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**Narasimhan et al.**

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(54) **MIMO-OFDM RECEIVER PROCESSING WITH FREQUENCY AND CHANNEL ESTIMATION**

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(51) **Int. Cl.**  
**H04B 1/69** (2006.01)  
**H04B 1/04** (2006.01)

(52) **U.S. Cl.** ..... **375/148**; 375/299; 455/132

(58) **Field of Classification Search** ..... 375/148, 375/347, 349, 299, 346, 348; 324/614; 455/132, 455/101

See application file for complete search history.

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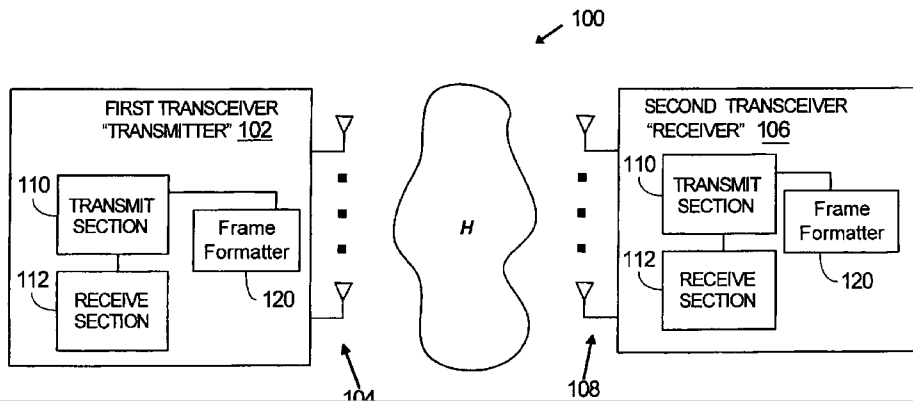
(Continued)

Primary Examiner—Khai Tran

(57) **ABSTRACT**

A receiver in a MIMO-OFDM system may process OFDM symbols received on a number ( $M_R$ ) of receive antennas. The system may utilize a MIMO-OFDM frame format that includes additional long training OFDM symbols, for training additional antennas and for link adaptation, and a header with an additional SIGNAL symbol to indicate MIMO-OFDM-specific information.

