

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
21 May 2004 (21.05.2004)

PCT

(10) International Publication Number
WO 2004/042981 A3

(51) International Patent Classification⁷: **H04K 1/10**,
H04L 27/28

CZ, DE, DK, DM, DZ, EC, EE, 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, 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.

(21) International Application Number:
PCT/US2003/034510

(22) International Filing Date: 28 October 2003 (28.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/284,927 31 October 2002 (31.10.2002) US

(84) Designated States (regional): ARIPO patent (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).

(71) Applicant: **MOTOROLA, INC.** [US/US]; 1303 East Algonquin Road, Schaumburg, IL 60196 (US).

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

(72) Inventor: **CORRAL, Celestino, A.**; 7584 Northtree Club Drive, Lake Worth, FL 33467 (US).

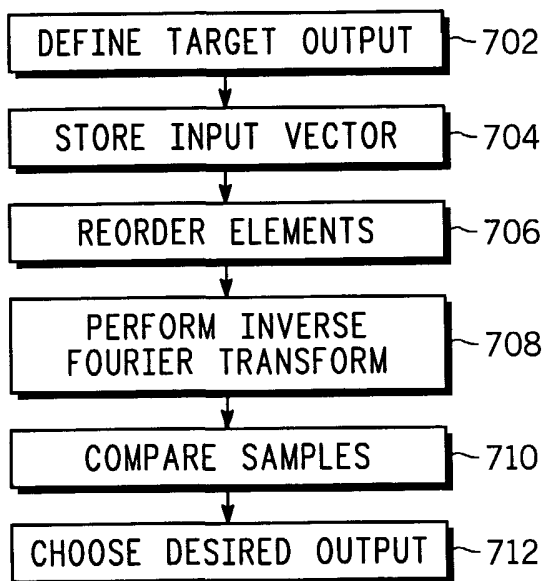
(74) Agents: **VAAS, Randall, S.** et al.; 600 North US Highway 45, AN475, Libertyville, IL 60048 (US).

(88) Date of publication of the international search report:
3 March 2005

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

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.

(54) Title: METHOD AND APPARATUS FOR REDUCING A PEAK-TO-AVERAGE POWER RATIO IN AN ORTHOGONAL FREQUENCY DIVISION MULTIPLEX SIGNAL



(57) Abstract: An apparatus and method therein for reducing a PAPR in an OFDM signal includes: a reorderer (104) that reorders (706) a plurality of elements of an original frequency-domain input vector in a predetermined manner to create a plurality of candidate input vectors; a Fourier processor (108) that performs (708) an inverse Fourier transform on the candidate input vectors to obtain a corresponding plurality of approximating OFDM outputs; a comparator (114) that compares (710) samples of each of the approximating OFDM outputs with corresponding samples of a target output signal; and an output selector (110) that chooses (712) a desired output signal from the approximating OFDM outputs, in response to a comparison of the samples.

WO 2004/042981 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/34510

A. CLASSIFICATION OF SUBJECT MATTER		
IPC(7) : H04K 1/10; H04L 27/28 US CL : 375/260		
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) U.S. : 375/260, 261, 295, 346; 370/208, 210, 203; 455/296		
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) Please See Continuation Sheet		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,E	US 2004/0141458 A1 (PARK et al.) 22 July 2004, see entire document.	1-24
A,P	US 2003/0067866 A1 (JUNG) 10 April 2003, see entire document.	1-24
A,E	US 2004/0008616 A1 (JUNG et al.) 15 January 2004, see entire document.	1-24
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input 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 application or patent 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 15 December 2004 (15.12.2004)	Date of mailing of the international search report 11 JAN 2005	
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Kenneth Wieder Telephone No. 703-305-4700 <i>Eugenio Lopez</i>	

INTERNATIONAL SEARCH REPORT

PCT/US03/34510

Continuation of B. FIELDS SEARCHED Item 3:
USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB
inverse, fourier, transform