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(54) **BROADBAND SPECTROSCOPIC ROTATING COMPENSATOR ELLIPSOMETER**

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(52) **U.S. Cl.** **356/369**
(58) **Field of Search** 356/369, 364; 250/225

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(57) **ABSTRACT**

An ellipsometer, and a method of ellipsometry, for analyzing a sample using a broad range of wavelengths, includes a light source for generating a beam of polychromatic light having a range of wavelengths of light for interacting with the sample. A polarizer polarizes the light beam before the light beam interacts with the sample. A rotating compensator induces phase retardations of a polarization state of the light beam wherein the range of wavelengths and the compensator are selected such that at least a first phase retardation value is induced that is within a primary range of effective retardations of substantially 135° to 225°, and at least a second phase retardation value is induced that is outside of the primary range. An analyzer interacts with the light beam after the light beam interacts with the sample. A detector measures the intensity of light after interacting with the analyzer as a function of compensator angle and of wavelength, preferably at all wavelengths simultaneously. A processor determines the polarization state of the beam as it impinges the analyzer from the light intensities measured by the detector.

7 Claims, 5 Drawing Sheets