

- ii. including a cancelling means for removing the effects of the eddy magnetic fields,
 - iii. positioned to magnetically interact with the magnetic field associated with the magnetization of the magnetic film, and
 - iv. magnetically isolated from interacting with the magnetic field produced by the generator means;
 - c. a regulating means, coupled for varying the applied magnetic field intensity H generated by the generator means, the generator means, the sensor means and the regulator means thereby cooperating to determine the M-H data points in sufficient number to define the hysteresis loop associated with the particular magnetic disc under test, thereby characterizing the M and the H characteristics of the disc.
2. The apparatus defined in claim 1, wherein the generator means comprises:
- a. a magnetic core,
 - i. formed with a top section and a bottom section which are symmetrical with respect to each other,
 - ii. the top section being positioned adjacent the magnetic disc and the bottom section being positioned away from the magnetic disc, and
 - iii. provided with a coupling member for coupling the top section and the bottom section symmetrically with respect to each other around the coupling member;
 - b. a first gap,
 - i. located in a top region of the center top of the top section,
 - ii. characterized by a first gap length and a first gap area which in cross-section is identical to the cross-sectional area of the top section in which the first gap is located;
 - c. a second gap,
 - i. located in a bottom region of the center bottom of the bottom section,
 - ii. characterized by a second gap length and a second gap area which in cross-section is identical to the cross-sectional area of the bottom section in which the second gap is located, and
 - iii. substantially identical to the first gap in the sense that the ratio of the respective gap lengths to the respective gap areas (i.e., gap length:gap area, or gap length/gap area) is identical for the first gap and the second gap, and
 - d. at least four electromagnetic coils,
 - i. including a first coil, a second coil, a third coil and a fourth coil,
 - ii. symmetrically positioned with respect to one another and with respect to the magnetic core,

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- iii. coupled to magnetically interact with the magnetic core,
 - iv. each coil having the same number of amp-turns NxI.
3. The apparatus defined in claim 2, wherein the sensor means for determining the magnetization M comprises:
- a. a sense coil,
 - i. wound around the symmetrical center of the magnetic core,
 - ii. formed to detect the magnetization M signal emerging from the magnetic disc, and in response generate an electric signal; and
 - b. a shielding means, formed for magnetically isolating the sense coil so that the sense coil only detects the magnetization M signal emerging from the magnetic disc.
4. The apparatus defined in claim 3, wherein the regulating means for varying the applied magnetic field intensity comprises: a current means,
- a. coupled electrically in series with each of the four electromagnetic coils, and
 - b. formed for delivering an alternating current having a varying amplitude.
5. The apparatus defined in claim 4, further including a balance circuit, coupled for adjusting the magnetic flux generated in the magnetic core so the total magnetic flux can be selectively adjusted to substantially equal zero, thereby achieving a balanced magnetic core operation as measured by a zero output signal emerging from the sense coil, the balance circuit comprising:
- a. a first balancing coil,
 - i. coupled through a first winding for delivering a first balancing flux to the magnetic core,
 - ii. the first winding being wound in a first direction around the magnetic core;
 - b. a second balancing coil,
 - i. connected in series with the first balancing coil,
 - ii. coupled through a second winding for delivering a second balancing flux to the magnetic core,
 - iii. the second winding being wound in a second direction around the magnetic core,
 - iv. the second winding being wound around the magnetic core in a direction opposite to the direction of the first winding; and
 - c. an attenuator means,
 - i. connected in series to the first balancing coil and the second balancing coil,
 - ii. formed for balancing the first balancing flux and the second balancing flux,
- whereby the sensor coil generates a zero output signal.

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