A stimulation device is provided that stimulates breathing to manipulate blood gas concentrations such as SaO₂ or PCO₂ and thereby treat underlying causes of breathing disorders and heart failure progression. A programmable device is provided for setting diaphragm stimulation waveforms that adjust minute ventilation about a predetermined baseline value. Normal breathing of the subject is observed to establish a baseline reference minute ventilation, and the device is programmed to produce stimulation waveforms that may provide either a decrease or an increase in the patient's minute ventilation. The minute ventilation of the subject may be decreased or increased from the baseline level by decreasing or increasing a parameter that changes minute ventilators.
before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(88) Date of publication of the international search report:
9 June 2005
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61N 1/36
US Cl. : 607/42

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)

U.S. : 607/20, 42, 116, 600/934

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>US 6,415,183 B1 (SHEINER et al.) 2 July 2002 (2.07.2002), column 2 and 5, lines 2-9 and 44-49.</td>
<td>11-14 and 21-25</td>
</tr>
<tr>
<td>Y</td>
<td>US 6,212,435 B1 (LATTNER et al.) 3 April 2001 (3.04.2001), column 1, lines 32-36, column 4, lines 34-45; columns 9 and 10, lines 66-67 and 1-5.</td>
<td>1-10 and 15-20</td>
</tr>
</tbody>
</table>

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

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"E" document member of the same patent family

Date of the actual completion of the international search: 10 March 2005 (10.03.2005)

Date of mailing of the international search report: 15 April 2005

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