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SPIN VALVE SENSOR WITH ANTIPARALLEL MAGNETIZATION OF PINNED LAYERS

ABSTRACT

A magnetoresistive (MR) sensor (30) comprises a dual differential spin valve structure (32, 34). Each of the spin valves (32, 34) comprises first (free) (31, 39) and second (pinned) layers (35, 43) of ferromagnetic material separated by a thin film layer of nonmagnetic material (33, 41). The magnetization direction of the pinned layers (35, 43) of ferromagnetic material in each spin valve (32, 34) is fixed, and their magnetization is set antiparallel to each other. A current flow is produced through the MR sensor (30), and the variations in voltage across the MR sensor (30) are sensed due to changes in resistance of the MR sensor (30) produced by rotation of the magnetization in the free layers (31, 39) of ferromagnetic material as a function of the magnetic field being sensed.

Fig. 2