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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Robert	E.	Wright	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	State/Province	Country of Residence
Denver	CO	US

Mailing Address of Inventor:

Address 1	925 Lincoln Street, PH
Address 2	
City	Denver
State/Province	CO
Postal Code	80203
Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Scott	A.	Brandt	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

City	State/Province	Country of Residence
Denver	CO	US

Mailing Address of Inventor:

Address 1	333 S. Monroe St. Unit 113
Address 2	
City	Denver
State/Province	CO
Postal Code	80209
Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

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Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	20995		
Email Address	efiling@knobbe.com	Add Email	Remove Email

Application Information:

Title of the Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY		
Attorney Docket Number	NBUS.001C1	**Small Entity Status Claimed**	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	19	**Suggested Figure for Publication (if any)**	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	● Customer Number	US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	20995		

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	Continuation of	12/940974	2010-11-05
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
12/940974	Claims benefit of provisional	61/280557	2009-11-05
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
12/940974	Claims benefit of provisional	61/347351	2010-05-21

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

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Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 — Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	Nimbus Concepts, LLC		
Mailing Address Information For Applicant:			
Address 1	925 Lincoln Street, PH		
Address 2			
City	Denver	**State/Province**	CO
Country	US	Postal Code	80203
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
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Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Adam Gilbert/			Date (YYYY-MM-DD)	2016-04-14
First Name	Adam	Last Name	Gilbert	Registration Number	59967

Additional Signature may be generated within this form by selecting the Add button. Add

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

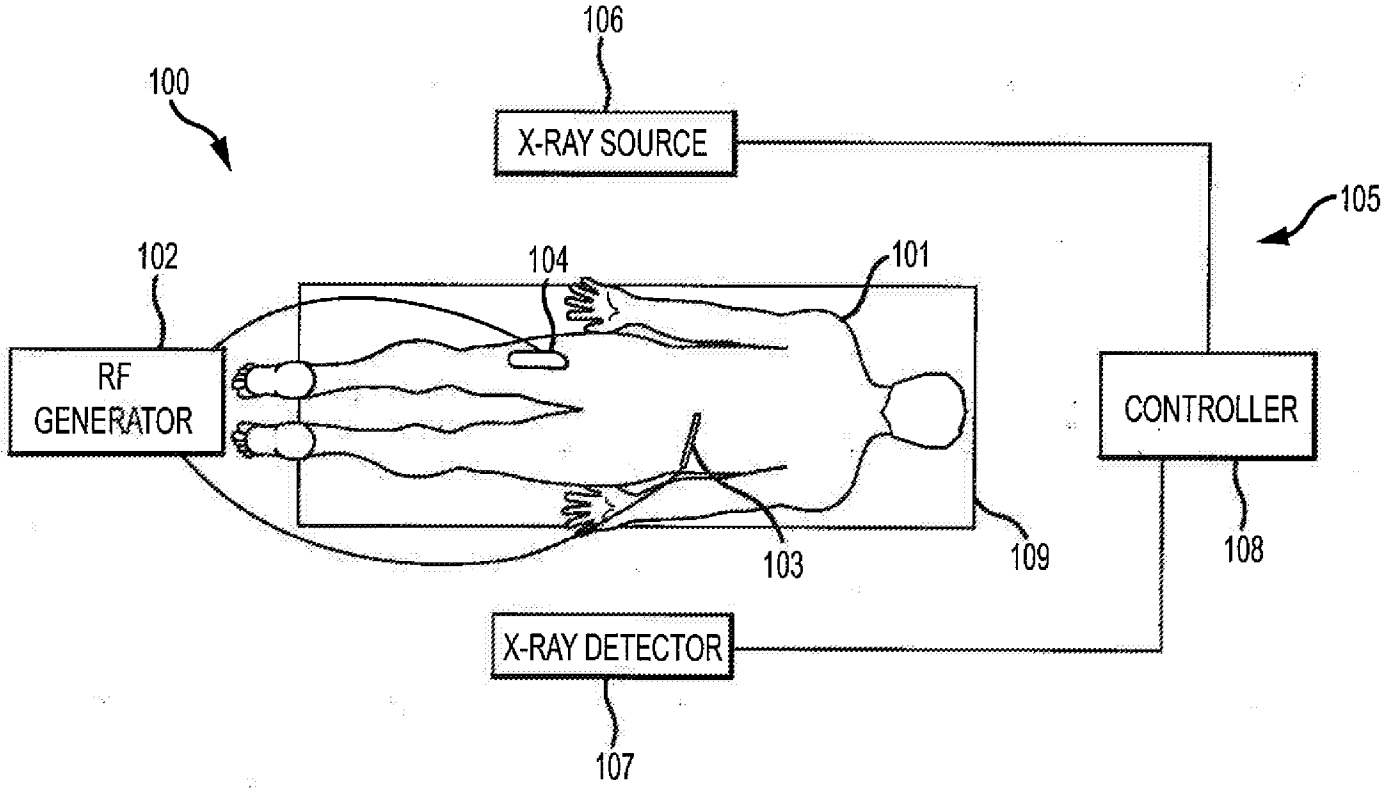


FIG.1

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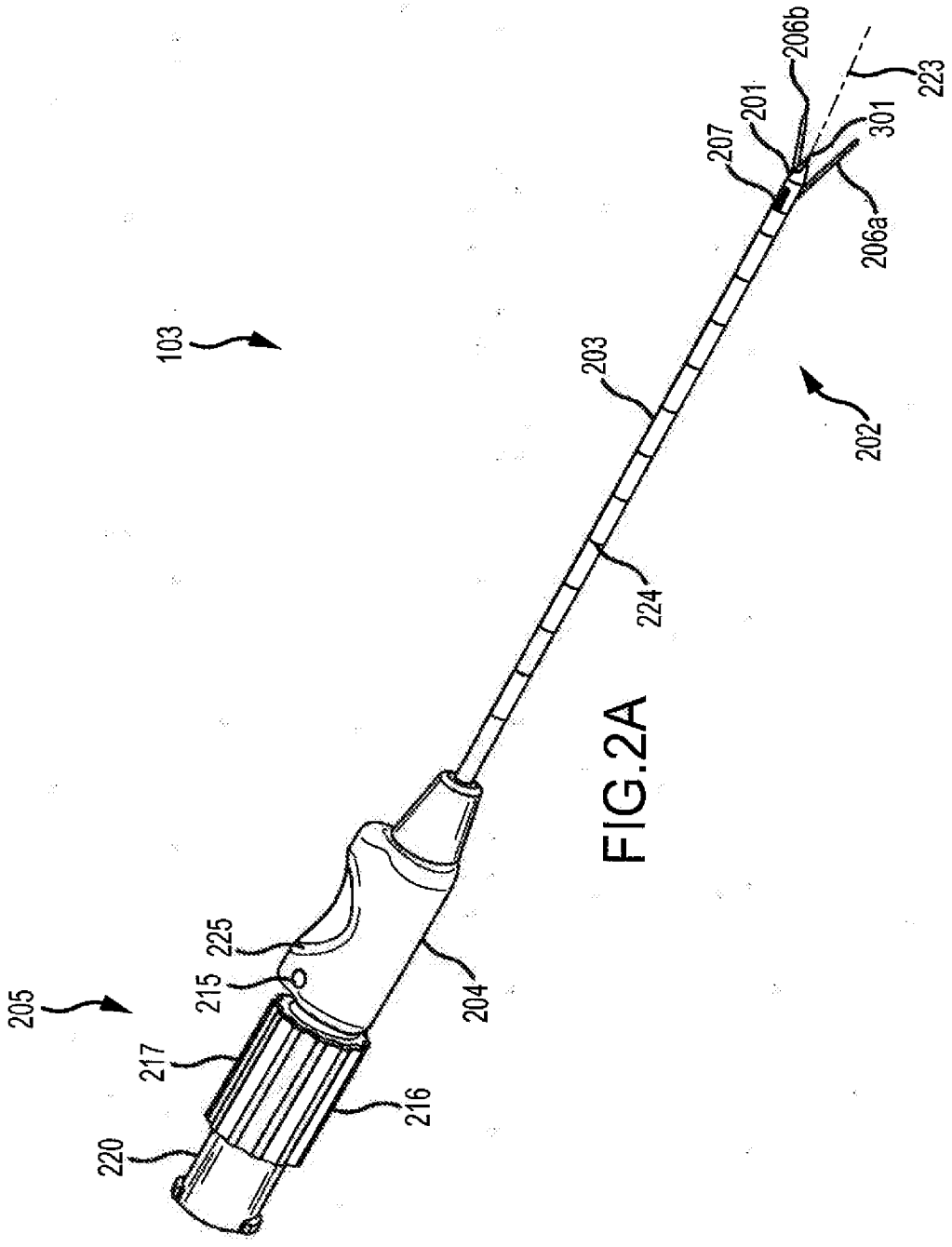

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FIG.2A

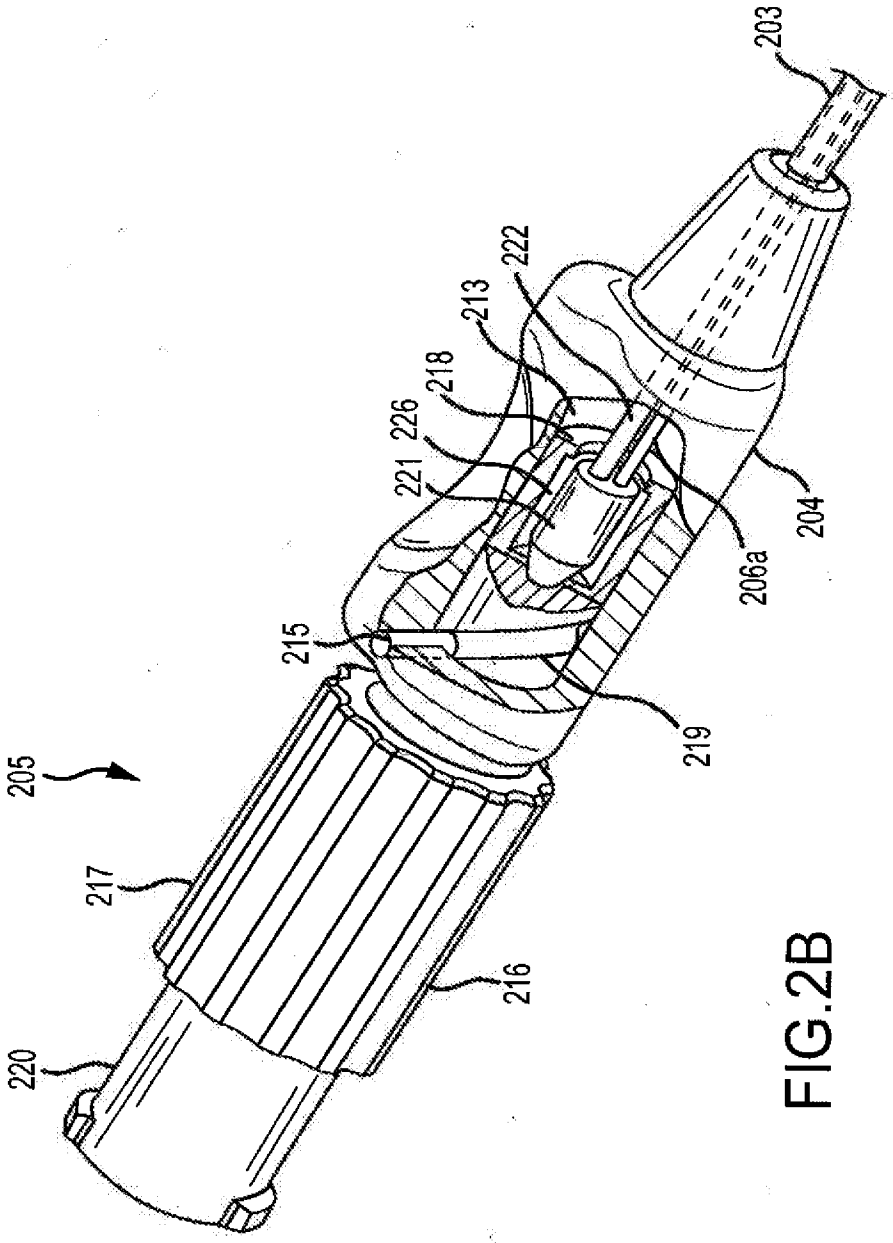


FIG.2B

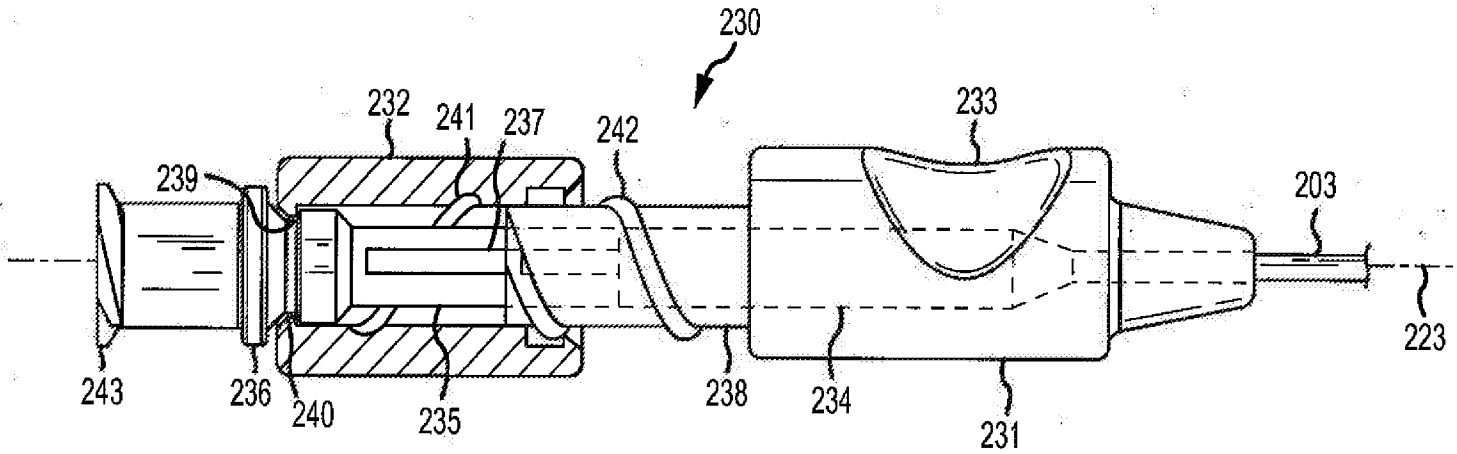


FIG.2C

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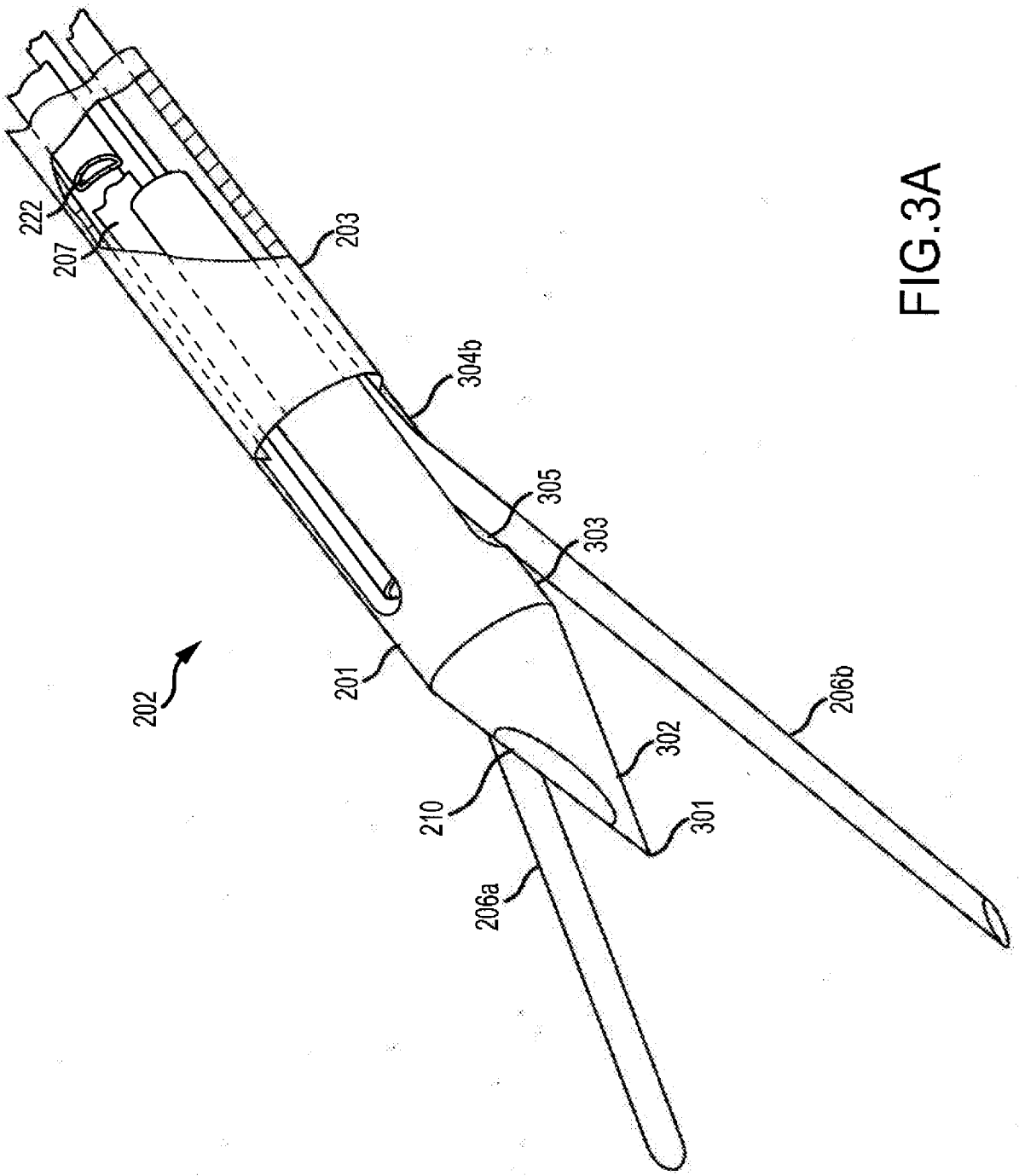


