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**Shifrin**

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(54) **TRANSMIT CIRCUIT FOR IMAGING WITH ULTRASOUND**

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(75) Inventor: **Lazar A. Shifrin**, San Jose, CA (US)

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(73) Assignee: **Siemens Medical Solutions USA, Inc.**,  
Malvern, PA (US)

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(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 37 days.

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*Primary Examiner*—Francis J. Jaworski

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(65) **Prior Publication Data**

(57) **ABSTRACT**

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A digital-to-analog converter with differential outputs is connected to two difference amplifiers through current splitters. The current splitters isolate the compliance voltage of the digital-to-analog converter so that larger resistances may be used with the difference amplifiers. The larger resistances allow for better signal-to-noise ratio performance of the transmit circuit. The difference amplifiers provide current signals to a push-pull output amplifier through their supply nodes. A single scaling resistor connects between the conventional outputs of two differential amplifiers to reduce mismatching between the positive and negative waveform paths. As a result of the feedback between the two difference amplifiers, a lower level of subharmonic and/or harmonic distortion products is achieved.

(51) **Int. Cl.**<sup>7</sup> ..... **A61B 8/00**

(52) **U.S. Cl.** ..... **600/437**

(58) **Field of Search** ..... 600/437–471;  
310/317; 367/138; 330/271

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**18 Claims, 6 Drawing Sheets**

