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Ketchum et al.

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(54) **RECEIVER SPATIAL PROCESSING FOR EIGENMODE TRANSMISSION IN A MIMO SYSTEM**

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(51) **Int. Cl.**

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H04J 3/00	(2006.01)
H04J 1/00	(2006.01)

(52) **U.S. Cl.** **375/341**; 375/229; 375/265; 375/262; 370/480; 370/497; 370/498; 370/529

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See application file for complete search history.

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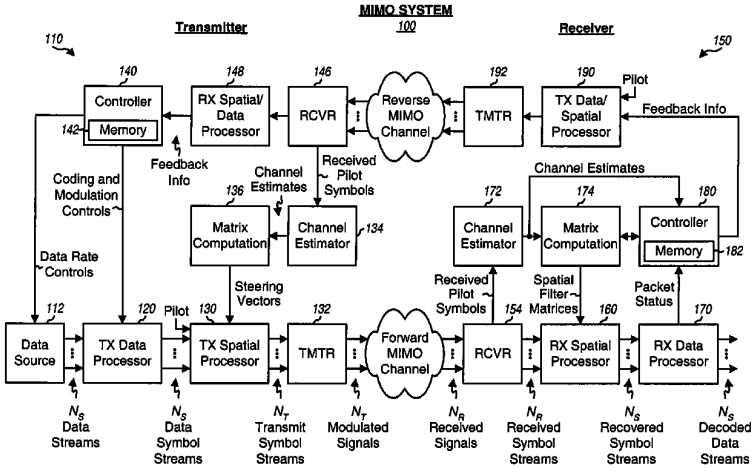
(57) **ABSTRACT**

For eigenmode transmission with minimum mean square error (MMSE) receiver spatial processing, a transmitter performs spatial processing on N_S data symbol streams with steering vectors to transmit the streams on N_S spatial channels of a MIMO channel. The steering vectors are estimates of transmitter steering vectors required to orthogonalize the spatial channels. A receiver derives a spatial filter based on an MMSE criterion and with an estimate of the MIMO channel response and the steering vectors. The receiver (1) obtains N_R received symbol streams from N_R receive antennas, (2) performs spatial processing on the received symbol streams with the spatial filter to obtain N_S filtered symbol streams, (3) performs signal scaling on the filtered symbol streams with a scaling matrix to obtain N_S recovered symbol streams, and (4) processes the N_S recovered symbol streams to obtain N_S decoded data streams for the N_S data streams sent by the transmitter.

31 Claims, 6 Drawing Sheets



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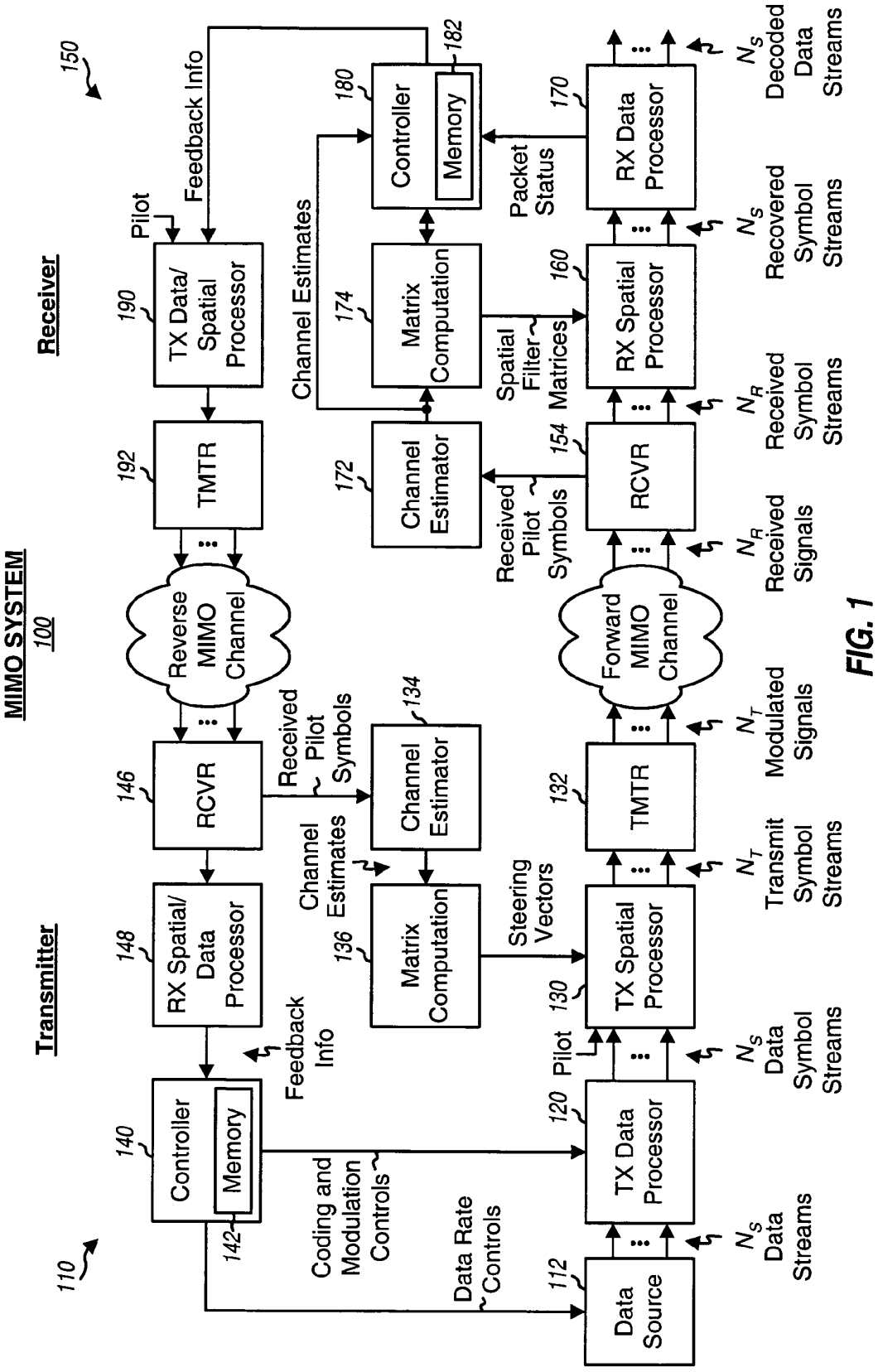

