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

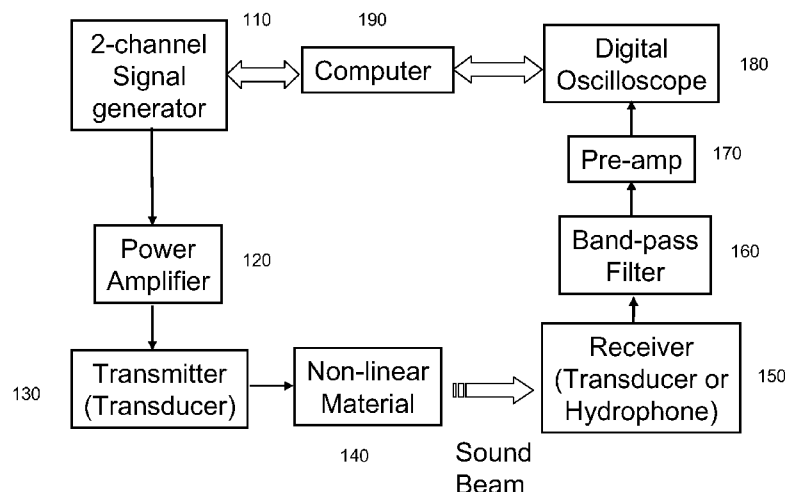


FIG. 1

(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 broad-band acoustic pulse at a first broad-band frequency range having a first central frequency and a first bandwidth spread; generating a second broad-band acoustic pulse at a second broad-band frequency range different than the first frequency range having a second central frequency and a second bandwidth spread, wherein the first acoustic pulse and second acoustic pulse are generated by at least one transducer arranged on a tool located within the borehole; and transmitting the first and the second broad-band acoustic pulses into an acoustically non-linear medium, wherein the composition of the non-linear medium produces a collimated pulse by a non-linear mixing of the first and second acoustic pulses, wherein the collimated pulse has a frequency equal to the difference in frequencies between the first central frequency and the second central frequency and a bandwidth spread equal to the sum of the first bandwidth spread and the second bandwidth spread.



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