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Birchak et al.

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[54] **ACOUSTIC DEVICE FOR MEASURING FLUID PROPERTIES**

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[52] **U.S. Cl.** **364/509**; 73/151; 73/24; 364/558; 364/422

[58] **Field of Search** ..... 364/509, 422, 558; 73/151, 32 A, 24; 367/140, 35, 157, 912, 141, 142, 151, 903

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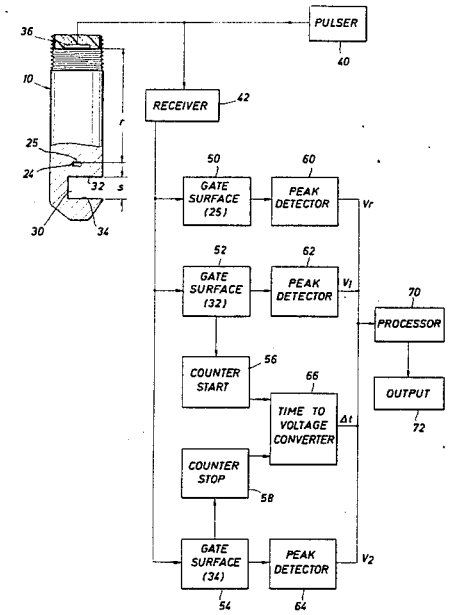
[57] **ABSTRACT**

An apparatus and method for measuring fluid characteristics, particularly useful in performing measurements in remote and severe environments is disclosed. The probe employs an ultrasonic transmitter and receiver, preferably a unitary ultrasonic transducer to both transmit and receive the ultrasonic signal. Further, the probe includes an internal reference reflecting surface hermetically sealed from contact with the fluid and one or more solid/fluid reflecting surfaces as are required. Preferably, two solid/fluid reflecting surfaces are located on opposite sides of a fluid receiving gap. The apparatus and method are useful in measuring fluid characteristics both at remote surface and in downhole drilling locations.

21 Claims, 3 Drawing Figures