**50 Claims, 8 Drawing Sheets**



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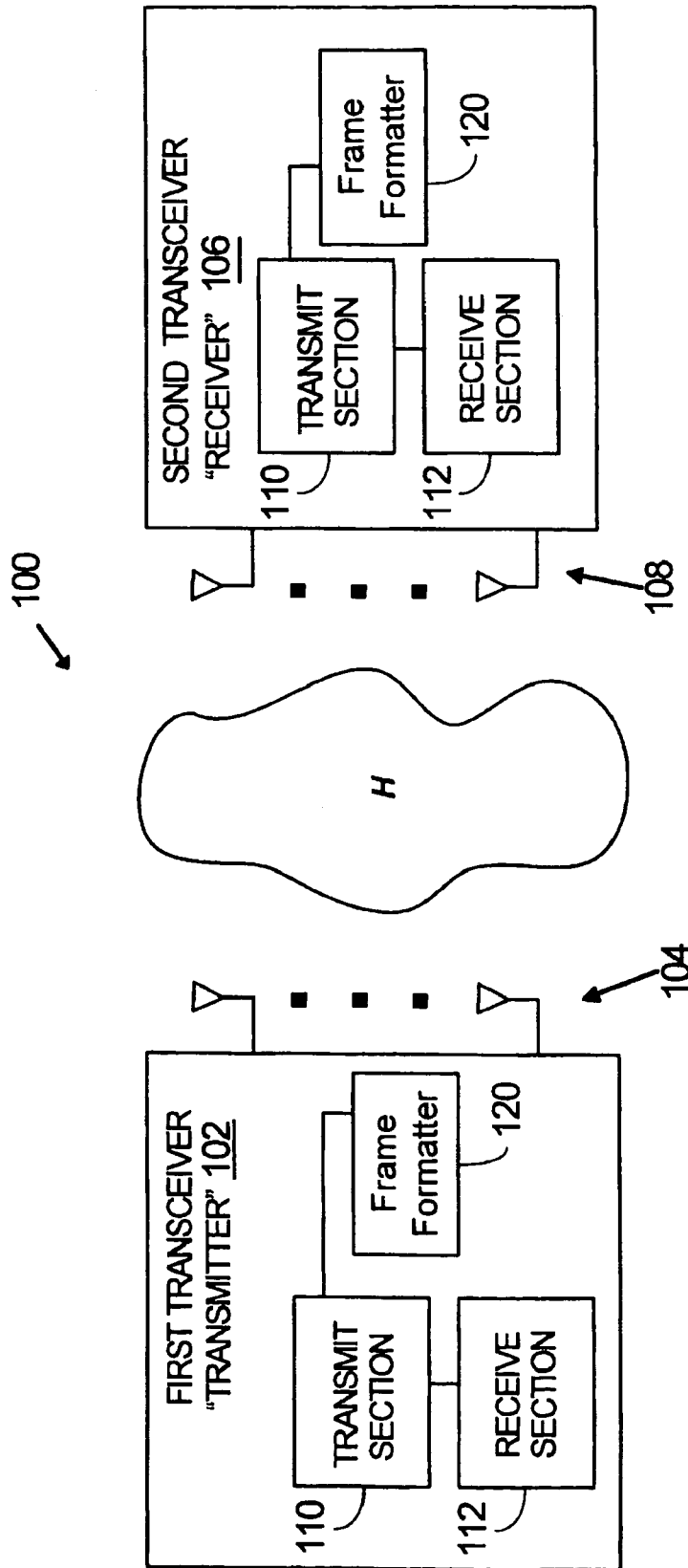