FIG.3A

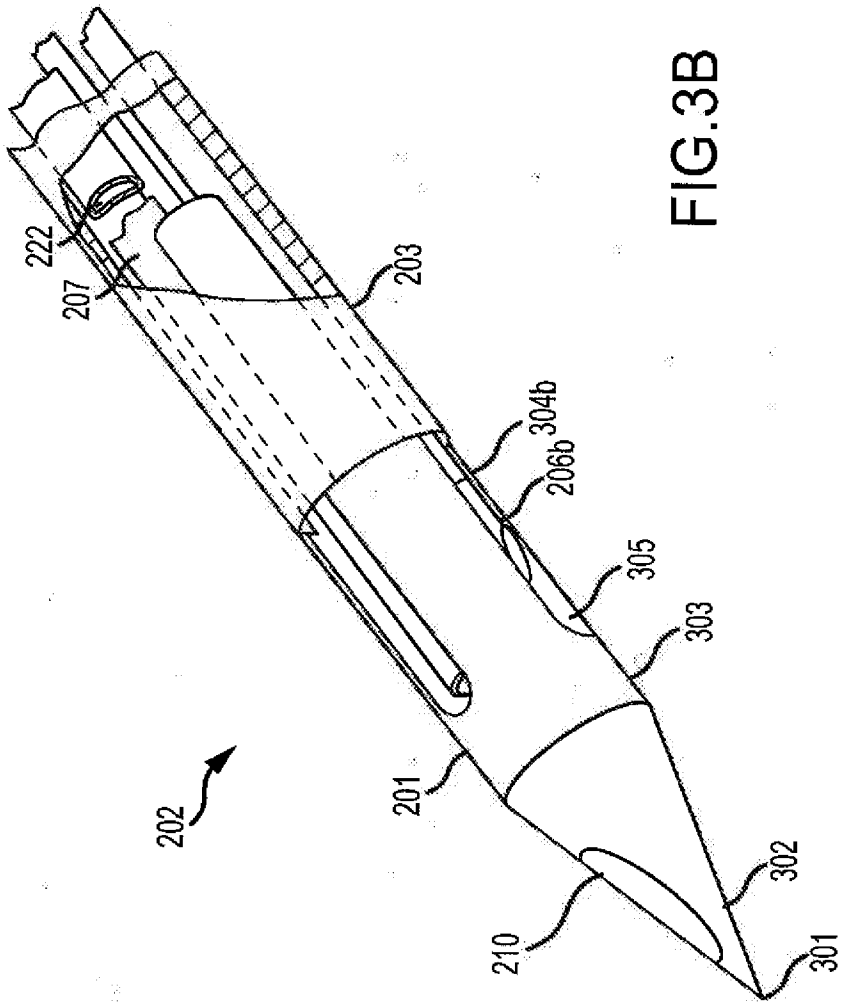


FIG.3B

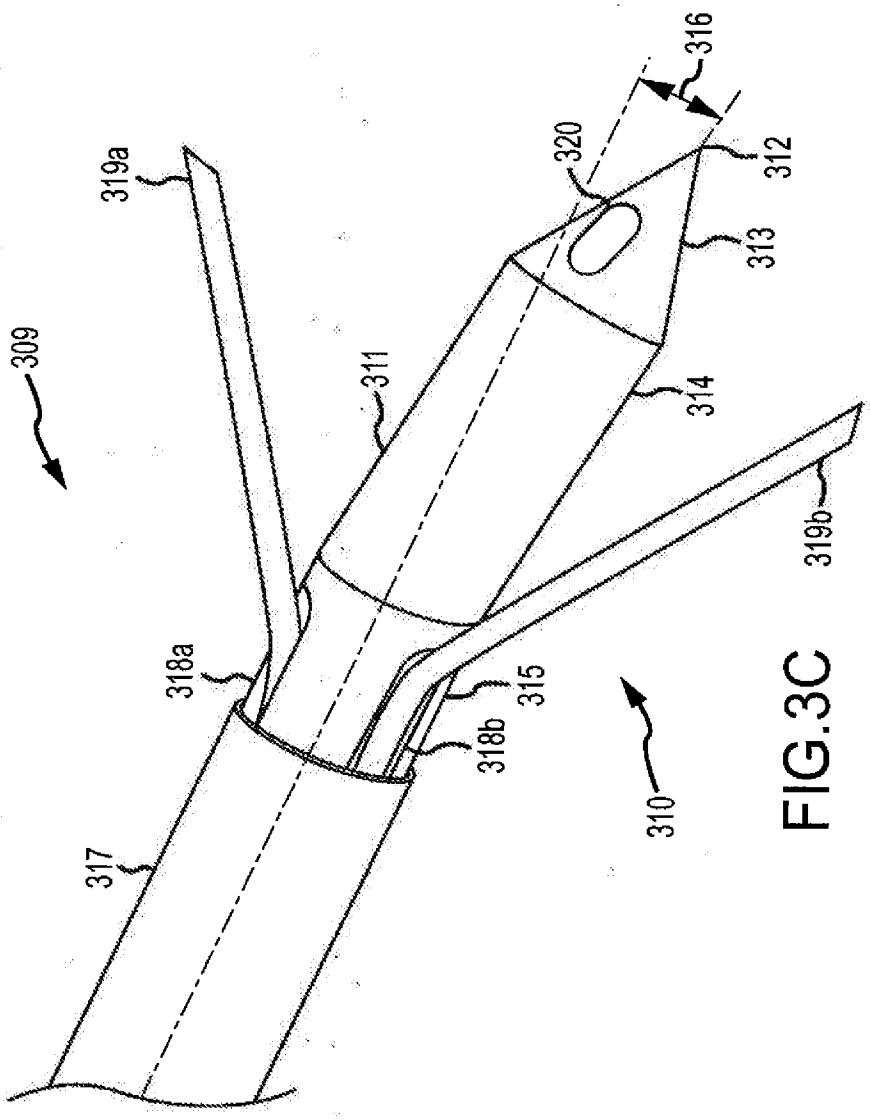


FIG.3C

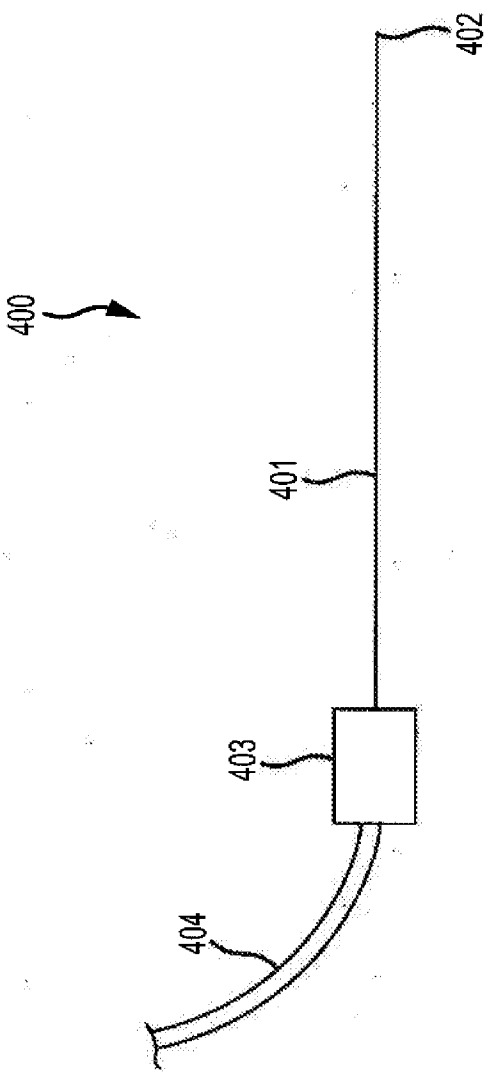


FIG.4

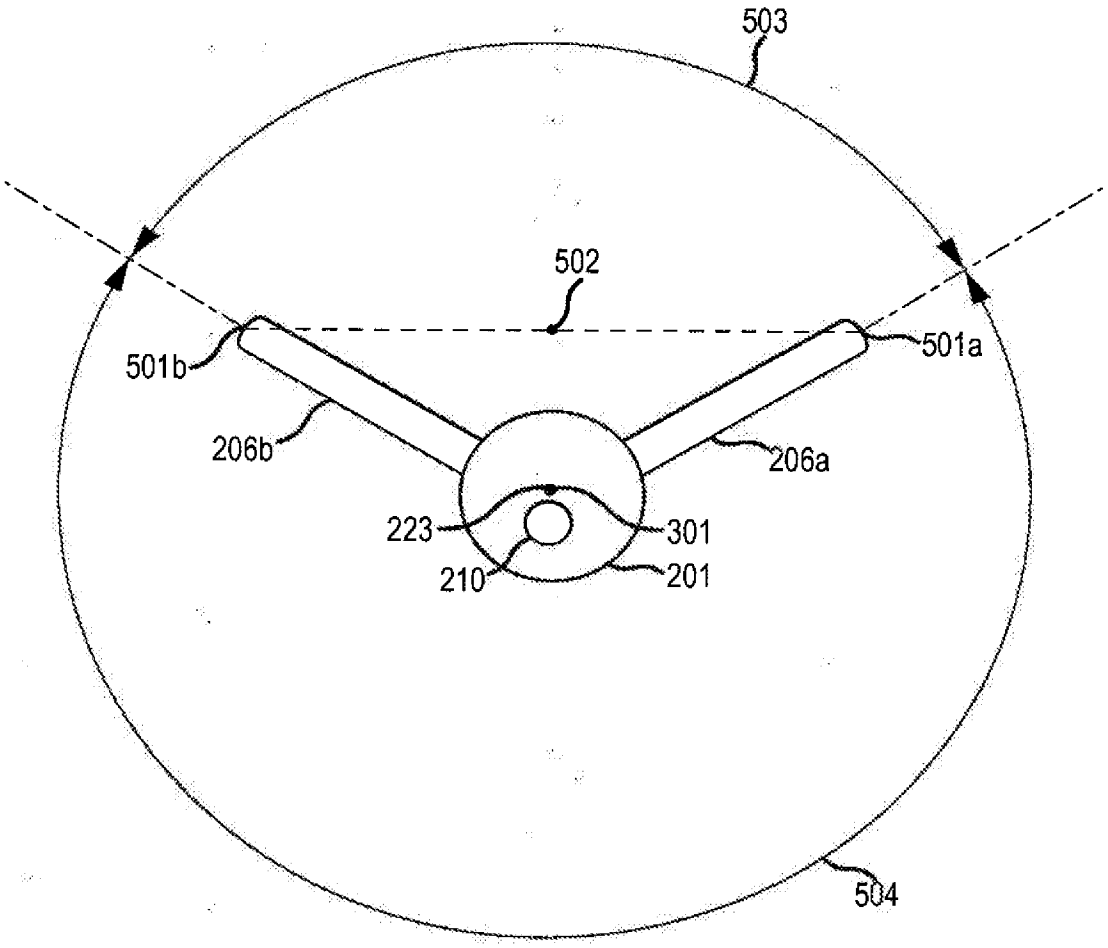


FIG.5

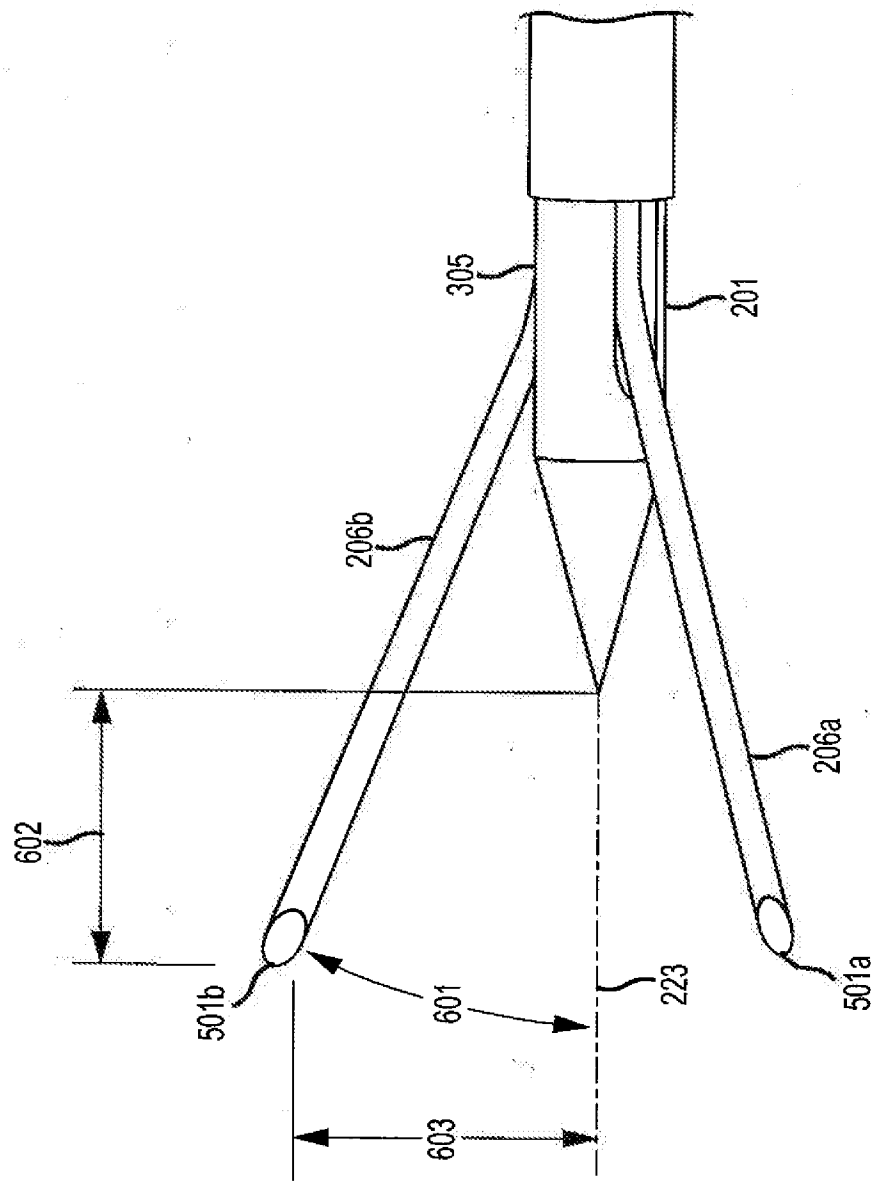


FIG.6

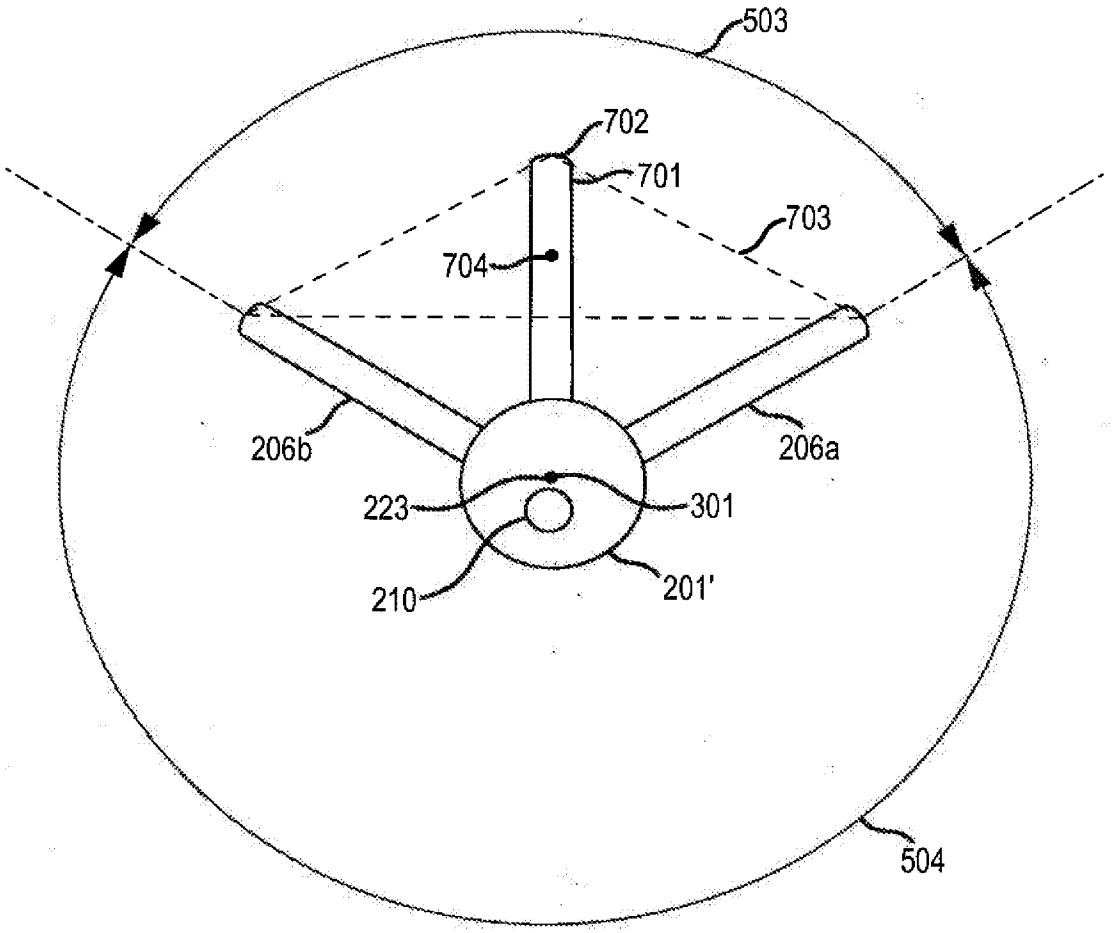


FIG.7

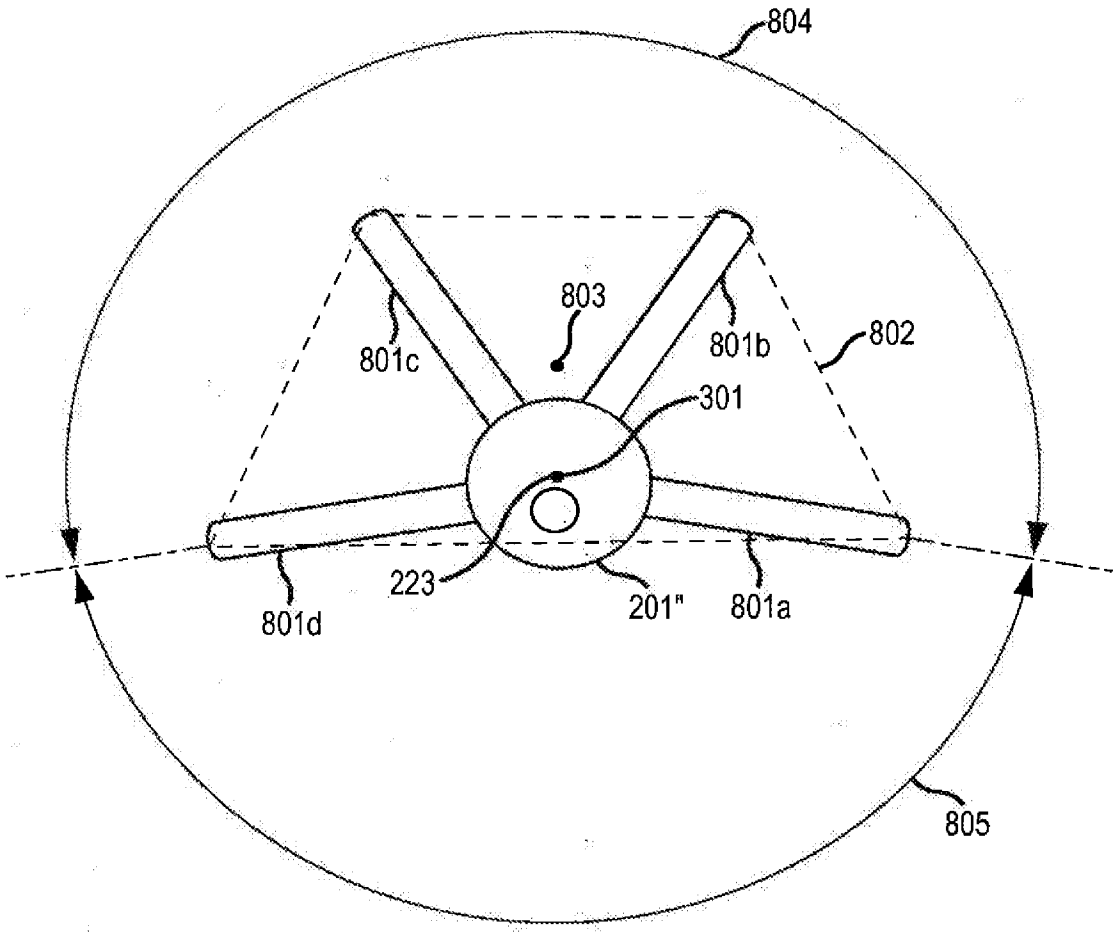


FIG.8

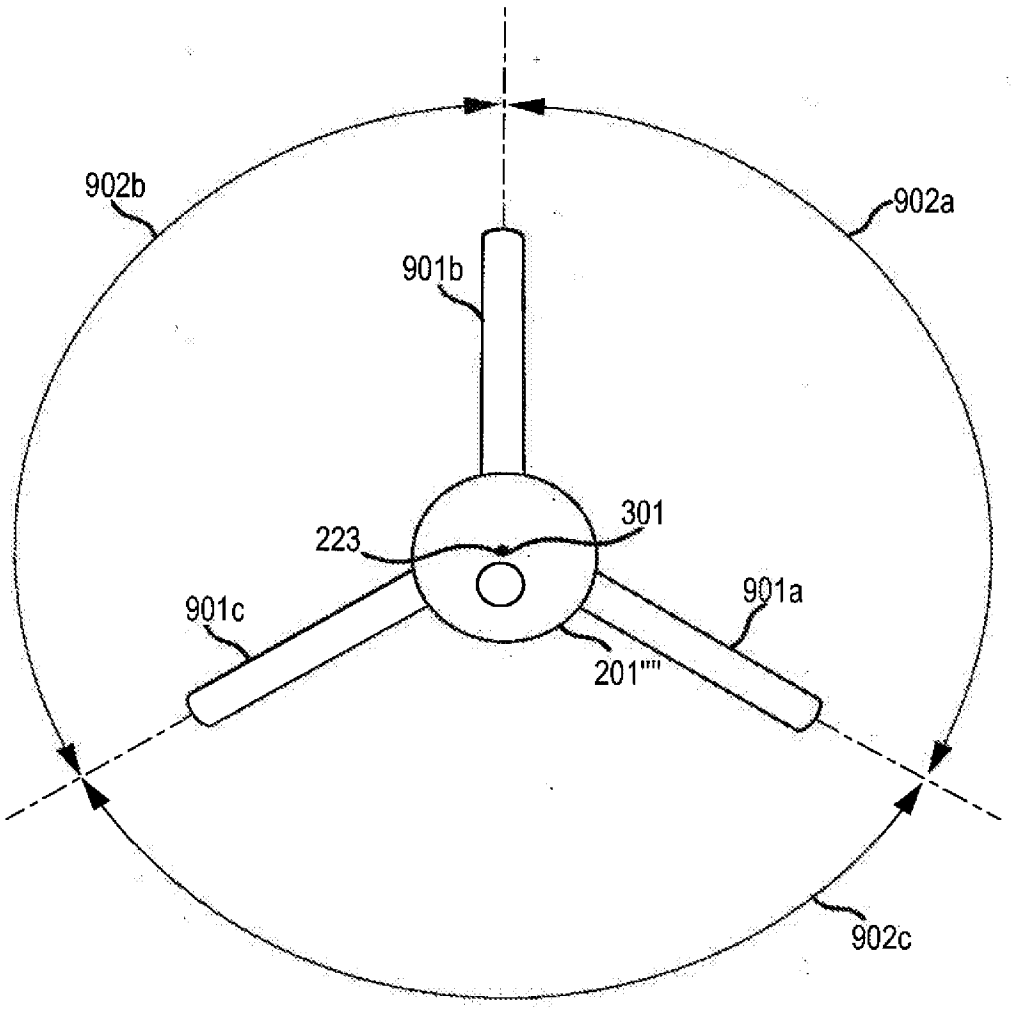


FIG.9

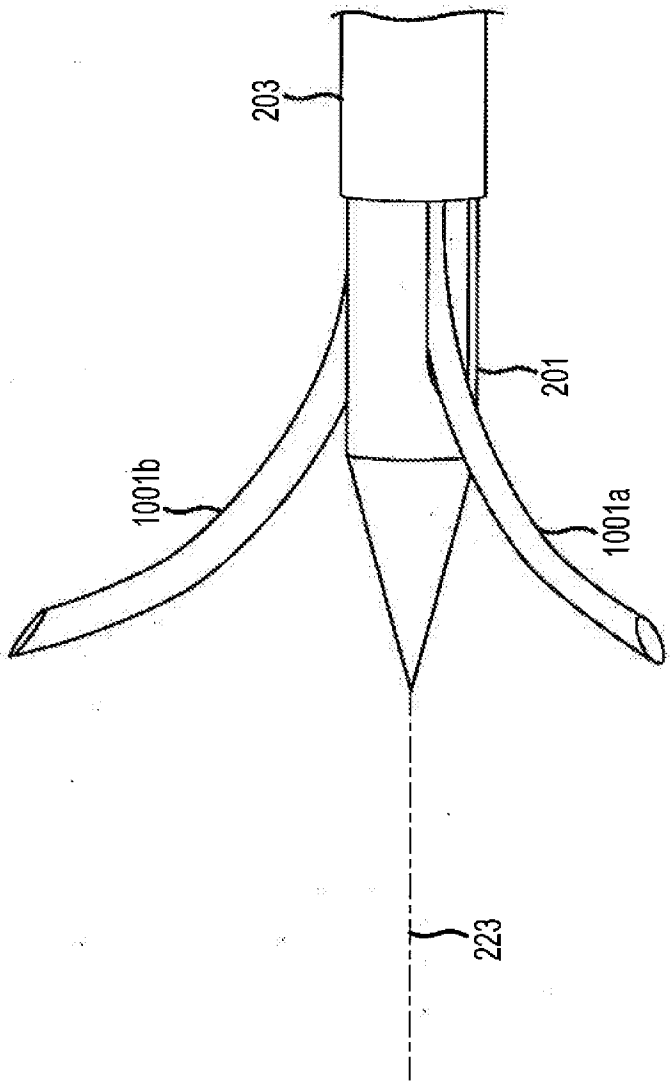


FIG.10

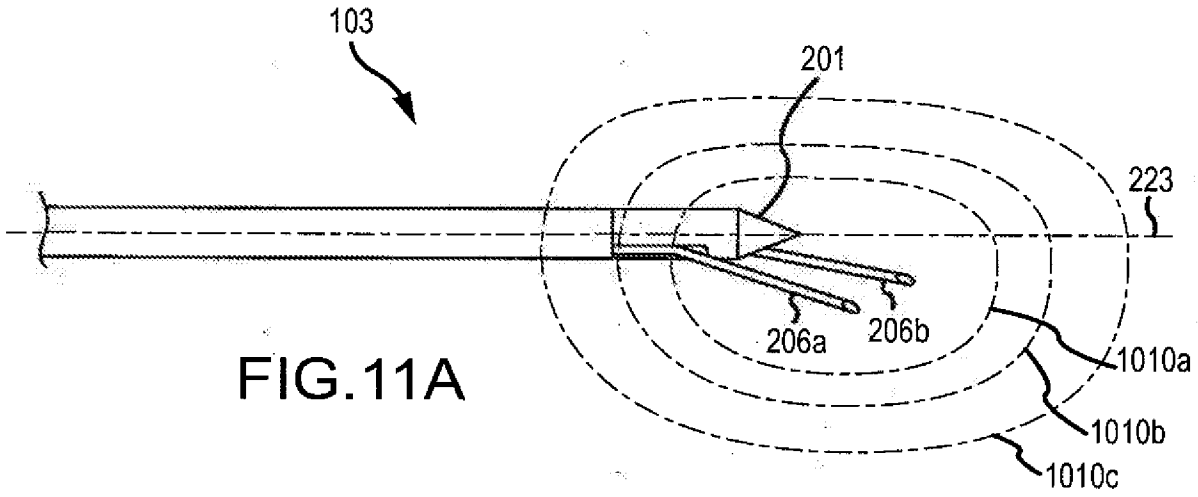


FIG.11A

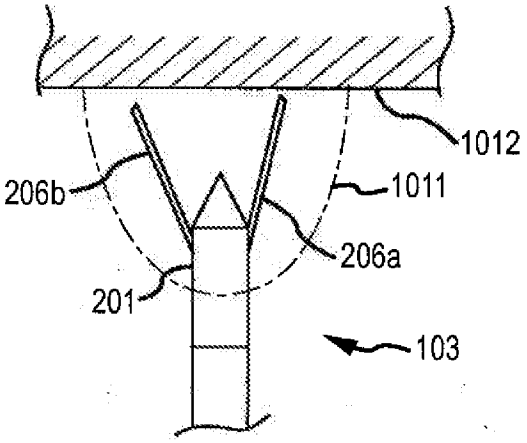


FIG.11B

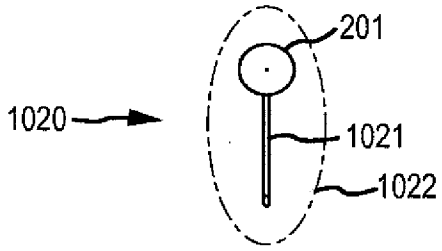


FIG.11C

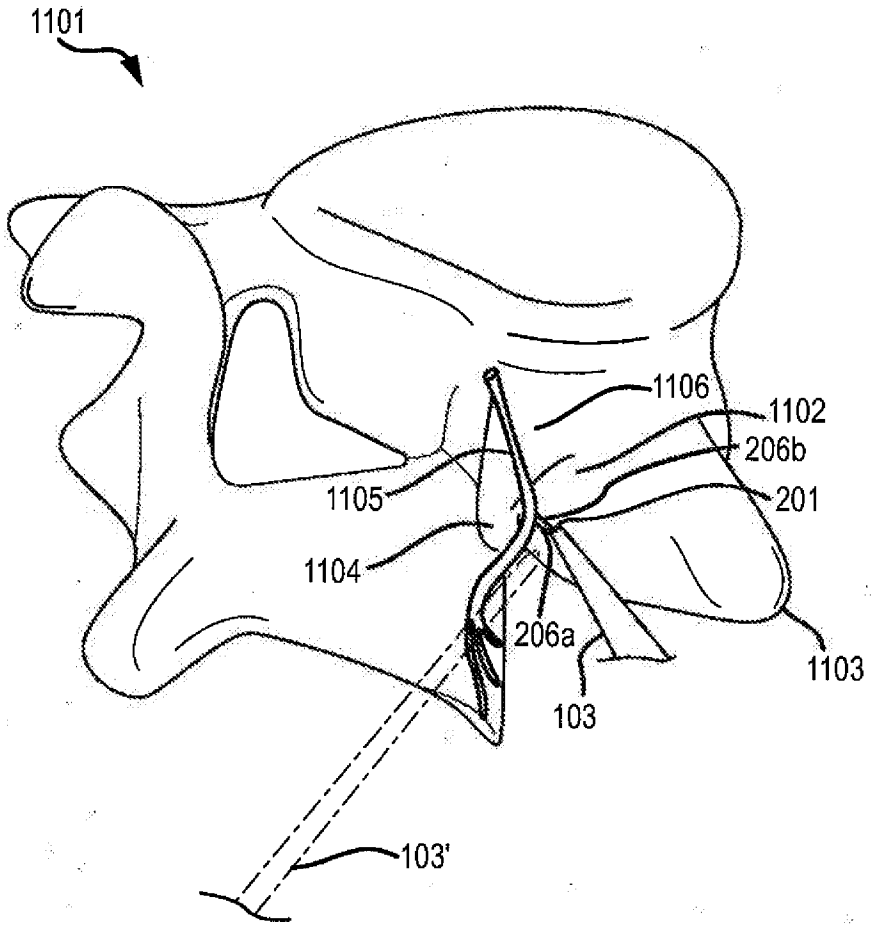


FIG.12

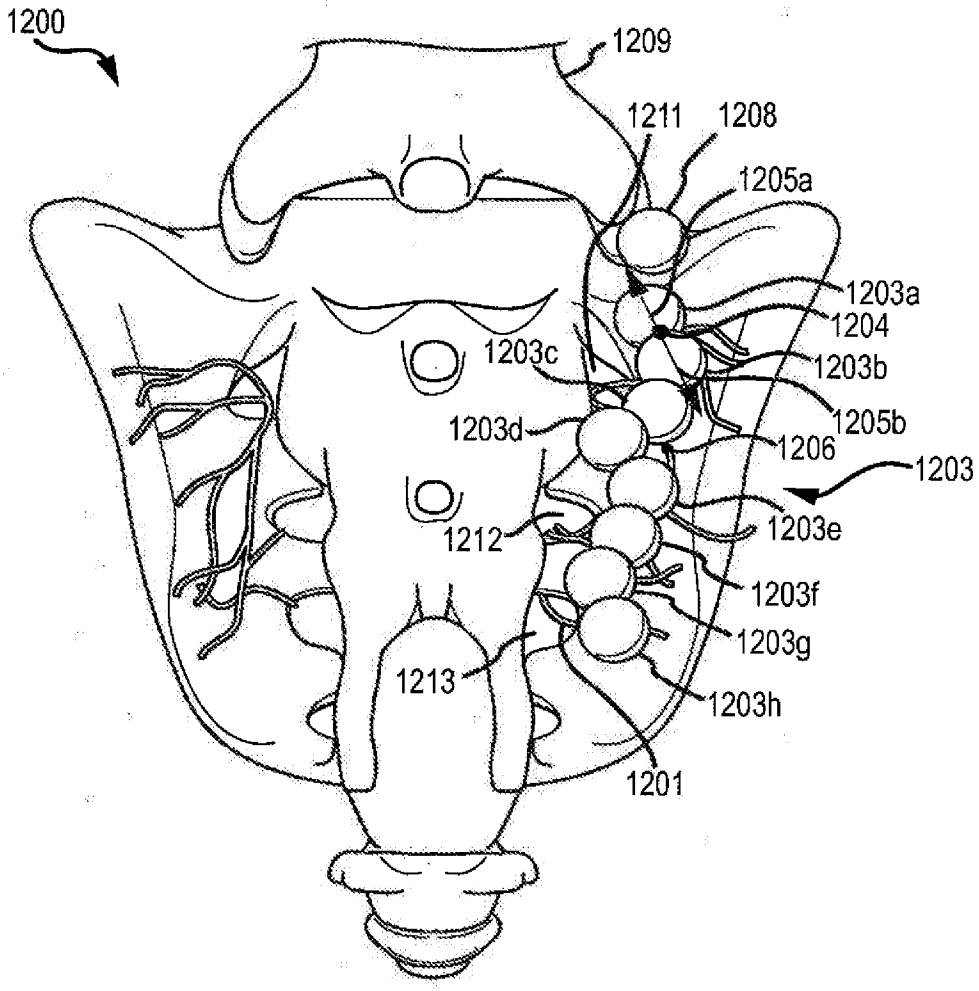

1200
1209
1211
1208
1205a
1203a
1204
1203c
1203b
1203d
1205b
1206
1203
1212
1203e
1203f
1203g
1213
1203h
1201

FIG.13

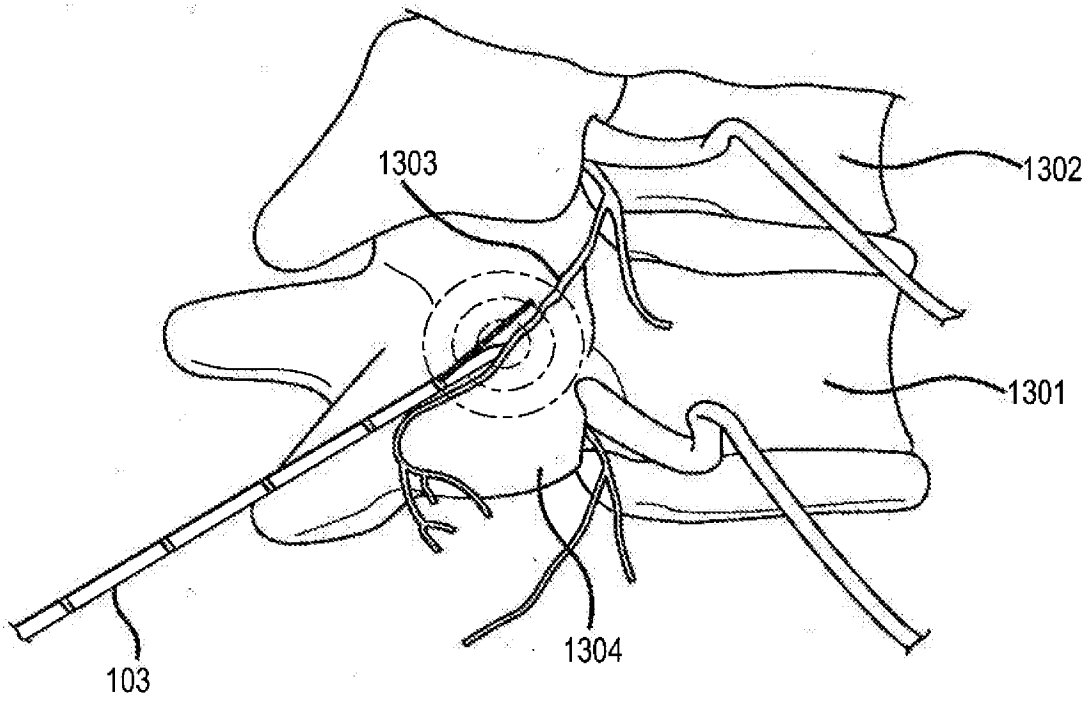


FIG.14

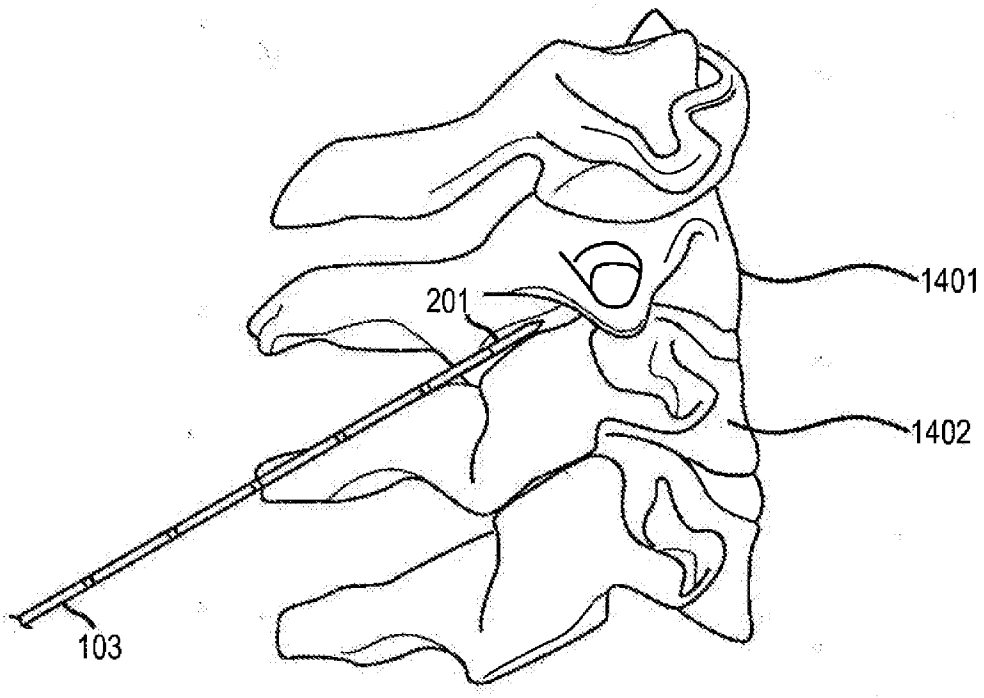


FIG.15

METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent App. No. 12/940,974, filed on November 5, 2010, which is hereby incorporated by reference in its entirety and which claims the benefit of U.S. Provisional Patent App. No. 61/280,557, filed on November 5, 2009, and U.S. Provisional Patent App. No. 61/347,351, filed on May 21, 2010, both of which are hereby incorporated by reference in their entirety.

FIELD OF THE INVENTION

[0002] The present invention relates to thermal ablation systems and methods and, more specifically, to improved systems and methods for performing Radio Frequency (RF) neurotomy. The invention is particularly apt for spinal RF neurotomy procedures.

BACKGROUND OF THE INVENTION

[0003] Thermal ablation involves the creation of temperature changes sufficient to produce necrosis in a specific volume of tissue within a patient. The target volume may be, for example, a nerve or tumor. A significant challenge in ablation therapy is to provide adequate treatment to the targeted tissue while sparing the surrounding structures from injury.

[0004] RF ablation uses electrical energy transmitted into a target volume through an electrode to generate heat in the area of the electrode tip. The radio waves emanate from a non-insulated distal portion of the electrode tip. The introduced radiofrequency energy causes molecular strain, or ionic agitation, in the area surrounding the electrode as the current flows from the electrode tip to ground. The resulting strain causes the temperature in the area surrounding the electrode tip to rise. Temperature calibration or measurement devices, for example thermocouples, in the electrode may provide feedback and allow precise control of the temperatures produced at the electrode tip.

[0005] RF neurotomy uses RF energy to cauterize a target nerve to disrupt the ability of the nerve to transmit pain signals to the brain. Known RF neurotomy methods typically use a single RF probe generating a generally oval or oblate spheroid lesion. The RF

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probe is positioned in an attempt to include the target nerve within the oval or oblate spheroid lesion. In various procedures, access to a target nerve may be limited (e.g., limited to a restricted angular range), thereby raising significant challenges to medical personnel to create sufficient lesions to provide optimal clinical outcomes. Additionally, anatomical variations of the nerve location relative to anatomical landmarks provide additional challenges.

SUMMARY OF THE INVENTION

[0006] The present invention is directed toward improved methods, systems, and related apparatuses for performing thermal ablation in general, and in particular, improved methods, systems, and related apparatuses for performing RF neurotomy, specifically in the region of the spine of a patient.

[0007] In one aspect, a needle is provided for use (e.g., insertion into a patient) during an RF ablation procedure that comprises a hub, an elongate member fixed to the hub, a tip fixed to the elongate member at a distal end thereof, and a plurality of filaments disposed within at least a portion of the elongate member. The needle may further include an actuator interconnected to the plurality of filaments, wherein the actuator may move relative to the hub so as to move the plurality of filaments relative to the tip of the needle.

[0008] In one approach, the tip and first and second ones of the plurality of filaments are operable as a single monopolar RF electrode. By way of example, in one implementation the needle may include a lumen disposed within the elongate member, wherein the lumen and tip are configured to receive an RF probe, wherein the tip and the first and second filaments may be electrically connected to the RF probe for delivery of an RF energy signal. In another implementation, an RF probe may be integrated into the needle structure for communication of an RF signal to the tip and plurality of filaments.

[0009] In another approach, the tip and the plurality of filaments may be operable in a bipolar manner. For example, the tip and/or one or more of the plurality of filaments may be electrically interconnected to an RF energy source to combinatively operate as an active RF electrode. In turn, one or a plurality of additional ones of the plurality of filaments may be electrically interconnected to combinatively function as a return RF electrode.

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[0010] In a further aspect, the actuator may be operable to move the plurality of filaments relative to the tip between a retracted position and a deployed position, wherein in the deployed position the plurality of filaments extend outwardly from the tip. In this regard, each filament may comprise a distal end, wherein in a deployed position the distal ends of the filaments each define a point, and wherein the average of all the points is offset from a central longitudinal axis of the elongate member.

[0011] In one embodiment, the average of distal end points of first and second filaments may be at midpoint between such distal ends. In certain embodiments, the distal end of each of the plurality of filaments defines a vertex of a polygon, wherein an average of corresponding points is a centroid of the polygon.

[0012] In certain embodiments, a first filament and a second filament may have corresponding distal ends which, together with a distal end of the tip, define a polygon therebetween. In this regard, in various implementations the plurality of filaments may be disposed asymmetrically about a central longitudinal axis of the elongate member in their deployed position.

[0013] In another aspect, a method for performing RF neurotomy in a patient is provided (e.g., spinal RF neurotomy), and includes the steps of moving a tip of a needle to a first position proximate to a target nerve along the spine of a patient, and after achieving the first position, advancing a plurality of filaments relative to the tip to a deployed position. After such positioning, the method may include the step of applying RF energy to the tip and/or at least one of the plurality of filaments, wherein said RF energy application generates heat to ablate at least a portion of the target nerve.

[0014] In one approach, the RF energy may be applied to the needle tip and each of the plurality of filaments to yield monopolar operation. In another approach, the RF energy may be applied to the tip and/or one or more of the plurality of filaments to define an active electrode, while one or more additional one of the plurality of filaments are electrically isolated to function as a return electrode for bipolar operation.

[0015] In relation to the present invention it is recognized that, as RF energy penetrates biological tissue, protein and water molecules oscillate in response to the RF current and the tissue adjacent to the active needle tip heats secondary to ionic friction. As the

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tissue heats, and coagulates, the biophysical properties of the tissue change. These tissue changes limit penetration of the RF energy beyond a leading edge defined by the shape and size of the active needle tip. The size of a radiofrequency lesion using conventional needle technology is limited regardless of the duration of lesion or maximum temperature delivered.

[0016] The described invention overcomes this obstacle and expands the effective area of RF energy delivery by increasing the overall active tip surface area from which the RF energy emanates. The use of multiple filaments provides additional conduits for RF energy creating a multipolar RF field effect. The size and specific conformation of the RF lesion may be dictated by the location and orientation of the filaments, and may be beneficially modified to suit a specific anatomical application by changing the size, placement, and number of filaments.

[0017] Additional aspects and advantages of the present invention will become apparent to one skilled in the art upon consideration of the further description that follows. It should be understood that the detailed description and specific examples are intended for purposes of illustration only and are not intended to limit the scope of the invention. Furthermore, any of the above arrangements, features and/or embodiments may be combined with any of the above aspects where appropriate.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] For a more complete understanding of the present invention and further advantages thereof, reference is now made to the following Detailed Description of the Invention taken in conjunction with the accompanying drawings, wherein:

[0019] FIG. 1 is a schematic diagram of an RF neurotomy system being used to perform RF neurotomy on a patient.

