

[54] ACOUSTIC EXAMINATION METHODS AND APPARATUS

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[57] ABSTRACT

An acoustic microscope system in which the insonification frequency f_s is continuously modulated, at a rate asynchronous relative to the optical scanning frequencies, to minimize acoustic speckle; the filter means employed to develop a video signal from the scanning beam has its center frequency continuously varied to track the insonification frequency changes. The filter means employs a constant-frequency IF stage, utilizing an IF mixer that subtracts f_s from the initial scanning information but adds a fixed carrier to allow for subsequent effective filtering. A combined deflector and demodulating light shield structure provides for improved alignment of the system optics. For optically opaque specimens, a polished surface of the specimen is used as the acoustic-optic interface, with no coverslip required and both optical and acoustical images derived from a single scanning beam. Shear-mode insonification is employed for improved resolution and to examine special properties of some materials.

29 Claims, 5 Drawing Figures

