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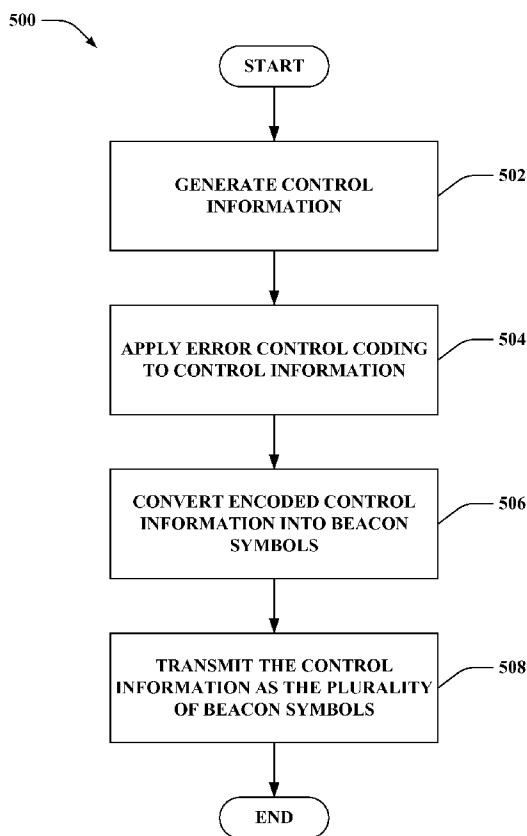
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(54) Title: BEACON-BASED CONTROL CHANNELS



(57) Abstract: Systems and methodologies are described that facilitate transmitting control information in wireless networks. Portions of bandwidth can be blanked for transmitting control information, and the control information transmitters can utilize beacon symbols to convey the control information. In this regard, interference is mitigated with respect to data transmissions over the control information bandwidth. Selected frequencies of the beacon symbols in a codeword can be used to indicate the control information. The codewords can be encoded with an error control code to provide redundancy for decoding in the presence of some interference.

FIG. 5

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B. FIELDS SEARCHED

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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-Internal, WPI Data, INSPEC, COMPENDEX, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2006/134032 A (SIEMENS AG [DE]; BREUER VOLKER [DE]; FAERBER MICHAEL [DE]) 21 December 2006 (2006-12-21) page 3, line 27 - page 4, line 4 page 5, line 11 - line 16 page 6, line 8 - line 29 page 7, line 5 - line 8	1-50
X	WO 2007/106980 A (NORTEL NETWORKS LTD [CA]; JIA MING [CA]; MA JIANGLEI [CA]; TONG WEN [C]) 27 September 2007 (2007-09-27) page 12, line 24 - page 13, line 15 page 24, line 1 - line 13 page 14, line 1 - line 28	1-50
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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.
X	US 2005/233746 A1 (LAROIA RAJIV [US] ET AL) 20 October 2005 (2005-10-20) paragraph [0110] paragraph [0127] paragraph [0134] paragraph [0148] paragraphs [0153] - [0155]	1-50
A	QUALCOMM EUROPE: "Neighbor Cell Search - Analysis and Simulations" 3GPP DRAFT; R1-063432, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE, no. Riga, Latvia; 20061106, 1 November 2006 (2006-11-01), XP050103869 paragraph [04.1] - paragraph [04.3]	1-50
A	WO 2007/025308 A (QUALCOMM INC [US]; SAMBHWANI SHARAD DEEPAK [US]; AGRAWAL AVNEESH [US];) 1 March 2007 (2007-03-01) paragraph [0011]	1-50
P,X, L	WO 2008/049136 A (QUALCOMM INC [US]; RICHARDSON TOM [US]; LI HUSHENG [US]; LI JUNYI [US]) 24 April 2008 (2008-04-24) paragraphs [0043] - [0045] paragraph [0060] paragraph [0066]	1,10,17, 24,26, 35,42,49

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2008/075238

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2006134032 A	21-12-2006	DE 102005028179 A1	28-12-2006
WO 2007106980 A	27-09-2007	EP 2005614 A1	24-12-2008
US 2005233746 A1	20-10-2005	AU 2004319486 A1 BR PI0418748 A CA 2562679 A1 EP 1735918 A1 JP 2007533255 T KR 20070009707 A NZ 550530 A WO 2005109657 A1	17-11-2005 11-09-2007 17-11-2005 27-12-2006 15-11-2007 18-01-2007 30-05-2008 17-11-2005
WO 2007025308 A	01-03-2007	AR 055396 A1 EP 1917835 A1 JP 2009506684 T KR 20080049779 A US 2007049324 A1	22-08-2007 07-05-2008 12-02-2009 04-06-2008 01-03-2007
WO 2008049136 A	24-04-2008	NONE	