[0020] FIG. 2A is a perspective view of a needle that may be used in an RF neurotomy procedure.

[0021] FIG. 2B is a cut away perspective view of a portion of the needle of FIG. 2A.

[0022] FIG. 2C is a cut away view of a portion of an alternate embodiment of a needle that may be used in an RF neurotomy procedure.

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[0023] FIG. 3A is a detailed view of a tip of the needle of FIG. 2A with filaments disposed in a fully deployed position.

[0024] FIG. 3B is a detailed view of a tip of the needle of FIG. 2A with filaments disposed in a retracted position.

[0025] FIG. 3C is a detailed view of an alternate tip of the needle of FIG. 2A with filaments disposed in a deployed position.

[0026] FIG. 4 is a schematic diagram of an RF probe assembly.

[0027] FIG. 5 is an end view of the needle of FIG. 2A.

[0028] FIG. 6 is a side view of the tip of the needle of FIG. 2A.

[0029] FIG. 7 is an end view of another alternate embodiment of the needle of FIG. 2A.

[0030] FIG. 8 is an end view of another alternate embodiment of the needle of FIG. 2A.

[0031] FIG. 9 is an end view of another alternate embodiment of the needle of FIG. 2A.

[0032] FIG. 10 is a side view of another alternate embodiment of the needle of FIG. 2A.

[0033] FIG. 11A is an illustration of an exemplary set of isotherms that may be created with the needle of FIG. 2A.

[0034] FIG. 11B is an illustration of an exemplary lesion that may be created with the needle of FIG. 2A.

[0035] FIG. 11C is an illustration of an exemplary lesion that may be created with a single-filament needle.

[0036] FIG. 12 is a perspective view of the needle of FIG. 2A positioned relative to a lumbar vertebra for performing RF neurotomy.

[0037] FIG. 13 is an illustration of a sacrum including target lesion volumes for performing Sacroiliac Joint (SIJ) RF neurotomy.

[0038] FIG. 14 is a perspective view of the needle of FIG. 2A positioned relative to a thoracic vertebra for performing RF neurotomy.

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[0039] FIG. 15 is a perspective view of the needle of FIG. 2A positioned relative to the C2/3 cervical zygapophyseal joint (z joint)for performing cervical medial branch RF neurotomy on the third occipital nerve.

DETAILED DESCRIPTION OF THE INVENTION

[0040] In the following description, the invention is set forth in the context of apparatus and methods for performing RF ablation. More particularly, the systems and methods may be used to perform RF neurotomy to ablate portions of target nerves. Even more particularly, the systems and methods may be used to perform spinal RF neurotomy to ablate portions of target nerves along the spine of a patient to relieve pain. For example, embodiments of methods and apparatuses described herein relate to lumbar RF neurotomy to denervate a facet joint between the L4 and L5 lumbar vertebrae. Denervation is achieved by application of RF energy to a portion of a medial branch nerve to ablate or cauterize a portion of the nerve, thus interrupting the ability of the nerve to transmit signals to the central nervous system. In another example, embodiments described herein relate to sacroiliac joint RF neurotomy.

[0041] FIG. 1 is an illustration of an RF neurotomy system 100 for performing RF neurotomy on a patient 101. The patient 101 may be positioned face down on a table 109 or surface to allow access along the spine of the patient 101. The table 109 may be made of radiolucent materials substantially transparent to x-rays, such as carbon fiber.

[0042] The system 100 may include an RF generator 102 capable of generating an RF energy signal sufficient to ablate target tissue (e.g. cause lesions in targeted volumes; cauterize targeted portions of target nerves). The RF generator 102 may, for example, be capable of delivering RF energy of about 460,000-500,000 Hz. A needle 103 capable of conducting (e.g., transmitting or directing) RF energy may be interconnected to the RF generator 102 and may be used to deliver an RF energy signal to a specific site within the patient 101. Where the needle 103 is a monopolar device, a return electrode pad 104 may be attached to the patient 101 to complete a circuit from the RF generator 102, through the needle 103, through a portion of the patient 101, and back to the RF generator 102 through

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the return electrode pad 104. In other bipolar arrangements the needle 103 may comprise at least one supply electrode and at least one return electrode to define the circuit.

[0043] The RF generator 102 may be operable to control the RF energy emanating from the needle 103 in a closed-loop fashion. For example, the needle 103 and/or an RF probe disposed within the needle 103 may contain a temperature measurement device, such as a thermocouple, to measure the temperature at the target tissue. Data may also be available from the RF generator 102, such as power level and/or impedance, which may also be used for closed-loop control of the needle 103.

[0044] Turning to FIG. 4, an exemplary RF probe assembly 400 compatible with the needle 103 is illustrated. The RF probe assembly 400 includes an RF probe 401 that may be inserted into a patient (e.g., through needle 103) and may direct RF energy to the target tissue. The RF probe 401 may include a thermocouple operable to measure temperature at a distal end 402 of the RF probe 401. The RF probe assembly 400 may include a connector 403 and a cable 404 for use in connecting the RF probe 401 to the RF generator 102.

[0045] Returning to FIG. 1, the system 100 may include an imaging system 105 capable of producing internal images of the patient 101 and the needle 103 to facilitate navigation of the needle 103 during a procedure. The system 100 may further include a display for displaying the generated images to a physician performing the RF ablation procedure. In one example, the imaging system 105 may be a fluoroscope capable of generating real-time two dimensional images of the needle 103 and internal structures of the patient 101. As such, the imaging system may include an X-ray source 106, an X-ray detector 107 and a controller 108. The X-ray source 106 and X-ray detector 107 may be mounted on a movable structure (e.g., a C-arm), to facilitate capturing a variety of images of the patient 101 (e.g., at various angles or projection views). Alternatively, the imaging system 105 may be any other appropriate imaging system, such as, for example, a computed tomography (CT) scanner.

[0046] FIG. 2A is a detailed view of the needle 103 of the system 100 for performing RF neurotomy. The needle 103 may include a tip 201 that tapers to a point 301 capable of piercing the skin of a patient. The needle 103 may further include an elongate member 203 connected to the tip 201 at a distal end 202 of the needle 103 and connected to a

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hub 204 at a proximal end 205 of the needle 103. The needle 103 includes a central longitudinal axis 223 that is disposed along the center of the elongate member 203.

[0047] The needle 103 may include a self-contained mechanical mechanism, in the form of deployable filaments 206a, 206b, operable to expand the volume of effective RF energy delivery as compared to known single-electrode RF probes. The filaments 206a, 206b may be at least partially disposed within the elongate member 203 and may be operable to emerge through a side wall of the needle 103 proximate to the distal end 202 of the needle 103. Alternatively, the needle 103 may include a single filament or three or more filaments. The filaments 206a, 206b allow offsetting and/or contouring of the lesion geometry produced using the needle 103 to match a desired target volume. The filaments 206a, 206b may be deployable and/or retractable by moving an actuator 216 relative to the hub 204.

[0048] As will be further described, the needle 103 may further include a tube 207 that includes a lumen therethrough. The lumen may be used to transport fluids to and/or from the target volume. The lumen may also accept the RF probe 401 for delivery of RF energy to the target volume. In an alternate embodiment, the RF probe 401 may be integrated into the needle 103. In such an embodiment, the tube 207 need not be present for RF energy delivery, although it may be included to facilitate fluid delivery. The filaments 206a, 206b may include lumens therethrough for the transportation of fluid to and/or from the target volume. The filaments 206a, 206b may function as thermocouples.

[0049] As RF energy penetrates biological tissue, protein and water molecules oscillate in response to the RF current and the tissue adjacent to the RF electrode is heated. As the tissue heats and coagulates, the biophysical properties of the tissue change. These tissue changes limit penetration of the RF energy beyond a leading edge defined by the shape and size of an active needle tip. Accordingly, the size of a radiofrequency lesion using conventional single needle technology is thus practically limited after achievement of a certain temperature delivered for a certain time.

[0050] The needle 103 with deployable filaments 206a, 206b overcomes this obstacle and expands the effective area of RF energy delivery by providing multiple locations (e.g., tip 201 and filaments 206a, 206b) from which the RF energy emanates. The use of multiple filaments 206a, 206b provides additional conduits for RF energy creating a multiple

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electrode RF field effect. The size, shape and location of a lesion created with the needle 103 may be established by the quantity, location and orientation of the filaments, and may be beneficially modified to suit a specific anatomical application by changing various aspects of the filaments as discussed below.

[0051] Where it is desired to create a lesion offset from the central longitudinal axis 223, the lesion may be preferentially offset in a desired direction from the central longitudinal axis 223 by rotationally orienting the needle 103. Moreover, the needle 103 may be used to create a lesion offset from the central longitudinal axis 223 in a first direction. Then, the filaments 206a, 206b may be retracted, the needle 103 rotated, and the filaments 206a, 206b re-deployed to create a lesion offset from the central longitudinal axis 223 in a second direction.

[0052] FIGS. 3A and 3B are detailed views of the distal end 202 of the needle 103 that includes the tip 201. The tip 201 may include the sharpened point 301 for piercing the skin of a patient and facilitating advancement through tissue. The tip 201 may further include a tapered portion 302 that transitions the tip 201 from the point 301 to a body portion 303. The body portion 303 is the portion of the tip 201 that is disposed proximal to the tapered portion 302. The body portion 303 may be cylindrical as illustrated, or it may be of any other appropriate shape. The body portion 303 may have a cross-section that coincides with the cross section of the elongate member 203.

[0053] The tip 201 may act as an RF energy delivery element. As such, the tip 201 may be made from a conductive material such as, for example, stainless steel. The tip 201 may be coated. The tip 201 material and optional coating may be selected to improve radiopacity, improve and/or alter RF energy conduction, improve lubricity and/or reduce tissue adhesion.

[0054] The tip 201 may include filament port or slot 304a (not visible in the views of FIGS. 3A and 3B) and filament port or slot 304b. The geometry of the filament slots 304a, 304b may be selected to allow filaments 206a, 206b to be adequately retracted (e.g., such that they are disposed within a cross-sectional envelope of the body portion 303 of the tip 201) while the needle 103 is inserted into the body, so that the filaments 206a, 206b do not cause any unintended damage to the patient. Such positioning of the filament slots 304a,

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304b avoids having filament exit features on the tapered portion 302 and thus avoids potential coring that could be caused by such positioning.

[0055] The internal geometry of the filament slots 304a, 304b may be designed such that the filaments 206a, 206b may be easily retracted and advanced. For example, the internal geometry of the filament slots 304a, 304b may include a transition region 305 that meets the outer surface of the body portion 303 at an angle of about 30 degrees. The transition region 305 may, for example, be curved or planar. Thus, when the filaments 206a, 206b are in the form of a member without a pre-set bias (e.g., substantially straight), advancement of the filaments 206a, 206b relative to the filament slots 304a, 304b, will cause the filaments 206a, 206b to be deflected outwardly as the filaments 206a, 206b move distally along the transition region 305. Depending on the positioning of the transition region 305 relative to where the filaments 206a, 206b are confined (e.g., in the needle 103 of FIG. 3A the filaments 206a, 206b are confined to only longitudinal movement where they enter into the elongate member 203) and on the mechanical properties of the filaments 206a, 206b, various deployment angles of the filaments 206a, 206b relative to the central longitudinal axis 223 may be achieved. Generally, the portions of the filaments 206a, 206b that extend outwardly away from the filament slots 304a, 304b may be unrestrained and thus may take any appropriate form. For example, where there is no pre-set bias, the portions of the filaments that extend outwardly away from the filament slots (and therefore from the tip) may be substantially straight, such as shown in FIGS. 2A, 3A, 3C, 6, 11A-11C and 14. Where a pre-set bias is present, the portions of the filaments that extend outwardly away from the filament slots may take any appropriate shape, such as, for example, curved as shown in FIG. 10.

[0056] The radial orientation of the filament slots 304a, 304b may be selected such that a center point between the filament slots 304a, 304b does not coincide with the central longitudinal axis 223. For example, as shown in FIGS. 2A, 3A and 3B, the filament slots 304a, 304b may be positioned such that they are about 120 degrees apart about the circumference of the tip 201. Other filament slot configurations may be configured to achieve the filament placements discussed below. These configurations may be achieved by varying the quantity of filament slots, the placement of filament slots about the circumference of the

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tip 201, and/or the placement of filament slots along the center longitudinal axis 223 to achieve the filament placements discussed below.

[0057] As noted above, and illustrated in FIGS. 3A and 3B, the needle 103 may comprise a tube 207 that includes a lumen 222 therethrough. The lumen 222 may be employed to accept the RF probe 40 for delivery of RF energy and/or for the transport of fluids. In this regard, the tip 201 may further include a fluid port 210 that may be in fluid communication via a channel through the tip 201 with the lumen 222. The fluid port 210 may be centrally located or it may be located offset from the center longitudinal axis 223 as shown in FIGS. 2A and 3A. The fluid port 210 may be used to transfer fluid between the region of the tip 201 and the proximal end 205 of the needle 103. For example, during an RF neurotomy procedure, an anesthetic and/or an image enhancing dye may be introduced into the region of tissue around the tip 201 through the fluid port 210. In an alternate embodiment, the fluid port 210 may be located along the body portion 303 of the tip 201.

[0058] As may be appreciated, the channel through the tip 201 may be sized to accommodate a tip of the RF probe 401 that may be inserted into the needle 103. The channel may be sized such that RF energy from the inserted RF probe 401 is satisfactorily passed from the RF probe 401 to the tip 201 and filaments 206a, 206b.

[0059] The elongate member 203 may be in the form of a hollow tube (e.g., sheath, cannula) interconnecting the tip 201 with the hub 204. The elongate member 203 may be configured with adequate strength to allow the needle 103 to pierce the patient's skin and advance to a target area through various tissue types, including, for example, fat and muscle tissue. The elongate member 203 may also be capable of resisting kinking as it is advanced. In an alternate embodiment, the elongate member 203 may be a rod with a plurality of lumens along its length to accommodate filaments 206a, 206b, the RF probe 401, and/or a fluid passage.

[0060] The elongate member 203 houses portions of the filaments 206a, 206b and the tube 207, and allows for relative movement of the filaments 206a, 206b. The elongate member 203 may be of any appropriate size and internal configuration to allow insertion into the patient 101 and to house componentry therein. In an exemplary embodiment, the elongate member 203 may, for example, be a 16 gauge round tube or smaller. For example, the

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elongate member 203 may be 18 or 20 gauge. For example, the elongate member may have a maximum cross dimension of at most about 1.7 mm. In another example, the elongate member may have a maximum cross dimension of at most about 1 mm. The elongate member 203 may have a length selected for performing a specific spinal RF neurotomy procedure on a particular patient. The elongate member 203 may be constructed from an insulative material to reduce the amount of RF energy emitted along the length of the elongate member 203 when the RF probe 401 is disposed therein. For example, the elongate member 203 may be constructed from polymeric, ceramic or other insulative material. The elongate member 203 may include a coating that may improve radiopacity to aid in visualization of the position of the needle 103 using fluoroscopy. The elongate member 203 may include a coating to improve its insulative properties. The elongate member 203 may include a lubricious coating to improve its ability to be inserted and positioned within the patient and to reduce tissue adhesion. The elongate member 203 may include markers 224 along its length to assist in determining the depth to which the needle 103 has entered into the anatomy. Such markers 224 may be radiopaque so that they may be viewed under fluoroscopy. A collar (not shown) may be disposed about the elongate member 203 to assist in placement of the tip 201 of the needle 103. For example, the tip 201 may be positioned in a first position, the collar may then be placed against the patient's 101 skin, and then the needle 103 may be withdrawn a certain distance. Such a distance will be indicated by the distance between the collar and the patient's 101 skin.

[0061] The elongate member 203 may be fixedly interconnected to the tip 201 and hub 204 in any appropriate manner. For example, the tip 201 may be press fit into the elongate member 203 and the elongate member 203 may be press fit into the hub 204. Other possible methods of attachment include adhesive bonding and welding. In an alternate embodiment, the elongate member 203 and the tip 201 may be a single unitary structure. The elongate member 203 may be steerable and incorporate controlling mechanisms allowing the elongate member 203 to be deflected or steered after insertion into the anatomy.

[0062] The tube 207 containing the lumen 222 may be constructed from any appropriate material. For example, the tube 207 may be constructed from a conductive material, such as stainless steel, such that when the RF probe 401 is inserted within the tube

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207, the RF energy emitted by the RF probe 401 may be conducted through the tube 207 and into and through the tip 201 and filaments 206A, 206b. The tube 207 may be interconnected to the tip 201 such that the lumen 222 is in sealed, fluid communication with the channel through the tip 201. This may be accomplished by a press fit, weld, or any other appropriate method.

[0063] As noted, the lumen 222 may be in fluid communication with the tip 201 at the distal end 202. A proximal end of the lumen 222 may be disposed at the proximal end 205 of the needle 103. In this regard, the lumen 222 may run from the distal end 202 to the proximal end 205 with the only access being at the distal and proximal ends. Furthermore, the lumen 222 may be the only lumen of the needle 103 disposed along the elongate member 103.

[0064] Accordingly, the RF probe 401 inserted into the lumen 222 may be positioned such that an end of the RF probe 401 is proximate the tip 201. For example, the RF probe 401 may be positioned such that the distal end 402 of the RF probe 401 is in the lumen 222 near the tip 201 or in the channel through the tip 201. Thus, RF energy transmitted through the RF probe 401 may be conducted by the tip 201 and filaments 206a, 206b. The size of the lumen 222 may be selected to accommodate a particular size of RF probe 401. For example, for a 22 gauge RF probe 401, at least a 21 gauge or larger lumen 222 may be employed. For example, the lumen 222 may have a maximum cross-dimension of less than about 0.85 mm.

[0065] The proximal end of the tube 207 may be operable to receive the RF probe 401. Moreover, the proximal end of the tube 207 and the actuator 216 may be configured to accept a connector, such as a Luer fitting, such that a fluid source may be connected to the tube 207.

[0066] As illustrated in FIGS. 2A and 3A, the needle 103 includes two filaments 206a, 206b disposed within and along elongate member 203. Distal ends of the filaments 206a, 206b are disposed proximate to the tip 201 and proximal ends of the filaments 206a, 206b are fixed to a filament hub 221 discussed below. The filaments 206a, 206b are movable along the central longitudinal axis 223 between a fully deployed position as illustrated in FIGS. 2A and 3A and a retracted position illustrated in FIG. 3B. Moving the filaments 206a,

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206b distally from the retracted position moves the filaments 206a, 206b toward the fully deployed position, while moving the filaments 206a, 206b proximally from the deployed position moves the filaments 206a, 206b toward the retracted position. The filaments 206a, 206b may be deployed in intermediate positions between the fully deployed positions and the retracted positions.

[0067] In the fully deployed position as shown in FIG. 3A, the distal ends of the filaments 206a, 206b are disposed away from the tip 201. In the refracted position as shown in FIG. 3B, the distal ends of the filaments 206a, 206b are disposed entirely within an outer perimeter (e.g., circumference where the non-tapered portion 303 of the tip 201 is round) of the tip 201. In the deployed position, the filaments 206a, 206b act as broadcast antennae for the RF probe 401 (e.g., RF energy passes from the RF probe 401 to tip 201 and filaments 206a, 206b, and into a target volume within the patient 101). In this regard, together, the RF probe 401 inserted into the lumen 222, the tip 201, and the filaments 206a, 206b, may form a monopolar electrode for application of RF energy to the target volume. The filaments 206a, 206b allow the RF energy from the RF probe 401 to be dispersed over a larger volume than would be possible with the tip 201 alone.

[0068] The filaments 206a, 206b may be constructed from a material operable to conduct RF energy, e.g., a metal such as stainless steel, Nitinol or shape memory alloy. The filaments 206a, 206b may be coated to enhance their ability to conduct RF energy. The filaments 206a, 206b may include a lubricious coating to aid in insertion and/or reduce tissue adhesion. The distal ends of the filaments 206a, 206b may be shaped (e.g., pointed) to improve their ability to move through tissue.

[0069] The positioning of the filaments 206a, 206b of the embodiment illustrated in FIGS. 2A and 3A will now be described in relation to FIG. 5. FIG. 5 is an end view of the tip 201 and deployed filaments 206a, 206b of the embodiment illustrated in FIGS. 2A and 3A. The filaments 206a, 206b are positioned at a filament angle 503 of about 120 degrees apart from each other about the central longitudinal axis 223. This coincides with the positions of the filament slots 304a, 304b discussed above since the filaments 206a, 206b emerge from the filament slots 304a, 304b. Accordingly, a filament-free angle 504 of about 240 degrees is defined as the largest angle about the circumference of the tip 201 that is free

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of filaments 206a, 206b. In an embodiment consisting of two filaments, the filament angle 503 may be less than 180 degrees and the filament-free angle 504 may be correspondingly greater than 180 degrees (e.g., greater than 200 degrees or greater than 240 degrees).

[0070] In FIG. 5, the central longitudinal axis 223 is perpendicular to the plane of the illustration. A midpoint 502 is defined between distal ends 501a, 501b of the filaments 206a, 206b, respectively. The midpoint 502 is offset from the central longitudinal axis 223. For example, in an embodiment, the midpoint 502 may be offset from the central longitudinal axis 223 by about 2 mm. Accordingly, when RF energy is transmitted from the tip 201 and filaments 206a, 206b, it will be transmitted asymmetrically with respect to the central longitudinal axis 223 as energy will be emitted from the tip 201 and the filaments 206a, 206b. As oriented in FIG. 5, the energy will be biased in an upward direction in the direction from the point 301 toward the midpoint 502. Thus, when RF energy is transmitted during an RF neurotomy procedure, a lesion will be created that is correspondingly offset from the central longitudinal axis 223 in the direction from the point 301 toward the midpoint 502.

[0071] FIG. 6 is a side view of the tip 201 and filaments 206a, 206b oriented such that deployed filament 206b is disposed entirely within the plane of the figure. The filaments 206a, 206b extend from the tip 201 at a common distance, or location, along the central longitudinal axis 223. The filament 206b is deflected radially outwardly from the central longitudinal axis 223. The filament 206b emerges from the tip 201 at an angle 601 of about 30 degrees as dictated by the positioning of the transition region 305 relative to where the filament 206b is confined and on the mechanical properties of the filament 206b (as previously discussed). Also, it is noted that the distal tips 501a, 501b are positioned distally beyond the point 301 by a distance 602 and are disposed at a distance 603 from the central longitudinal axis 223. In the embodiment illustrated in FIG. 6, the distance 602 may be about 3.5 mm and the distance 603 may be about 3 mm. Such an arrangement may distally offset a lesion created by the needle 103 as compared to a lesion created with a tip without filaments or a lesion created with the needle 103 with the filaments 206a, 206b in the retracted position.

[0072] Accordingly, the filament 206a, 206b arrangement illustrated in FIGS. 2A, 3A, 3B, 5 and 6 may be operable to produce lesions that are radially offset from the central longitudinal axis 223 and distally offset from the point 301 as compared to a lesion created

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by the tip 201 without the filaments or a lesion created with the needle 103 with the filaments 206a, 206b in the retracted position.

[0073] Variations of filament positions and configurations from those illustrated in FIGS. 2A, 3A, 3B, 5 and 6 will now be addressed. Variations in the relative shapes, positions and sizes of lesions created with the needle 103 may be achieved by repositioning the filaments. For example, as noted above, the lesion produced by the needle 103 will be in different positions depending on whether the filaments are in the deployed or refracted positions. Accordingly, intermediately shaped, positioned and/or sized lesions may be achieved by positioning the filaments in intermediate positions between the fully deployed or refracted positions. Thus, for any given configuration of deployable filaments discussed herein, the positions and/or sizes of lesions created by those configurations may be varied by varying the positioning of the filaments to intermediate positions between the fully deployed and retracted positions. As noted above, the needle 103 with deployed filaments is operable to produce larger lesion volumes than the needle 103 with retracted filaments. For example, the needle 103 with fully deployed filaments may be operable to produce lesion volumes of about 500 mm^3.

[0074] Further variation in the shape, position and/or size of lesions created by needles with deployable filaments may be achieved by different configurations of filaments. Variations may include variations in materials, the number of filaments, the radial positioning of the filaments, the axial positioning of the filaments, the length of the filaments, the angle at which the filaments exit the tip, and the shape of the filaments. By varying these parameters the needle may be configured to produce lesions of various sizes and shapes that are positioned at various locations relative to the tip. Such variations may be specifically tailored to be used in specific procedures, such as RF neurotomy procedures of particular nerves adjacent to particular vertebrae.

[0075] Variations of the materials used for the tip and/or the filaments may be selected to achieve particular lesion sizes, positions and/or shapes. For example, the tip may be made form a material that does not conduct RF energy. In such an embodiment, RF energy from the RF probe 401 may be conducted by substantially only the deployed filaments. Such an arrangement may provide for a lesion with a larger offset from the central longitudinal

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axis 223 than would be produced where the tip conducts RF energy and acts as an electrode along with the filaments.

[0076] Another material-related variation that may affect lesion shape, size and/or position is the addition and placement of insulation over the tip and/or filaments. For example, by placing a layer of insulation over the proximal half of the portions of the filaments that extend from the tip when in the deployed position, the shape of the lesion may be altered since RF energy may primarily emanate from the distal, non-insulated portion of the filaments. Similarly, insulation may be added to the tip to alter the RF energy delivered from the tip.

[0077] Moreover, the materials used in making the filaments and tip may be selected based on RF conductivity. For example, by using a material for the tip that is less conductive of RF energy, the proportion of RF energy emanating from the tip as compared to that emanating from the filaments may be altered resulting in a corresponding change in lesion size, position and/or shape.

[0078] The RF needles and RF probes discussed herein may be constructed from materials that are Magnetic Resonance Imaging (MRI) compatible. As such, MRI equipment may be used to verify the positioning of such RF needles and/or monitor the progress of an ablation procedure (e.g., RF neurotomy) using such RF needles.

[0079] Variations of the number of filaments used for needle may be selected to achieve particular lesion sizes, positions and/or shapes. For example, as illustrated in FIG. 7, a third filament 701 may extend from tip 201' in a position between filaments 206a, 206b. The tips 501a, 501b of the filaments 206a, 206b and a tip 702 of filament 701 may form a polygon 703 that has a centroid 704. The centroid 704 is offset from the central longitudinal axis 223. Such an arrangement may produce a lesion that is offset from the central longitudinal axis 223 to a different degree than, and shaped differently than, a lesion created by the needle of FIG. 5. In general, where a centroid of a polygon formed by the tips of filaments (or, in the case where there are two filaments, the midpoint between them) is offset from the central longitudinal axis 223, a lesion created by such a configuration will be correspondingly offset from the central longitudinal axis 223. The filaments 206a, 206b, 702 are positioned within the same filament angle 503 of about 120 degrees as in the embodiment

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of FIG. 5. Furthermore, the embodiment of FIG. 7 has a filament-free angle 504 of about 240 degrees, also the same as in the embodiment of FIG. 5. In general, where the filaments are positioned within an arc that is less than 180 degrees, resultant lesions will be offset from the central longitudinal axis 223 in the direction of the filaments. In general, in an embodiment consisting of three or more filaments where the filaments are positioned within an arc that is less than 180 degrees, the filament-free angle may be correspondingly greater than 180 degrees (e.g., greater than 200 degrees or greater than 240 degrees).

[0080] Variations in the radial positioning of filaments of a needle may be selected to achieve particular lesion sizes, positions and/or shapes. For example, as illustrated in FIG. 8, four filaments 801a-801d are positioned about a tip 201". The tips of the filaments 801a-801d may form a polygon 802 that has a centroid 803. Such an arrangement may produce a lesion whose center is offset from the central longitudinal axis 223 in the direction of the centroid 803. The filaments 801a-801d are positioned within a filament angle 804 of about 200 degrees. Furthermore, the embodiment of FIG. 8 has a filament-free angle 805 (i.e., the largest angle about the circumference of the tip 201" that is free of filaments) of about 160 degrees. It will be appreciated that, as illustrated in FIG. 8, a configuration capable of producing a lesion offset from the central longitudinal axis 223 may have a filament-free angle that is less than 180 degrees.

[0081] In the above-described embodiment of FIGS. 2A, 3A, 3B, 5, and 6 with two filaments, a midpoint 502 between the filaments was discussed. In embodiments with more than two filaments, a centroid of a polygon formed by the distal ends of the filaments was discussed. Both the midpoints and the centroids may be considered to be "average" points of the filaments for their particular configurations. In such embodiments, the midpoint between filaments in two-filament embodiments and the centroid of the polygon in embodiments with more than two filaments may be offset from the central longitudinal axis of the elongate member. For example, the midpoint or centroid may be offset from the central longitudinal axis by 1 mm or more. In embodiments, the polygon may lie in a plane perpendicular to the central longitudinal axis.

[0082] As illustrated in, for example, FIGS. 2A, 3A, 3C, 5, 7, 8 and 9 the distal ends of the filaments when fully deployed may be disposed in a common plane. In an

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embodiment, the common plane may be disposed perpendicular to the central longitudinal axis. Such a common plane for the distal ends of deployed filaments may be disposed distally from the distal end of the tip.

[0083] As illustrated in, for example, FIGS. 2A, 3A, 3C, 5 and 7 the filaments of the needle may be deployed on a common side of a central plane of the needle (where the central longitudinal axis is disposed entirely within the central plane). In such embodiments, the distal ends of the fully deployed filaments may all be disposed on a common side of the central plane. Such a configuration may enable the needle to be used to create a lesion that is offset from the tip of the needle to the same side of the central plane as the deployed filament ends.

[0084] As illustrated, inter alia, in FIG. 2A, the filaments when fully deployed may point in an at least partially distal direction. In this regard, a vector extending axially from the distal end of a filament and coinciding with a central axis of the filament at the end of the filament has at least some distal component. Accordingly, the fully deployed filaments embodiments shown in FIGS. 2A, 3A and 10 all point in an at least partially distal direction.

[0085] In another variation of the radial positioning of filaments of a needle, the filaments may be uniformly distributed about the circumference of the tip. Such an embodiment is illustrated in FIG. 9. The needle of FIG. 9 includes 3 equally distributed filaments 901a, 901b, 901c. Consequently, the angles 902a, 902b, 902c between the filaments 901a, 901b, 901c may each equal 120 degrees. Such a needle may be operable to produce a lesion that is generally centered along the central longitudinal axis 223. However, the position of the produced lesion axially along the central longitudinal axis 223 may be determined by the configuration of the filaments. For example, relatively longer filaments may be operable to produce lesions that are positioned distal to lesions produced by configurations with relatively shorter filaments.

[0086] Variations in the axial positioning of where deployed filaments emerge from the tip of a needle may be selected to achieve particular lesion sizes, positions and/or shapes. For example, returning to FIG. 7, if the third filament 701 of the embodiment of FIG. 7 were axially positioned such that it is distal to filaments 206a, 206b, the resultant lesion may be produced may be longer along the central longitudinal axis 223 than that of an

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embodiment where the filaments 206a, 206b, 701 are positioned at the same point along the central longitudinal axis 223. In another variation, as deployed, two or more filaments may be disposed at the same radial position and at different axial positions. Such embodiments may include multiple rows of filaments.

[0087] The lengths of filaments beyond the tip (when the filaments are in the deployed position) in a needle may be varied to achieve particular lesion sizes, positions and/or shapes. For example, increasing the length of the deployed portions of the filaments 206a and 206b of the embodiment illustrated in FIGS. 5 and 6 may result in a needle capable of producing lesions that are more distally positioned than those created by the embodiment as shown in FIGS. 5 and 6. The effects of lengthening or shortening the deployed length of the filaments are similar to those discussed above with respect to partially deploying filaments.

[0088] Embodiments of a needle may include deployed filaments of different lengths. Where all of the filaments of a particular needle are moved by a common actuator, such variations may be achieved by varying the overall length of the filaments. In such an embodiment, the end points of the shorter filaments may be retracted further into the tip or elongate member than longer filaments. The effects of lengthening or shortening the deployed length of the filaments are similar to those discussed above with respect to variations in the axial positioning of where deployed filaments emerge from the tip of the needle.

[0089] The angle (such as angle 601 of FIG. 6) at which a filament exits a tip may be varied to achieve particular lesion sizes, positions and/or shapes. For example, an embodiment similar to the embodiment of FIGS. 5 and 6, but where the deployed filaments are at a 60 degree angle instead of the 30 degree angle shown in FIG. 6, may be operable to produce a lesion that has a larger maximum cross-sectional dimension in a plane perpendicular to the central longitudinal axis 223 than the embodiment of FIGS. 5 and 6. This may be due to the filaments emanating RF energy at a distance further away from the central longitudinal axis than the embodiment of FIGS. 5 and 6. A particular embodiment of the needle may include deployed filaments at different angles relative to the central longitudinal axis.

