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CHEVRON U.S.A. INC. [US/US]; P.O. Box 6006, San Ramon, California 94583 (US). **LOS ALAMOS NATIONAL SECURITY LLC** [US/US]; Mail Stop A187, P.O. Box 1663, Los Alamos, New Mexico 87544 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **VU, Cung Khac** [US/US]; 2811 Lafayette Street, Houston, Texas 77005 (US). **SINHA, Dipen N.** [US/US]; 112 Shirlane Place, Los Alamos, New Mexico 87544 (US). **PANTEA, Cristian** [RO/US]; 70 Santolina, Los Alamos, New Mexico 87544 (US). **NIHEI, Kurt T.** [US/US]; 5839 Amy Drive, Oakland, California 94618 (US). **SCHMITT, Denis P.** [US/US]; 3903 S. Mason Rd. #1131, Katy, Texas 77450 (US). **SKELT, Christopher** [GB/US]; 10219 Inwood Dr., Houston, Texas 77042 (US).(74) Agents: **PEREZ, Robert C.F.** et al.; PILLSBURY WINTHROP SHAW PITTMAN LLP, P.O. Box 10500, McLean, Virginia 22102 (US).

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[Continued on next page]

(54) Title: DEVICE AND METHOD FOR GENERATING A COLLIMATED BEAM OF ACOUSTIC ENERGY IN A BORE-HOLE

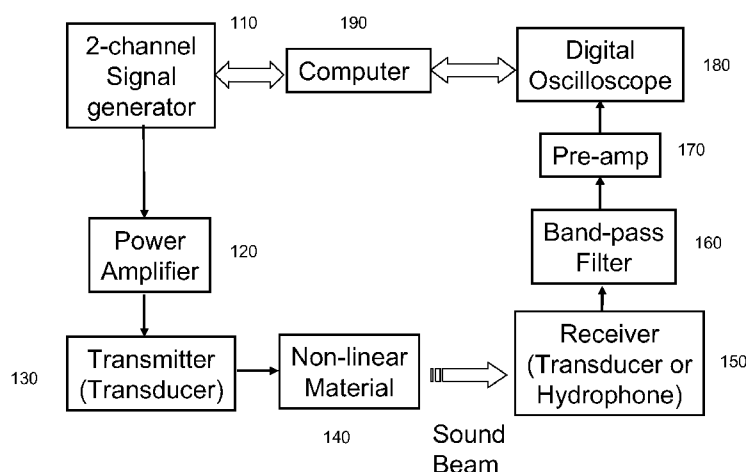


FIG. 1

(57) Abstract: In some aspects of the invention, a method of generating a beam of acoustic energy in a borehole is disclosed. The method includes generating a first acoustic wave at a first frequency; generating a second acoustic wave at a second frequency different than the first frequency, wherein the first acoustic wave and second acoustic wave are generated by at least one transducer carried by a tool located within the borehole; transmitting the first and the second acoustic waves into an acoustically non-linear medium, wherein the composition of the non-linear medium produces a collimated beam by a non-linear mixing of the first and second acoustic waves, wherein the collimated beam has a frequency based upon a difference between the first frequency and the second frequency; and transmitting the collimated beam through a diverging acoustic lens to compensate for a refractive effect caused by the curvature of the borehole.



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