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Walton et al.

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(45) **Date of Patent: Dec. 9, 2003**

(54) **METHOD AND APPARATUS FOR ALLOCATING DOWNLINK RESOURCES IN A MULTIPLE-INPUT MULTIPLE-OUTPUT (MIMO) COMMUNICATION SYSTEM**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 143 days.

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(51) **Int. Cl.**[7] **H04B 1/38**; H04M 1/00
(52) **U.S. Cl.** **455/562**; 455/452
(58) **Field of Search** 455/561, 562, 455/69, 101, 103, 102, 562.1, 450, 451, 452.1, 452.2, 509, 513; 375/347, 349

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(57) **ABSTRACT**

Techniques to schedule downlink data transmission to a number of terminals in a wireless communication system. In one method, one or more sets of terminals are formed for possible data transmission, with each set including a unique combination of one more terminals and corresponding to a hypothesis to be evaluated. One or more sub-hypotheses may further be formed for each hypothesis, with each sub-hypothesis corresponding to specific assignments of a number of transmit antennas to the one or more terminals in the hypothesis. The performance of each sub-hypothesis is then evaluated, and one of the evaluated sub-hypotheses is selected based on their performance. The terminal(s) in the selected sub-hypothesis are then scheduled for data transmission, and data is thereafter coded, modulated, and transmitted to each scheduled terminal from one or more transmit antennas assigned to the terminal.

