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[54] **SYSTEM AND METHOD FOR POWERING, CONTROLLING, AND COMMUNICATING WITH MULTIPLE INDUCTIVELY-POWERED DEVICES**

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[52] **U.S. Cl.** **607/61**; 607/33; 607/60

[58] **Field of Search** 607/60, 61, 31, 607/65, 32, 33; 128/899; 320/108

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[57] **ABSTRACT**

Magnetic Vector Steering (MVS) and Half-Cycle Amplitude Modulation (HCAM) are novel techniques which enhance the powering and control of multiple arbitrarily oriented implant devices. Together, these techniques enable arbitrarily oriented implants to receive power and command, programming, and control information in an efficient manner that preserves battery life and transmission time while reducing overall implant device bulk. By steering the aggregate magnetic field from a near-orthogonal set of AC-energized coils, selected implants can be powered or communicated with at desired times. Communication with individual implants can also be enhanced through half-cycle amplitude modulation—a technique that allows bit rates up to twice the energizing frequency. Unlike prior art systems, power and data transfer can be realized over the same frequency channel.

6 Claims, 7 Drawing Sheets