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(54) **METHOD AND APPARATUS FOR CHARACTERIZING FLOWS BASED ON ATTENUATION OF IN-WALL PROPAGATING WAVE MODES**

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(52) **U.S. Cl.** **73/861.25**; 73/861.18

(58) **Field of Search** 73/861–861.25, 73/861.28, 861.26

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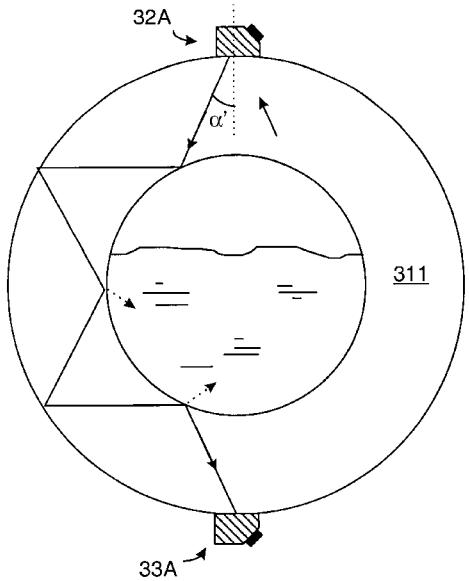
(57) **ABSTRACT**

Methods and apparatus are described that characterize flows within a conduit by generating acoustic waves, and receiving acoustic energy representing at least one in-wall leaky acoustic wave mode. Attenuation of acoustic energy that has entirely propagated within the wall of the conduit is measured and evaluated in order to derive parameters relating to the fluid or fluids flowing in the conduit. The wave modes described include bulk waves and lamb waves and propagate in axial and circumferential directions.

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