* determining quality metrics corresponding to the repeated codewords;
- \* generating reverse link power control commands based on comparing the quality metrics to a power control set point; and
- \* transmitting the reverse link power control commands to the mobile station

#### 2. claims: 29-46,64-71

A method implemented by a mobile station of transmitting control information to a base station comprising: \* encoding first control information to form a first codeword:

\* repetitively transmitting the first codeword to a radio base station a predetermined number of times;

Information on patent family members

International Application No
PCT/IB2004/000375

Patent document cited in search report	Publication date	Patent family Publication member(s) date	
WO 0074289 A	07-12-2000	KR 2000075369 A 15-12-2000 AU 756259 B2 09-01-2003 AU 5110600 A 18-12-2000 CA 2337909 A1 07-12-2000 CN 1310895 T 29-08-2001 EP 1101311 A1 23-05-2001 WO 0074289 A1 07-12-2000	
US 5812938 A	22-09-1998	US 5603096 A 11-02-1997 AU 685967 B2 29-01-1998 AU 2968395 A 09-02-1996 BR 9508263 A 23-12-1997 CA 2193979 A1 25-01-1996 CN 1152384 A 18-06-1997 EP 0770293 A1 02-05-1997 FI 970117 A 10-03-1997 IL 114512 A 10-11-2002 JP 3200069 B2 20-08-2001 JP 10502778 T 10-03-1998 W0 9602097 A1 25-01-1996 ZA 9505603 A 16-04-1996	
WO 0137443 A	25-05-2001	KR 2001046841 A 15-06-2001 KR 2001068691 A 23-07-2001 AU 767199 B2 06-11-2003 AU 1896001 A 30-05-2001 BR 0015608 A 30-07-2002 CA 2391631 A1 25-05-2001 CN 1390396 T 08-01-2003 DE 20023314 U1 26-02-2004 EP 1234384 A1 28-08-2002 JP 2003514484 T 15-04-2003 WO 0137443 A1 25-05-2001 KR 2002050288 A 26-06-2002 US 6810264 B1 26-10-2004 US 2004157635 A1 12-08-2004	