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(54) **MAGNETIC SENSOR WITH REDUCED WING REGION MAGNETIC SENSITIVITY**

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(58) **Field of Search** 360/324.12, 324.1, 360/324, 324.2

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(57) **ABSTRACT**

A magnetic sensor. According to one embodiment, the sensor comprises a synthetic antiferromagnetic (SAF) layer having first and second wing regions and an active region therebetween. The SAF layer includes a non-magnetic metal layer having first and second wing region portions and an active region portion therebetween, the non-magnetic metal layer including first and second opposing surfaces. The SAF layer also includes a first ferromagnetic layer adjacent a first surface of the non-magnetic metal layer and having first and second wing region portions and an active region portion therebetween. The SAF layer further includes a second ferromagnetic layer adjacent the second surface of the non-magnetic metal layer and including a first wing region portion adjacent the first wing region portion of the non-magnetic metal layer and a second wing region portion adjacent the second wing region portion of the non-magnetic metal layer. The second ferromagnetic layer is of adequate thickness such that the magnetic susceptibility of the first and second wing region portions of the first ferromagnetic layer is substantially zero when magnetic fields are present only in the first and second wing regions.

13 Claims, 12 Drawing Sheets