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[0090] The shapes of the portions of the filaments that extend away from the tip may be varied to achieve particular lesion sizes, positions and/or shapes. For example, FIG. 10 illustrates the tip 201 and filaments 1001a, 1001b, where the portions of the filaments 1001a, 1001b that extend beyond the tip 201 are curved. Such curvatures may be achieved by, for example, filaments that comprise a shape memory alloy (e.g., Nitinol) or spring material. When the filaments 1001a, 1001b are retracted, the shape of the tip 201 and/or elongate member 203 may keep the filaments 1001a, 1001b in a constrained straightened position. As the filaments 1001a, 1001b are advanced toward the fully deployed position, they become unconstrained and return to their curved shape as shown in FIG. 10. The deployed shape of the filaments 1001a, 1001b may be predetermined, or the filaments 1001a, 1001b may be made from a material that may be shaped by a user prior to insertion.

[0091] The curved filaments 1001a, 1001b of FIG. 10 are positioned within planes that include the central longitudinal axis 223. In other embodiments, the filaments 1001a, 1001b may be curved in other directions, such as in a corkscrew arrangement. This may be beneficial to assist the filaments in remaining anchored to the tissue during delivery of RF energy. The curved filaments 1001a, 1001b of FIG. 10 may be operable to produce a flatter (in a plane perpendicular to the central longitudinal axis 223) lesion than the straight filaments 206a, 206b of FIG. 6.

[0092] FIG. 3C is a detailed view of the distal end 310 of a needle 309 that is an alternate embodiment of the needle 103. The distal end 310 includes a tip 311 that may include a sharpened point 312 for piercing the skin of a patient and facilitating advancement through tissue. The tip 311 may further include a tapered portion 313 that transitions the tip 311 from the point 312 to a first body portion 314. The first body portion 314 may be connected to a second body portion 315 at an angle 316. In an exemplary embodiment, the angle 316 may be about 15°. The second body portion 315 may be aligned with an elongate member 317. The elongate member 317 may be similarly configured as the elongate member 203 of FIGS. 3A and 3B. The angle 316 between the first body portion 314 and the second body portion 315 may aid the physician in navigating the needle 309 to a desired position. For example, by rotating the needle 309 such that the first body portion 314 is pointing in a

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desired direction, subsequent advancement of the needle 309 may result in the needle 309 following a non-straight path biased toward the desired direction.

[0093] The first and second body portions 314, 315 may be cylindrical as illustrated, or they may be of any other appropriate shape. The first and second body portions 314, 315 may have cross-sections that coincide with the cross section of the elongate member 317.

[0094] The tip 311, or a non-insulated portion thereof, may act as an RF energy delivery element. As such, the tip 311 may be made from a conductive material such as, for example, stainless steel. The tip 311 may be coated. The tip 311 material and optional coating may be selected to improve radiopacity, improve and/or alter RF energy conduction, improve lubricity and/or reduce tissue adhesion.

[0095] The tip 311 may include filament slot 318a and filament slot 318b. The geometry of the filament slots 318a, 318b may be selected to allow filaments 319a, 319b to be adequately retracted (e.g., such that they are disposed within a cross-sectional envelope of the second body portion 315) while the needle 309 is inserted into the body, so that the filaments 319a, 319b do not cause any unintended damage to the patient. Such positioning of the filament slots 318a, 318b avoids having filament exit features on the tapered portion 313 and on the first body portion 314 and thus avoids potential coring that could be caused by such positioning.

[0096] The internal geometry of the filament slots 318a, 318b may be designed such that the filaments 319a, 319b may be retracted and advanced. For example, the internal geometry of the filament slots 318a, 318b may be configured such that advancement of the filaments 319a, 319b relative to the filament slots 318a, 318b, will cause the filaments 319a, 319b to be deflected outwardly as the filaments 319a, 319b move distally relative to the second body portion 315. Depending on the configuration of the filament slots 318a, 318b and on the mechanical properties of the filaments 319a, 319b, various deployment angles of the filaments 319a, 319b relative to a central longitudinal axis of the second body portion 315 may be achieved.

[0097] The configuration and orientation of the filament slots 318a, 318b may be selected such that deployed filaments 319a, 319b may achieve the positioning illustrated in

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FIG. 3C. In FIG. 3C, the filaments 319a, 319b are generally positioned in a plane that is perpendicular to a plane that includes the angle 316 between the first and second body portions 314, 315. As illustrated, the filaments 319a, 319b may be positioned such that they extend at an angle relative to the plane that includes the angle 316. Other filament slot 318a, 318b configurations may be configured to achieve other desired filament 319a, 319b placements. These configurations may be achieved by varying the quantity of filament slots and filaments, the placement of filament slots about the circumference of the tip 311, the angle at which the filaments extend away from the first and second body portions 314, 315, and/or the placement of filament slots along the first and second body portions 314, 315.

[0098] Similar to the embodiment of FIGS. 3A and 3B, the needle 309 may comprise a tube that includes a lumen therethrough. The lumen may be employed to accept an RF probe for delivery of RF energy and/or for the transport of fluids. In this regard, the tip 311 may further include a fluid port 320 that may be in fluid communication via a channel through the tip 311 with the lumen. The fluid port 320 may be used to transfer fluid between the region of the tip 311 and a proximal end of the needle 309.

[0099] In the deployed position as shown in FIG. 3C, the distal ends of the filaments 319a, 319b are disposed away from the tip 311. In a retracted position (not shown, but similar to as shown in FIG. 3B), the distal ends of the filaments 319a, 319b are disposed entirely within an outer perimeter (e.g., circumference where the second body portion 315 of the tip 311 is round) of the tip 311. In the deployed position, the filaments 319a, 319b act as broadcast antennae for an RF probe inserted into the needle 309. In this regard, together, the RF probe inserted into the lumen, the tip 311, and the filaments 319a, 319b, may form a monopolar electrode for application of RF energy to the target volume. The filaments 319a, 319b may allow the RF energy from the RF probe to be dispersed over a larger volume than would be possible with the tip 311 alone.

[0100] The filaments 319a, 319b may be constructed in a manner similar to as described with respect to the filaments 206a, 206b.

[0101] In general, any or all of the above variables may be incorporated into a particular embodiment of a needle to yield a needle capable of producing a lesion with a particular size, position and shape relative to the tip of the needle. Such custom sizes,

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positions and shapes may be designed for specific procedures. For example, a particular lesion size, position and shape may be selected to enable a physician to navigate the needle to a particular landmark (e.g., proximate or touching a bone visible using fluoroscopy) and then orient the needle such that deployed filaments will be operable to produce a lesion at a particular location relative to the landmark. By navigating to a particular internal landmark, as opposed to attempting to visualize a relative position of a needle offset from a landmark, a more accurate and/or consistent positioning of the needle may be achieved. In this regard, the skill level required to accurately position the needle for a particular procedure may be reduced.

[0102] The lesion shapes achievable through selection of the above variables may include, for example, generally spherical, oblong, conical, and pyramidal shapes. The orientation relative to, and the amount of offset from, the tip of such shapes may be selectable. In an embodiment, the tips of the deployed filaments may be positioned distally relative to the point of the tip to provide for a facile positioning of the lesion relative to the tip. Such capability may allow for the needle to be inserted directly toward a target volume. In other embodiments, the tips of the deployed filaments may be positioned at the same axial position along the central longitudinal axis as the point of the tip or the tips of the deployed filaments may be positioned proximally relative to the point of the tip. In other embodiments, some filament endpoints may be located distal to the point of the tip while others are disposed proximal to the point of the tip.

[0103] In the embodiment of FIGS. 2A, 2B, 3A, 3B, 5 and 6, the filaments 206a, 206b have been illustrated as running the entire length of the elongate member 203 from the filament hub 221 to the tip 201. In an embodiment, a single member may run along at least part of the elongate member 203 and the filaments may be interconnected to the single member at some point proximal to the tip 201. Furthermore, the filaments 206a, 206b have been illustrated as being straight within the elongate member 203. In alternate embodiments, the filaments within the elongate member 203 may be braided, wrapped or twisted together. Such embodiments may have increased column strength, providing resistance to buckling and/or bending within the elongate member 203.

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[0104] The filaments discussed herein may be encased within lumens sized to help prevent buckling or bending of the filaments within the elongate member 203. Such lumens may be part of the elongate member or they may be separate members (e.g., tubes within the elongate member). Such lumens may be formed by an inner member (not shown) within the elongate member where the inner member includes channels along its periphery in which the filaments may lie with the elongate member forming a portion of the lumens. Lumens used for filaments may also serve as lumens for the transfer of liquid to and/or from the region surrounding the tip. In another variation, the filaments may be hollow and may be used for transfer of liquid to and/or from the region surrounding the tip.

[0105] The illustrated embodiments show all of the filaments of a given embodiment as commonly deployed or refracted. In a variation, one or more filaments may be separately deployed and/or refracted such that the physician could selectively engage a desired number of elements. In another variation, a plurality of filaments may exit from the tip at a common location and form a fan-like arrangement as they are deployed.

[0106] Deployment of filaments discussed above has been described as the filaments moving relative to a stationary tip. Alternatively, embodiments may be deployed by pulling the tip back relative to the filaments. Such embodiments may be beneficial where the needle is initially advanced such that it is in contact with bone to ensure proper positioning. Then the tip may be withdrawn, leaving the filaments (e.g., curved shape memory filaments) in a precise, known position.

[0107] Returning to FIGS. 2A and 2B, as noted, the hub 204 may be fixedly attached to the elongate member 203. The hub 204 may be the primary portion of the needle 103 gripped by the physician during insertion and manipulation of the needle 103. The hub 204 may have an asymmetric feature, such as indicator 225, that is oriented in a known fashion relative to the asymmetry of the tip 201. In this regard, the indicator 225 may be used to communicate to the physician the orientation of the tip 201 within the patient 101. Internally, the hub 204 may include a cavity 213 sized to house a protrusion 218 of the actuator 216. The hub 204 may include a hole through which a projection 215 may project into the interior of the cavity 213 to control the motion of the actuator 216 relative to the hub

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204 and to secure the actuator 216 to the hub 204. The hub 204 may be made from any appropriate material, e.g., a thermoset plastic.

[0108] The actuator 216 may be used to control the motion to deploy and/or retract the filaments 206a, 206b. The actuator 216 is operable to move along the central longitudinal axis 223 relative to the hub 204, elongate member 203 and tip 201. The actuator 216 includes the protrusion 218 extending into the cavity 213 of the hub 204. The outer surface of the protrusion 218 includes a helical track 219 sized to accommodate the projection 215. In this regard, as the actuator is rotated relative to the hub 204 (e.g., by a physician to deploy the filaments 206a, 206b), the helical track 219 and projection 215 combine to cause the actuator 216 to move axially along the central longitudinal axis 223. The actuator 216 has an interface portion 217 that may be gripped by a user when twisting the actuator 216. The interface portion 217 may be knurled or otherwise textured to enhance the physician's ability to twist the actuator 216. The protrusion 218 may include an inner cavity 226 sized to accept the filament hub 221 and to allow the filament hub 221 to rotate freely relative to the actuator 216. In this regard, the linear motion of the actuator 216 may be transmitted to the filament hub 221 while the rotational motion of the actuator 216 may not be transmitted to the filament hub 221.

[0109] The actuator 216 may include a Luer fitting 220 or any other appropriate fitting type on a proximal end thereof. The Luer fitting 220 may be in fluid communication with the lumen 222 and provide a connection such that fluid may be delivered into the lumen 222 and to the fluid port 210 of the tip 201. The Luer fitting 220 may also be configured to allow for the insertion of the RF probe 401 into the lumen 222. The actuator 216 may be made from any appropriate material.

[0110] The filaments 206a, 206b may be fixedly interconnected to the filament hub 221. In this regard, the axial movement of the filament hub 221 due to the actuator 216 may be communicated to the filaments 206a, 206b to deploy and retract the filaments 206a, 206b when the actuator 216 is rotated. The filament hub 221 may be made from any appropriate material.

[0111] Thusly, the physician may be able to deploy or retract the filaments 206a, 206b by twisting the actuator 216. For example, as illustrated, a counterclockwise (as seen

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from the viewpoint of FIG. 5) rotation of the actuator 216 relative to the hub 204 will result in the deployment (extension) of the filaments 206a, 206b. Relatedly, a clockwise rotation of the actuator 216 relative to the hub 204 will result in the retraction of the filaments 206a, 206b. Additionally, by partially rotating the actuator 216 relative to the hub 204, the filaments 206a, 206b may be partially deployed or refracted. The actuator 216 and/or the hub 204 may include markings to indicate the position of the filaments 206a, 206b (e.g., the depth of deployment). The actuator 206 and/or hub 204 may include detents to provide a tactile feedback of the position of the filaments 206a, 206b.

[0112] Other types of mechanisms may be used to control the deployment and retraction of the filaments 206a, 206b. For example, a spring loaded mechanism may be used. Such a configuration may use a spring that acts upon the filaments 206a, 206b to bias the filaments 206a, 206b toward a predetermined position (e.g., either deployed or retracted). Such a mechanism may be analogous to a spring loaded mechanism used in retractable ballpoint pens. In another example, a roll clamp mechanism may be incorporated. A roller wheel could be incorporated into the hub 204 such that as the wheel is rotated with the user's thumb, the filaments 206a, 206b would advance or retract. In another example, the hub 204 and actuator 216 may interact via complimentary threaded features. As the actuator 216 is threaded into the hub 204, the filaments 206a, 206b would advance. As the actuator 216 is threaded out of the hub 204, the filaments 206a, 206b would retract. In another example, a Touhy-Borst type mechanism could be incorporated to control the deployment and retraction of the filaments 206a, 206b. Any other appropriate mechanism for controlling linear motion of the filaments 206a, 206b may be incorporated into the needle 103.

[0113] FIG. 2C is a cut away view of a portion of an alternate embodiment of a hub 231 and actuator 232 that may be part of RF needle 103 used in an RF neurotomy procedure. The hub 231 may be fixedly attached to the elongate member 203. The hub 231 may be the primary portion of the needle 103 gripped by the physician during insertion and manipulation of the needle 103. The hub 231 may have an asymmetric feature, such as indicator 233, that is oriented in a known fashion relative to the asymmetry of the tip 201. In this regard, the indicator 233 may be used to communicate to the physician the orientation of the tip 201 within the patient 101. Internally, the hub 231 may include a cavity 234 sized to

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house a protrusion 235 of a slide member 236. The protrusion 235 may include a keyway or key slot 237 that may run along a longitudinal direction of the protrusion 235. The internal surface of the hub 231 through which the protrusion 235 moves may include a mating key (not shown) configured to fit and slide within the key slot 237. Together, the key slot 237 and mating key of the hub 231 may limit the slide member 236 to a linear motion along the central longitudinal axis 223.

[0114] Filaments 206a, 206b may be fixedly connected to the protrusion 235 of the slide member 236 for movement therewith. In this regard, distal movement (e.g., movement to the right as shown in FIG. 2C) of the protrusion 235 relative to the hub 231 may cause extension of the filaments 206a, 206b relative to the hub 231, elongate member 203 and tip 201 (not shown in FIG. 2C). For example, distal movement of the protrusion 235 may be used to move the filaments 206a, 206b from a retracted position to a deployed position. Similarly, proximal movement (e.g., movement to the left as shown in FIG. 2C) of the protrusion 235 relative to the hub 231 may result in retraction of the filaments 206a, 206b relative to the hub 231, elongate member 203 and tip 201 (not shown in FIG. 2C).

[0115] The hub 231 may be made from any appropriate material, e.g., a thermoset plastic. The hub 231 may be at least partially transparent such that the position of the protrusion 235 and/or other components within the hub 231 may be observable by a user. The hub 231 may further include demarcations (e.g., molded or printed marks) such that the amount of extension of the filaments 206a, 206b may be determined from the position of the protrusion 235 and/or other components relative to the demarcations.

[0116] An actuator 232 may be used to control the motion to deploy and/or retract the filaments 206a, 206b fixedly connected to the protrusion 235. The actuator 232 may be generally tubular such that it may fit around a hub projection 238 projecting from the proximal end of the hub 231. At least a portion of the cavity 234 may be disposed within the hub projection 238. The actuator 232 may also include an annular feature 239 configured to fit within an annular slot 240 in the slide member 236. The annular feature 239 may be sized relative to the annular slot 240 such that the actuator 232 may rotate relative to the slide member 236 about the central longitudinal axis 223 (or an axis parallel thereto) while the position of the actuator 232 relative to the slide member 236 along the central longitudinal

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axis 223 remains fixed. In this regard, the actuator 232 and the slide member 236 may be configured to move in tandem relation along the central longitudinal axis 223. The annular feature 239 and annular slot 240 may be configured such that, during assembly, the actuator 232 may be pressed onto the slide member 236 and the annular feature 239 may snap into the annular slot 240.

[0117] The inner surface of the actuator 232 may include a helical track 241 sized to accommodate a corresponding mating helical thread 242 on the hub projection 238. In this regard, as the actuator 232 is rotated relative to the slide member 236 and hub 231 (e.g., by a physician to deploy the filaments 206a, 206b), the helical track 241 and helical thread 242 combine to cause the actuator 232 and the slide member 236 to move axially along the central longitudinal axis 223. In this regard, a linear motion of the slide member 236 relative to the hub 231 may be created while the rotational motion of the actuator 232 may not be transmitted to the slide member 236 and the hub 231. An outer surface of the actuator 232 may be textured or include features to assist the user in gripping and twisting the actuator 232. In an alternative configuration, the helical track 241 may be disposed on the hub projection 238 and the helical thread 242 may be disposed on the inner surface of the actuator 232.

[0118] The slide member 236 may include a Luer fitting 243 or any other appropriate fitting type on a proximal end thereof. The Luer fitting 243 may be in fluid communication with a lumen passing through the slide member 236 and may provide a connection such that fluid may be delivered through the Luer fitting 243 and into the lumen of the slide member 236. In turn, the lumen of the slide member 236 may be in fluid communication with the cavity 234 of the hub 231, which may in turn be in fluid communication with a lumen disposed within the elongate member 223. The lumen disposed within the elongate member 223 may be in fluid communication with the tip 201. In this regard, fluid may flow into the Luer fitting 243, into and through the lumen within the slide member 236, into and through the cavity 234 of the hub 231, into and through the elongate member 223, and out from the tip 201. The Luer fitting 243, the lumen within the slide member 236, the cavity 234 of the hub 231, and the lumen of the elongate member 223 may all also be configured to allow for the insertion of the RF probe 401 therethrough. Moreover,

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the protrusion 235 and cavity 234 of the hub projection 238 may be sized and/or configured to form a fluid seal therebetween. Accordingly, fluid delivered under pressure through the Luer fitting 220 may flow through the cavity 238 and into the elongate member 203 substantially without leaking past the interface between the protrusion 235 and the cavity 234 of the hub projection 238.

[0119] As noted, the filaments 206a, 206b may be fixedly interconnected to the slide member 236. In this regard, the axial movement of the slide member 236 due to the actuator 232 may be communicated to the filaments 206a, 206b to deploy and retract the filaments 206a, 206b when the actuator 232 is rotated. The slide member 236 may be made from any appropriate material. The actuator 232 may be made from any appropriate material.

[0120] Thusly, the physician may be able to deploy or retract the filaments 206a, 206b by twisting the actuator 232. Additionally, by partially rotating the actuator 232 relative to the hub 231, the filaments 206a, 206b may be partially deployed or refracted. The actuator 232 and/or hub 231 may include detents to provide a tactile feedback of the position of the filaments 206a, 206b. The detents may be configured such that tactile feedback associated with engagement of a detent coincides with a predetermined amount of deployment or retraction of the filaments 206a, 206b. In this regard, such tactile feedback may be used in determining filament position.

[0121] In alternate embodiments, the needle 103 may be a bipolar device instead of the monopolar device described above. In such embodiments, the filaments may be isolated from each other and the tip to enable bipolar operation. Where more than two filaments are included, elements may be included to allow for selection of the polarity of the filaments to aid in lesion shape, size and position control. In another variation, the needle 103 may be used in either a monopolar or a bipolar mode as selected by the physician.

[0122] The above-described embodiments of needles may used in spinal RF neurotomy procedures, which will now be described. In general, for an RF neurotomy procedure, the patient may lie face down on a table so that the spine of the patient is accessible to the physician. At any appropriate time before, during, and/or after the procedure, the physician may use imaging equipment, such a fluoroscope, to visualize the

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patient's anatomy and/or to visualize the positioning of equipment (e.g., the needle relative to a target volume).

[0123] The patient may be administered sedatives and/or intravenous fluids as appropriate. The skin of the patient surrounding where the procedure will take place may be prepared and maintained using an appropriate sterile technique. Where the needle is a monopolar device, a return electrode pad may be attached to the patient. A local anesthetic may be injected subcutaneously where the needle will be inserted. Anesthetic may also be administered along the approximate path the needle will take.

[0124] With the filaments in the retracted position, the needle may be introduced into the patient and moved to a target position relative to a target portion of a target nerve or to a target position relative to a target volume in which the target nerve is likely situated (all of which are generally referred to herein as the target nerve or portion of the target nerve). The target nerve may be an afferent nociceptive nerve such as, for example, a medial branch nerve proximate a lumbar facet joint. Introduction into the patient may include percutaneously using the tip of the needle to pierce the skin of the patient. The moving of the needle may include navigating toward the target position using fluoroscopic guidance. Furthermore, the moving of the needle may include advancing the needle to an intermediate position and then repositioning the needle to the target position. For example, the needle may be advanced until it contacts a bone or other structure to achieve the intermediate position. This may be followed by retracting the needle a predetermined distance to achieve the target position. Such a procedure may be facilitated by the markers 224 or collar previously discussed.

[0125] During the moving of the needle or after the target position has been achieved, the needle may be used to inject an anesthetic and/or a dye. The dye may increase contrast in fluoroscopic images to assist in visualizing the patient's anatomy, which may aid the physician in guiding and/or verifying the position of the needle.

[0126] The needle may be rotated about the central longitudinal axis of the elongate member of the needle to achieve a desired orientation relative to the target nerve. For example, the needle may be rotated such that a lesion created with the needle with the filaments deployed will be offset from the central longitudinal axis toward the target nerve.

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Such rotation of the needle may be performed prior to insertion of the needle into the patient and/or after insertion into the patient. For example, the physician may rotate the needle prior to insertion such that the needle is generally in the desired rotational orientation. Then, after achieving the target position, the physician may fine tune the rotational orientation of the needle by rotating the needle to a more precise orientation.

[0127] Once the target position and desired rotational orientation have been achieved, the next step may be to advance one or more filaments of the needle relative to the tip of the needle. The particular needle used for a procedure may have been selected to enable the creation of a particular sized and shaped lesion at a particular position relative to the needle. As such, the particular needle used may be of any appropriate configuration (e.g., any appropriate number of filaments, any appropriate filament positioning) discussed above.

[0128] Where the needle is configured as shown in FIG. 5, the advancement of filaments may include advancing the filaments such that when the filaments are in their respective deployed positions, a midpoint between a distal end of the first filament and a distal end of the second filament is offset from the central longitudinal axis of the needle and the filament endpoints are disposed distal to the tip of the needle. Such deployment may enable the needle to be used to create a lesion that is offset from the tip of the needle toward the midpoint between the deployed filament ends. The lesion created may also be positioned at least partially distal to the tip of the needle.

[0129] FIG. 11A is an illustration of an exemplary set of isotherms 1010a-1010c that may be created with the needle 103 of FIG. 2A. As illustrated by the set of isotherms 1010a-1010c, RF energy emanating from the tip 201 and filaments 206a, 206b, may produce a region of elevated temperatures disposed about the tip 201 and filaments 206a, 206b. The isotherms 1010a-1010c may be offset from the central longitudinal axis 223 such that a centroid of the isotherms as viewed in FIG. 11A is offset from the central longitudinal axis 223 in the direction of the filaments 206a, 206b. The centroid of the isotherms 1010a-1010c as viewed in FIG. 11A may also be disposed distally relative to the tip 201 such that it is disposed between the tip 201 and the distal ends of the deployed filaments 206a, 206b. The isotherms 1010a-1010c may also be shaped such that, as viewed in FIG. 11A, the isotherms 1010a-1010c have a maximum cross dimension along the central longitudinal axis 223 that is

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greater than a maximum cross dimension in the plane of FIG. 11A perpendicular to the central longitudinal axis 223. Similarly, as shown in FIG. 11B discussed below, the isotherms 1010a-1010c may have a maximum cross dimension along the central longitudinal axis 223 that is greater than a maximum cross dimension perpendicular to the plane of FIG. 11A and perpendicular to the central longitudinal axis 223.

[0130] The offset of the centroid of the isotherms 1010a-1010c from the central longitudinal axis 223 results in greater lesion width in a plane perpendicular to the central longitudinal axis 223, as compared to a similarly sized straight needle with no filaments. The offset of the centroid of the isotherms 1010a-1010c also allows for projection of the centroid of a corresponding lesion volume in a direction away from the central longitudinal axis 223. By way of example, such offsets may advantageously enable the execution of the exemplary procedures described herein. In addition, such offsets may advantageously enable the creation of lesion volumes distal (relative to the needle 103) to potentially interfering structures (e.g., an ossified process). Moreover, such offsets may advantageously enable the needle 103 to be inserted into a patient at a more desirable angle (e.g., closer to perpendicular to the surface of the patient such as within 30° of perpendicular to the surface of the patient) than would be required using a needle without offset lesion capabilities.

[0131] FIG. 11B is an illustration of an exemplary lesion 1011 that may be created with the needle 103 of FIG. 2A. In FIG. 11B, the needle 103 has been placed perpendicular to a surface 1012. The surface 1012 may, for example, be the surface of a bone, such as a lumbar vertebra. As illustrated, the filaments 206a, 206b are deployed such they are proximate to the surface 1012. As such, the lesion 1011 has a width along the surface 1012 that is wider than would be created by the needle 103 if the filaments 206a, 206b were not deployed. Such capabilities may, for example, be advantageous where a target structure (e.g., a nerve) is known to be positioned along the surface 1012, but its exact position is unknown. In such a case, the needle 103 may be positioned generally perpendicular to the surface 1012 to achieve the illustrated lesion width along the surface 1012, whereas the needle 103 without the filaments 206a, 206b deployed, would require either multiple repositioning steps or for the needle 103 to be placed generally parallel to the surface 1012 to achieve the same lesion width along the surface 1012.

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[0132] FIG. 11C is an illustration of an exemplary lesion 1022 that may be created with a single-filament needle 1020. The single-filament needle 1020 is similar to the needle 103 with a difference that the single-filament needle 1020 includes only a single filament 1021. The filament 1021 may be configured similarly to the filaments 206a, 206b. The single-filament needle 1020 with the filament 1021 deployed may be operable to produce a lesion 1022 that is a flattened version (e.g., thinner in a direction perpendicular to the central longitudinal axis 223--the left to right direction as illustrated in FIG. 11C) of a lesion that may be produced by the needle 103 with its filaments 206a, 206b deployed. The capability to produce such a lesion shape may be beneficial when it is desirable to have a relatively large lesion in a particular direction (e.g., to compensate for the variability of location of a target nerve) and a relatively small lesion width in another direction (e.g., to avoid a structure such as viscera or a patient's skin).

[0133] Where the needle is configured such that all of the filaments of the needle are deployed on a common side of a central plane of the needle (where the central longitudinal axis is disposed entirely within the central plane), the advancement of filaments may include advancing the filaments such that when the filaments are in their respective deployed positions, the distal ends of all of the filaments are disposed on a common side of the central plane. Such deployment may enable the needle to be used to create a lesion that is offset from the tip of the needle to the same side of the central plane as the deployed filament ends. The lesion created may also be positioned at least partially distal to the tip of the needle.

[0134] Where the needle is configured as shown in FIG. 8, the advancement of filaments may include advancing the filaments such that when the filaments are in their respective deployed positions, each filament distal end defines a vertex of a polygon whose centroid is offset from a central longitudinal axis of the needle. Such deployment may enable the needle to be used to create a lesion that is offset from the tip of the needle toward the centroid. The lesion created may also be positioned at least partially distal to the tip of the needle.

[0135] The advancement of the filaments may be achieved using any of the mechanisms discussed above. For example, in the embodiment of FIG. 2A, rotating the

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actuator 216 relative to the hub 104 may cause the filaments to advance to the deployed position. The advancement of the filaments may be performed such that each of the plurality of filaments passes through a surface of the needle that is parallel to the central longitudinal axis of the needle. In an embodiment, the filaments of the needle may be advanced to a position that is an intermediate position between the retracted position and the fully deployed position. The degree of deployment may be based on the desired lesion size and/or the accuracy of the placement of needle. For example, the same needle may be used in two different procedures where the variability of the location of a target nerve is greater in the first procedure than it is in the second procedure. In such situation, the greater deployment of the filaments may be used in the first procedure, whereas in the second procedure, a smaller degree of deployment may be used since a smaller lesion may suffice to ensure that the target nerve has been lesioned. In another example, after placement of the needle during a procedure, the position of the needle may be determined to be slightly offset from a target position. In such a case, the filaments may be deployed to a greater degree than would have been required if the needle were placed exactly on target. In such a case, the greater degree of deployment may be used to compensate for the needle positioning inaccuracy. In such a case, needle repositioning and possible associated trauma may be avoided.

[0136] After advancing the filaments to the deployed position, their positions may be confirmed using the imaging system (e.g., using a fluoroscope). Furthermore, proper positioning may be verified by using the needle to stimulate the target nerve. An electrical signal (e.g., up to about 2 volts applied at about 2 Hz) may be applied to the needle and the physician may observe any related patient movement (e.g., muscle fasciculation in the territory supplied by the nerve). In another example, an electrical signal (e.g., up to about 1 volt applied at about 50 Hz) may be applied to the needle and the patient may indicate if they feel any associated sensations and their locations to assist in verifying correct needle positioning. Such stimulation (either physician-observed or patient reported) may be used to stimulate a targeted nerve to determine if the deployed position is adequate to achieve denervation of the targeted nerve. In this regard, it is desirable for the stimulation to affect the targeted nerve.

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[0137] Such stimulation may be used to attempt to stimulate a nerve that is not targeted for denervation (e.g., a nerve where no denervation is desired) to determine the position of the needle relative to such a non-targeted nerve. In this regard, if the stimulation signal does not stimulate the non-targeted nerve, it may be assumed that the position of the needle relative to the non-targeted nerve is such that the application of RF energy to the needle will not result in significant damage to the non-targeted nerve. And if the stimulation does stimulate the non-targeted nerve, the needle may be repositioned to avoid damaging the non-targeted nerve. In this regard, it is desirable for the stimulation not to affect the non-targeted nerve.

[0138] After correct needle positioning has been verified (e.g., by imaging and/or patient response), an anesthetic may be injected through the needle.

[0139] After the filaments have been advanced to the desired position, the next step may be to apply RF energy to the needle using the interconnected RF generator. In embodiments that use a separate RF probe to deliver RF energy, the RF probe may be inserted into a lumen of the needle prior to application of the RF energy. Additionally, when using such a configuration, the application of RF energy may include applying RF energy to the RF probe and conducting the RF energy away from the probe by the tip and/or filaments.

[0140] The resultant RF energy emanating from the tip and filaments may generate heat that ablates the target nerve. Such ablation may be achieved by creating a lesion that includes the target nerve. It is desired that the target nerve be completely ablated to prevent incomplete neurotomy which may result in dysesthesia and patient discomfort. In an exemplary embodiment, a lesion with a maximum cross dimension of 8-10 mm may be created. Larger or smaller lesions may be created by varying filament characteristics (e.g., filament advancement distance) and/or RF energy levels. The created lesion may be offset from the central longitudinal axis of the needle. The center of the lesion may be positioned distal to the tip of the needle. Of note, since the RF energy is emanating from the tip and filaments, a particularly sized lesion may be created with a lower peak temperature (the maximum temperature experienced in the patient) than would be possible if a needle without filaments were to be used to create the same-sized lesion. For example, a particular lesion may be achieved with the needle with deployed filaments where the peak temperature is

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about 55-60° C., whereas creation of the same lesion using a needle without filaments could require a peak temperature of about 80° C. Such lower temperatures required by the needle with deployed filaments may result in greater patient safety.

