MAGNETIZATIONS OF PINNED AND FREE LAYERS OF A SPIN VALVE SENSOR SET BY SENSE CURRENT FIELDS

ABSTRACT OF THE DISCLOSURE

A self-biasing magnetoresistive (MR) spin valve sensor (140) is provided which does not require an antiferromagnetic layer for orienting magnetizations. A non-magnetic electrically-conducting spacer layer (146) is sandwiched between ferromagnetic free (142) and pinned (144) layers. A first flux guide is magnetically coupled to first edges of the layers at the ABS and a second flux guide is magnetically coupled to second edges of the free layer recessed from the ABS so that the effect of the demagnetization field H_{DEMAG} on the free layer is at least minimized and preferably zero. A sense current (154) is directed through the spin valve sensor (140) so that the sense current field (154) from the pinned layer balances the ferromagnetic coupling (150) on the free layer and the sense current field (156) from the free layer adds to the ferromagnetic coupling (150) on the pinned layer (144).

FIG. 7