49 Claims, 9 Drawing Sheets

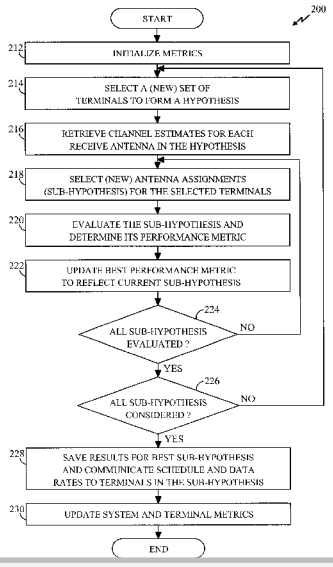

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Exhibit 1012

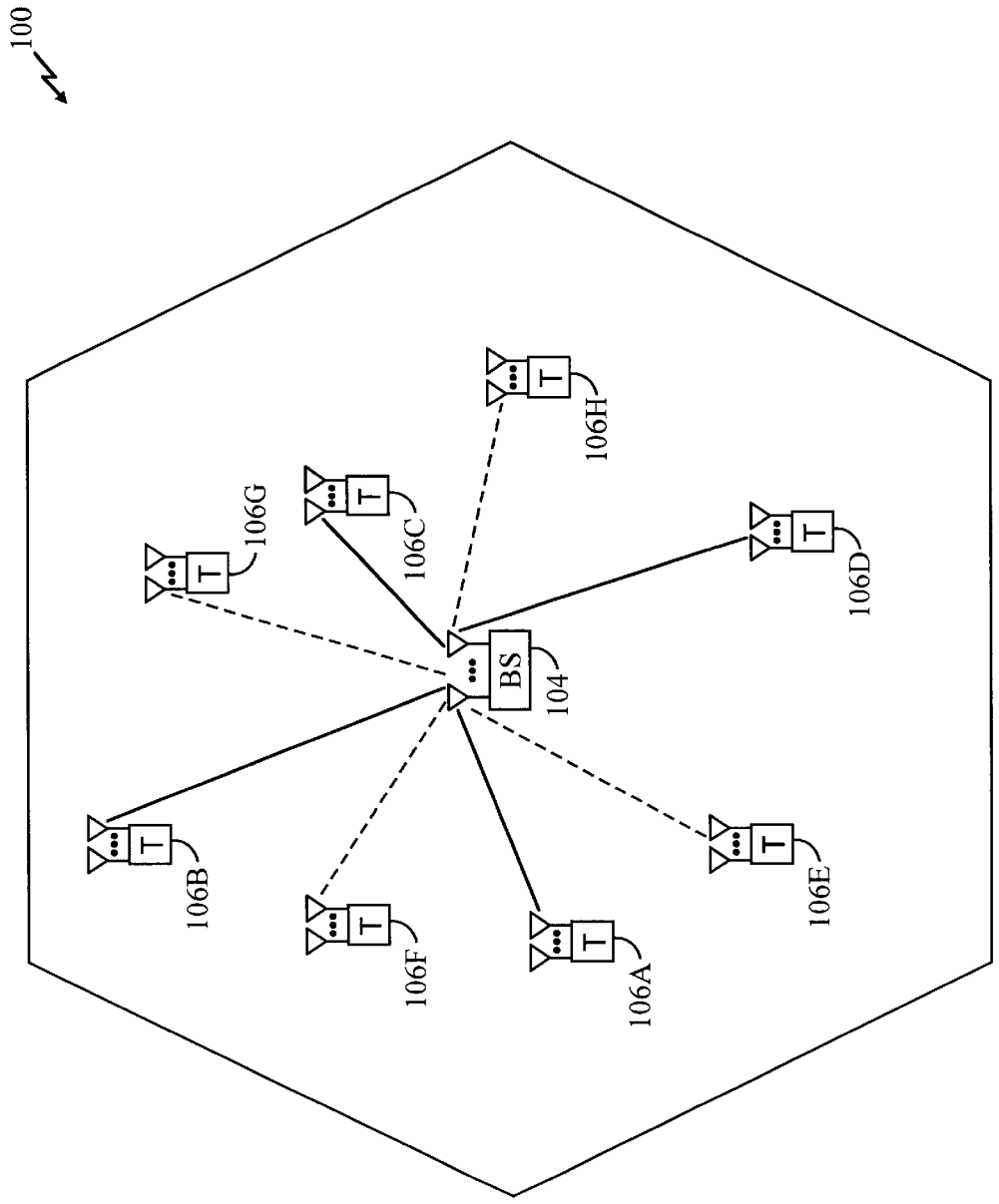

FIG. 1

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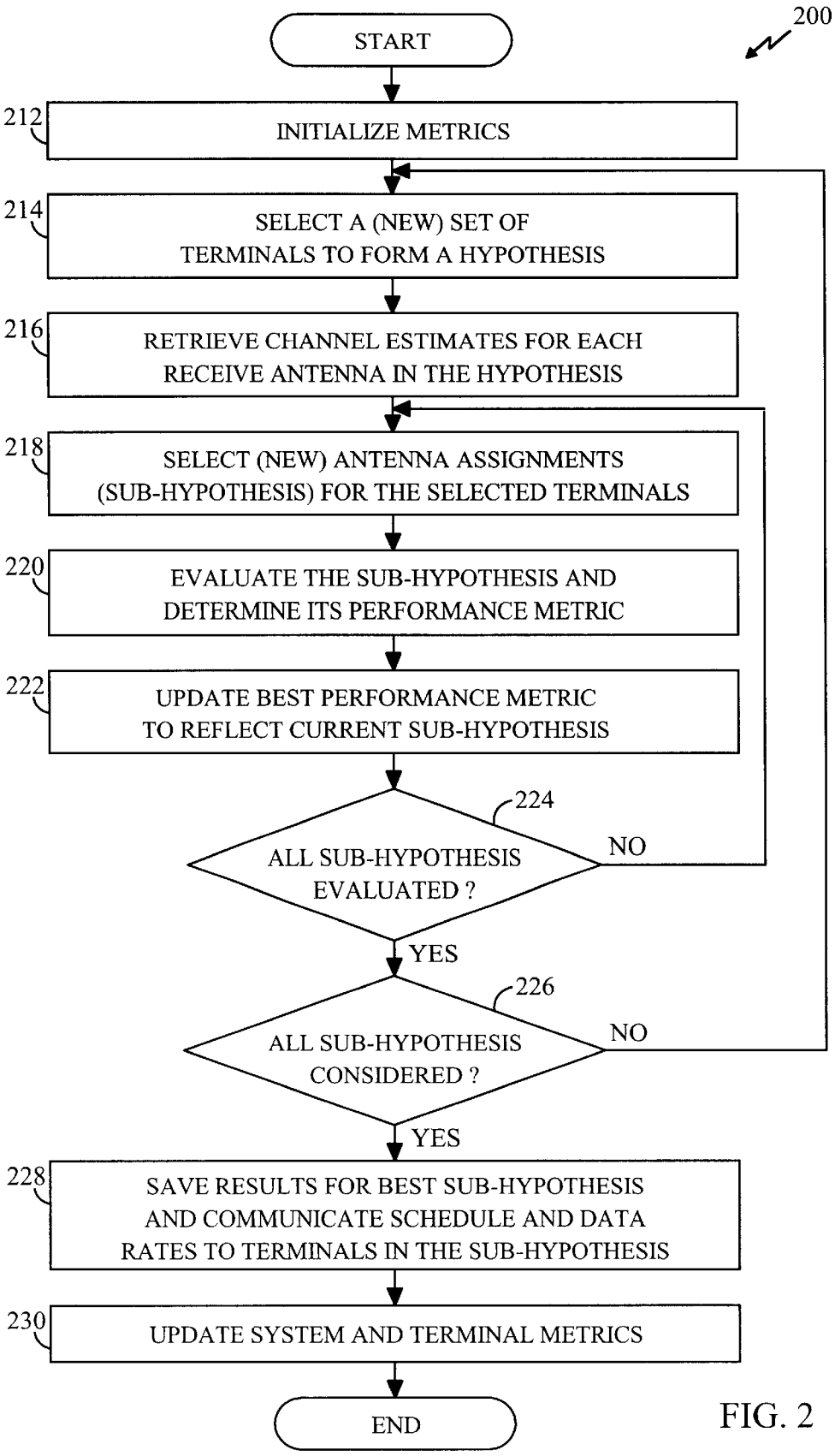