[0141] Before, during, and after the application of RF energy, a temperature sensor (e.g., thermocouple) at or near the tip of the needle may be used to monitor the temperature at or near the tip. Such readings may be used as control signals (e.g., a feedback loop) to control the application of RF energy to the needle. If it is desired to ablate additional target nerves or to ablate an additional volume to ensure ablation of the original target nerve, the spinal RF neurotomy procedure may continue.

[0142] Where the particular needle is configured to create lesions offset from the central longitudinal axis of the needle, and the additional target nerve or target volume is within a volume that may be lesioned using the needle in its current position but in a different rotational orientation, the procedure may continue as follows. First, after the initial RF energy application, the filaments may be retracted into the needle. Once retracted, the needle may be rotated, and the filaments redeployed. Next, the reoriented needle may be used to at least partially ablate the additional target nerve or target volume. Such retargeting of ablation volumes without repositioning (e.g., without withdrawing the needle from the patient and reinserting), may result in reduced patient trauma as compared to known spinal RF neurotomy procedures which may require removal and reinsertion of a needle to achieve lesioning of the second target volume. Moreover, such retargeting of ablation volumes without repositioning may result in the ability to create uniquely shaped lesions from a single insertion position. Such shaped lesions may include, for example, lesions that are in the shape of two or more intersecting spheres. The steps of retracting the filaments, rotating the needle, redeploying the filaments, and applying RF energy may be repeated a plurality of times.

[0143] Where the additional target nerve or target volume is not within a volume that may be lesioned using the needle in its current position, the needle may be repositioned. Such repositioning may include partially or fully removing the needle from the patient and then repositioning the needle and repeating the above-described steps.

[0144] At any point where no additional lesioning is desired, the filaments of the needle may be retracted, and the needle may be removed from the patient. After removal of

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the needle, a sterile bandage may be placed over the needle insertion site or sites. The patient may then be held for observation and recovery from the effects of any sedative that may have been administered.

[0145] Examples of specific spinal RF neurotomy procedures will now be described. Generally, steps unique to each procedure will be discussed while steps common to any spinal RF neurotomy procedure (e.g., site preparation, needle removal) will not be further discussed. Each of the procedures is described as being performed with the needle 103 of FIGS. 2A-6. It will be appreciated that the variations in needle configuration discussed above may be used in these procedures. For example, to increase the offset of the created lesion relative to the central longitudinal axis, curved (e.g., FIG. 10) and/or partially insulated filaments may be used that may create a lesion with a greater offset from the central longitudinal axis than the embodiment of FIG. 2A-6.

[0146] 1. Lumbar RF Neurotomy of a Medial Branch Nerve Proximate a Lumbar Facet Joint.

[0147] This process may include using a needle that enables the creation of lesions which are offset from the central longitudinal axis of the needle. The procedure will be described as being performed on the L5 vertebra 1101 using FIG. 12 and the needle 103 of FIG. 2A. It should be understood that other embodiments of needles described herein may be used in the procedure.

[0148] The lumbar RF neurotomy process may include positioning the tip 201 of the needle 103 (e.g., using fluoroscopic navigation) such that it is in contact with, or proximate to the groove 1102 between the transverse 1103 and superior articular 1104 processes of the targeted lumbar vertebra 1101. Such positioning is shown in FIG. 12. By contacting the lumbar vertebra 1101, a positive determination of the position of the needle 103 may be made. By way of example, such positioning may be performed such that the needle 103 is within 30° of being perpendicular to the lumber vertebra 1101 at the point of contact with the lumbar vertebra 1101, or at the point of the lumbar vertebra 1101 closest to the tip 201 of the needle 103. Optionally, from such a position, the needle 103 may be retracted a predetermined amount (e.g., between about 3 mm and 5 mm) as measured by

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markers 224 on the needle 103, as determined using the collar about the elongated member 203 discussed above, and/or by fluoroscopic navigation.

[0149] The process may include rotating the needle 103 such that the midpoint 502 is oriented toward the superior articular process 1104 and a medial branch nerve 1105 that is positioned along a lateral face 1106 of the superior articular process 1104. Next, the filaments 206a, 206b may be advanced to the deployed position (as shown in FIG. 12). The position of the needle 103 and deployed filaments 206a, 206b may be verified using fluoroscopy and/or patient stimulation. The RF probe 401 may then be inserted into the lumen 222 such that RF energy emanating from the probe 103 will be conducted by the tip 201 and filaments 206a, 206b to the target medial branch nerve 1105 and away from the intermediate branch of the posterior primary ramus.

[0150] Next, RF energy may be applied to the RF probe 401. The RF energy emanating from the needle 103 may be preferentially biased toward the target medial branch nerve 1105. The lesion created by such a procedure may, for example, have a maximum cross dimension of 8-10 mm, and may ablate a corresponding portion of the medial branch nerve 1105, thus denervating the facet joint.

[0151] In a variation, the needle may be operable to create a generally symmetric lesion relative to its central longitudinal axis. In such a variation the sequence of steps may include insert needle, deploy filaments, and apply RF energy.

[0152] In another variation, the needle may be inserted so it is positioned along the length of a portion of the nerve (as illustrated by needle 103'). Such positioning is similar to known methods of RF neurotomy performed with needles without filaments. After positioning the needle, the filaments may be deployed and a lesion may be created. As noted above, a needle with deployable filaments that is capable of producing a lesion equivalent to that of a needle without deployable filaments may be smaller in diameter than the needle without deployable filaments. Accordingly, although the positioning of needle 103' may be similar to known processes, the process utilizing the needle with deployable filaments may cause less trauma and be safer than procedures using a needle without deployable filaments due to the smaller size of the needle with deployable filaments. Moreover, as discussed above, the peak temperatures required to produce the desired lesion volume may be less when

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using the needle with deployable filaments as compared to the needle without deployable filaments, further contributing to patient safety. Furthermore, the filaments of needle 103' may be partially or fully deployed to achieve a desired lesion location, shape and/or size.

[0153] It is noted that the illustrated deployment of needle 103 with the filaments 206a, 206b deployed may be used to create a lesion that approximates a lesion that would be created with the a prior art (non filament) needle placed in the position of needle 103' (e.g., parallel to the target nerve 1105). Moreover, the placement of needle 103 generally perpendicular to the surface of the L5 vertebra 1101 may be less difficult to achieve than the parallel placement of the needle 103'.

[0154] 2. Sacroiliac Joint (SIJ) RF Neurotomy of the Posterior Rami.

[0155] This process may include using a needle that enables the creation of lesions which are offset from the central longitudinal axis of the needle. The procedure will be described as being performed on the posterior rami 1201 of the SIJ referencing FIG. 13 and using the needle 103 of FIGS. 2A-6. It should be understood that other embodiments of needles described herein may be used in the procedure.

[0156] As part of the SIJ RF neurotomy process, it may be desirable to create a series of lesions in a series of lesion target volumes 1203a-1203h lateral to the sacral foramina 1211, 1212, 1213 of a side of the sacrum 1200 to ablate posterior rami 1201 that are responsible for relaying nociceptive signals from the SIJ. Since the exact positions of the rami 1201 may not be known, lesioning such a series of target volumes 1203a-1203h may accommodate the variations in rami 1201 positions. The series of target volumes 1203 may be in the form of one or more interconnected individual target volumes, such as target volumes 1203a and 1203b. In addition, the process may include an additional lesion 1208 between the L5 vertebra 1209 and the sacrum 1200.

[0157] The SIJ RF neurotomy process may include positioning the tip 201 of the needle 103 (e.g., using fluoroscopic navigation) such that it is in contact with, or proximate to, and in lateral relation to the S1 posterior sacral foraminal aperture (PSFA) 1211 at a first point 1204 that is at the intersection of the two target volumes 1203a and 1203b. Such positioning may be performed such that the needle 103 is oriented within 30° of being perpendicular to the sacrum 1200 at the point of contact (or at the point of the sacrum 1200

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closest to the tip 201 of the needle 103). By contacting the sacrum 1200, a positive determination of the position of the needle 103 may be made. Optionally, from such a position, the needle 103 may be retracted a predetermined amount (e.g., between 3 mm and 5 mm) as measured by markers 224 on the needle 103, as determined using the collar about the elongated member 203 discussed above, and/or by fluoroscopic navigation. For example, a contralateral posterior oblique view may be obtained to ascertain that the tip 201 has not entered the spinal canal. For example, a fluoroscopic view may be obtained looking down the length of the needle 103 to verify that the needle 103 is properly offset from the S1 PSFA 1211 and/or a fluoroscopic view may be obtained looking perpendicular to the central longitudinal axis 223 of the needle 103 to verify that the needle is not below the surface of the scrum (e.g., disposed within the S1 PSFA 1211). Additionally, an electrical signal may be applied to the needle 103 to stimulate nerves proximate to the tip 201 to verify correct needle 103 placement.

[0158] The process may include rotating the needle 103 such that the midpoint 502 is oriented toward the first target volume 1203a in the direction of arrow 1205a. Next, the filaments 206a, 206b may be advanced to the deployed position. The position of the needle 103 and deployed filaments 206a, 206b may be verified using fluoroscopy and/or stimulation. The RF probe 401 may then be inserted into the lumen 222 such that RF energy emanating from the needle 103 will be conducted by the tip 201 and filaments 206a, 206b to the first target volume 1203a. Next, RF energy may be applied to the RF probe 401. The RF energy emanating from the needle 103 may be preferentially biased toward the first target volume 1203a. The lesion created by such an application of RF energy may, for example, have a maximum cross dimension of 8-10 mm, and may ablate a corresponding portion of the rami 1201.

[0159] Next, the filaments 206a, 206b may be retracted and the needle 103 may be rotated approximately 180 degrees such that the midpoint 502 is oriented toward the second target volume 1203b in the direction of arrow 1205b. Optionally, some lateral repositioning of the needle may performed (e.g. without any needle pull back or with a small amount of needle pull back and reinsertion). Next, the filaments 206a, 206b may be advanced to the deployed position. The position of the needle 103 and deployed filaments 206a, 206b

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may be verified using fluoroscopy and/or stimulation. Next, RF energy may be applied to the RF probe 401 to create a lesion corresponding to the second target volume 1203b.

[0160] In this regard, with a single insertion of the needle 103, two interconnected lesions (which may also be considered to be a single oblong lesion) may be created. Thus, as compared to known methods where an RF probe must be repositioned prior to each application of RF energy, the number of probe repositioning steps may be greatly reduced, thus reducing patient trauma and procedure duration. In this regard, a continuous region of lesioning may be achieved disposed about the S1 PSFA 1211 such that the lesion occupies a volume surrounding the S1 PSFA 1211 from about the 2:30 clock position to about the 5:30 clock position (as viewed in FIG. 13). Such lesioning may help to achieve denervation of the posterior rami proximate to the S1 PSFA 1211.

[0161] The above procedure may be repeated as appropriate to create lesions corresponding to the entire series of target volumes 1203a-1203h, thus denervating the SIJ. In this regard, a similar continuous region of lesioning may be achieved disposed about the S2 PSFA 1212 and a region of lesioning from about the 12:00 clock position to about the 3:00 clock position (as viewed in FIG. 13) relative to the S3 PSFA may be achieved disposed about the S3 PSFA 1213. Furthermore, a lesion 1208 may be created at the base of the superior articular process of the L5 1209 dorsal ramus in the grove between the superior articular process and the body of the sacrum. The needle 103 may be inserted generally perpendicular to the plane of FIG. 13 to produce lesion 1208.

[0162] In a variation of the above procedure, three or more lesions may be created with a needle in a single position. For example, a needle positioned at a point 1106 proximate to three target volumes 1203c, 1203d, and 1203e, may be operable to create lesions at each of the three target volumes 1203c, 1203d, and 1203e, thus further reducing the number of needle repositionings.

[0163] In another variation, each individual lesion corresponding to the series of target volumes 1203 may be created using a needle with deployable filaments where the needle is repositioned prior to each application of RF energy. In such a variation the sequence of steps may be insert needle, deploy filaments, apply RF energy, retract filaments, reposition needle, and repeat as appropriate to create each desired lesion. Such a procedure may be

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conducted using a needle capable of producing a lesion symmetric to a central longitudinal axis of the needle (e.g., the needle of FIG. 9).

[0164] 3. Thoracic RF Neurotomy of a Medial Branch Nerve.

[0165] This process may include using a needle that enables the creation of lesions which are offset from the central longitudinal axis of the needle. Successful treatment of thoracic z-joint pain using radiofrequency ablation of relevant medial branch nerves is challenging owing to the inconsistent medial branch location in the intertransverse space, especially levels T5-T8. A conventional RF cannula must be positioned at multiple locations within the intertransverse space to achieve the sufficient tissue ablation for successful medial branch neurotomy. The procedure will be described as being performed on an intertransverse space between adjacent ones 1301, 1302 of the T5 to T8 thoracic vertebrae using FIG. 14 and the needle 103 of FIGS. 2A-6. It should be understood that other embodiments of needles described herein may be used in the procedure.

[0166] The process may include obtaining an optimized segmental anteroposterior image at target level defined by meticulous counting from T1 and T12. This may be followed by obtaining an image that is ipsalateral oblique 8-15 degrees off sagittal plane of the spine to visualize costotransverse joint lucency clearly. This allows improved visualization of superior-lateral transverse process (especially in osteopenic patients). This angle aids in directing the probe to a thoracic anatomic safe zone medial to the lung, minimizing risk of pneumothorax.

[0167] The skin entry site for the needle 103 may be over the most inferior aspect of transverse process slightly medial to costotransverse joint. Inserting the needle 103 may include navigating the device over transverse process over bone to touch superior transverse process slightly medial to costotransverse joint. The process may include checking anteroposterior imaging to demonstrate active tip 201 of the needle 103 is at the superolateral corner of the transverse process. The process may also include checking a contralateral oblique (e.g., +/-15 degrees) image view to demonstrate the target transverse process in an elongate fashion. This view is useful for demonstrating the tip 201 of the needle 103 in relationship to the superolateral margin of the transverse process subadjacent to the targeted

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medial branch nerve. The process may include retracting the active tip 201 slightly (e.g., 1 mm to 3 mm).

[0168] The process may include rotating the needle 103 such that the midpoint 502 is oriented toward the intertransverse space between the vertebrae 1301, 1302 and the medial branch nerve 1303 that is positioned therein. Next, the filaments 206a, 206b may be advanced ventral into the intertransverse space between the vertebrae 1301, 1302 to the deployed position. The position of the needle 103 and deployed filaments 206a, 206b may be verified using fluoroscopy (e.g., using lateral imaging). The RF probe 401 may then be inserted into the lumen 222 such that RF energy emanating from the probe 103 will be conducted by the tip 201 and filaments 206a, 206b to the target medial branch nerve 1303. Stimulation (e.g., motor and/or sensory) may be performed to verify positioning. Next, RF energy may be applied to the RF probe 401. The RF energy emanating from the needle 103 may be preferentially biased toward the volume between the vertebrae 1301, 1302. The lesion created by such a procedure may, for example, have a maximum cross dimension of 8-10 mm, and may ablate a corresponding portion of the medial branch nerve 1303.

[0169] It is noted that thoracic RF neurotomy performed on other thoracic vertebrae may require different sized lesions. For example, thoracic RF neurotomy performed on the T3-T4 vertebrae may require a smaller lesion volume than the above-described procedure, and thoracic RF neurotomy performed on the T1-T2 vertebrae may require a still smaller lesion volume. As described herein, the deployment of the filaments of the needle 103 may be varied to achieve such desired target lesion volumes.

[0170] 4. Cervical Medial Branch RF Neurotomy.

[0171] Embodiments of needles described herein (e.g., the needle 103 of FIG. 2A) are capable of creating a volume of tissue ablation necessary for complete denervation of the cervical zygapophyseal joints, including the C2/3 cervical zygapophyseal joint (z-joint). Tissue ablation for cervical z-joint using embodiments of needles described herein may be accomplished using a single placement and single heating cycle. Such single placement and single heating cycle may avoid unnecessary tissue damage from multiple placements of a conventional probe, and unintended injury to collateral tissue caused by excessive lesioning. The zone of ablation created by various embodiments of the device is designed to provide

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sufficient, and necessary tissue coagulation for a successful procedure, and thus may be expected to improve the outcomes of patients undergoing this spinal radiofrequency neurotomy.

[0172] A cervical medial branch RF neurotomy procedure will be described as being performed on the third occipital nerve at the C2/3 z-joint using the needle 103 as shown in FIG. 15. In FIG. 15, the needle 103 is positioned between the C2 1401 and C3 1402 vertebrae.

[0173] In a first step, the patient may be placed in a prone position on a radiolucent table suited to performing fluoroscopically guided spinal procedures. Sedation may be administered. The patient's head may be rotated away from the targeted side. Sterile skin prep and draping may be performed using standard well-described surgical techniques.

[0174] For Third Occipital Nerve (TON) ablation (C2/3 joint innervation) the lateral aspect of the C2/3 Z-joint is located under either parasagittal or alternatively, ipsilateral oblique rotation of less than/equal to 30 degrees of obliquity relative to the true sagittal plane of the cervical spine. The skin entry point may be infiltrated with local anesthetic. Then the tip 201 of the needle 103 is moved over the most lateral aspect of bone of the articular pillar at the juncture of the C2/3 z-joint to a first position contacting bone proximate to the most posterior and lateral aspect of the z-joint complex

[0175] Once boney contact is made, the needle 103 may be retracted a predetermined distance (e.g., 1-3 mm) and the filaments are deployed towards the lateral aspect of the C2/3 z-joint. The needle 103 may be rotated about a central longitudinal axis prior to filament deployment to ensure that deployment will occur in the desired direction.

[0176] Multiplanar fluoroscopic imaging may then be employed to verify that the tip and filaments are positioned as desired. For example, it may be verified that the filaments are positioned straddling the lateral joint lucency, and posterior to the C2/3 neural foramen. Useful imaging angles include anterior-posterior (AP), lateral, and contralateral oblique (Sluijter) views. To further verify adequate positioning of the needle 103, motor stimulation may be performed by delivering a voltage (of up to 2 volts) at 2 Hz to the tip 201 and filaments. Furthermore, sensory stimulation may be performed at appropriate voltage (e.g., 0.4 to 1 volt) and frequency (e.g., 50 Hz).

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[0177] After position verification, RF energy may be applied to the tip and the plurality of filaments to generate heat that ablates a portion of the third occipital nerve. After lesioning, the device may be removed. For levels below the C2/3 z-joint, the procedure may be similar than as described above with respect to the third occipital nerve, with the exception that the initial boney contact target is at the waist of inflection point of the articular pillar.

[0178] Similar to the above procedures, other spinal RF procedures may benefit from the asymmetrical application of RF energy from embodiments of probes described herein. Such asymmetry may, for example, be used to project RF energy in a desired direction and/or limit the projection of RF energy in undesired directions. The configuration of the filaments may be selected for a particular application to produce a desired size, shape and location (relative to the needle tip) of a lesion within the patient. The location of the lesion may be offset distally and/or laterally from the tip of the needle as required for a particular application.

[0179] It will be appreciated that the delivery of RF energy to tissue in the anatomy is practiced for a multitude of reasons and embodiments of needles described herein may be adapted (modified or scaled) for use in other medical procedures. For example, embodiments of needles described herein could be used to deliver RF energy as a means to cauterize "feeder vessels," such as in bleeding ulcers and/or in orthopedic applications. Further, embodiments of needles described herein could also be adapted to procedures such as cardiac ablation, in which cardiac tissue is destroyed in an effort to restore a normal electrical rhythm in the hart. This application could further benefit from the ability of embodiments of needles described herein to deliver fluid through a lumen since, for example, emerging procedures in cardiac therapy require the ability to deliver stem cells, vascular endothelial growth factor (VEGF), or other growth factors to cardiac tissue. The ability to steer embodiments of the needle (previously discussed) may provide significant benefit to the in the field of cardiovascular drug delivery.

[0180] While various embodiments of the present invention have been described in detail, it is apparent that further modifications and adaptations of the invention will occur to those skilled in the art. However, it is to be expressly understood that such modifications and adaptations are within the spirit and scope of the present invention.

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WHAT IS CLAIMED IS:

1. A needle for insertion into a patient during an RF ablation procedure, the needle comprising:

a hub;

an elongate member fixed to the hub;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments disposed within at least a portion of the elongate member;

an actuator interconnected to the plurality of filaments, wherein movement of the actuator relative to the hub moves the plurality relative to the tip; and

a lumen within the elongate member, wherein the lumen and the tip are configured to accept an RF probe such that an electrode of an inserted RF probe, the tip, and the first and second filaments are operable to form a single monopolar RF electrode.

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ABSTRACT

Methods and systems for spinal radio frequency neurotomy. Systems include needles capable of applying RF energy to target volumes within a patient. Such target volumes may contain target medial branch nerves along vertebrae or rami proximate the sacrum. Such procedures may be used to ablate or cauterize a portion of the targeted nerve, thus blocking the ability of the nerve to transmit signals to the central nervous system. Disclosed needles may be operable to asymmetrically, relative to a central longitudinal axis of the needle, apply RF energy. Such asymmetry facilitates procedures where a tip of the needle is placed proximate to anatomical structures for location verification. Then RF energy may be applied in a selectable direction relative to the needle tip to ablate volumes that include the targeted medial branch nerves or rami, thus denervating facet joints or the sacroiliac joint, respectively, to relieve pain in a patient.

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Electronic Acknowledgement Receipt

EFS ID:	25489255
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	20995
Filer:	Adam J. Gilbert/Kevin Kraus
Filer Authorized By:	Adam J. Gilbert
Attorney Docket Number:	NBUS.001C1
Receipt Date:	14-APR-2016
Filing Date:	
Time Stamp:	14:01:42
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	2016-04-14_ADS_001C1.pdf	1823170 addd534edf2a9aef3ce16d783d3f6245f56ff77a	no	9

Warnings:	
Information:	

2	Drawings-only black and white line drawings	2016-04-14_Drawings_001C1.pdf	1105058 3050b8de248c1a1740312f42eab86538af879691	no	19
Warnings:					
Information:					
3		2016-04-14_Specification_001C1.pdf	193701 6968eeb064b31ec21a075c03520624d4918a695c	yes	48

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	46
	Claims	47	47
	Abstract	48	48

Warnings:	
Information:	
Total Files Size (in bytes):	3121929

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 15/098,673

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	1 minus 20 =	*	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	730		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/098,673	04/14/2016	3739	0.00	NBUS.001C1	1	1

CONFIRMATION NO. 5232

FILING RECEIPT

20995
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

OC000000082355375

Date Mailed: 04/29/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Robert E. Wright, Denver, CO;
Scott A. Brandt, Denver, CO;

Applicant(s)

Nimbus Concepts, LLC, Denver, CO;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 12/940,974 11/05/2010 ABN
which claims benefit of 61/280,557 11/05/2009
and claims benefit of 61/347,351 05/21/2010

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 04/27/2016

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The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/098,673**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

Preliminary Class

606

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1

CONFIRMATION NO. 5232

20995
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IRVINE, CA 92614

FORMALITIES LETTER

OC000000082555376

Date Mailed: 04/29/2016

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
- The application search fee must be submitted.
- The application examination fee must be submitted.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
  - The drawings must be reasonably free from erasures and must be free from alterations, overwriting, interlineations, folds, and copy marks. See Figure(s) ALL.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

- Surcharge as set forth in 37 CFR 1.16(f) must be submitted.
  The surcharge is due for any one of:
  - late submission of the basic filing fee, search fee, or examination fee,
  - late submission of inventor's oath or declaration,
  - filing an application that does not contain at least one claim on filing, or
  - submission of an application filed by reference to a previously filed application.

SUMMARY OF FEES DUE:

The fee(s) required within **TWO MONTHS** from the date of this Notice to avoid abandonment is/are itemized below. Small entity discount is in effect. If applicant is qualified for micro entity status, an acceptable Certification

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of Micro Entity Status must be submitted to establish micro entity status. (See 37 CFR 1.29 and forms PTO/SB/15A and 15B.)

- $ **70** basic filing fee.
- $ **70** surcharge.
- $ **300** search fee.
- $ **360** examination fee.
- $(**0**) previous unapplied payment amount.
- $ **800** TOTAL FEE BALANCE DUE.

Items Required To Avoid Processing Delays:

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Robert E. Wright
  Scott A. Brandt

Replies must be received in the USPTO within the set time period or must include a proper Certificate of Mailing or Transmission under 37 CFR 1.8 with a mailing or transmission date within the set time period. For more information and a suggested format, see Form PTO/SB/92 and MPEP 512.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web, including a copy of this Notice and selecting the document description "Applicant response to Pre-Exam Formalities Notice". https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at 1-866-217-9197 or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/sphouminh/

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 84 of 691

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Inventor	:	Wright et al.
App. No.	:	15/098,673
Filed	:	April 14, 2016
For	:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
Examiner	:	Unassigned
Art Unit	:	3739
Conf. No.	:	5232

PRELIMINARY AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Prior to examination, please enter the amendments submitted herein.

Amendments to the Drawings begin on page 2 of this paper. A "Replacement Sheet" for each sheet of drawings being amended is filed herewith.

Remarks begin on page 4 of this paper.

Petitioner's Exhibit 1007
Avanos v. Stratus
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AMENDMENTS TO THE DRAWINGS

The Replacement Sheet 1/19, which includes FIG. 1, replaces the original sheet including FIG. 1.

The Replacement Sheet 2/19, which includes FIG. 2A, replaces the original sheet including FIG. 2A.

The Replacement Sheet 3/19, which includes FIG. 2B, replaces the original sheet including FIG. 2B.

The Replacement Sheet 4/19, which includes FIG. 2C, replaces the original sheet including FIG. 2C.

The Replacement Sheet 5/19, which includes FIG. 3A, replaces the original sheet including FIG. 3A.

The Replacement Sheet 6/19, which includes FIG. 3B, replaces the original sheet including FIG. 3B.

The Replacement Sheet 7/19, which includes FIG. 3C, replaces the original sheet including FIG. 3C.

The Replacement Sheet 8/19, which includes FIG. 4, replaces the original sheet including FIG. 4.

The Replacement Sheet 9/19, which includes FIG. 5, replaces the original sheet including FIG. 5.

The Replacement Sheet 10/19, which includes FIG. 6, replaces the original sheet including FIG. 6.

The Replacement Sheet 11/19, which includes FIG. 7, replaces the original sheet including FIG. 7.

The Replacement Sheet 12/19, which includes FIG. 8, replaces the original sheet including FIG. 8.

The Replacement Sheet 13/19, which includes FIG. 9, replaces the original sheet including FIG. 9.

The Replacement Sheet 14/19, which includes FIG. 10, replaces the original sheet including FIG. 10.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 86 of 691

The Replacement Sheet 15/19, which includes FIGS. 11A-11C, replaces the original sheet including FIGS. 11A-11C.

The Replacement Sheet 16/19, which includes FIG. 12, replaces the original sheet including FIG. 12.

The Replacement Sheet 17/19, which includes FIG. 13, replaces the original sheet including FIG. 13.

The Replacement Sheet 18/19, which includes FIG. 14, replaces the original sheet including FIG. 14.

The Replacement Sheet 19/19, which includes FIG. 15, replaces the original sheet including FIG. 15.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 87 of 691

REMARKS

Drawing Amendments

The Notice to File Missing Parts dated April 29, 2016 states that the drawings as filed were not reasonably free from erasures and/or were not free from alterations, overwriting, interlineations, folds, and copy marks. The Applicant does not necessarily agree that any extraneous marks were unreasonable. Nevertheless, to avoid abandonment in compliance with the Notice, the Applicant submits herewith drawings that are freer of extraneous marks.

