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ABSTRACT

MAGNETORESISTIVE SENSOR

A magnetoresistive read sensor 30 based on the spin valve effect incorporates a multilayered, dual spin valve structure. The sensor read element includes first 31, second 35 and third 39 layers of ferromagnetic material separated from each other by layers of non-magnetic metallic material. The first and third layers of ferromagnetic material, i.e., the outer layers of the structure, have their magnetization orientation fixed, while the second, intermediate ferromagnetic layer is magnetically soft and has its magnetization oriented perpendicular to that of both the outer ferromagnetic layers in the absence of an applied magnetic field. In one preferred embodiment, the two outer ferromagnetic layers have their magnetizations fixed parallel to each other by exchange coupling with adjacent antiferromagnetic layers. In a second preferred embodiment, the directions or magnetization in the first and third layers of ferromagnetic material are aligned in an antiparallel orientation.

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