FIG. 1

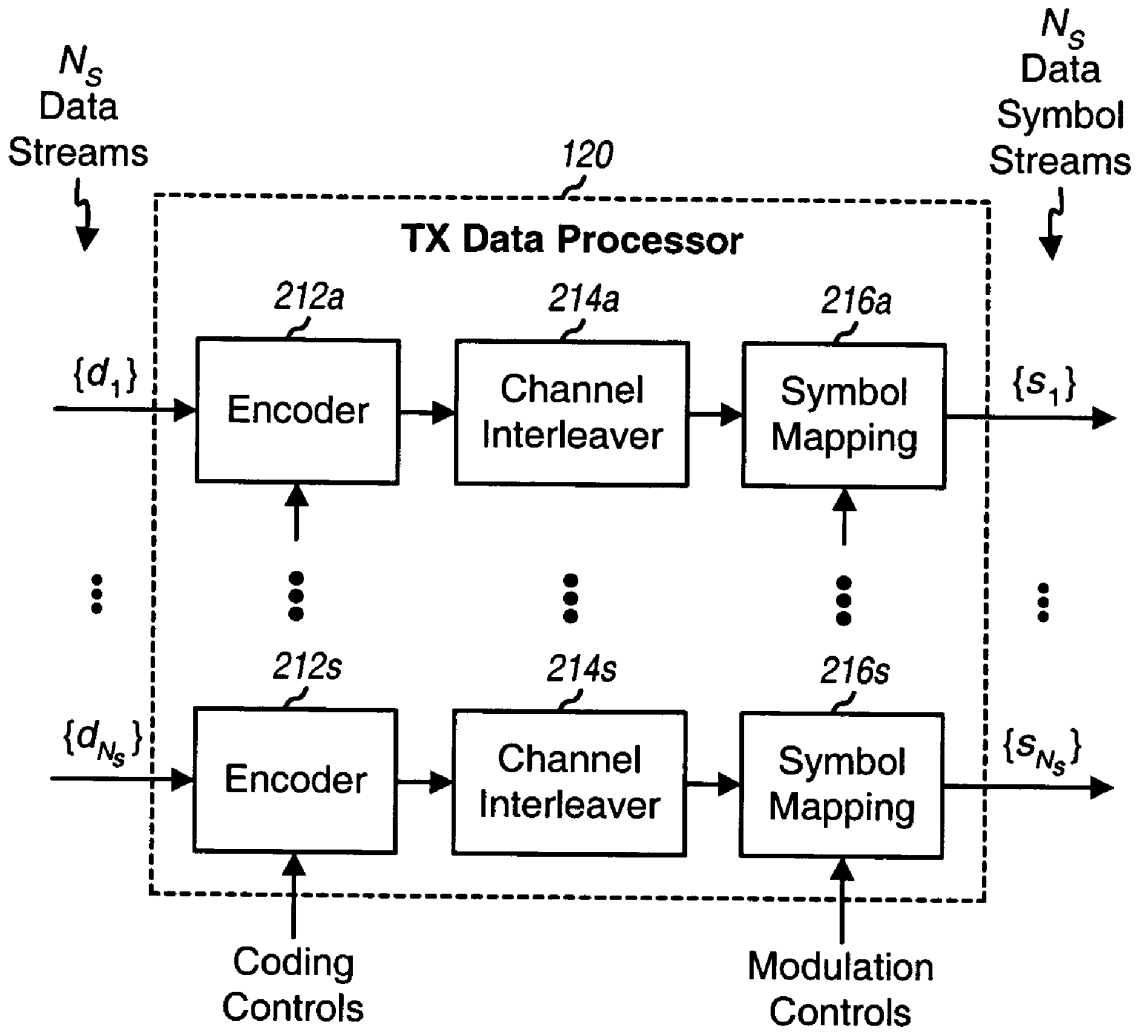

FIG. 2

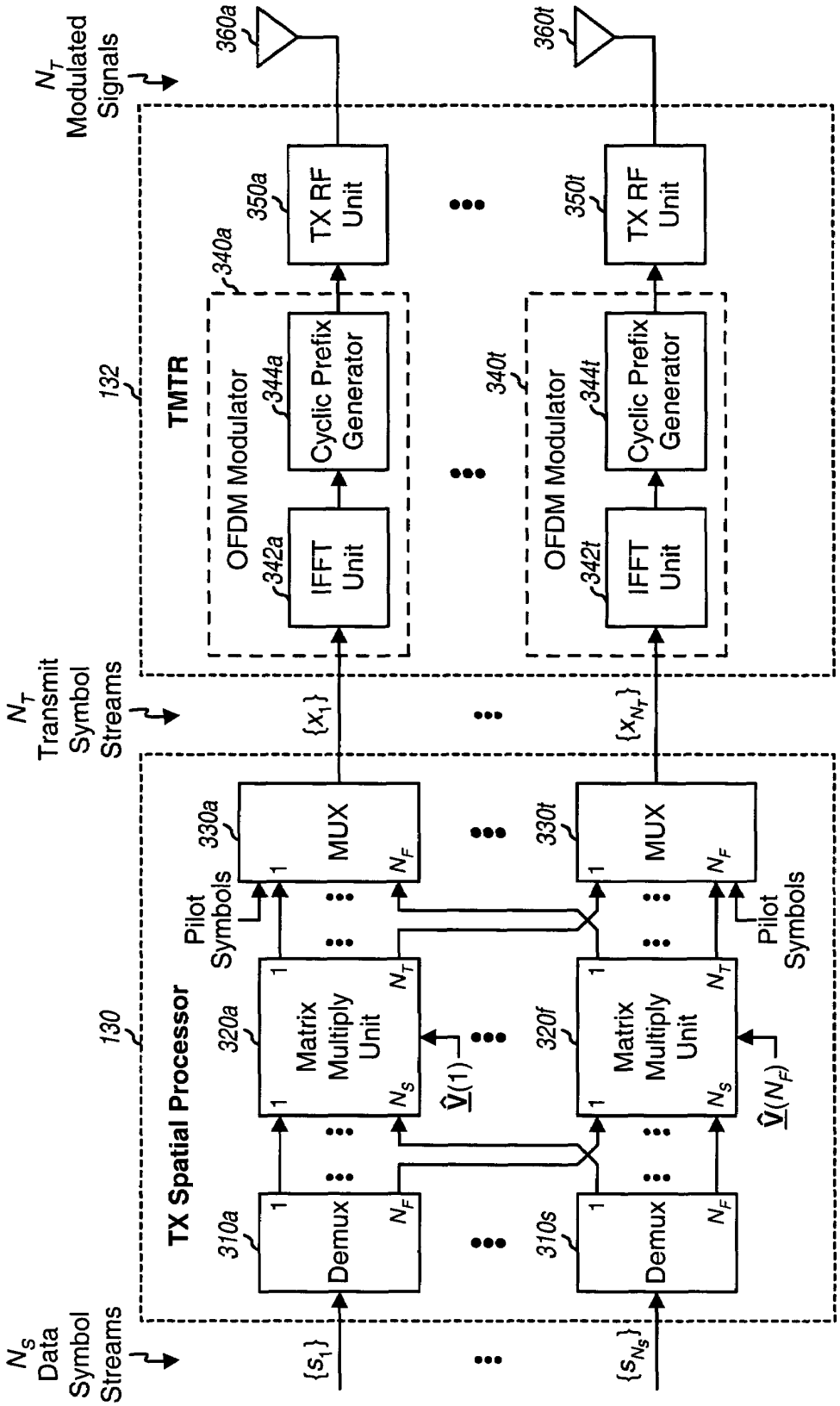

FIG. 3

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