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(54) **SYNTHETIC SPIN-VALVE DEVICE HAVING HIGH RESISTIVITY ANTI PARALLEL COUPLING LAYER**

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(57) **ABSTRACT**

The present invention provides an improved synthetic spin valve sensor having a high resistivity antiparallel coupling layer, typically formed of rhenium, between pinned layers. The spin valve sensor of the present invention may be formed having a layered structure as follows: pinning layer/first pinned layer/high resistivity antiparallel coupling layer/second pinned layer/metallic nonferromagnetic spacer layer/free layer. Capping and seed layers typically are also included. The high resistivity of the antiparallel coupling layer of the present invention reduces shunt current through that layer to improve the GMR effect of the spin valve while maintaining sufficient antiparallel coupling between the pinned layers. The antiparallel coupling layer of the present invention also provides improved thermal stability.

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(52) **U.S. Cl.** **360/324.11**

(58) **Field of Search** 360/113, 126, 360/324.11, 324.2; 324/252, 207.21

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23 Claims, 4 Drawing Sheets