FIG. 1

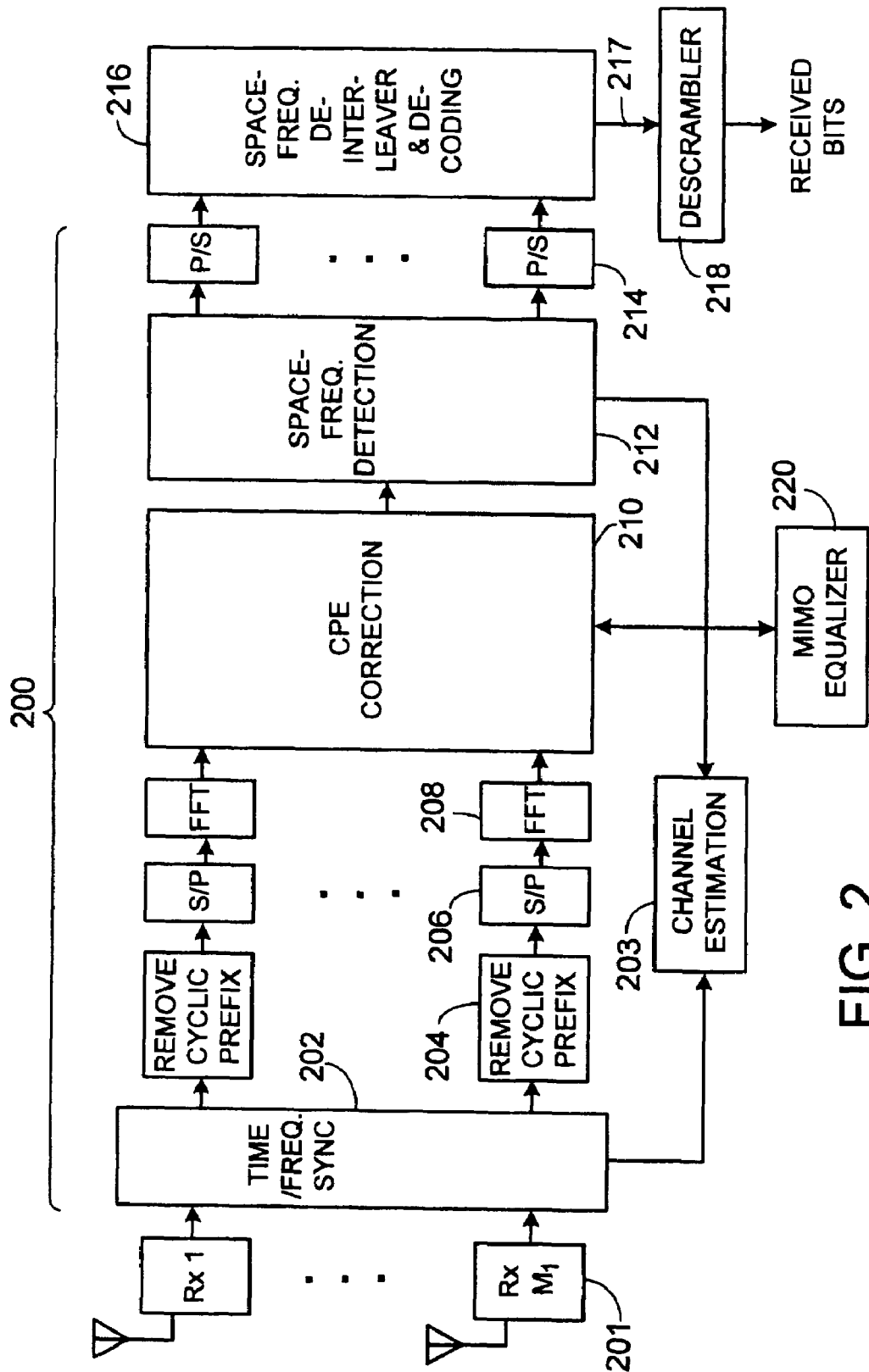


FIG. 2

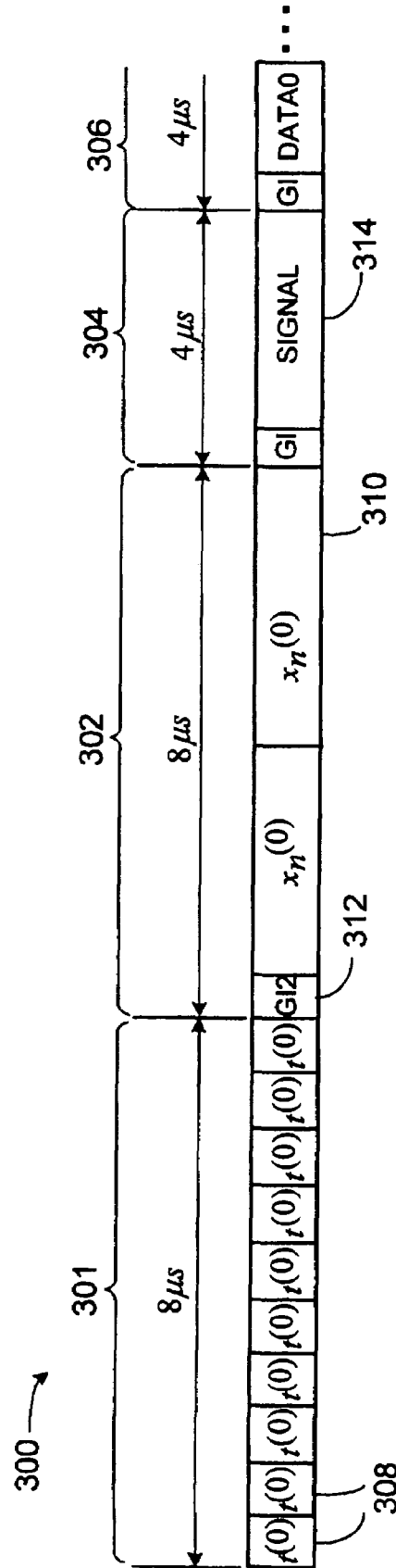


FIG. 3

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