No Disclaimers or Disavowals

Although the present and previous communications may include or have included alterations to the application or claims, or characterizations of claim scope or referenced art, the Applicant is not conceding in this application that previously pending claims are not patentable over the cited references. Rather, any alterations or characterizations are being made or were made to facilitate expeditious prosecution of this application. The Applicant expressly reserves the right to pursue at a later date any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child, or related prosecution history shall not reasonably infer that the Applicant has made any disclaimers or disavowals of any subject matter supported by the present application.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: November 29, 2016

By: /Adam Gilbert/
Adam Gilbert
Registration No. 59,967
Attorney of Record
Customer No. 20,995
(949) 760-0404

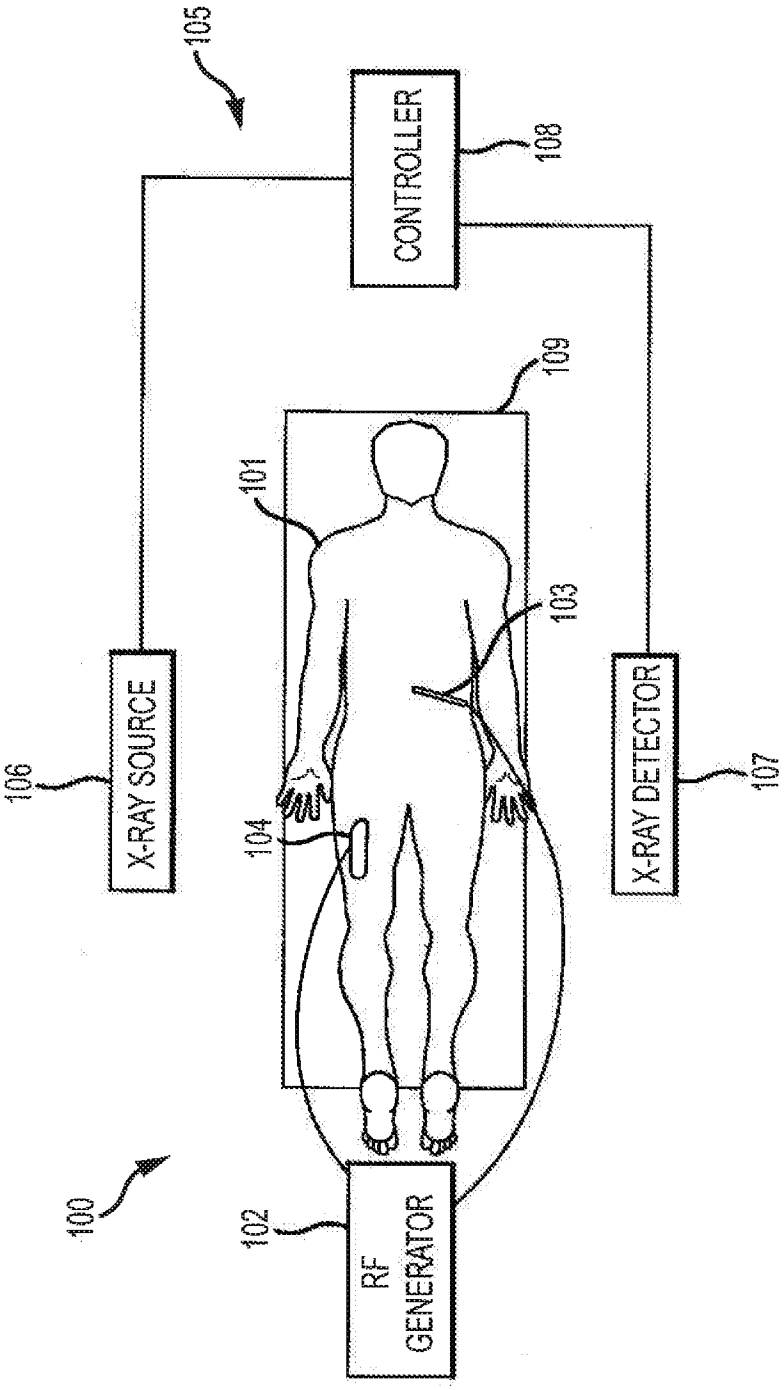

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X-RAY SOURCE
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X-RAY DETECTOR
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RF GENERATOR

