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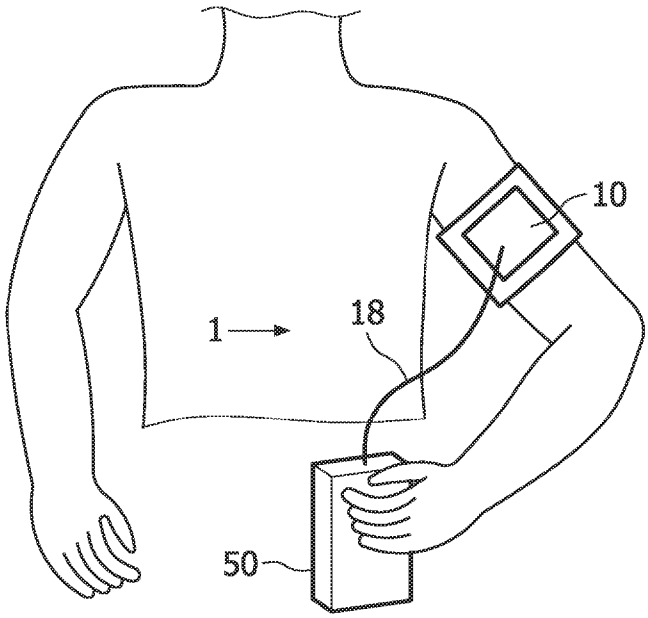
Declaration under Rule 4.17:
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

Published:
— *with international search report*

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31 May 2007

[Continued on next page]

(54) Title: MEASUREMENT AND STIMULATION OF MUSCLE TISSUE



(57) Abstract: An apparatus (1) for electrical stimulation of muscle tissue. The apparatus has an electrode system (10) with an electrode array (13). The array has a plurality of electrode pads (12) and can be placed in electrical contact with the muscle tissue. The electrode system Further has a sensor (30; 31-36) for sensing a property of the muscle tissue. The property forms a measure for the activity of the muscle tissue. The apparatus (1) has an electrode selector (530) for selecting one or more stimulating electrode pads. A signal generator (531) is connected to the electrode array (13) for providing an electrical stimulation signal to the stimulation electrode pad. A signal processor (532) is connected to said sensor (30; 31-36), for determining from the sensor signal a value of the muscle activity and outputting the value in a for humans perceptible form. This reduces the accuracy required to position the electrode system (10) and increases the accuracy of measuring the muscle tissue activity.

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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.

INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61N1/36
ADD. A61B5/00

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)
A61N

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 practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 2004/087258 A (JADIDI FARAMARZ [DK]) 14 October 2004 (2004-10-14) the whole document	1,4-12 3
X	US 2004/034396 A1 (FREED MARCY L [US] ET AL) 19 February 2004 (2004-02-19) figures 6,7,9 paragraphs [0002], [0021], [0022], [0048] - [0067]	1,2,4-6, 11-13
Y	US 5 048 522 A (PETROFSKY STEVEN H [US]) 17 September 1991 (1991-09-17) figure 6 column 1, lines 14-16 column 4, lines 43-50 column 11, line 5 - column 12, line 16	3

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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

"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

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
4 January 2007	24/01/2007

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Gentil, Cédric

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2006/052484

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 938 911 A2 (MO SEUNG KEE [KR]; LEE SOO YEOL [KR]) 1 September 1999 (1999-09-01) the whole document	1-13
A	WO 2004/050172 A (KINETIC MUSCLES INC [US]; KOENEMAN EDWARD J [US]; KOENEMAN JAMES B [US) 17 June 2004 (2004-06-17) the whole document	1-13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2006/052484

Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. [X] Claims Nos.: 14, 15
because they relate to subject matter not required to be searched by this Authority, namely:

see FURTHER INFORMATION sheet PCT/ISA/210

2. [X] Claims Nos.: 16
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

see FURTHER INFORMATION sheet PCT/ISA/210

3. [ ] Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. [ ] As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. [ ] As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. [ ] No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

[ ] The additional search fees were accompanied by the applicant's protest.

[ ] No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 14, 15

- Rule 39.1(iv) PCT - Method of treatment of the human or animal being by therapy.

The method defined in independent claim 14 comprises the step of providing electrical stimulation to muscle tissues and therefore relates to the curing of diseases or malfunctions of the body in order to restore or maintain health. The claimed method thus represents a method of treatment by therapy for which no international search report needs to be carried out (Rule 39.1(iv) PCT).

Independent claim 15 is directed to the use of an apparatus, as defined in any one of the apparatus claims 1-13, for the treatment of a muscle. Consequently, independent claim 15 is also regarded as a method of treatment by therapy for which no international search report needs to be carried out (Rule 39.1(iv) PCT).

Continuation of Box II.2

Claims Nos.: 16

Article 6 PCT

Claim 16 is directed to a "computer program product comprising program code portions for performing a method according to claim 14, when run on a programmable apparatus". However, said computer program product, when run on a programmable apparatus, can not perform the method defined in claim 14 since means for interacting with the patient (e.g. an electrode array comprising a plurality of electrode pads or means for measuring a property of muscle tissues, see claim 14) are not explicitly defined in claim 16. Consequently, independent claim 16 does not specify all of the essential features needed to define the invention and is therefore not in compliance with the provisions of clarity of Article 6 PCT.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2006/052484

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2004087258 A	14-10-2004	CN 1767873 A	03-05-2006
		EP 1610862 A1	04-01-2006
		JP 2006521844 T	28-09-2006
		US 2006184059 A1	17-08-2006
US 2004034396 A1	19-02-2004	NONE	
US 5048522 A	17-09-1991	NONE	
EP 0938911 A2	01-09-1999	US 6321116 B1	20-11-2001
WO 2004050172 A	17-06-2004	NONE	