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Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

[Continued on next page]

(54) Title: DEVICE AND METHOD FOR GENERATING A BEAM OF ACOUSTIC ENERGY FROM A BOREHOLE, AND APPLICATIONS THEREOF

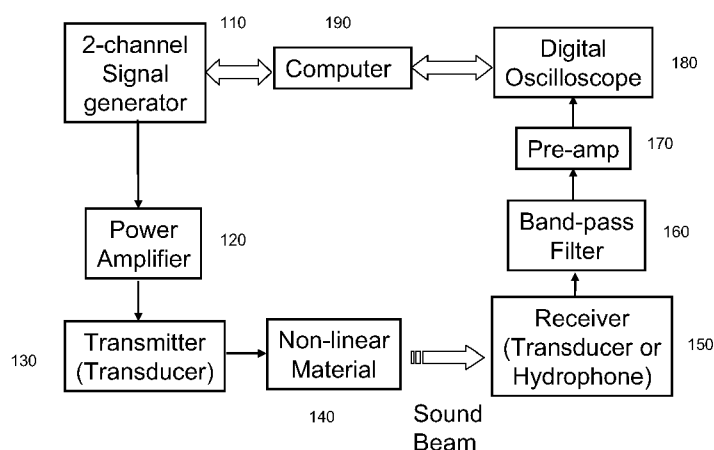


FIG. 1

(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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