

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
6 May 2010 (06.05.2010)

PCT

(10) International Publication Number
WO 2010/050723 A3

(51) International Patent Classification:
H04L 1/18 (2006.01) H04B 7/04 (2006.01)
H04B 7/26 (2006.01)

(KR). KIM, Jeong Ki [KR/KR]; LG Institute, #533, Hoge 1(il)-dong, Dongan-gu, Anyang-si, Gyeonggi-do 431-080 (KR).

(21) International Application Number:
PCT/KR2009/006220

(74) Agents: KIM, Yong In et al.; KBK & Associates, 7th Floor, Hyundai Building, 175-9, Jamsil-dong, Songpa-ku, Seoul, 138-861 (KR).

(22) International Filing Date:
27 October 2009 (27.10.2009)

(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, 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, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/108,559 27 October 2008 (27.10.2008) US
61/139,619 21 December 2008 (21.12.2008) US
61/139,635 22 December 2008 (22.12.2008) US
61/149,024 2 February 2009 (02.02.2009) US
61/149,708 4 February 2009 (04.02.2009) US
61/157,555 5 March 2009 (05.03.2009) US
61/168,223 10 April 2009 (10.04.2009) US
61/181,672 28 May 2009 (28.05.2009) US
61/220,584 26 June 2009 (26.06.2009) US
10-2009-0067915 24 July 2009 (24.07.2009) KR

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (for all designated States except US): LG ELECTRONICS INC. [KR/KR]; 20, Yeouido-dong, Yeongdeungpo-gu, Seoul 150-721 (KR).

(72) Inventors; and

(75) Inventors/Applicants (for US only): KIM, Su Nam [KR/KR]; LG Institute, #533, Hoge 1(il)-dong, Dongan-gu, Anyang-si, Gyeonggi-do 431-080 (KR). RYU, Ki Seon [KR/KR]; LG Institute, #533, Hoge 1(il)-dong, Dongan-gu, Anyang-si, Gyeonggi-do 431-080 (KR). CHOI, Jin Soo [KR/KR]; LG Institute, #533, Hoge 1(il)-dong, Dongan-gu, Anyang-si, Gyeonggi-do 431-080 (KR). IHM, Bin Chul [KR/KR]; LG Institute, #533, Hoge 1(il)-dong, Dongan-gu, Anyang-si, Gyeonggi-do 431-080

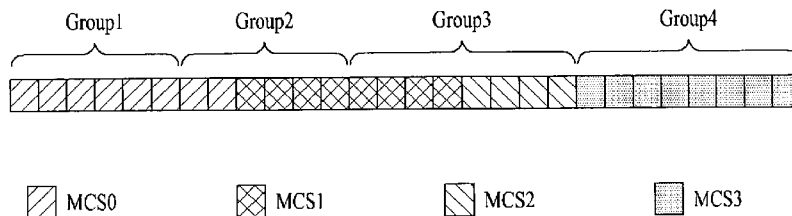
Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:
29 July 2010

(54) Title: METHOD FOR TRANSMITTING DOWNLINK CONTROL MESSAGES IN CELLULAR SYSTEM

FIG. 5



(57) Abstract: A method for transmitting control messages is disclosed. The method includes grouping a plurality of control messages for at least one user equipment based on at least one criteria of whether or not uplink ACK/NACK channel indexes are allowed to be implicitly used in the control messages, whether or not the user equipment corresponding to the control messages is able to implicitly use the uplink ACK/NACK channel indexes, sizes of Information Elements (IEs) of the control messages, whether or not the control messages are segmented into a predetermined number of subblocks, Modulation and Coding Scheme levels applied to the control messages, sizes of allocated IEs of the control messages after applying the MCS levels, and frequency partitions in which the IEs of the control messages are present, and transmitting the grouped control messages. The control messages included in each of the groups generated by grouping are equal in at said least one criteria.

WO 2010/050723 A3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2009/006220**A. CLASSIFICATION OF SUBJECT MATTER****H04L 1/18(2006.01)i, H04B 7/26(2006.01)i, H04B 7/04(2006.01)i**

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 1/18; H04B 7/26; H04J 3/00; H04W 72/04

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

(Chinese Patents and application for patent)

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

eKOMPASS(KIPO internal) & Keywords: Control message, Blind detection, Grouping

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-2007-0117812 A (SAMSUNG ELECTRONICS CO., LTD.) 13 December 2007 See claims 1-11 and figures 1-5.	1-9
A	KR 10-2005-0049299 A (SAMSUNG ELECTRONICS CO., LTD.) 25 May 2005 See claims 1-22 and figures 1-9.	1-9
A	US 2004-0013102 A1 (MO-HAN FONG et al.) 22 January 2004 See claims 1-23 and figures 1-4.	1-9

 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 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

31 MAY 2010 (31.05.2010)

Date of mailing of the international search report

31 MAY 2010 (31.05.2010)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-
gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

JUNG, Yun Seok

Telephone No. 82-42-481-8123



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2009/006220

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-2007-0117812 A	13.12.2007	EP 1865645 A1	12.12.2007
		EP 1865645 B1	20.01.2010
		US 2007-0287449 A1	13.12.2007
KR 10-2005-0049299 A	25.05.2005	AU 2004-311362 A1	02.06.2005
		AU 2004-311362 B2	01.05.2008
		AU 2004-311362 B9	09.10.2008
		CA 2540846 A1	02.06.2005
		CA 2540846 C	12.01.2010
		CN 1879325 A	13.12.2006
		EP 1534039 A2	25.05.2005
		EP 1534039 A3	02.01.2008
		JP 04-369481 B2	04.09.2009
		JP 2007-511975 A	10.05.2007
		US 2005-0107036 A1	19.05.2005
		US 2008-0130605 A1	05.06.2008
		WO 2005-050875 A1	02.06.2005
US 2004-0013102 A1	22.01.2004	US 7436857 B2	14.10.2008