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[54] **SINGLE CORE TRIAXIAL FLUX-GATE MAGNETOMETER**

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[58] Field of Search 324/247, 244, 253, 249, 324/258, 254, 255, 260, 262; 336/221, 233, 184, 213

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[57] **ABSTRACT**

A single core triaxial flux-gate magnetometer including a tall-toroidal core having a radial excitation winding, two orthogonal sets of axial or circumferential output windings, and an equatorial output winding oriented orthogonal to both axial output windings. The core is fabricated from a strip of magnetic tape material wrapped to form a toroid having a height approximately equal to its diameter. Each end of the strip is uniformly tapered along the top and bottom edges such that the tapered segments extend around an integer multiple of complete revolutions of the wrapping, the length of each tapered segment thereby being equal to the inner or outer circumference of the toroid or an integer multiple thereof. Leakage of the induced magnetic field at any point along the edge of the tapered segment will be generally proportional to the height of the tapered segment between its edges at that point, and will extend with equal magnitude in opposite directions from the strip parallel to the planar surface of the toroid and perpendicular to the edges. The tapered segments are oriented and aligned relative to one another in the wrapped toroid such that the induced magnetic field leakage is generally symmetrical and balanced across any diameter of the core.

20 Claims, 2 Drawing Sheets