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Williams, Jr. et al.

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[54] **PIEZOELECTRIC HEART ASSIST APPARATUS**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 301,553, Oct. 27, 1972, abandoned.

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[51] **Int. Cl.** **A61m 01/03,** A61f 01/24

[58] **Field of Search** ..... 128/1 D, 214 R, 273, 346; 3/1, DIG. 2; 251/9; 417/322, 478

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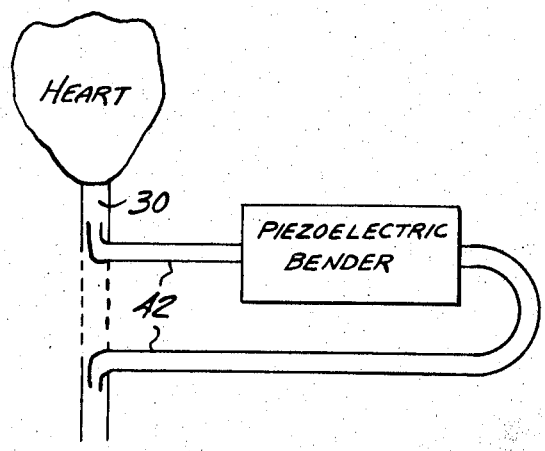
[57] **ABSTRACT**

An implantable piezoelectric heart assist apparatus generates pressure waves of approximately the same amplitude and frequency as the natural heart. The apparatus includes a brass support sandwiched between piezoelectric ceramics to form a piezoelectric bender. The bender compresses a tube which is sutured into the descending thoracic aorta. The bender is loaded at one end to change its resonant frequency and, upon application of a driving signal, the bender oscillates to generate pressure in the thoracic aorta.

6 Claims, 9 Drawing Figures