FIG. 2

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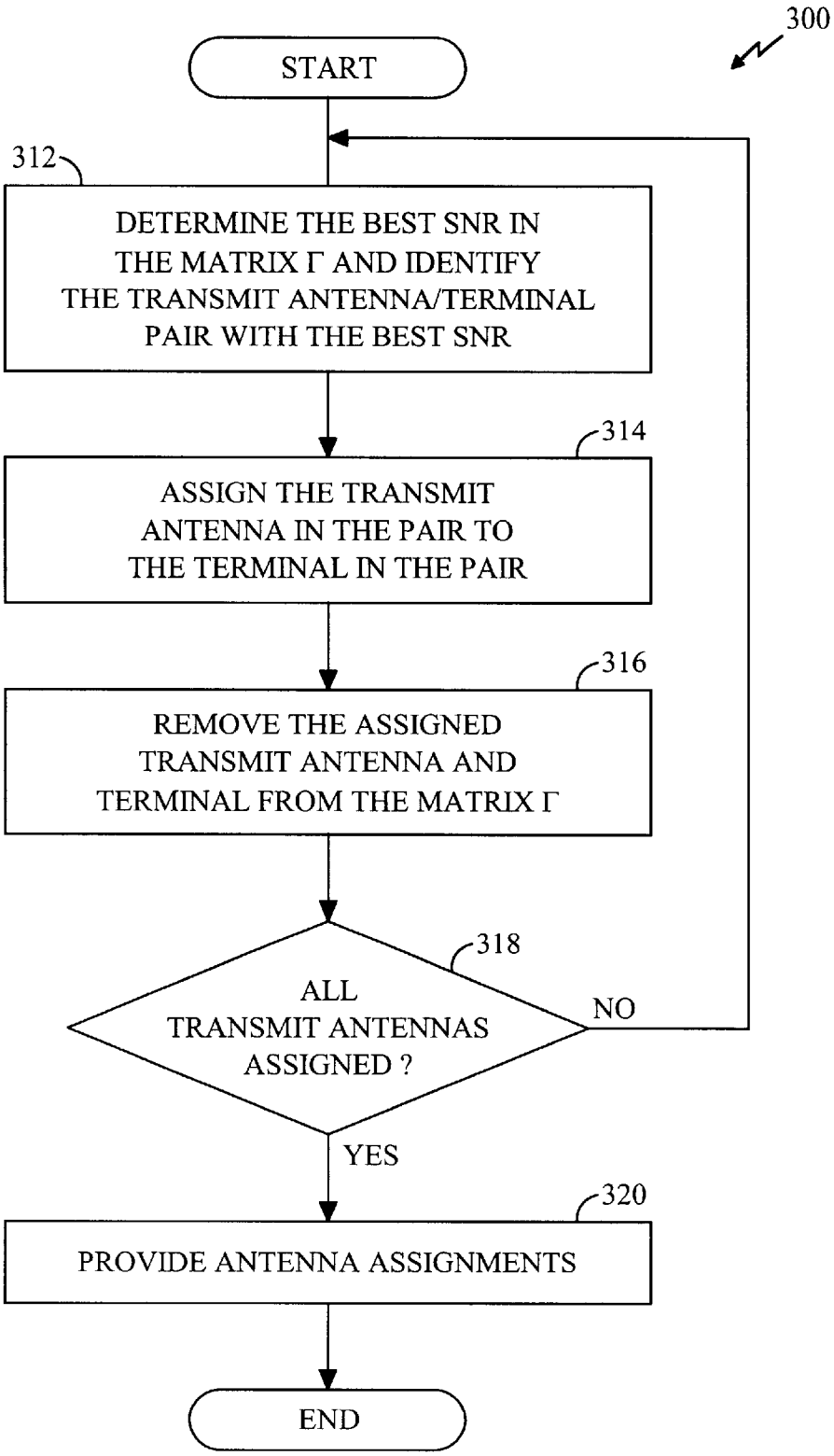

