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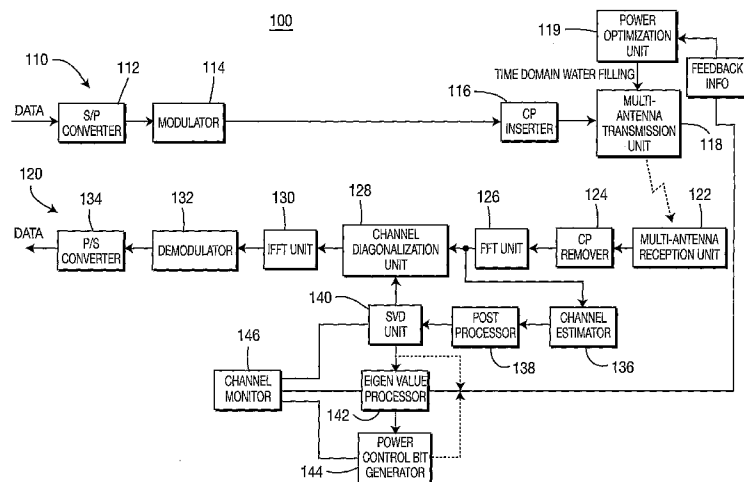
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(54) Title: METHOD AND APPARATUS FOR GENERATING FEEDBACK INFORMATION FOR TRANSMIT POWER CONTROL IN A MULTIPLE-INPUT MULTIPLE-OUTPUT WIRELESS COMMUNICATION SYSTEM



(57) Abstract: The present invention is related to a method and apparatus for generating feedback information for transmit power control in a multiple-input multiple-output (MIMO) wireless communication system. Both a transmitter and a receiver comprise multiple antennae for transmission and reception. The transmitter comprises a power allocation unit for controlling transmit power based on a feedback received from the receiver. The receiver comprises a channel estimator and a singular value decomposition (SVD) unit. The channel estimator generates a channel matrix from a signal received from the transmitter and the SVD unit decomposes the channel matrix into D, U and V matrices. The receiver sends a feedback generated based on output from the SVD unit to the transmitter. The feedback may be one of an eigenvalue, a transmit power level or a power control bit or command. A hybrid scheme for selecting one of them based on channel condition may be implemented.

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## INTERNATIONAL SEARCH REPORT

International application No.

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(8) - H04L 23/02 (2006.01) USPC - 455/522 According to International Patent Classification (IPC) or to both national classification and IPC																																		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC(8)- H04L 23/02, 13/18, 27/28, 01/02; H04Q 07/20 (2006.01) USPC - 455/522; 375/260, 267, 295, 299, 316, 347 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) USPTO EAST System (US, USPG-PUB, EPO, DERWENT), MicroPatent, DialogPro																																		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>																																		
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>US 2002/0187753 A1 (KIM et al) 12 December 2002 (12.12.2002) entire document</td> <td>1, 3-5, 17, 19-21</td> </tr> <tr> <td>Y</td> <td></td> <td>2, 6-13, 18, 22-29</td> </tr> <tr> <td>Y</td> <td>US 2004/0082356 A1 (WALTON et al) 29 April 2004 (29.04.2004) entire document</td> <td>2, 9-13, 18, 25-29</td> </tr> <tr> <td>Y</td> <td>US 2003/0235255 A1 (KETCHUM et al) 25 December 2003 (25.12.2003) entire document</td> <td>6-8, 22-24</td> </tr> <tr> <td>Y</td> <td>US 2003/0157954 A1 (MEDVEDEV et al) 21 August 2003 (21.08.2003) entire document</td> <td>10-13, 26-29</td> </tr> <tr> <td>Y</td> <td>US 2003/0091103 A1 (SENDONARIS) 15 May 2003 (15.05.2003) entire document</td> <td>13, 29</td> </tr> <tr> <td>A,P</td> <td>US 2005/0164645 A1 (LI et al) 28 July 2005 (28.07.2005) entire document</td> <td>1-32</td> </tr> <tr> <td>A</td> <td>US 2004/0190643 A1 (LIU et al) 30 September 2004 (15.05.2003) entire document</td> <td>1-32</td> </tr> <tr> <td>A</td> <td>US 2002/0154705 A1 (WALTON et al) 24 October 2002 (24.10.2002) entire document</td> <td>1-32</td> </tr> <tr> <td>A</td> <td>US 2002/0114269 A1 (ONGGOSANUSI et al) 22 August 2002 (22.08.2002) entire document</td> <td>1-32</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	US 2002/0187753 A1 (KIM et al) 12 December 2002 (12.12.2002) entire document	1, 3-5, 17, 19-21	Y		2, 6-13, 18, 22-29	Y	US 2004/0082356 A1 (WALTON et al) 29 April 2004 (29.04.2004) entire document	2, 9-13, 18, 25-29	Y	US 2003/0235255 A1 (KETCHUM et al) 25 December 2003 (25.12.2003) entire document	6-8, 22-24	Y	US 2003/0157954 A1 (MEDVEDEV et al) 21 August 2003 (21.08.2003) entire document	10-13, 26-29	Y	US 2003/0091103 A1 (SENDONARIS) 15 May 2003 (15.05.2003) entire document	13, 29	A,P	US 2005/0164645 A1 (LI et al) 28 July 2005 (28.07.2005) entire document	1-32	A	US 2004/0190643 A1 (LIU et al) 30 September 2004 (15.05.2003) entire document	1-32	A	US 2002/0154705 A1 (WALTON et al) 24 October 2002 (24.10.2002) entire document	1-32	A	US 2002/0114269 A1 (ONGGOSANUSI et al) 22 August 2002 (22.08.2002) entire document	1-32	<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>
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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. 571-273-3201	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774																																	