

Magnetoresistive Device With Exchange-Coupled Structure Having Half-Metallic Ferromagnetic Heusler Alloy In The Pinned Layer

Abstract of the Disclosure

A magnetoresistive device of the type with a pinned ferromagnetic layer and a free ferromagnetic layer separated by a nonmagnetic spacer layer has an exchange-coupled antiferromagnetic/ferromagnetic structure that uses a half-metallic ferromagnetic Heusler alloy with its near 100% spin polarization as the pinned ferromagnetic layer. The exchange-coupled structure includes an intermediate ferromagnetic layer between the AF layer and the pinned half-metallic ferromagnetic Heusler alloy layer, which results in exchange biasing. Magnetoresistive devices that can incorporate the exchange-coupled structure include current-in-the-plane (CIP) read heads and current-perpendicular-to-the-plane (CPP) magnetic tunnel junctions and read heads. The exchange-coupled structure may be located either below or above the nonmagnetic spacer layer in the magnetoresistive device.

Figure 4