



(43) International Publication Date  
17 September 2009 (17.09.2009)

- (51) International Patent Classification:  
H04B 7/02 (2006.01) H04B 7/26 (2006.01)  
H04L 27/26 (2006.01)
- (21) International Application Number:  
PCT/KR2009/001185
- (22) International Filing Date:  
10 March 2009 (10.03.2009)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
10-2008-0022235 10 March 2008 (10.03.2008) KR  
10-2008-0064700 4 July 2008 (04.07.2008) KR  
10-2008-0102490 20 October 2008 (20.10.2008) KR  
10-2008-0109102 4 November 2008 (04.11.2008) KR  
10-2008-0110662 7 November 2008 (07.11.2008) KR  
10-2008-0114567  
18 November 2008 (18.11.2008) KR  
10-2008-0127414  
15 December 2008 (15.12.2008) KR  
10-2009-0016052  
25 February 2009 (25.02.2009) KR  
10-2009-0020007 9 March 2009 (09.03.2009) KR

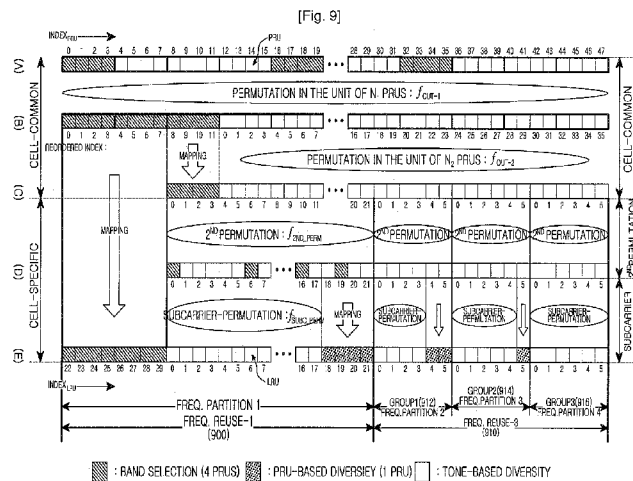
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **KIM, Tae-Young** [KR/KR]; #308-103 Kkachi Maeul Sinwon Apt., Gumi-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-739 (KR). **PARK, Jeong-Ho** [KR/KR]; #704, SaeSeoul Apt., 46(31/3) Banpo-dong, Seocho-gu, Seoul 137-802 (KR). **PARK, Dong-Seek** [KR/KR]; #107-1802 SK Apt., Seocheon-dong, Giheung-gu, Yongin-si, Gyeonggi-do 446-959 (KR). **KANG, Hee-Won** [KR/KR]; #201-1801 Hansol Maeul LG Apt., Jeongja-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-909 (KR). **CHOI, Ho-Kyu** [KR/KR]; #113-601 Sibeomdanji Hanshin Apt., Seohyeon-dong, Bundang-gu, Seongnam-si, Gyeonggi-do 463-772 (KR). **CHO, Jae-Weon** [KR/KR]; #104-1103 Hyundai I-Park Apt., Mangpo-dong, Yeongtong-gu, Suwon-si, Gyeonggi-do 443-770 (KR). **YU, Hyun-Kyu** [KR/KR]; #325-24 Yulhyeon-dong, Gangnam-gu, Seoul 135-210 (KR). **JEONG, Su-Ryong** [KR/KR]; #904-1701 Byeokjeokgol 9 Danji Apt., Yeongtong 2-dong, Yeongtong-gu, Suwon-si, Gyeonggi-do 443-726 (KR).

(74) Agents: **KWON, Hyuk-Rok** et al.; 2F, Seokwang Bldg., 1-96 Sinnun-ro 2ga, Jongro-ku, Seoul 110-062 (KR).

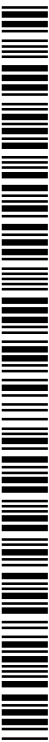
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KZ,

[Continued on next page]

(54) Title: APPARATUS AND METHOD FOR COMPOSING DIVERSITY SUBCHANNEL IN WIRELESS COMMUNICATION SYSTEM



(57) Abstract: An apparatus and a method for composing a subchannel in a wireless communication system are provided. The method includes performing a subband-based permutation on resources for composing a subchannel; selecting one or more subbands as resources for a band selection subchannel from the resources passing through the subband-based permutation; composing the band selection subchannel using at least one of the selected subbands; performing a resource allocation unit based permutation on resources not selected for the band selection subchannel; composing a resource allocation unit based diversity subchannel using subband remained in the selected subbands after the band selection subchannel is composed and at least one of the resource allocation units of the resources passing through the resource allocation unit based permutation; and composing a tone-based diversity subchannel by performing a tone-based permutation on resources remained after the resource allocation unit based diversity subchannel is composed.





LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**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)*)

**(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, TR),

**(88) Date of publication of the international search report:**  
17 December 2009

**A. CLASSIFICATION OF SUBJECT MATTER****H04B 7/02(2006.01)i, H04L 27/26(2006.01)i, H04B 7/26(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)

IPC: H04L, H04B

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

Korean Utility models applications for Utility Models since 1975, IPC as above

Japanese Utility Models and application for Utility Models since 1975, IPC as above

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

eKOMPASS, IEEEExpl, Google; subchannelization; diversity subchannel; band selection subchannel; permutation; OFDM;

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	C.Lengoumbi, et al, "Subchannelization Performance for the Downlink of a Multi-cell OFDMA System" In: Proceedings of Third IEEE International Conference on Wireless and Mobile Computing, Networking and Communications, October 2007. See Chapter III and IV.	1-3, 15-17
A		4-14, 18-25
Y	KR 10-2007-0116436 A(ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE, et al) 10 December 2007. See abstract, claims 1-2, paragraph <26>-<28> and figure 3a.	1-3, 15-17
A		4-14, 18-25
A	KR 10-2006-0134853 A(SAMSUNG ELECTRONICS CO., LTD.) 28 December 2006. See all documents.	1-25
A	US 2007/0263735 A1(WEN TONG, et al) 15 November 2007. See all documents.	1-25

 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

28 OCTOBER 2009 (28.10.2009)

Date of mailing of the international search report

**28 OCTOBER 2009 (28.10.2009)**

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

SEONG, KYOUNG A

Telephone No. 82-42-481-8171



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/KR2009/001185**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-2007-0116436 A	10. 12. 2007	WO 2007-142393 A1	13. 12. 2007
		KR 10-0785853 B1	14. 12. 2007
KR 10-2006-0134853 A	28. 12. 2006	KR 10-0790125 B1	02. 01. 2008
		AU 2006-259966 A1	22. 06. 2006
		CA 2605556 A1	28. 12. 2006
		CN 101204033 A	18. 06. 2008
		EP 1894335 A1	05. 03. 2008
		JP 2008-546303 A	18. 12. 2008
		US 2007-0009054 A1	11. 01. 2007
		WO 2006-137708 A1	28. 12. 2006
US 2007-0263735 A1	15. 11. 2007	CN 101091408 A	19. 12. 2007
		CN 101156322 A	19. 12. 2008
		EP 1726111 A1	29. 11. 2006
		EP 1730856 A1	13. 12. 2006
		EP 1730864 A1	13. 12. 2006
		EP 1752009 A1	14. 02. 2007
		EP 1766789 A1	28. 03. 2007
		EP 1766806 A1	28. 03. 2007
		EP 1787414 A1	23. 05. 2007
		EP 1803314 A1	04. 07. 2007
		KR 10-2007-0018106 A	13. 02. 2007
		US 2009-0003466 A1	01. 01. 2009
		US 2008-0268907 A1	30. 10. 2008
		US 2008-0253279 A1	16. 10. 2008
		US 2008-0108310 A1	08. 05. 2008
		US 2008-0095223 A1	24. 04. 2008
		US 2008-0069031 A1	20. 03. 2008
		US 2008-0039107 A1	14. 02. 2008
		US 2007-0286066 A1	13. 12. 2007
		US 2007-0274253 A1	29. 11. 2007
		US 2007-0218889 A1	20. 09. 2007
		US 2007-0183527 A1	09. 08. 2007
		US 2007-0105508 A1	10. 05. 2007
		WO 2006-002550 A1	12. 01. 2006
		WO 2006-039812 A1	20. 04. 2006
		WO 2006-000091 A1	05. 01. 2006
		WO 2005-125250 A1	29. 12. 2005
		WO 2005-125044 A1	29. 12. 2005
		WO 2005-125020 A1	29. 12. 2005
		WO 2005-120117 A1	15. 12. 2005
		WO 2005-099290 A1	20. 10. 2005
		WO 2005-096531 A1	13. 10. 2005
		WO 2005-096519 A1	13. 10. 2005
WO 2005-096510 A1	13. 10. 2005		
WO 2005-088882 A1	22. 09. 2005		
WO 2006-034577 A1	06. 04. 2006		
WO 2006-000094 A1	05. 01. 2006		