FIG. 1

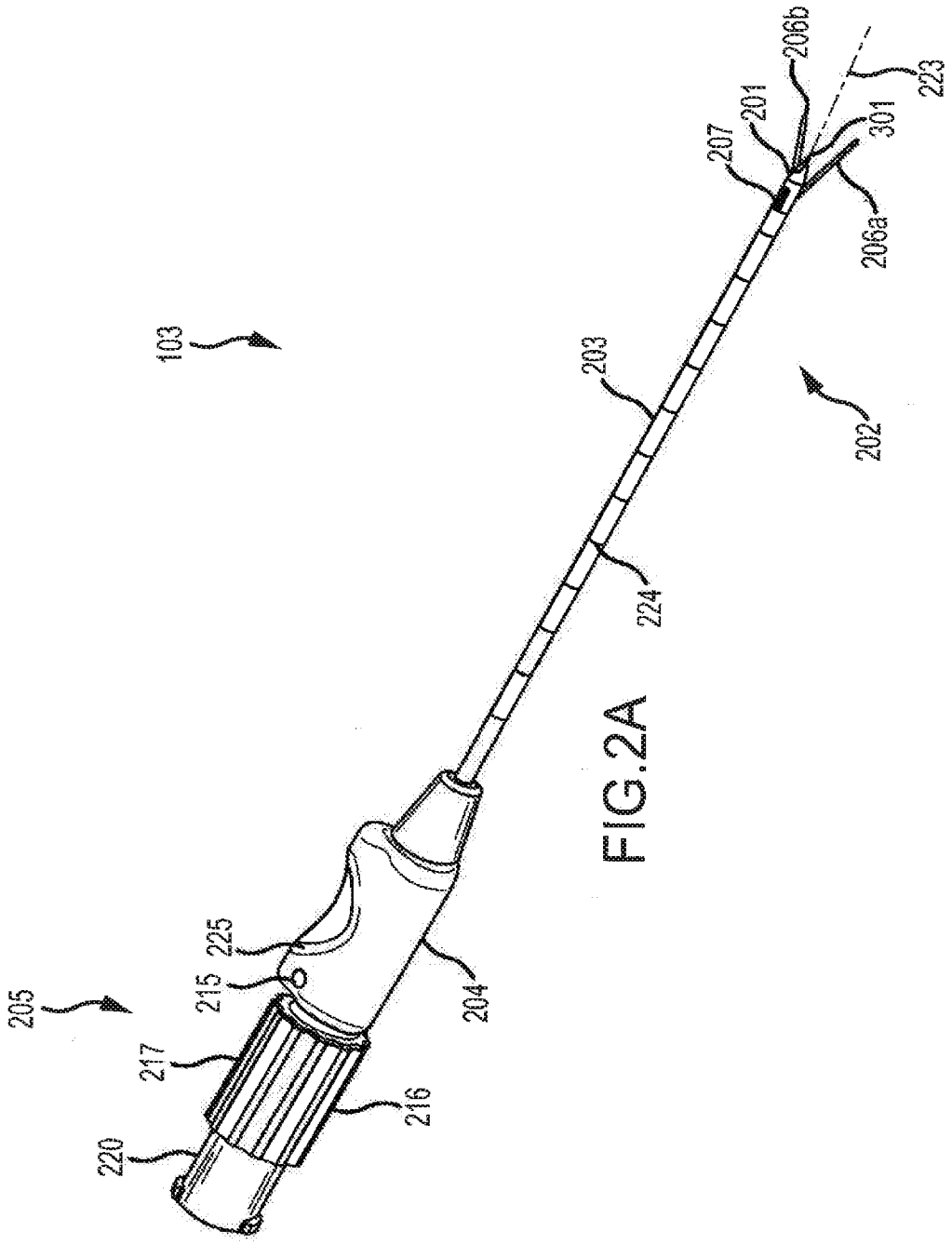

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FIG.2A

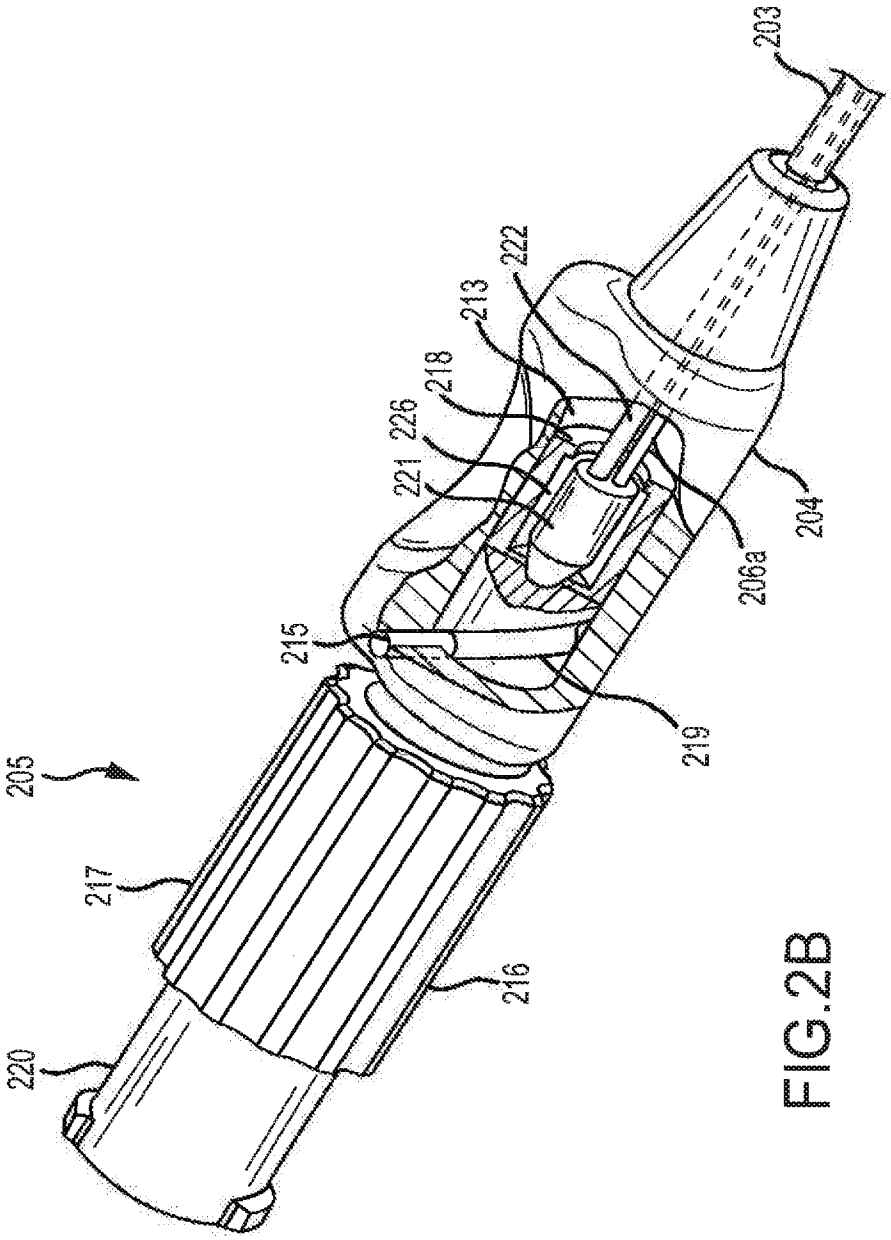


FIG.2B

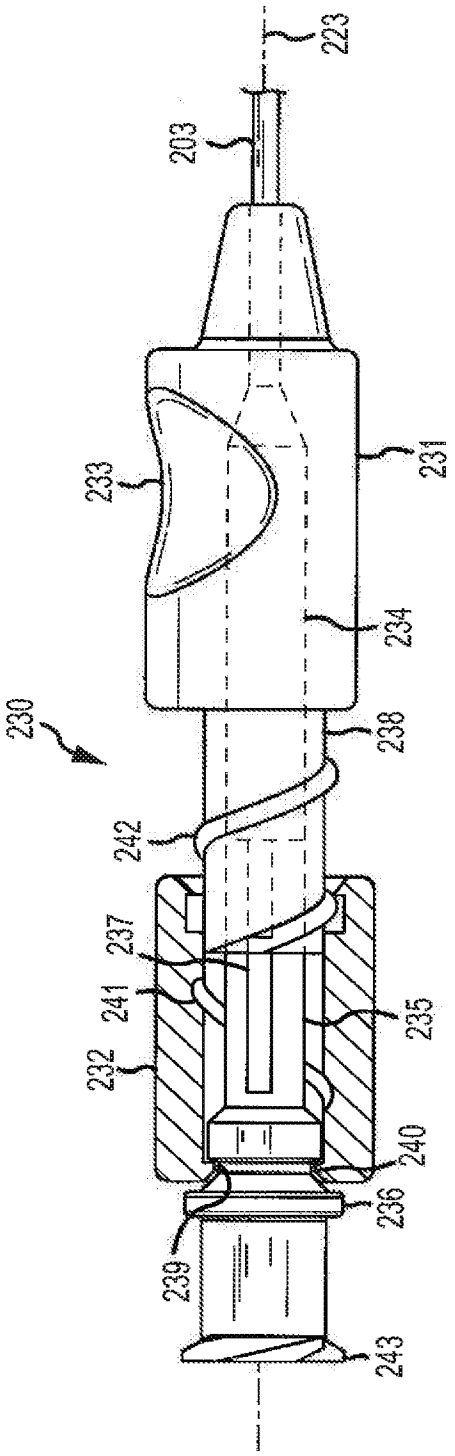


FIG.2C

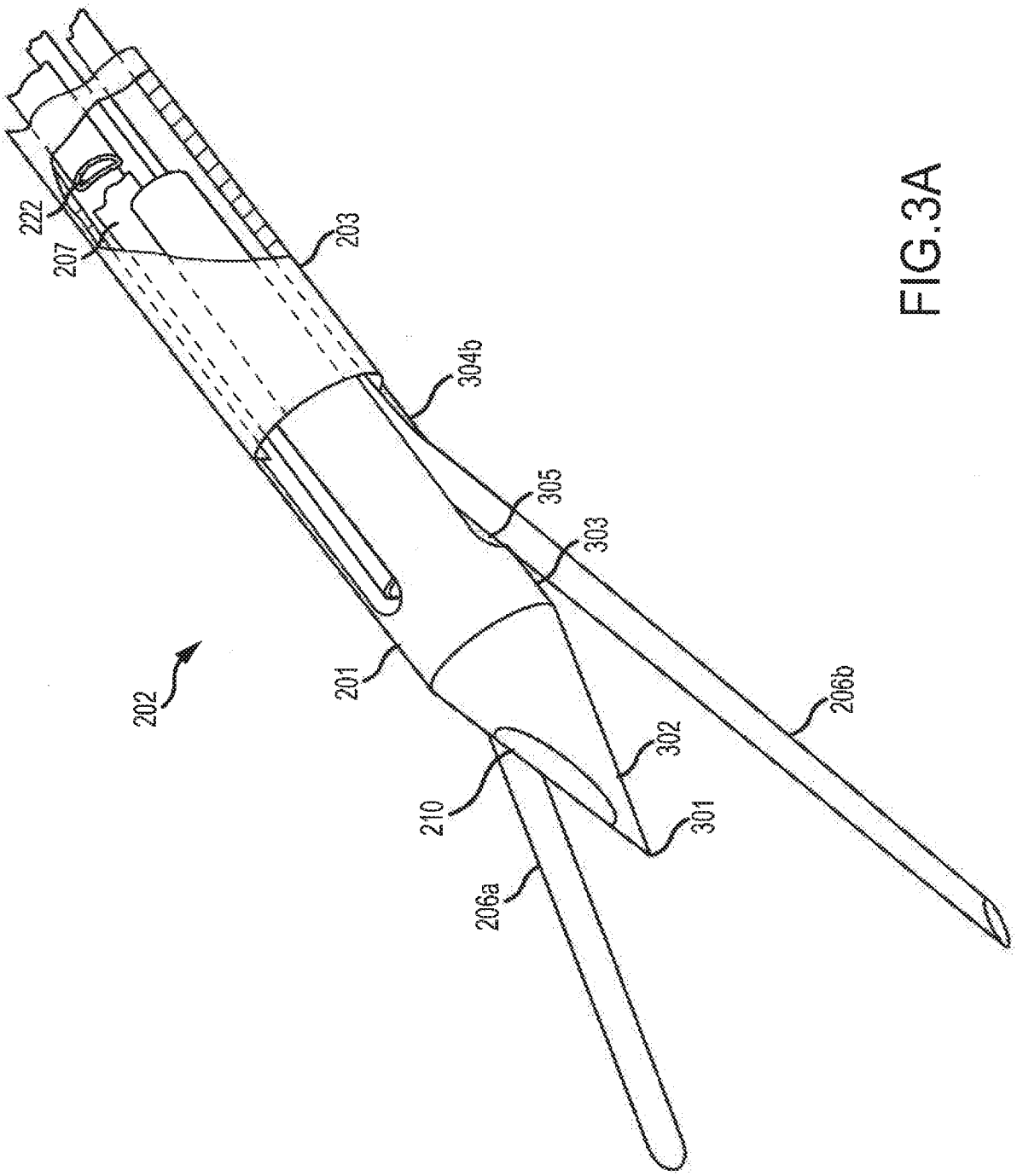


FIG.3A

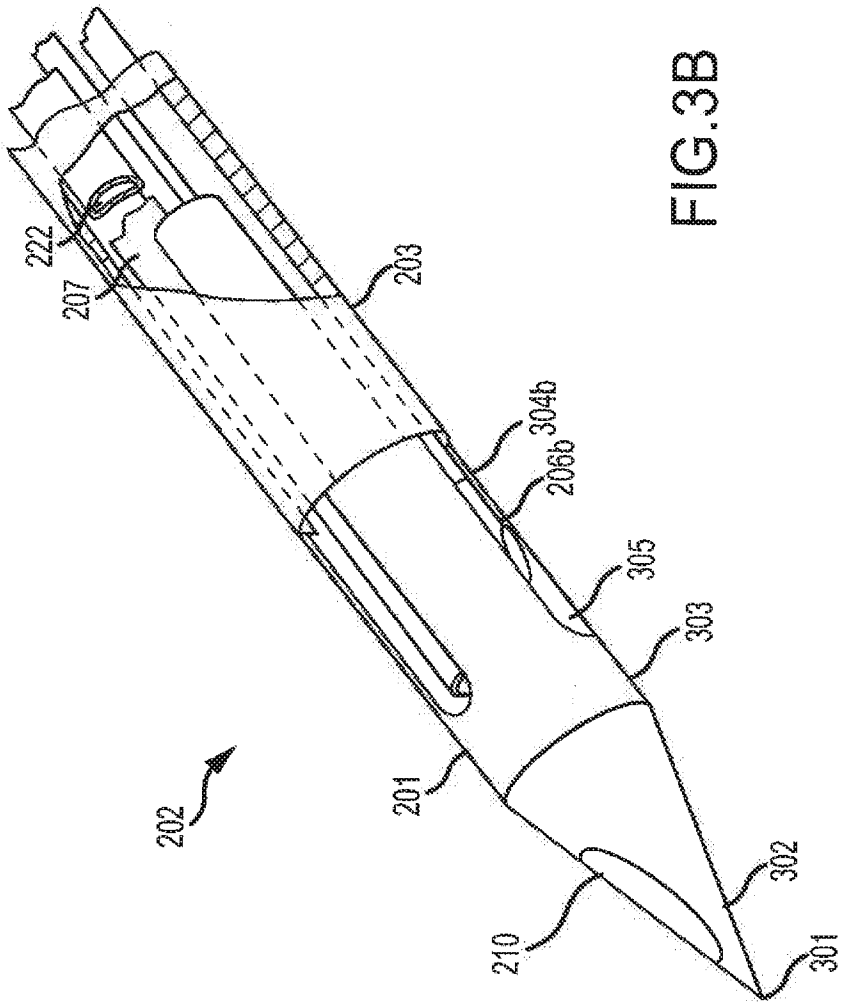


FIG.3B

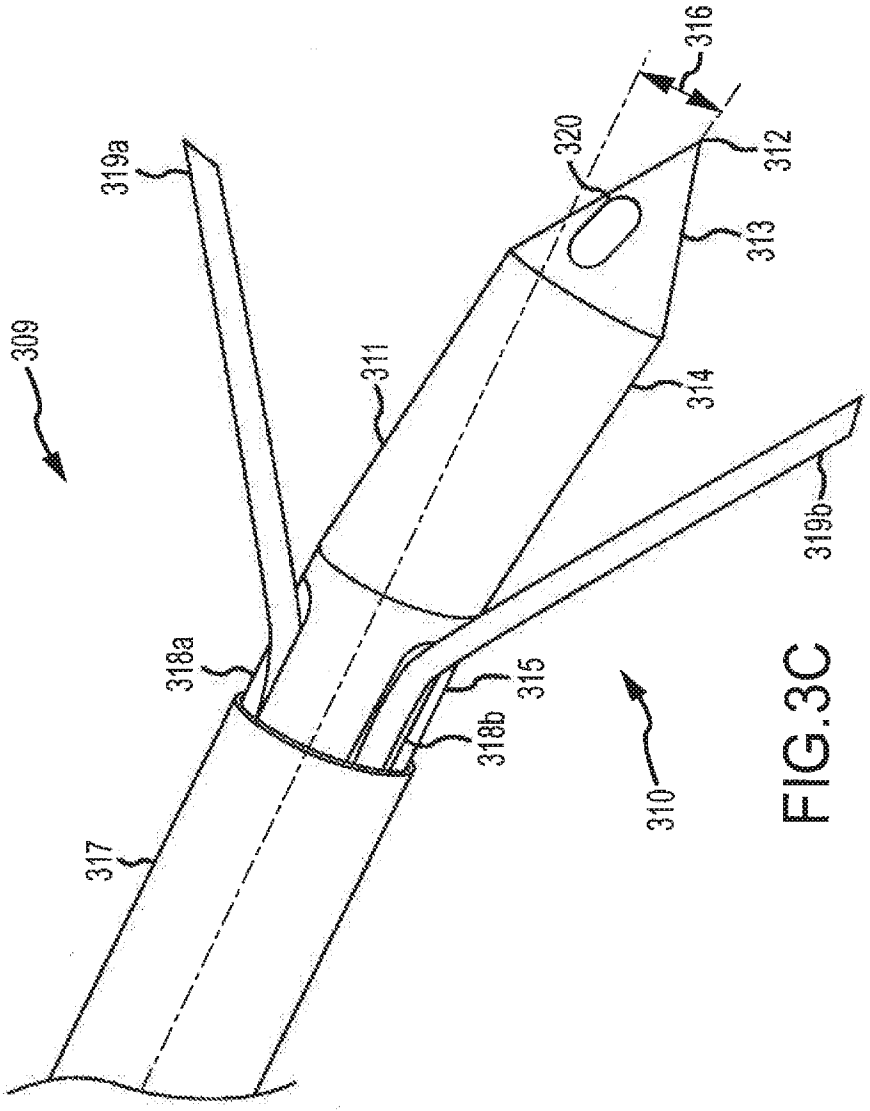


FIG.3C

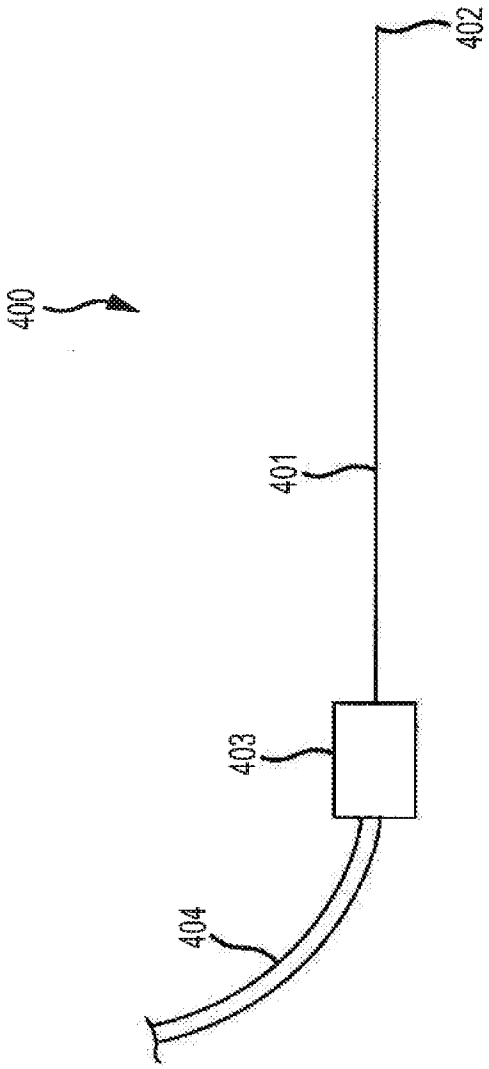


FIG.4

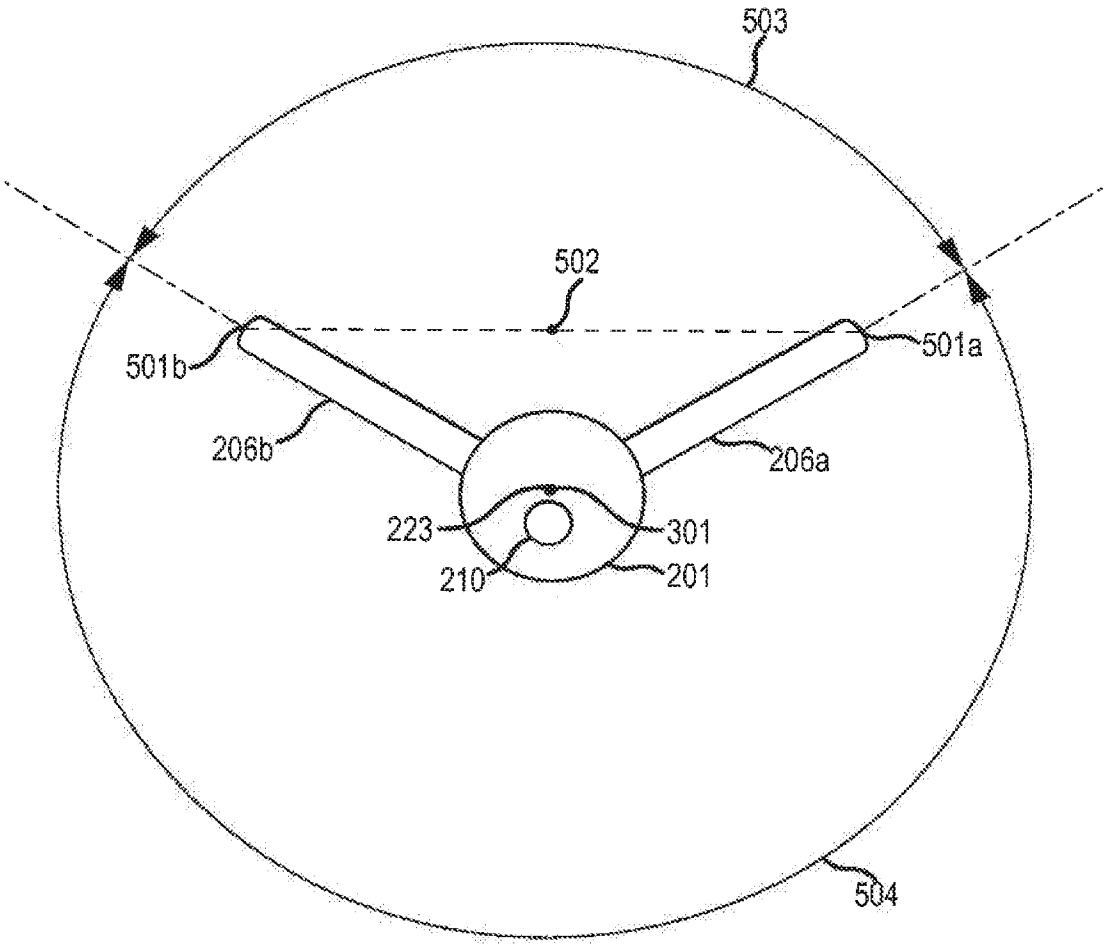


FIG.5

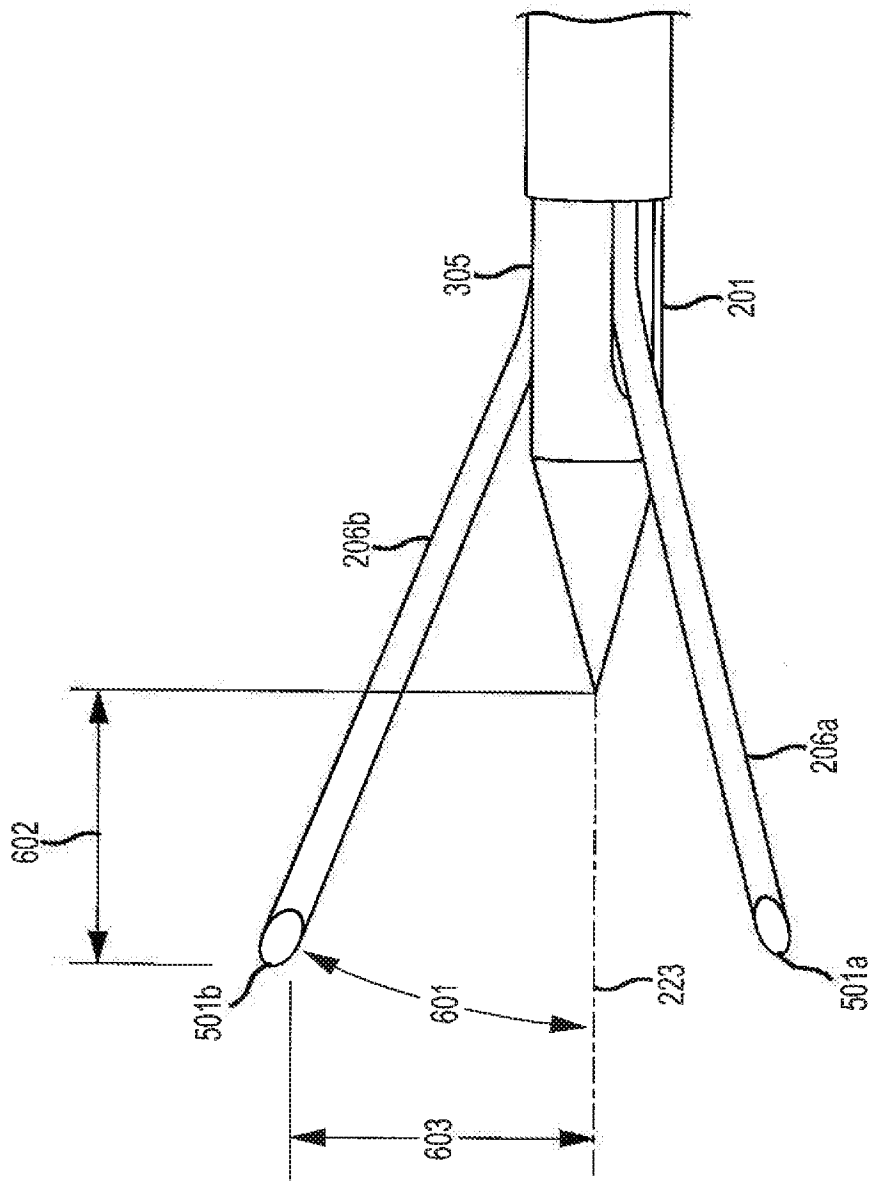


FIG.6

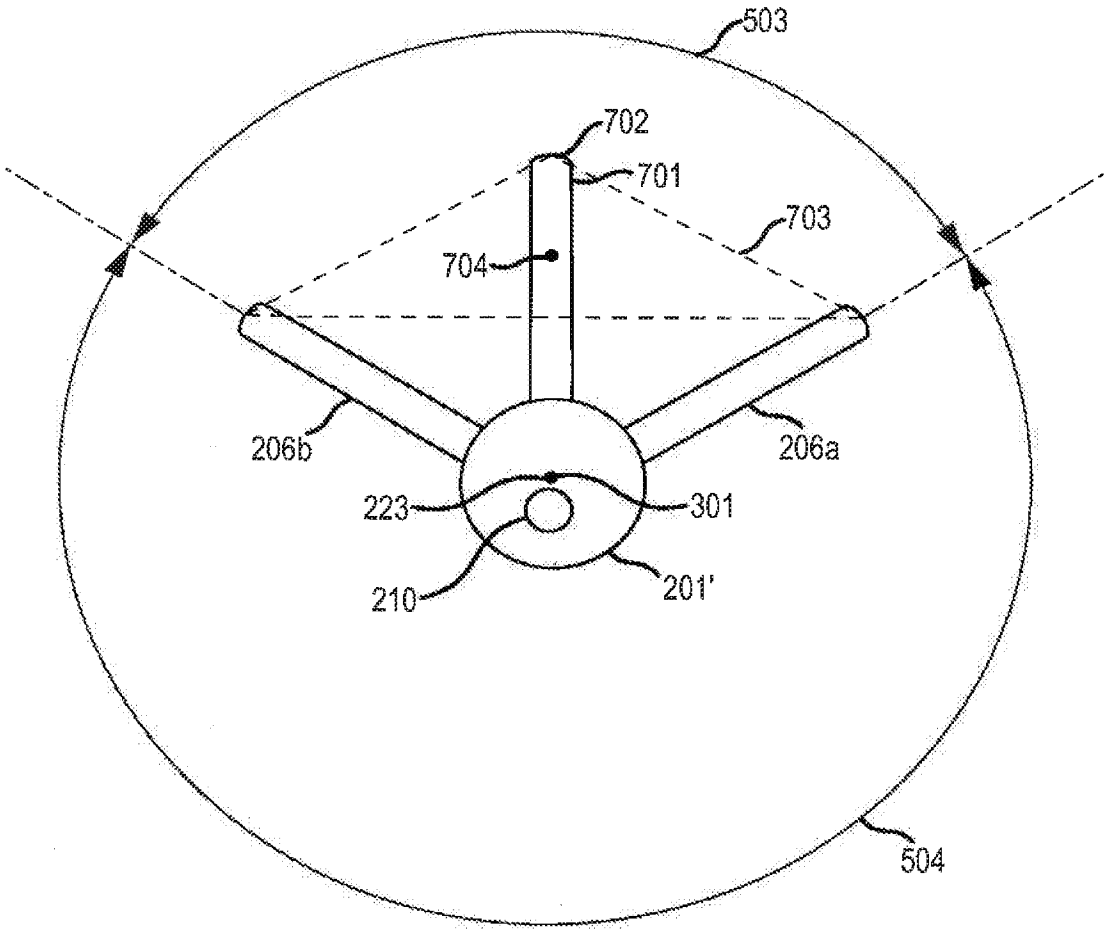


FIG.7

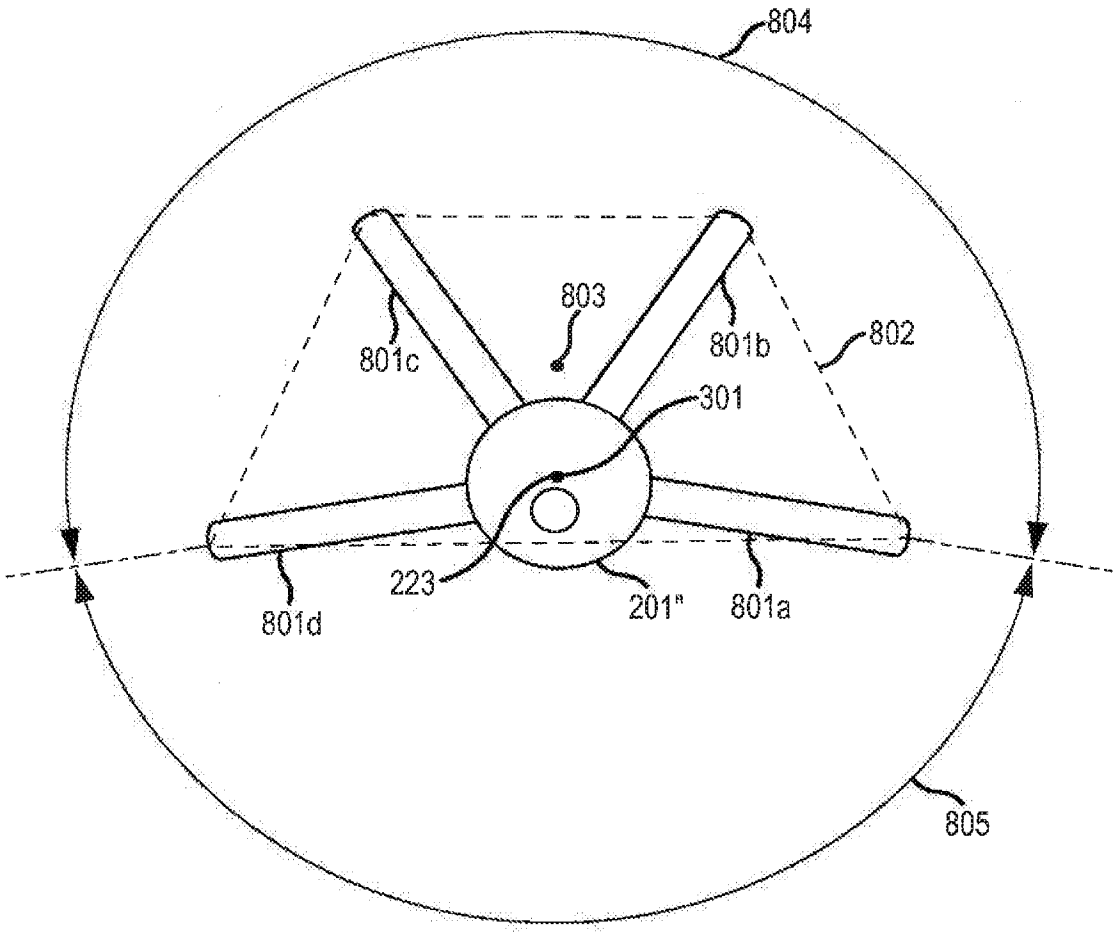


FIG.8

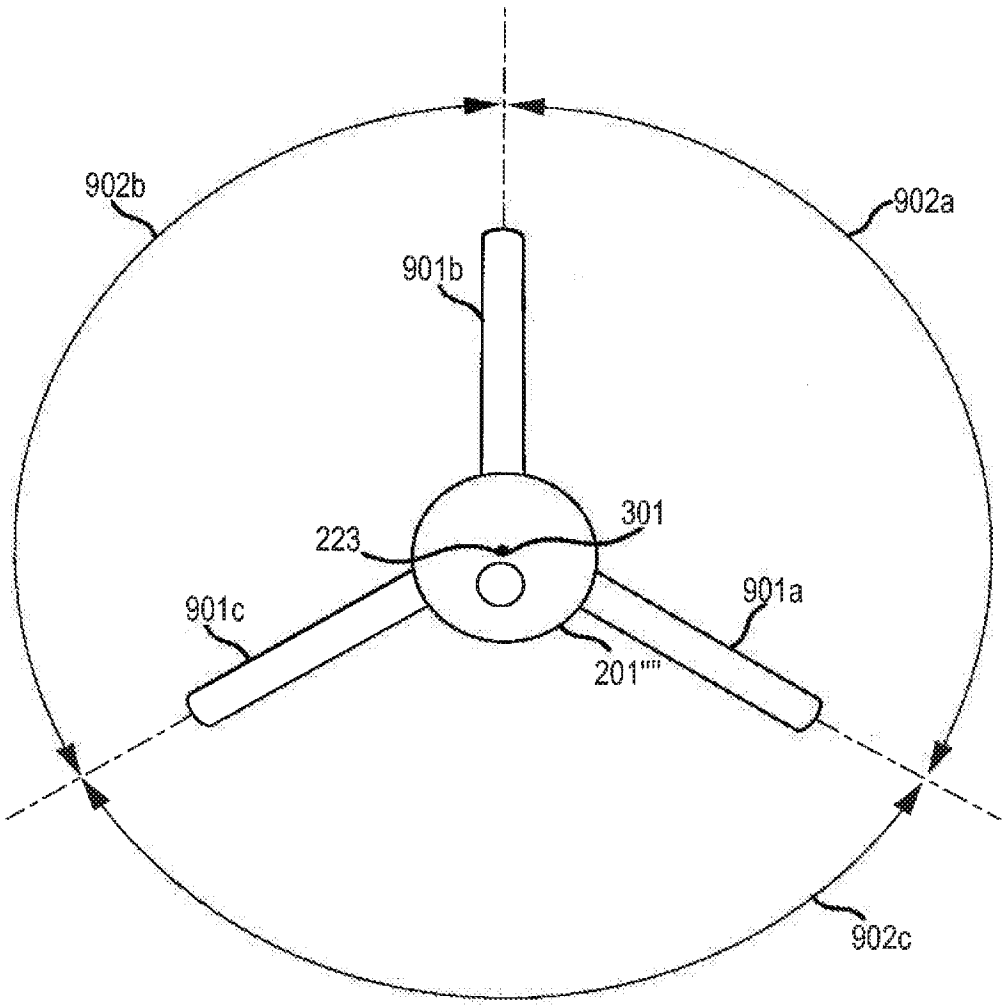


FIG.9

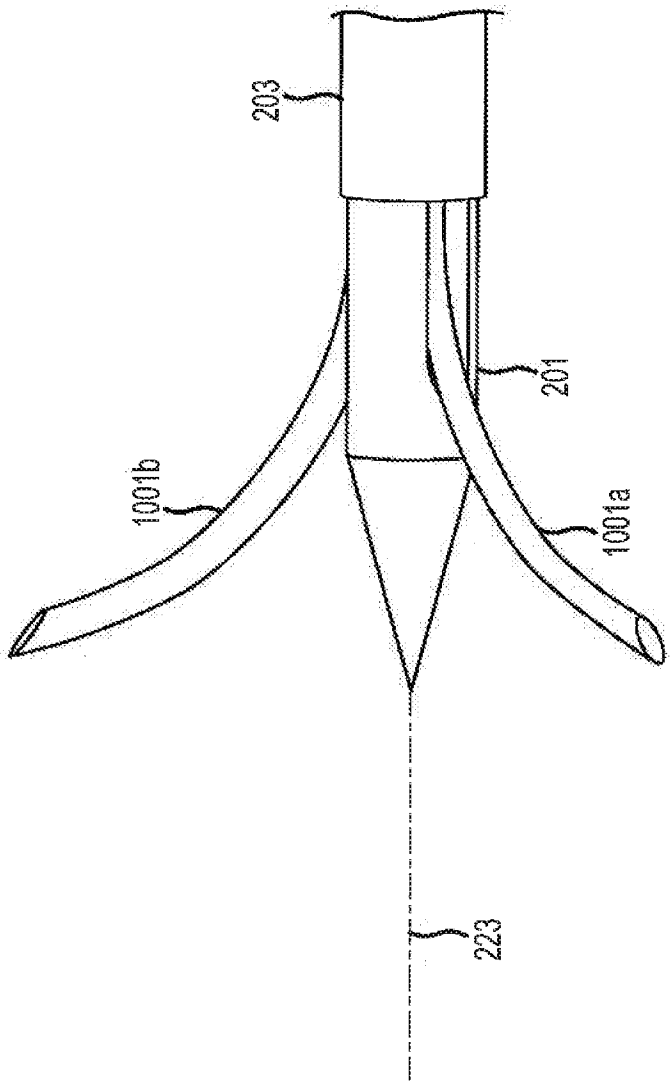


FIG.10

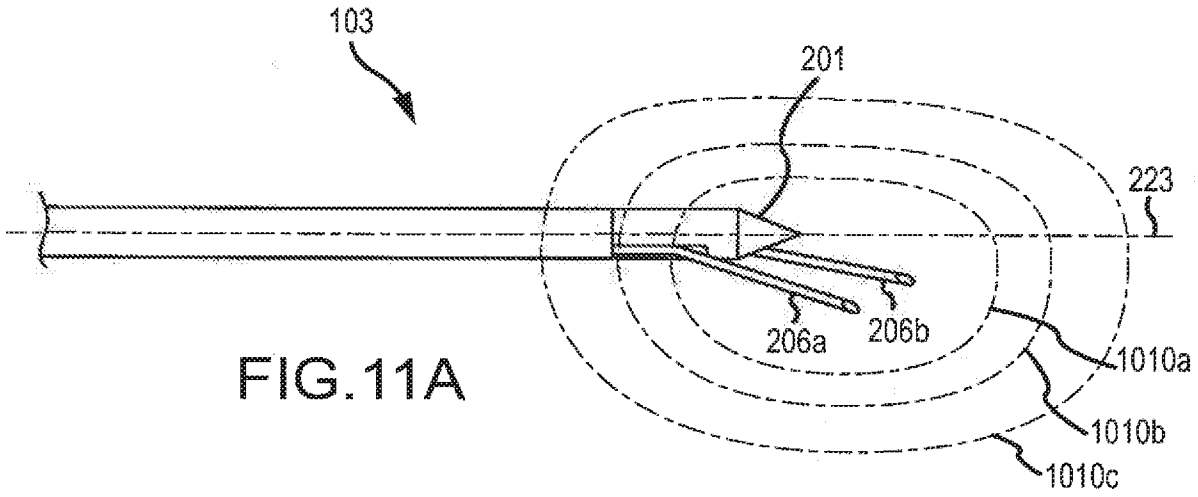


FIG.11A

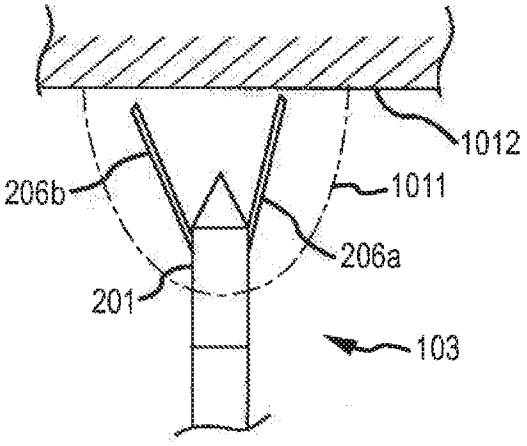


FIG.11B

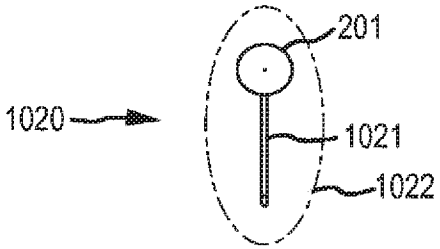


FIG.11C

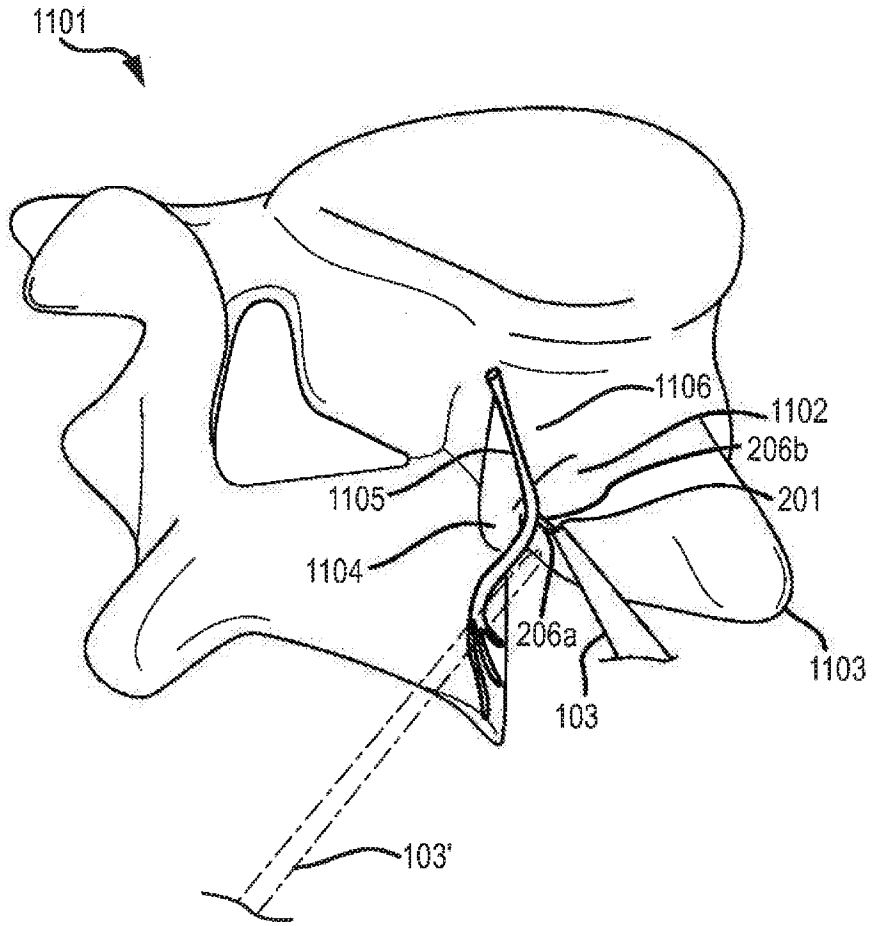


FIG.12

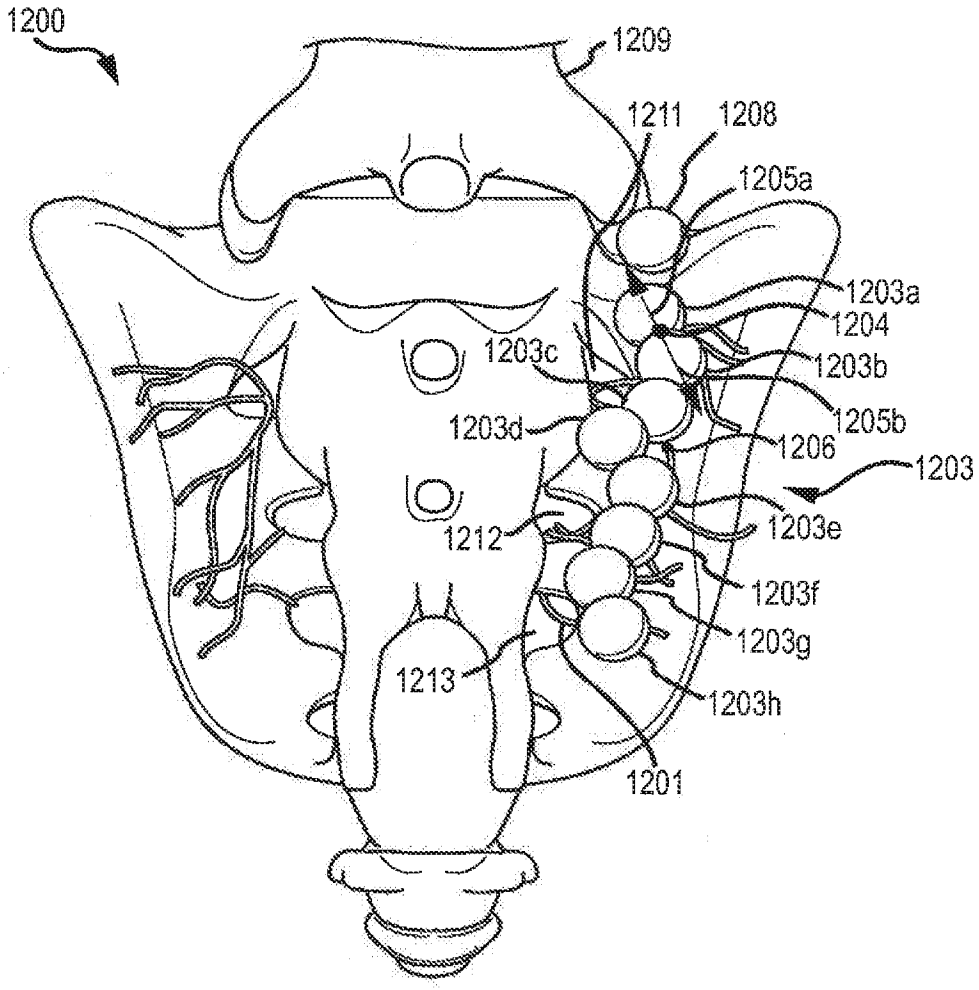

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FIG.13

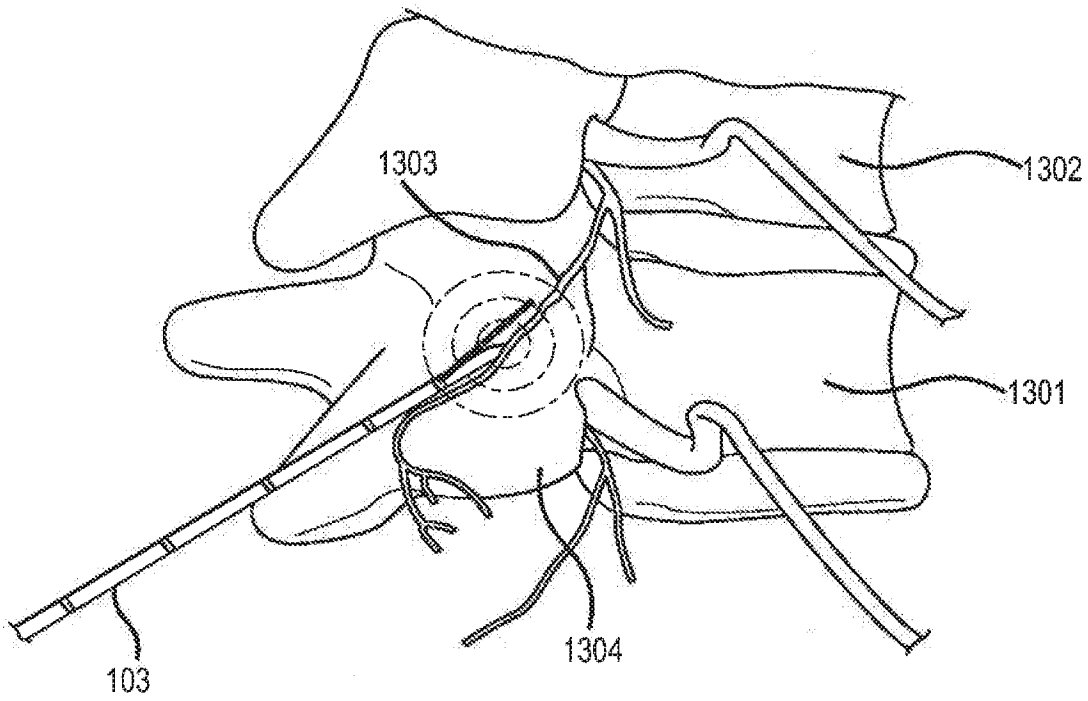


FIG.14

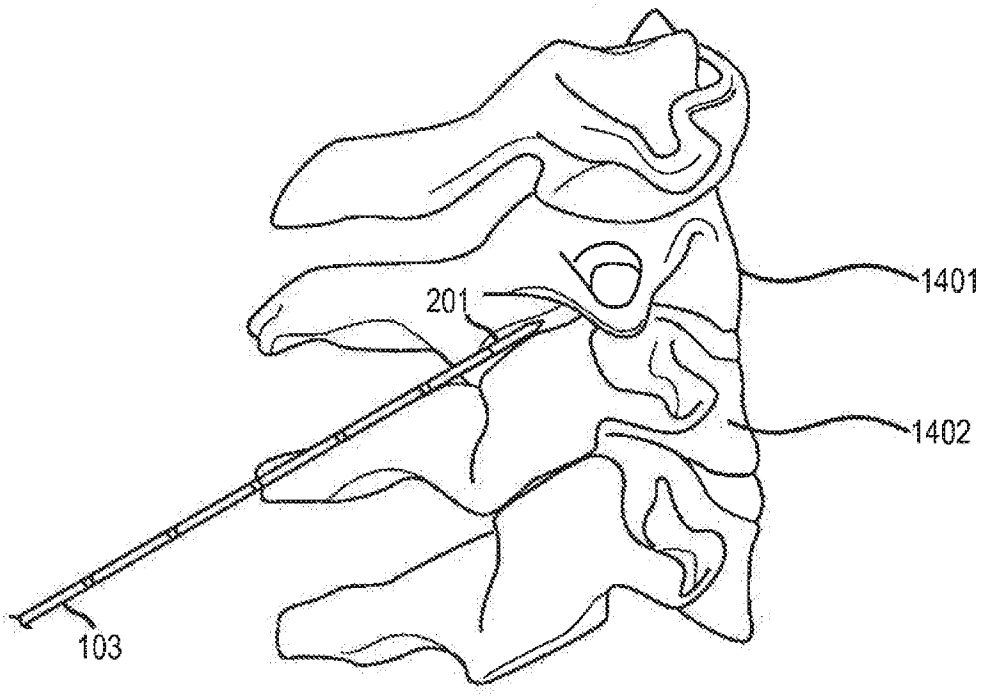


FIG.15

Electronic Patent Application Fee Transmittal

Application Number:	15098673
Filing Date:	14-Apr-2016
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Filer:	Adam J. Gilbert/Emilie Albert
Attorney Docket Number:	NBUS.001C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY FILING FEE (ELECTRONIC FILING)	4011	1	70	70
UTILITY SEARCH FEE	2111	1	300	300
UTILITY EXAMINATION FEE	2311	1	360	360
Pages:				
Claims:				
Miscellaneous-Filing:				
LATE FILING FEE FOR OATH OR DECLARATION	2051	1	70	70
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 5 months with $0 paid	2255	1	1500	1500
Miscellaneous:				
		Total in USD ($)		**2300**

Electronic Acknowledgement Receipt

EFS ID:	27633386
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	20995
Filer:	Adam J. Gilbert/Kevin Kraus
Filer Authorized By:	Adam J. Gilbert
Attorney Docket Number:	NBUS.001C1
Receipt Date:	29-NOV-2016
Filing Date:	14-APR-2016
Time Stamp:	16:57:20
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$2300
RAM confirmation Number	113016INTEFSW16582300
Deposit Account	111410
Authorized User	Kevin Kraus

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Applicant Response to Pre-Exam Formalities Notice	2016-11-29_Response_NBUS.pdf	18074 310a0f23708fc9955043baefb5a16c05e90449f3	no	1
Warnings:					
Information:					
2		2016-11-29_Amend_NBUS.pdf	26092 dbadf1c70817425d8631fce904b87cfd4603d804	yes	4

Multipart Description/PDF files in .zip description

Document Description	Start	End
Preliminary Amendment	1	1
Drawings-only black and white line drawings	2	3
Applicant Arguments/Remarks Made in an Amendment	4	4

Warnings:					
Information:					
3	Drawings-only black and white line drawings	2016-11-29_Drwgs_NBUS.pdf	3332825 509348bed8f507dfe3e3038ef3828ff960430323	no	19
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	39324 9fbd39e00df680362c491eb783faebdc6d386058	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3416315		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Please Direct All Correspondence to Customer Number 20,995

RESPONSE TO FORMALITIES NOTICE

Inventor	:	Wright et al.
App. No.	:	15/098,673
Filed	:	April 14, 2016
For	:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
Art Unit	:	3739
Conf. No.	:	5232

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The above-captioned application was filed lacking at least one item that would advance the application to examination.

(X) An Amendment in 4 pages; and

(X) Replacement Drawings in 19 pages.

(X) Fees will be paid via EFS Web. Any extension of time will be requested by payment of the appropriate extension fee.

The Commissioner is hereby authorized to charge any additional fees which may now be required, or credit any overpayment, to Account No. 11-1410.

Dated: November 29, 2016

By: /Adam Gilbert/
Adam Gilbert
Registration No. 59,967
Attorney of Record
Customer No. 20,995
(949) 760-0404

24714064

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/098,673	04/14/2016	3739	800	NBUS.001C1	1	1

CONFIRMATION NO. 5232

UPDATED FILING RECEIPT

20995
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

OC000000087552374

Date Mailed: 12/01/2016

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Robert E. Wright, Denver, CO;
Scott A. Brandt, Denver, CO;

Applicant(s)

Nimbus Concepts, LLC, Denver, CO;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 12/940,974 11/05/2010 ABN
which claims benefit of 61/280,557 11/05/2009
and claims benefit of 61/347,351 05/21/2010

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 04/27/2016

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 114 of 691

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/098,673**

Projected Publication Date: 03/09/2017

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

Preliminary Class

606

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

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Avanos v. Stratus
Page 115 of 691

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 116 of 691

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1

CONFIRMATION NO. 5232

20995
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

INFORMAL NOTICE

OC000000087552376

Date Mailed: 12/01/2016

INFORMATIONAL NOTICE TO APPLICANT

Applicant is notified that the above-identified application contains the deficiencies noted below. No period for reply is set forth in this notice for correction of these deficiencies. However, if a deficiency relates to the inventor's oath or declaration, the applicant must file an oath or declaration in compliance with 37 CFR 1.63, or a substitute statement in compliance with 37 CFR 1.64, executed by or with respect to each actual inventor no later than the expiration of the time period set in the "Notice of Allowability" to avoid abandonment. See 37 CFR 1.53(f).

The item(s) indicated below are also required and should be submitted with any reply to this notice to avoid further processing delays.

- A properly executed inventor's oath or declaration has not been received for the following inventor(s):
  Robert E. Wright
  Scott A. Brandt

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/ebekele/

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 117 of 691

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 15/098,673

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	1 minus 20 =	*	x 40 =	0.00	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	1 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	730		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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United States Patent and Trademark Office
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1

CONFIRMATION NO. 5232

20995
KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

PUBLICATION NOTICE

OC000000089780411

Title:METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

Publication No.US-2017-0065335-A1
Publication Date:03/09/2017

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Petitioner's Exhibit 1007
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PTO/AIA/122 (08-12)
Approved for use through 01/31/2018. OMB 0651-0035
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CHANGE OF CORRESPONDENCE ADDRESS
Application

Address to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	15/098673
Filing Date	14-Apr-2016
First Named Inventor	Robert E. Wright
Art Unit	3739
Examiner Name	Dvorak, Linda C.
Attorney Docket Number	NBUS.001C1

Please change the Correspondence Address for the above-identified patent application to:

☒ The address associated with Customer Number: 148468

OR

☐ Firm or Individual Name

Address

City	State	Zip

Country

Telephone	Email

This form cannot be used to change the data associated with a Customer Number. To change the data associated with an existing Customer Number use "Request for Customer Number Data Change" (PTO/SB/124).

I am the:

☐ Applicant

☐ Attorney or agent of record. Registration Number _____.

☒ Registered practitioner named in the application transmittal papers who acts in a representative capacity under 37 CFR 1.34. See 37 CFR 1.33(a)(1). Registration Number 59,967.

Signature /Adam Gilbert/

Typed or Printed Name Adam J. Gilbert

Date	Telephone
09/07/2018	949-760-0404

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	33654686
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	20995
Filer:	Adam J. Gilbert/Danika Gregory
Filer Authorized By:	Adam J. Gilbert
Attorney Docket Number:	NBUS.001C1
Receipt Date:	07-SEP-2018
Filing Date:	14-APR-2016
Time Stamp:	11:37:10
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Change of Address	2018-09-07_Change_of_Address-NBUS_001C1.pdf	171329 d56d1819e80d30287109464d10dc96ebc6348340	no	1

Warnings:

Information:	
Total Files Size (in bytes):	171329

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

148468 7590 09/11/2018

Med Venture Holdings, LLC
2700 S 900 W STE D
Salt Lake City, UT 84119

EXAMINER	
KIM, EUN HWA	

ART UNIT	PAPER NUMBER
3739	

MAIL DATE	DELIVERY MODE
09/11/2018	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 123 of 691

Office Action Summary	Application No. 15/098,673	Applicant(s) Wright et al.	
	Examiner EUNHWA KIM	Art Unit 3739	AIA Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 4/14/2016.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 4/14/2016 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 124 of 691

DETAILED ACTION

1. This action is pursuant to the claims filed on April 14, 2016. Claim 1 is pending. A first action on the merits of claim 1 is as follows.

Notice of Pre-AIA or AIA Status

2. The present application is being examined under the pre-AIA first to invent provisions.

3. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Claim Objections

4. Claim 1 is objected to because of the following informalities:

5. Claim 1, ln. 1-: "the plurality relative to the tip" should be changed to –the plurality of filaments relative to the tip—to correct for missing words. Appropriate correction is required.

Claim Rejections - 35 USC § 102

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. **Claim(s) 1 is/are rejected under pre-AIA 35 U.S.C. 102(b) as being anticipated by Young (U.S. PGPub. No. 2006/0084965).**

7. Young discloses a needle (tissue ablation system in Figs. 1-7) for insertion into a patient during an RF ablation procedure (abstract), the needle comprising:

a. a hub (handle body 29);

b. an elongate member (elongate cannula 12) fixed to the hub;

c. a tip (distal tip 94) fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient (distal tip is beveled and comprises a point 94 as shown in Figs. 2-7 for tissue piercing);

d. a plurality of filaments within at least a portion of the elongate member (two electrode 26);

e. an actuator interconnected to the plurality of filaments, wherein movement of the actuator relative to the hub moves the plurality of filaments relative to the tip (handle assembly 28 and shaft 20, [0038]: the handle assembly 27 and shaft 20 can be configured such that the electrodes 26 can be deployed by rotating the handle portion 28 relative to the handle body 29) and

f. a lumen (lumen within the shaft 20 which is electrically conductive in Figs. 2, 3, 5 and 6) within the elongate member, wherein the lumen and the tip are configured to accept an RF probe (connectors 38a 38b are configured to accept electrical connectors/probes so as to connect to an RF generator), the tip, and the first and second filaments are operable to form a single monopolar RF electrode ([0034]: electrical connectors 38a and 38b can be conveniently coupled to the electrodes 26 via shaft 20 (which is electrically conductive); [0033]: “the array 30 of electrodes 26 and the operative electrode 92 are monopolar electrodes and current will pass from the electrodes 26 and the electrode 92 to the dispersive electrode to thereby deliver ablation energy in a monopolar configuration”).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUNHWA KIM whose telephone number is (571)270-1265. The examiner can normally be reached on 9AM-5:30PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOSEPH STOKLOSA can be reached on (571) 272-1213. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EUN HWA KIM/
Examiner, Art Unit 3739
9/10/2018

Notice of References Cited	Application/Control No. 15/098,673	Applicant(s)/Patent Under Reexamination Wright et al.	
	Examiner EUNHWA KIM	Art Unit 3739	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20060084965-A1	04-2006	Young; Kimbolt	A61B18/148	606/41
	B					
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 128 of 691

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	Art Unit
	EUNHWA KIM	3739

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	09/10/2018								
	1	✓								

Petitioner's Exhibit 1007
Avanos v. Stratus
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	Art Unit
	EUNHWA KIM	3739

CPC - Searched*		
Symbol	Date	Examiner
A61B18/1477,1467; A61B2018/1253,00577	09/10/2018	EK

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Assignee & Inventor Search	09/10/2018	EK
See search history printout	09/10/2018	EK

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 130 of 691

Bibliographic Data

Application No: 15/098,673

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: /EUN HWA KIM/ Examiner's Signature | Initials

Title: METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
04/14/2016	606	3739	NBUS.001C1
RULE			

APPLICANTS

Nimbus Concepts, LLC, Denver, CO,

INVENTORS

Robert E. Wright Denver, CO, UNITED STATES

Scott A. Brandt Denver, CO, UNITED STATES

CONTINUING DATA

This application is a CON of 12940974 11/05/2010

12940974 has PRO of 61347351 05/21/2010

12940974 has PRO of 61280557 11/05/2009

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

04/27/2016

**** SMALL ENTITY ****

STATE OR COUNTRY

UNITED STATES

ADDRESS

Med Venture Holdings, LLC
2700 S 900 W STE D
Salt Lake City, UT 84119
UNITED STATES

FILING FEE RECEIVED

$2,300

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	628	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2018/09/10 20:23
L2	25	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2018/09/10 20:23
L3	0	((("NIMBUS") near3 ("CONCEPTS") near3 ("LLC"))).AS,AANM.	USPAT	OR	OFF	2018/09/10 20:23
L4	2	"20060084965"	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:25
L5	66	("20040158239" | "20050080409" | "20050107781" | "20060217702" | "3174851" | "3351463" | "3753700" | "5472441" | "5507743" | "5536267" | "5827276" | "5855576" | "6090105").PN. OR ("7229438").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:25
L6	5060	(A61B18/1477 or A61B2018/1467).cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:28
L7	739	6 and (stylet)	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:28
L8	402	6 and (stylet) and monopolar	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:28
L9	109	6 and (stylet filaments) with actuat$4	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:41
L10	2	"13101009"	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:43
L11	8841	(A61B2018/1253 or A61B2018/00577).cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:51
L12	1129	11 and (stylet filament)	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:51
S1	5986	606/41,44.ccls.	US-PGPUB; USPAT	OR	ON	2014/01/29 10:14
S2	501	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:32
S3	110	((ROBERT) near2 (WRIGHT)).INV.	EPO; JPO; DERWENT	OR	ON	2014/01/29 11:33
S4	22	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
S5	3	((SCOTT) near2 (BRANDT)).INV.	EPO; JPO; DERWENT	OR	ON	2014/01/29 11:33
S6	3	S2 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
S7	0	S3 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
S8	2	S4 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:34
S9	0	S5 and "606".CLAS.	US-	OR	ON	2014/01/29

