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(54) Title: ULTRA BROADBAND SOUND AND ULTRASONIC TRANSDUCER

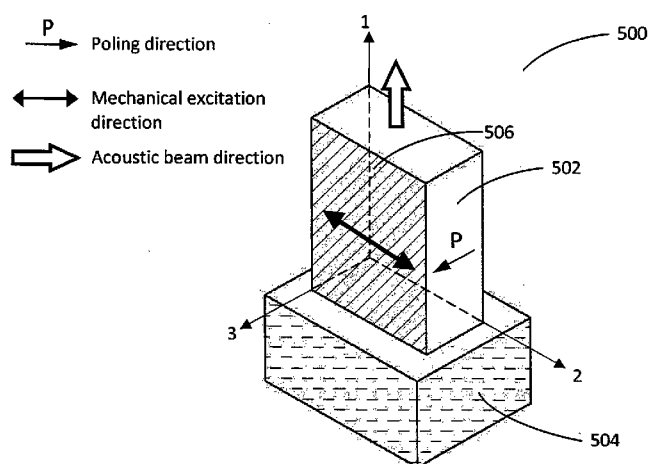


Figure 5

(57) Abstract: The present invention provides a transverse width mode for sound and ultrasound generation and reception. The transverse width mode can be combined with conventional longitudinal or transverse mode to make sonic and ultrasonic transducers and/or arrays of multiple resonant modes, a broadband coupled mode or their combinations. Due to its half-wavelength resonance nature, when the transverse width mode is designed to operate with suitable head mass and/or matching layers, ultra broadband transducers of moderate to high sound pressure level can be realized. With active materials having low transverse sound velocities, the transverse dimensions of each transducer element can be kept about or smaller than half the wavelengths of sounds in water and human tissues, making the transverse width mode highly suited for various array designs and operations.

