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[Continued on next page]

(54) Title: DEVICES FOR THERAPEUTIC NASAL NEUROMODULATION AND ASSOCIATED METHODS AND SYSTEMS

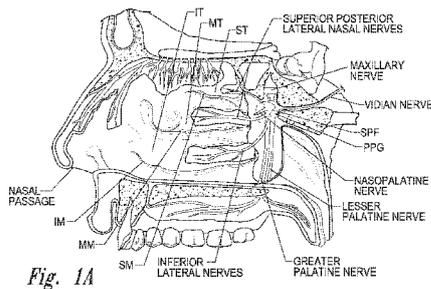


Fig. 1A

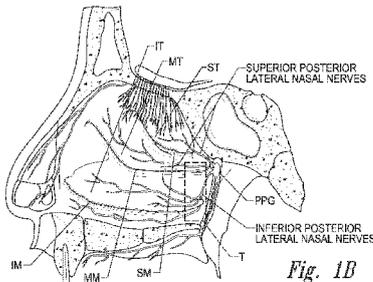


Fig. 1B

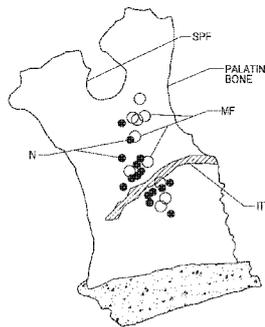


Fig. 1C

(57) Abstract: Devices for therapeutic nasal neuromodulation and associated systems and methods are disclosed herein. A system for therapeutic neuromodulation in a nasal region configured in accordance with embodiments of the present technology can include, for example, a shaft and a therapeutic element at a distal portion of the shaft. The shaft can locate the distal portion intraluminally at a target site inferior to a patient's sphenopalatine foramen. The therapeutic element can include an energy delivery element configured to therapeutically modulate postganglionic parasympathetic nerves at microforamina of a palatine bone of the human patient for the treatment of rhinitis or other indications. In other embodiments, the therapeutic element can be configured to therapeutically modulate nerves that innervate the frontal, ethmoidal, sphenoidal, and maxillary sinuses for the treatment of chronic sinusitis.





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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

**(88) Date of publication of the international search report:**  
29 December 2016

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**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. A61N1/32 A61N1/18 A61B18/00 A61B18/02 A61B18/18  
 A61N1/36 A61N1/05 A61B18/04  
 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)  
 A61N A61B

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 2007/031341 A1 (DIMAURO THOMAS M [US] ET AL) 8 February 2007 (2007-02-08) abstract; figures 1-12C paragraphs [0028] - [0163] -----	1-3,6-8, 103
X	US 2012/323214 A1 (SHANTHA TOTADA R [US]) 20 December 2012 (2012-12-20) abstract; figures 1-26 paragraphs [0059] - [0458] -----	1-9,103
X	WO 2015/013252 A1 (WEDGE THERAPEUTICS LLC [US]) 29 January 2015 (2015-01-29) abstract; figures 1-30 pages 3-44 ----- -/--	1-9,103

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
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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

- "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 <b>2 November 2016</b>	Date of mailing of the international search report <b>14/11/2016</b>
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer  <b>Lins, Stephanie</b>
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## INTERNATIONAL SEARCH REPORT

International application No  
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2012/078377 A1 (GONZALES DONALD A [US] ET AL) 29 March 2012 (2012-03-29) abstract; figures 1-31B paragraphs [0016] - [0298] -----	1-8,103
X	US 2014/114233 A1 (DEEM MARK E [US] ET AL) 24 April 2014 (2014-04-24) abstract; figures 1-32 paragraphs [0059] - [0141] -----	26
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X	US 2007/129760 A1 (DEMARAIS DENISE [US] ET AL) 7 June 2007 (2007-06-07)  abstract; figures 1-10 paragraphs [0021] - [0074] -----	13,14, 19, 23-26, 30-33, 36-40
X	US 2014/025069 A1 (WILLARD MARTIN R [US] ET AL) 23 January 2014 (2014-01-23) abstract; figures 1-9 paragraphs [0026] - [0098] -----	26,34,35
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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2016/032132

## 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.: 45-93, 98-102  
because they relate to subject matter not required to be searched by this Authority, namely:  
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy
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.:

### 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: 1-9, 103

Device for chemical neuromodulation in a nasal region.

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2. claims: 10, 12-40

Therapeutic assembly with RF electrodes and expandable structure

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3. claims: 11, 41-44

System for neural mapping and neuromodulation

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4. claims: 94-97

Device for therapeutic neuromodulation with flexible support.

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No

PCT/US2016/032132

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