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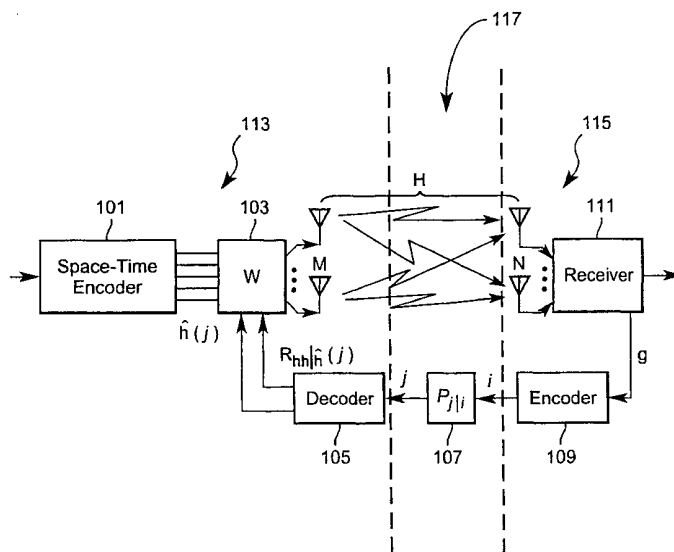
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(54) Title: **ROBUST UTILIZATION OF FEEDBACK INFORMATION IN SPACE-TIME CODING**



(57) **Abstract:** Side information in the form of quantized channel feedback information is utilized to improve an orthogonal space-time block code by means of a linear transformation. The feedback link utilizes COVQ quantization in order to provide the transmitter with an estimate of the current channel realization. The channel realization estimate, together with reliability information, is then used in the transmission scheme for determining the appropriate linear transformation. The result is a system which effectively combines conventional transmit beam forming with orthogonal space-time block coding, thereby providing a scheme which is more robust with respect to the errors that originate from the noise in the feedback channel.

INTERNATIONAL SEARCH REPORT

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PCT/SE 01/00523

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L1/06

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 7 H04L H04B H03M

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GEORGE JÖNGREN ET AL: "Combining transmit antenna weights and orthogonal space-time block codes by utilizing side information" THIRTY-THIRD ASILOMAR CONFERENCE ON SIGNALS, SYSTEMS, AND COMPUTERS, vol. 2, 24 - 27 October 1999, pages 1562-1566, XP002901981 abstract section 1,2,2.1,3.1	1-28
A	NARIMAN FARVARDIN: "A study of vector quantization for noisy channels" IEEE TRANSACTIONS ON INFORMATION THEORY, vol. 36, no. 4, July 1990 (1990-07), XP002901982 abstract section VD, VI	3-28
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☒ Further documents are listed in the continuation of box C.

☐ Patent family members are listed in annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/SE 01/00523

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ARADHANA NARULA ET AL: "Efficient use of side information in multiple-antenna data transmission over fading channels" IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS, vol. 16, no. 8, October 1998 (1998-10), XP002901983 abstract section III, III-A-2 ---	1-28
A	R W HEATH JR ET AL: "A simple scheme for transmit diversity using partial channel feedback " CONFERENCE OF THE THIRTY-SECOND ASILOMAR CONFERENCE ON SIGNALS, SYSTEMS & COMPUTERS, vol. 2, 1 - 4 November 1998, XP002901984 the whole document ---	1-28
A	NARIMAN FARVARDIN ET AL: "On the performance and complexity of channel-optimized vector quantizers" IEEE TRANSACTIONS ON INFORMATION THEORY, vol. 37, no. 1, January 1991 (1991-01), XP002901985 abstract section II, III ---	3-28
P,X	GEORGE JÖNGREN ET AL: "Utilizing quantized feedback information in orthogonal space-time block coding" GLOBAL TELECOMMUNICATIONS CONFERENCE 2000 '00 IEEE, vol. 2, 27 November 2000 (2000-11-27) - 1 December 2000 (2000-12-01), pages 995-999, XP002901986 the whole document ---	1-28
P,X	JONGREN G ET AL: "Combining transmit beamforming and orthogonal space-time block codes by utilizing side information" PROCEEDINGS OF THE 2000 IEEE SENSOR ARRAY AND MULTICHANNEL SIGNAL PROCESSING WORKSHOP. 2000, 16 - 17 March 2000, pages 153-157, XP002901987 abstract section 1,2,2.1. -----	1-28