FIG. 3

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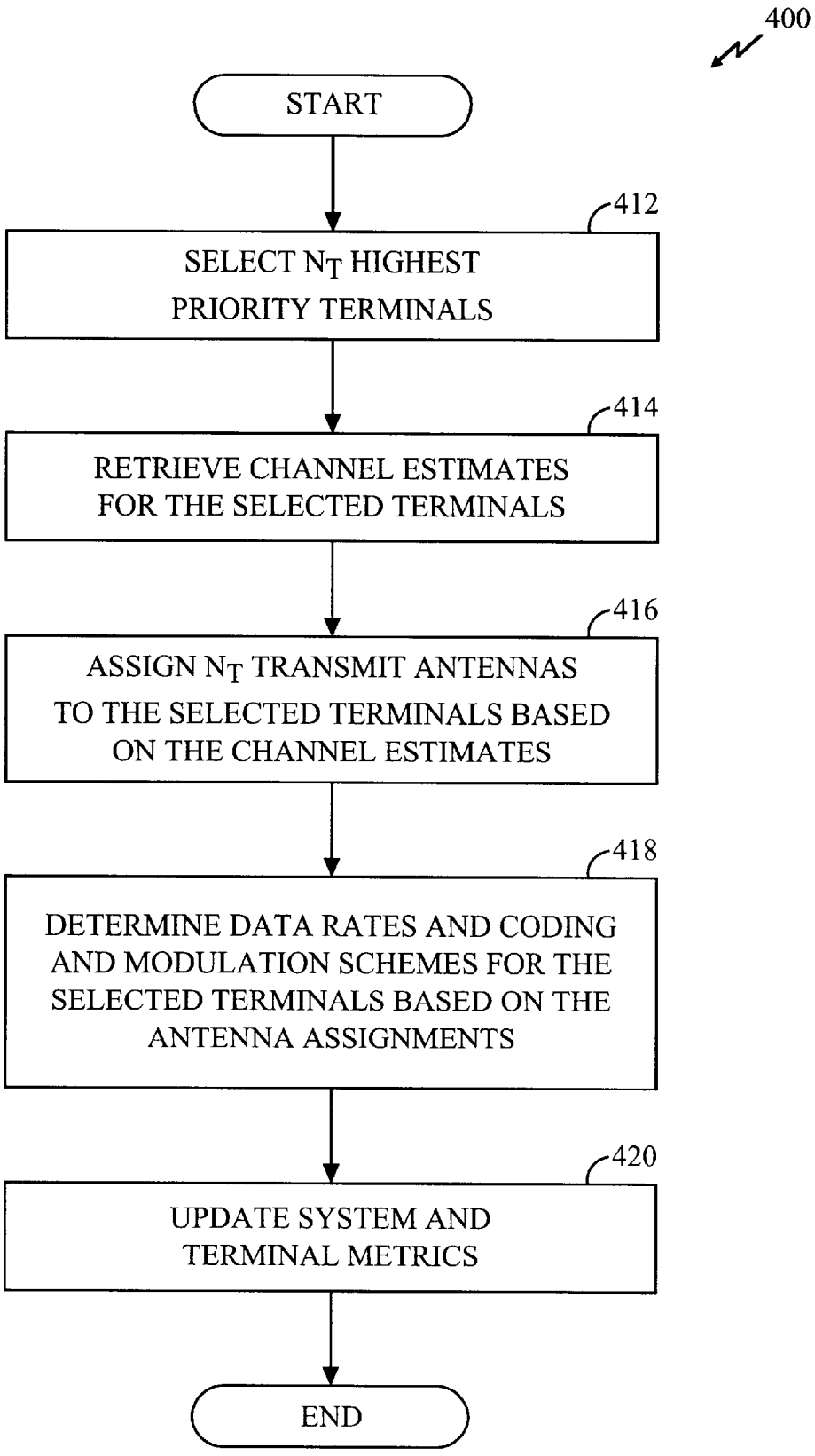

FIG. 4

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