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**Nugent**

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(54) **EXPENDABLE DEVICE FOR MEASUREMENT OF SOUND VELOCITY PROFILE**

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(57) **ABSTRACT**

A system for determining the sound velocity profile in a medium, such as water, includes an acoustic signal transmitting system at a transmitting location and an acoustic signal receiving and processing system at a receiving location. In one example, the acoustic signal receiving and processing system is located in a submarine or other similar vessel, and the acoustic signal transmitting system is located in an expendable vehicle or probe that moves throughout the water surrounding the submarine or vessel. At one or more transmission times and transmitting locations, the acoustic signal transmitting system transmits an acoustic signal. The acoustic signal receiving and processing system receives each acoustic signal at an arrival time and determines the sound velocity in the water between the transmitting location and the receiving location using the arrival time, the predetermined transmission time, and the predetermined transmitting location. Using the sound velocity calculated based upon multiple transmitting locations, a sound velocity profile is determined within the water.

**17 Claims, 2 Drawing Sheets**

