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(54) **Title:** METHOD AND APPARATUS FOR NEUROMODULATOR OF RENAL NEURAL FIBERS

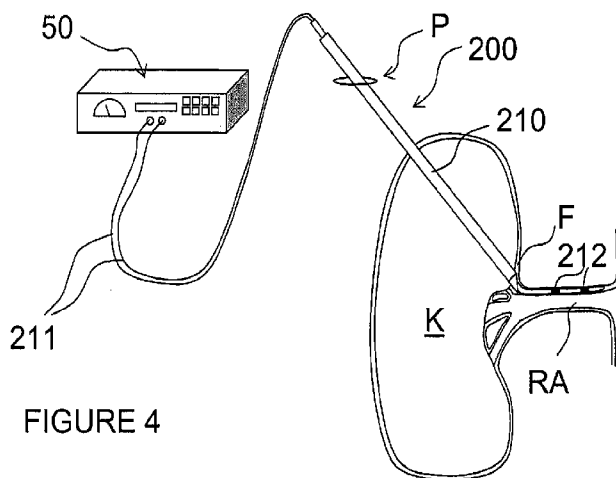


FIGURE 4

(57) **Abstract:** Methods and apparatus are provided for treating congestive heart failure, e.g., via a pulsed electric field, via a stimulation electric field, via localized drug delivery, via high frequency ultrasound, via thermal techniques, etc. Such neuromodulation may effectuate irreversible electroporation or electrofusion, necrosis and/or inducement of apoptosis, alteration of gene expression, action potential attenuation or blockade, changes in cytokine up-regulation and other conditions in target neural fibers. In some embodiments, neuromodulation is applied to neural fibers that contribute to renal function. In some embodiments, such neuromodulation is performed in a bilateral fashion. Bilateral renal neuromodulation may provide enhanced therapeutic effect in some patients as compared to renal neuromodulation performed unilaterally, i.e., as compared to renal neuromodulation performed on neural tissue innervating a single kidney.

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**A. CLASSIFICATION OF SUBJECT MATTER**  
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 USPC - 607/3  
 According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**  
 Minimum documentation searched (classification system followed by classification symbols)  
 IPC(8) - A61N 1/00 (2008.01)  
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
 USPC - 607/3  
 (Text Search)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 PubWEST (PGPB, USPT, USOC, EPAB, JPAB); DialogPRO (Engineering), PubMed and Google Scholar.  
 Search Terms: neuromodulat\$, renal, nerve, electric field, contrast nephropathy, ablation, hypertension, sever, severed, cut, laparoscopic, high frequency, ultrasound, severing.

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y	US 2005/0288730 A1 (DEEM et al.) 29 December 2005 (29.12.2005) abstract; para [0033], [0035], [0036], [0040]-[0042], [0087], [0101], [0114], [0122], [0135].	1-11, 13-33, 35-55, 57-77, 79-88 ----- 89-99, 101-110
X	US 2006/0041277 A1 (DEEM et al.) 23 February 2006 (23.02.2006) claim 29, 30; para [0033], [0035], [0038].	12, 34, 56, 78, 100
Y	US 2005/0245892 A1 (ELKINS et al.) 03 November 2005 (03.11.2005) para [0012], [0117].	89-110

Further documents are listed in the continuation of Box C.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

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