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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,

DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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- (88) **Date of publication of the international search report:**
24 January 2013

- (15) **Information about Correction:**

Previous Correction:

see Notice of 29 November 2012

- (54) **Title:** DETECTING, ASSESSING AND MANAGING EXTREME EPILEPTIC EVENTS

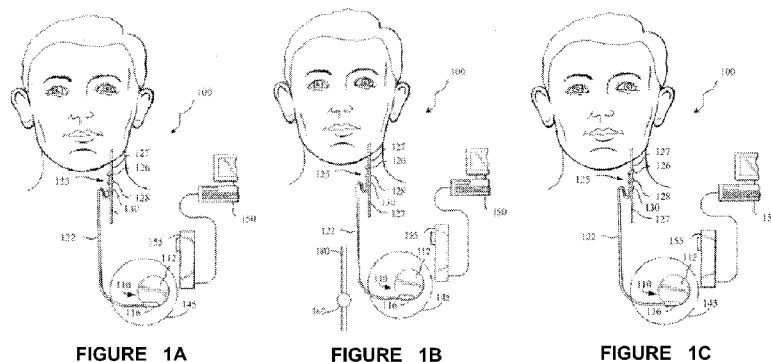


FIGURE 1A

FIGURE 1B

FIGURE 1C

- (57) **Abstract:** Methods, system and apparatus for identifying extreme epileptic events are provided. In one aspect, an inter-seizure interval (ISI) value related to at least two seizure events is determined, compared to a reference value, and an extreme seizure event is determined from the comparison. In another aspect, a first seizure event is detected, and a body index affected by the seizure is determined. An extreme seizure event is determined when a second seizure event occurs prior to the body index value returning to a reference value. Another method includes determining an one index from body data, identifying a seizure event based upon the index, determining at least one seizure severity index (SSI) value for the seizure, comparing the SSI value to a reference value, and determining an extreme seizure event from the comparison. A further method includes determining an increased risk of death and responding to the increased risk.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2012/027639

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B5/0476 A61B5/0205
ADD.

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)
A61B G06F

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)

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	US 2010/274303 A1 (BUKHMANN VLADISLAV [US]) 28 October 2010 (2010-10-28) paragraphs [0042] - [0061], [0065] - [0071], [0115] - [0125] -----	1,8, 11-14, 16-21, 57,58, 79,80,85
X	US 2008/033508 A1 (FREI MARK G [US] ET AL) 7 February 2008 (2008-02-07) paragraphs [0045], [0062], [0101] - [0105], [0121] - [0132] paragraphs [0187] - [0190] ----- -/--	1,6-8, 11-14, 16-21



Further documents are listed in the continuation of Box C.



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 application or patent 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

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04/10/2012

Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2012/027639

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	OSORIO I ET AL: "Toward a quantitative multivariate analysis of the efficacy of antiseizure therapies", EPILEPSY AND BEHAVIOR, ACADEMIC PRESS, SAN DIEGO, CA, US, vol. 18, no. 4, 1 August 2010 (2010-08-01) , pages 335-343, XP027210402, ISSN: 1525-5050 [retrieved on 2010-06-11] * 4. Discussion p. 341-342 * -----	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/027639

Box No. 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. ☒ Claims Nos.: 2-5, 23-26, 28, 29, 60, 72
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210
2. ☐ Claims Nos.:
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:
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 No. 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:

see additional sheet

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 fees, this Authority did not invite payment of additional fees.
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.:
1, 6-8, 11-14, 16-21, 57, 58(completely); 79, 80, 85(partially)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1, 6-8, 11-14, 16-21, 57, 58(completely); 79, 80, 85(partially)

A method for identifying an extreme seizure event in a patient according to claim 1 comprising performing at least one of ranking the identified extreme seizure event in reference to at least one prior extreme event or determining the time elapsed since at least one of a plurality of prior extreme seizure events.

2. claims: 9, 10, 62, 63(completely); 83(partially)

A method/computer readable storage device for identifying an extreme seizure event in a patient according to claims 1, 57, 80(part) further applying a specific decision rule.

3. claim: 15

A method for identifying an extreme seizure event in a patient according to claim 1 comprising the step of determining at least one of a quality of life index or a physical fitness/integrity index

4. claims: 22, 27, 30-42, 51-56

A method/computer readable storage device for identifying an extreme seizure event in a patient according to claims 22, 30, 51 determining at least one inter-seizure interval (ISI) value related to at least two seizure events

5. claims: 43-50

A method for identifying an extreme seizure event in a patient according to claim 43 determining at least one body index having at least a first body index reference value associated with an inter-ictal state

6. claims: 59, 61(completely); 81, 82(partially)

A method/computer readable storage device for identifying an extreme seizure event in a patient according to claims 57, 79 further comprising a step of tracking the development of seizure events

7. claim: 64

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

A method for identifying an extreme seizure event in a patient according to claim 57 determining a specific cardiac parameter

8. claims: 65-67(completely); 84(partially)

A method/computer readable storage device for identifying an extreme seizure event in a patient according to claims 57, 79 providing information indicative of the severity indication commensurate with the increased risk of death

9. claims: 68-78, 86-88(completely); 79-85(partially)

A method/computer readable storage device for identifying an extreme seizure event in a patient according to claims 68, 79, 85 determining the increased risk of death based on a stimulus based arousal, awareness and/or responsiveness index.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 2-5, 23-26, 28, 29, 60, 72

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

Dependent claims 2-5, 23-26, 28, 29, 60, 72 relate to a method of identifying an extreme seizure in a patient including the step of providing therapy. These claims are thus considered to involve a method for treatment of the human or animal body by surgery within the meaning of Rule 39.1(iv) PCT.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2012/027639

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2010274303 A1	28-10-2010	US 2010274303 A1 WO 2010123542 A2	28-10-2010 28-10-2010
US 2008033508 A1	07-02-2008	US 2008033508 A1 US 2008064934 A1	07-02-2008 13-03-2008