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(54) **SYSTEM FOR AND METHOD OF POWER EFFICIENT ELECTRICAL TISSUE STIMULATION**

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(52) **U.S. Cl.** **607/2; 607/4; 607/9; 607/34; 607/53; 607/61**

(58) **Field of Classification Search** **607/34, 607/36, 33, 61, 2, 4-5, 9, 13, 53**

See application file for complete search history.

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(57) **ABSTRACT**

Circuitry for and method of power efficient operation of, and energy recovery from, tissue-stimulating electrodes having high charge capacities. Post-stimulation energy is recovered from the electrodes through a variety of techniques into circuit elements such as other electrodes, an intermediate distribution system, a power supply or any other elements, through the use of sequential switching. Energy is also recoverable from the intermediate distribution system, which preferably is comprised of one or more storage capacitors operating a different voltages. Efficient power transfer among circuit elements is effected by transferring energy while limiting element-element voltage differences and/or voltage differences between the elements and the capacitances of the electrodes.

3 Claims, 11 Drawing Sheets

