HIGHLY SENSITIVE ORTHOGONAL SPIN VALVE READ HEAD

ABSTRACT OF THE DISCLOSURE

An orthogonal spin valve read head is provided wherein a spin valve sensor (40) is asymmetrically located between first and second shield layers (S1,S2) so that image currents in the first and second shield layers (S1,S2) produce a resultant image field which partially or completely counterbalances a stiffening field from antiferromagnetic (74), pinned (72) and spacer (76) layers in the MR sensor when sense current is conducted therethrough. Accordingly, the spin valve sensor (40) may be located a greater distance from the second shield layer (S2) by providing a mid-gap layer between the spin valve sensor (40) and a second gap layer (G2). In one example, the total thickness of the mid-gap and second gap layer (G2) is four times as thick as the first gap layer (G1) which results in the image fields from the first and second shield layers (S1,S2) completely counterbalancing the field from the antiferromagnetic (74), pinned (72) and spacer (76) layers due to the sense current.

FIG. 4