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- (54) **Title:** SYSTEM AND METHOD FOR INVESTIGATING SUB-SURFACE FEATURES OF A ROCK FORMATION

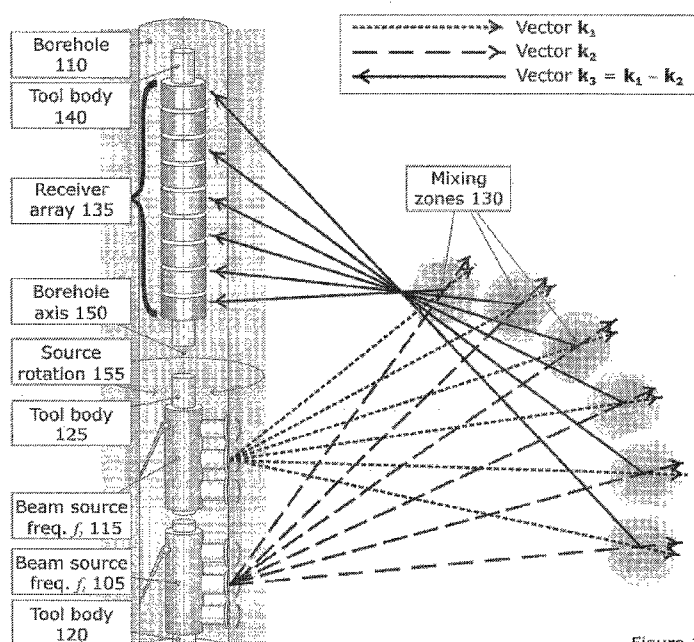


Figure 1

(57) **Abstract:** A method and system for investigating rock formations outside a borehole are provided. The method includes generating a first acoustic wave at a first frequency by a first acoustic source (105); and generating a second acoustic wave at a second frequency by a second acoustic source (115). The first and the second acoustic waves intersect in an intersection volume (130) outside the borehole. The method further includes receiving a third acoustic wave at a third frequency, the third shear acoustic wave returning to the borehole due to a non-linear mixing process in a nonlinear mixing zone within the intersection volume at a receiver (135) arranged in the borehole. The third frequency is equal to a difference between the first frequency and the second frequency.



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