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			PGPUB; USPAT			11:34
S10	373	US-1234567-$.DID. OR US-D372086-$.DID. OR US-4011872-$.DID. OR US-4206761-$.DID. OR US-4206762-$.DID. OR US-4281667-$.DID. OR US-4353371-$.DID. OR US-4375220-$.DID. OR US-4378809-$.DID. OR US-4385636-$.DID. OR US-4411266-$.DID. OR US-4565200-$.DID. OR US-4573980-$.DID. OR US-4583538-$.DID. OR US-4593703-$.DID. OR US-4618978-$.DID. OR US-4646752-$.DID. OR US-4653508-$.DID. OR US-4660568-$.DID. OR US-4676255-$.DID. OR US-4698207-$.DID. OR US-4787886-$.DID. OR US-4796615-$.DID. OR US-4827927-$.DID. OR US-4838265-$.DID. OR US-4886506-$.DID. OR US-4907589-$.DID. OR US-4966597-$.DID. OR US-5010897-$.DID. OR US-5160337-$.DID. OR US-5217457-$.DID. OR US-5230623-$.DID. OR US-5233515-$.DID. OR US-5244462-$.DID. OR US-5257630-$.DID. OR US-5291896-$.DID. OR US-5304114-$.DID. OR US-5304115-$.DID. OR US-5312329-$.DID. OR US-5312391-$.DID. OR US-5318013-$.DID. OR US-5324255-$.DID. OR US-5334183-$.DID. OR US-5342292-$.DID. OR US-5370645-$.DID. OR US-5370675-$.DID. OR US-5372596-$.DID. 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S11	4	US-1234567-$.DID. OR US-5507802-$.DID. OR US-7270661-$.DID. OR US-20070287996-$.DID.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:38
S12	20	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$).did.	US-PGPUB; USPAT	OR	ON	2014/01/29 12:00
S13	379	S10 or S11 S12	US-PGPUB; USPAT	OR	ON	2014/01/29 12:00
S14	20	S13 and S12	US-PGPUB; USPAT	OR	ON	2014/01/29 12:19
S15	379	S13 S12	US-PGPUB; USPAT	OR	ON	2014/01/29 12:19
S16	23	S15 and (detent)	US-PGPUB; USPAT	OR	ON	2014/01/29 12:19
S17	100218	"606"/$.ccls.	US-PGPUB; USPAT	OR	ON	2014/01/29 12:21
S18	136	neurotomy	US-PGPUB; USPAT	OR	ON	2014/01/29 12:21
S19	5	"7108696".pn. "7357798".pn. "20090221998".pgnr. "20060217705".pgnr. "200620200121".pgnr. "20090024124".pgnr.	US-PGPUB; USPAT	OR	ON	2014/01/29 12:46
S20	88	US-8292822-$.DID. OR US-5540778-$.DID. OR US-5672375-$.DID. OR US-3918455-$.DID. OR US-4341094-$.DID. OR US-5232442-$.DID. OR US-5304141-$.DID. OR US-5379900-$.DID. OR US-5562685-$.DID. OR US-5709692-$.DID. OR US-20050059964-$.DID. OR US-5226912-$.DID. OR US-5269808-$.DID. OR US-5425746-$.DID. OR US-5437726-$.DID. OR US-5569302-$.DID. OR US-5250247-$.DID. OR US-5507777-$.DID. OR US-5649962-$.DID. OR US-5374278-$.DID. OR US-5639506-$.DID. OR US-5643628-$.DID. OR US-5891247-$.DID. OR US-6031018-$.DID. OR US-6053086-$.DID. OR US-4124153-$.DID. OR US-4282637-$.DID. OR US-4457128-$.DID. OR US-4501133-$.DID. OR US-4907741-$.DID. OR US-5503092-$.DID. OR US-5532657-$.DID. OR US-5648003-$.DID. OR US-5683025-$.DID. OR US-5891166-$.DID. OR US-5897044-$.DID. OR US-5954242-$.DID. OR US-5991957-$.DID. OR US-6035916-$.DID. OR US-6051180-$.DID. OR US-6126676-$.DID. OR US-6270464-$.DID. OR US-6402770-$.DID. OR US-6536482-$.DID. OR US-6699205-$.DID. OR US-6730042-$.DID. OR US-6739024-$.DID. OR US-7761964-$.DID.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2014/02/11 12:24
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S22	50	("20110213356" "20110288540" "5540778" "5672375" "3918455" "4341094" "5232442" "5304141" "5379900" "5562685" "5709692" "20050059964" "5226912" "5269808" "5425746" "5437726" "5569302" "5250247" "5507777" "5649962" "5374278" "5639506" "5643628" "5891247" "6031018" "6053086" "4124153" "4282637" "4457128" "4501133" "4907741" "5503092" "5532657" "5648003" "5683025" "5891166" "5897044" "5954242" "5991957" "6035916" "6051180" "6126676" "6270464" "6402770" "6536482" "6699205" "6730042" "6739024" "7761964" "8292822").pn.	US-PGPUB; USPAT	OR	ON	2014/02/11 12:26
S23	85	S20 S21 S22	US-PGPUB; USPAT	OR	ON	2014/02/11 12:26
S24	85	S20 S21 S22	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/11 12:26
S25	1	"20090221998"	DERWENT	OR	ON	2014/02/11 12:39
S26	259590	a61b2018/0016, "00166", "00196", "00208", "00273", "00279", "0091", "00434", "0044", "1425",	DERWENT	OR	ON	2014/02/11

		"143", "1432", "1465" "1475".cpc.				12:56
S27	891	a61b2018/0016,00166,00196,00208,00273,00279,0091,00434,0044,1425,143,1432,1465,1475.cpc.	DERWENT	OR	ON	2014/02/11 12:58
S28	5217	a61b2018/0016,00166,00196,00208,00273,00279,0091,00434,0044,1425,143,1432,1465,1475.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/11 12:58
S29	3226	S28 and @py<"2009"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/11 13:00
S30	3	"7108696".pn. "7357798".pn. "20060217705".pgnr. "7108696".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 09:58
S31	3	"7108696".pn. "7357798".pn. "20060217705".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 09:59
S32	2	"7270661".pn. "5507802.pn" "20070287996".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:01
S33	3	"7270661".pn. "5507802".pn. "20070287996".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:02
S34	50	(actuator actuate actuating) same (helical adj track thread) same (filament electrode) same (hub)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:34
S35	12	(actuator actuate actuating) same (helical adj track thread) same (filament electrode) same (hub) same (advanced advancing deployed deploying deploy retracted retracting retract)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:38
S37	316	(actuator actuate actuating) same (helical adj track thread) same (advanced advancing deployed deploying deploy retracted retracting retract) near3 (filament stylet anchor element)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:41
S38	274031	("600" "606" "607").CLAS.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:45
S39	13082	S38 and filament	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:45
S40	3630	S39 and (actuate actuator actuating)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:46
S41	6	S39 and (hub with thread) and (actuat$3 with thread)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:47
S42	2598	S39 and (rotate rotat$4) same (deployment deploy retract retract$4 advance advancing)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:33
S43	251	S39 and (rotate rotat$4) same (deployment deploy retract retract$4 advance advancing) same (filament)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:34
S44	1	"5964756".pn.	US-PGPUB; USPAT;	OR	ON	2014/02/12 11:55

			USOCR; EPO; JPO			
S45	110	S39 and (rotate rotat$4) with (actuate actuating actuated) and (deployment deploy retract retract$4 advance advancing) same (filament)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 12:00
S46	52	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$).did.	US-PGPUB; USPAT	OR	ON	2014/02/12 14:02
S47	49	S46 and (filament antenna electrode)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:04
S48	37500	S46 and (filament antenna electrode) and (single near2 wire) or ("same" near2 wire)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:05
S49	3	S46 and (filament antenna electrode) and ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:05
S50	4674	S38 and (filament antenna electrode) and ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:06
S51	1425	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S52	2	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) with (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S53	4	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) same (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S54	92	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) same2 (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:08
S55	504	S38 and (filament antenna electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:09
S56	258	S38 and (filament antenna electrode) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:09
S57	17	US-6379353-$.DID. OR US-6888919-$.DID. OR US-20020077627-$.DID. OR US-20040024300-$.DID. OR US-20040096033-$.DID. OR US-20040158239-$.DID. OR US-20050261570-$.DID. OR WO-9903397-$.DID. OR WO-0222019-$.DID. OR WO-2005036124-$.DID.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2014/02/12 14:23
S58	0	("2010/0256625").URPN.	USPAT	OR	ON	2014/02/12 14:23
S59	331	(filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:31
S60	258	S38 and(sylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:31
S61	258	S38 and(stylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:32
S62	258	S38 and(stylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:32
S63	1332	(filament electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:33
S64	495	(filament electrode) with (form$3 made built) with (single near2 wire) and S38	US-PGPUB; USPAT;	OR	ON	2014/02/12 14:34

			USOCR; FPRS; EPO; JPO			
S65	237	S64 not S59	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:34
S66	0	"606"/$.clas. and (helical) near2 (track thread) with (detents) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S67	0	"606"/$.clas. and (helical) near2 (track thread) same (detents) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S68	0	"606"/$.clas. and (track thread) same (detent) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S69	4757	(track thread) same (detent) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S70	14	(track thread) same (detent) same (indicat$4 alert$4) with (deploy$4 retract$4 advanc$4) same (visual tactile audible)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:57
S71	2	"20060264974".pgnr. "5827276".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 16:33
S72	1332	(filament electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:00
S73	2599	(filament electrode) with (form$3 made built) with (single near2 wire or "same" near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:01
S74	389	S73 and "606"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:01
S75	50	"606"/$.ccls. and (distal near2 (tip end)) near4 (insulat$4) with (partially partial "part of")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:41
S76	0	"606"/$.ccls. and (distal near2 (tip end)) with (insulat$4) with (partially partial "part of") same ("non-adhere" "adhere")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:55
S77	126	"606"/$.ccls. and (distal near2 (tip end)) with (insulat$4 insulate insulated) with (partially partial "part of")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:56
S78	76	S77 not S75	US-	OR	ON	2014/02/14

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			PGPUB; USPAT; USOCR; FPRS; EPO; JPO			12:56
S79	57	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$ or US-20060264974-$ or US-20020143302-$ or US-20040199179-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$ or US-5827276-$ or US-5855576-$).did.	US-PGPUB; USPAT	OR	ON	2014/02/14 13:07
S80	27	S79 and (distal near2 (tip end point)) with (insulat$4 insulate insulated)	US-PGPUB; USPAT	OR	ON	2014/02/14 13:32
S81	8	(tip) with (filament stylet tine) with (active adj electrode)	US-PGPUB; USPAT	OR	ON	2014/06/16 15:31
S82	587	("0164184" | "1366756" | "1735271" | "1814791" | "1889609" | "1932258" | "1943543" | "1952617" | "1983669" | "2050904" | "2056377" | "2196171" | "2888928" | "3035580" | "3460539" | "3595239" | "3601126" | "3614414" | "3648001" | "3685518" | "3699967" | "3707149" | "3801766" | "3815604" | "3845771" | "3847153" | "3885569" | "3898991" | "3901242" | "3902494" | "3903891" | "3920021" | "3920022" | "3923063" | "3929137" | "3939839" | "3945375" | "3963030" | "3964487" | "3970088" | "3974833" | "4011872" | "4016881" | "4024467" | "4033351" | "4040426" | "4043342" | "4051855" | "4060088" | "4069827" | "4074718" | "4092986" | "4114623" | "4116198" | "4119102" | "4126137" | "4154240" | "4189685" | "4200104" | "4202337" | "4204549" | "4210152" | "4228800" | "4248231" | "4271837" | "4281373" | "4301802" | "4326529" | "4346332" | "4376263" | "4381007" | "4416277" | "4418692" | "4429698" | "4448198" | "4474179" | "4476862" | "4492231" | "4494541" | "4512338" | "4517976" | "4524770" | "4532924" | "4534347" | "4548207" | "4559943" | "4559951" | "4562838" | "4565200" | "4567890" | "4580557" | "4590934" | "4593691" | "4617927" | "4657015" | "4658819" | "4658820" | "4669468" | "4674499" | "4681122" | "4682596" | "4688569" | "4696668" | "4706667" | "4709698" | "4712544" | "4727874" | "4735201" | "4769005" | "4781175" | "4799480" | "4800899" | "4802476" | "4805616" | "4813429" | "4820298" | "4823791" | "4827927" | "4832048" | "4850353" | "4860744" | "4878493" | "4886074" | "4919129" | "4920978").PN. OR ("4931047" | "4936281" | "4936301" | "4936310" | "4936842" | "4943290" | "4950267" | "4955377" | "4966597" | "4967765" | "4969885" | "4976711" | "4994069" | "4998933" | "5007908" | "5009656" | "5013312" | "5019076" | "5035696" | "5037379" | "5047026" | "5047027" | "5057107" | "5062031" | "5071418" | "5080660" | "5083565" | "5085659" | "5088997" | "5098431" | "5099840" | "5108391" | "5108407" | "5117978" | "5122138" | "5133365" | "5158561" | "5167658" | "5167659" | "5171255" | "5171311" | "5178620" | "5190517" | "5195959" | "5196007" | "5197963" | "5201743" | "5207675" | "5217457" | "5217458" | "5217459" | "5221281" | "5244462" | "5249585" | "5250047" | "5258006" | "5259395" | "5261906" | "5267994" | "5267997" | "5277201" | "5277696" | "5281213" | "5281216" | "5282799" | "5282845" | "5290282" | "5290283" | "5300068" | "5300069" | "5300070" | "5304214" | "5306238" | "5318563" | "5320627" | "5330470" | "5330471" | "5334193" | "5334198" | "5336222" | "5342357" | "5342391" | "5344428" | "5352222" | "5354296" | "5366443" | "5370645" | "5370675" | "5372596" | "5382247" | "5383874" | "5383876" | "5383917" | "5383923" | "5395363" | "5395368" | "5403311" | "5419767" | "5422567" | "5423808" | "5423809" | "5423810" | "5423811" | "5431649" | "5437662" | "5438302" | "5441499" | "5443470" | "5454809" | "5462521" | "5472441" | "5472443" | "5480397" | "5480398" | "5496312" | "5496314" | "5505728" | "5505730" | "5507743" | "5514129" | "5514130" | "5514131" | "5520684" | "5520685" | "5522815").PN. OR ("5531744" | "5536267" | "5540680" | "5540681" | "5540682" | "5540683" | "5540684" | "5540685" | "5542916" | "5542945" | "5545161" | "5545193" | "5549605" | "5554172" | "5555618" | "5556396" | "5556397" | "5558671" | "5562720" | "5569164" | "5569242" | "5569244" | "5569245" | "5575789" | "5578007" | "5582609" | "5582610" | "5584830" | "5591141" | "5599344" | "5599345" | "5599346" | "5599347" | "5599348" | "5599349" | "5603711" | "5603712" | "5607422" | "5609151" | "5609573" | "5611798" | "5620481" | "5624439" | "5626560" | "5626575" | "5626576" | "5626578" | "5628745" | "5628771" | "5630426" | "5633578" | "5634924" | "5672174" | "5683366" | "5693045" | "5697281" | "5697536" | "5697882" | "5697909" | "5700262" | "5766153" | "5810764" | "5843019" | "5860951" | "5871469" | "5873855" | "5888198" | "5891095" | "Re33925").PN. OR ("6015406").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/06/16 15:33
S83	67	("5800482" | "5807395").PN. OR ("6053937").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/01 15:55
S84	1050	"606"/$.ccls. and (bipolar) and (stylet filament) and (trocar needle)	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/01 15:56
S85	752	"606"/29-41.ccls. and (bipolar) and (stylet filament) and (trocar needle)	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/01 15:57
S86	43	"606"/29-41.ccls. and (bipolar) same (stylet filament antenna) same (trocar needle)	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/02 08:26
S87	2	"7270661".pn. "5507802".pn.	US-	OR	ON	2014/10/02

			PGPUB; USPAT; USOCR			08:32
S88	9	bevel with (stylet filament) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 10:21
S89	1	"20070287996".pgnr.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:00
S90	64	(insulat$6) near4 (point tip) with (needle trocar) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:02
S91	1518	(insulat$6) near4 (point tip end) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:12
S92	7	(partial$6) near2 (cover$4) with (insulat$6) near4 (point tip end) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:12
S93	1	"20070203486".pgnr.	US-PGPUB; USPAT	OR	ON	2014/10/09 10:21
S94	522	bevel$4 with (filament tine)	US-PGPUB; USPAT	OR	ON	2014/10/09 10:28
S95	45	bevel$4 with tip with (filament tine)	US-PGPUB; USPAT	OR	ON	2014/10/09 10:37
S96	299	bevel$4 with tip with (filament tine stylet)	US-PGPUB; USPAT	OR	ON	2014/10/09 10:38
S97	16	bevel$4 with tip with (filament tine stylet) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/09 10:39
S98	1	13/101009.app.	US-PGPUB; USPAT	OR	ON	2014/10/09 10:52
S99	2	"20070203486"	US-PGPUB; USPAT	OR	ON	2015/03/20 13:40
S100	1	"13101009"	US-PGPUB; USPAT	OR	ON	2015/03/20 17:00
S101	0	(stylet filament antenna) with (retract$4) with (offset) with (angle)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:33
S102	19	(stylet filament antenna) with (retract$4) with (offset)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:34
S103	2309	(indicia indicat$4 marking marker) with (rotat$4) with (distal) near5 (tip end)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:47
S104	11	(indicia indicat$4 marking marker) near5 (hub) with (rotat$4) with (distal) near5 (tip end)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:48
S105	89	(indicia indicat$4 marking marker) near5 (hub handle) with (rotat$4) with (distal) near5 (tip end)	US-PGPUB; USPAT	OR	ON	2015/03/23 11:32
S106	2	"20070203486"	US-PGPUB; USPAT	OR	ON	2015/03/23 11:36
S107	1	"13101009"	US-PGPUB; USPAT	OR	ON	2015/03/23 12:41
S108	9	("20010012956" | "20040059328" | "20040158239" | "20060084965" | "20070112340" | "20080161804" | "20080249392" | "20080269558" | "20110213356").PN.	US-PGPUB; USPAT	OR	ON	2015/03/23 12:43
S109	106	("2001/0012956" | "2004/0059328" | "2004/0158239" | "2006/0084965" | "2007/0112340" | "2008/0161804" | "2008/0249392" | "2008/0269558" | "2011/0213356").URPN.	USPAT	OR	ON	2015/03/23 12:43
S110	167	("1653819" | "20010044596" | "20020010491" | "20020055731" | "20020077676" | "20020099323" | "20020138117" | "20020183735" | "20020183740" | "20020193831" | "20030009110" | "20030060856" | "20030088189" | "20030130711" | "20030170898" | "20030195406" | "20030208200" | "20030225360" | "20040019371" | "20040059328" | "20040059389" | "20040146877" | "20040153057" | "20040199159" | "20040243107" | "20040267189" | "20050043726" | "20050049541" | "20050165393" | "20050171523" | "20050171574" | "20050182462" | "20050261672" | "20050288730" | "20060015147" | "20060025760" | "20060079883" | "20060121610" | "20060212078" | "20060217703" | "20060264752" | "20070016183" | "20070043345" | "20070118069" | "20070203486" | "20080052786" | "20080154259" | "20080167649" | "20090062792" | "20090228001" | "20090281477"	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:44

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		"20100049190" | "20100087813" | "20100130975" | "20100222677" | "20110202053" | "20120165813" | "20120310236" | "20130110106" | "4016886" | "4226246" | "4262672" | "4407943" | "4810963" | "4907601" | "4946793" | "5019034" | "5052391" | "5058605" | "5098843" | "5134070" | "5173158" | "5193537" | "5273525" | "5283194" | "5318563" | "5328451" | "5389069" | "5403311" | "5425752" | "5439440" | "5458625" | "5533999" | "5536240" | "5575811" | "5626146" | "5634899" | "5674267" | "5702359" | "5720921" | "5778894" | "5782882" | "5800378" | "5810762" | "5836905" | "5843026" | "5873849" | "5919142" | "5947889" | "5983131" | "5991697" | "5999847" | "6009347" | "6010613" | "6016452").PN. OR ("6041252" | "6055453" | "6068650" | "6085115" | "6090106" | "6102885" | "6106521" | "6109270" | "6122599" | "6132419" | "6159163" | "6208893" | "6210402" | "6212433" | "6216034" | "6219577" | "6241702" | "6261831" | "6278895" | "6300108" | "6326177" | "6347247" | "6349233" | "6351674" | "6387671" | "6403348" | "6470211" | "6482619" | "6493592" | "6500173" | "6526320" | "6562604" | "6607529" | "6611706" | "6613211" | "6627421" | "6653091" | "6669691" | "6692493" | "6697669" | "6697670" | "6702808" | "6795728" | "6801804" | "6865416" | "6881213" | "6892099" | "6912417" | "6927049" | "6962587" | "6972014" | "6994706" | "7053063" | "7063698" | "7130697" | "7211083" | "7267676" | "7387626" | "7455675" | "7771401" | "8511317").PN. OR ("8753335").URPN.				
S111	273	S109 S110	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:45
S112	2	S111 and (rotat$4) near3 (mechanism) with (advancement advanc$4 deploy$4 retract$4)	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:46
S113	3	S111 and (rotat$4) near3 (mechanism) same(advancement advanc$4 deploy$4 retract$4)	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:46

9/10/2018 8:53:38 PM
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PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/098,673	Filing Date 04/14/2016	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $40 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $210 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	03/11/2019	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/POLIN ANG/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Robert E. Wright	)	
Application No.:	15/098,673	)	Art Unit: 3739
Filing Date:	April 14, 2016	)	
Title:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	)	
Examiner:	Eun Hwa Kim	)	
Confirmation No.:	5232	)	
Customer No.:	148468	)	

AMENDMENT AND RESPONSE TO OFFICE ACTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Responsive to the Office Action dated September 11, 2018, the Applicant respectfully requests reconsideration of the pending claims in view of the amendments and remarks herein.

Amendments to the Claims are reflected in the listing of claims which begins on page 2.

Remarks begin on page 6.

Electronic Patent Application Fee Transmittal

Application Number:	15098673
Filing Date:	14-Apr-2016
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Filer:	Daniel Christopher Higgs
Attorney Docket Number:	NBUS.001C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 3 months with $0 paid	2253	1	700	700
Miscellaneous:				
			Total in USD ($)	**700**

Electronic Acknowledgement Receipt

EFS ID:	35388859
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	11-MAR-2019
Filing Date:	14-APR-2016
Time Stamp:	19:10:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$700
RAM confirmation Number	031219INTEFSW19112200
Deposit Account	602176
Authorized User	Daniel Higgs

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	NBUS001C1_Extension.pdf	140957 b7c08e39ffc446e4ed2110df0465b95046da8fd2	no	2
Warnings:					
Information:					
2		NBUS001C1_RTOA.pdf	105879 1c75c458fe27a37bd7b2e828e66b9f17d308e50c	yes	8

Multipart Description/PDF files in .zip description

Document Description	Start	End
Applicant Arguments/Remarks Made in an Amendment	6	8
Claims	2	5
Amendment/Req. Reconsideration-After Non-Final Reject	1	1

Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30951 77c2e869ea4951b9e1c9183df5a67704cab88d40	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	277787		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/22 (03-13)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional): NBUS.001C1

Application Number: 15/098,673

Filed: April 14, 2016

For: METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY ABLATION

Art Unit: 3739

Examiner: Eun Hwa Kim

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	Micro Entity Fee	
☐ One month (37 CFR 1.17(a)(1))	$200	$100	$50	$
☐ Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$
☑ Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$ 700
☐ Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐ Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 602176.

☑ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.

☐ attorney or agent of record. Registration number _____.

☑ attorney or agent acting under 37 CFR 1.34. Registration number 55265.

/Daniel C. Higgs/ — Signature

March 11, 2019 — Date

Daniel C. Higgs — Typed or printed name

(801) 703-1961 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☐ * Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Remarks

This paper is submitted in response to the Office Action mailed September 11, 2018. Claim 1 was pending in the Application and stands rejected. By this paper, claim 1 is amended and new claims 2-20 are added. Accordingly, after entry of this paper, claims 1-20 will be pending in the Application. The amendments to the claims are fully supported by the application, as filed, and add no new matter to the Application. Reconsideration of the pending claims is respectfully requested.

Claim Objections

Claim 1 stands objected to for the language "the plurality relative to the tip." Without acquiescing to the propriety of this objection, the Applicant has amended the quoted language herein in the manner proposed in the Office Action.

Claim Rejections Under 35 U.S.C. § 102

Claim 1 stands rejected under pre-AIA 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent Application Publication No. 2006/0084965 to Young ("Young"). The Applicant respectfully traverses this rejection. However, in order to expedite prosecution of the present application, claim 1 has been amended.

As amended, independent 1 recites (emphasis added):

1. A needle for insertion into a patient during an RF ablation procedure, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

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Avanos v. Stratus
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a plurality of filaments disposed within at least a portion of the elongate member;

an actuator interconnected to the plurality of filaments, wherein rotation of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein rotation of the actuator in a second direction relative to the hub retracts the plurality of filaments into the lumen to a retracted position; and

a fitting in fluid communication with the lumen so as to provide a connection for injection of fluid through the fitting and through the lumen, the fitting being configured to allow for insertion of an RF probe into the lumen through the fitting,

wherein the lumen is configured to accept the RF probe such that an electrode of the inserted RF probe, the tip, and the first and second plurality of filaments are operable to form a single monopolar RF electrode.

The Applicant respectfully submits that Young fails to teach at least the emphasized portions of amended claim 1. Accordingly, the Applicant respectfully requests that the rejection of claim 1 under pre-AIA 35 U.S.C. § 102(b) be withdrawn.

New Claims 2-20

Each of new claims 2-20 depends from claim 1 and thus is patentable over Young for at least the same reasons as claim 1.

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Conclusion

In view of the foregoing amendments and remarks, the Applicant submits that the Application is in condition for allowance and thus requests the issuance of a Notice of Allowance. Please contact the undersigned attorney in the event that any remaining impediment to the prompt allowance of this application is found that could be clarified by a telephonic interview or may be overcome by an Examiner's Amendment.

DATED this 11th day of March, 2019.

Respectfully submitted,

/Daniel C. Higgs/

Daniel C. Higgs
Attorney for Applicant
Registration No. 55,265

MED VENTURE HOLDINGS, LLC
6030 W. Harold Gatty Drive
Salt Lake City, Utah 84116
(801) 703-1961

Petitioner's Exhibit 1007
Avanos v. Stratus
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Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A needle for insertion into a patient during an RF ablation procedure, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments disposed within at least a portion of the elongate member;

an actuator interconnected to the plurality of filaments, wherein ~~movement~~ rotation of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein rotation of the actuator in a second direction relative to the hub retracts the plurality of filaments into the lumen to a retracted position; and

a fitting in fluid communication with the lumen so as to provide a connection for injection of fluid through the fitting and through the lumen, the fitting being configured to allow for insertion of an RF probe into the lumen through the fitting,

~~a lumen within the elongate member,~~ wherein the lumen ~~and the tip are~~ is configured to accept ~~an~~ the RF probe such that an electrode of ~~an~~ the inserted RF probe, the tip, and the first and second plurality of filaments are operable to form a single monopolar RF electrode.

2. (New) The needle of claim 1, wherein the actuator fits around at least a portion of the hub, and wherein the actuator is configured to rotate relative to the hub about a central longitudinal axis of the needle.

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3. (New) The needle of claim 2, wherein the actuator is generally tubular.

4. (New) The needle of claim 1, further comprising a slide member coupled to the actuator and fixedly connected to the plurality of filaments, wherein the hub includes a cavity sized to house a protrusion of the slide member, and wherein the slide member is limited to a linear motion relative to the hub as the actuator is rotated.

5. (New) The needle of claim 4, wherein the slide member is configured to axially advance and retract without rotating relative to the hub.

6. (New) The needle of claim 1, wherein the tip comprises a fluid port in fluid communication with the lumen such that an anesthetic and/or an image enhancing dye may be introduced into a region around the tip through the fluid port.

7. (New) The needle of claim 1, wherein each filament of the plurality of filaments has a pre-set bias such that the filament is curved when in the deployed state.

8. (New) The needle of claim 1, wherein when each filament of the plurality of filaments is in the deployed position, the filaments extend outwardly from the tip.

9. (New) The needle of claim 8, wherein each filament comprises a distal end, wherein the distal end of each filament defines a point when each filament is in the deployed position, and wherein an average of all the points is offset from a central longitudinal axis of the elongate member.

10. (New) The needle of claim 1, wherein the plurality of filaments comprises three filaments, and wherein an angle between each pair of adjacent filaments is 120 degrees when each filament is in the deployed position.

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11. (New) The needle of claim 1, wherein the plurality of filaments are configured to form a lesion having a pyramidal shape.

12. (New) The needle of claim 1, wherein the tip tapers to a point, and wherein the elongate member and the tip comprise a single unitary structure.

13. (New) The needle of claim 1, wherein a proximal end of the elongate member is fixed to the hub.

14. (New) The needle of claim 1, wherein the tip is asymmetrical, and wherein the hub comprises an indicator that is oriented to communicate an orientation of the asymmetrical tip.

15. (New) The needle of claim 1, wherein the first hub and/or the actuator includes markings to indicate a depth of deployment of the plurality of filaments.

16. (New) The needle apparatus of claim 1, wherein the first hub and/or the actuator includes detents to provide a tactile feedback of a position of the plurality of filaments.

17. (New) A system comprising:
the needle of claim 1; and
the RF probe.

18. (New) The system of claim 17, wherein the RF probe comprises a cable for use in connecting the RF probe to a radiofrequency generator.

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19. (New) A method comprising:

inserting the needle of claim 1 into a patient;

rotating the actuator to transition the plurality of filaments from the retracted position to the deployed position; and

operating the RF probe, the tip, and the plurality of filaments as a monopolar electrode.

20. (New) The method of claim 19, further comprising inserting the RF probe into the lumen.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

148468 7590 06/18/2019

Med Venture Holdings, LLC
2700 S 900 W STE D
Salt Lake City, UT 84119

EXAMINER	
KIM, EUN HWA	

ART UNIT	PAPER NUMBER
3794	

MAIL DATE	DELIVERY MODE
06/18/2019	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 15/098,673	Applicant(s) Wright et al.	
	Examiner EUNHWA KIM	Art Unit 3794	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) 19-20 is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-18 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 11/29/2016 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

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DETAILED ACTION

1. This action is pursuant to the claims filed on March 11, 2019. Claims 1-20 are pending. Claims 19 and 20 are withdrawn. A final action on the merits of claims 1-18 is as follows.

Notice of Pre-AIA or AIA Status

2. The present application is being examined under the pre-AIA first to invent provisions.

3. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Election/Restrictions

4. Newly submitted claims 19 & 20 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claim 1 the needle does not positively recite the RF probe; as such, the needle and the plurality of filaments can be used as monopolar and/or bipolar RF electrode(s).

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 19 and 20 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

5. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. **Claims 1-3 7, 8, 12, 13, and 15-18 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Young (U.S. PGPub. No. 2006/0084965) in view of Young (hereinafter 'Young'111' U.S. PGPub. No. 2006/0206111), and further in view of Hinchliffe et al. (hereinafter 'Hinchliffe', U.S. PGPub. No. 2002/0143302).**

8. **In regard to independent claims 1 and 17 and dependent claims 2-3 and 18,** Young discloses a needle (tissue ablation system in Figs. 1-7) for insertion into a patient during an RF ablation procedure (abstract), the needle comprising:

a. a hub (handle body 29);

b. an elongate member (elongate cannula 12) fixed to the hub, the elongate member comprising a lumen at an interior thereof (lumen within the shaft 20 which is electrically conductive in Figs. 2, 3, 5 and 6);

c. a tip (distal tip 94) fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient (distal tip is beveled and comprises a point 94 as shown in Figs. 2-7 for tissue piercing);

d. a plurality of filaments within at least a portion of the elongate member (two electrode 26);

e. a fitting (the proximal end 29 of the handle body is capable of receiving shaft 24 [0035]) being configured to allow for insertion of an RF probe into the lumen through the fitting (the proximal end 29 of the handle body is also capable of receiving electrical connectors/wires 38a & 38b disposed within the shaft 24);

f. wherein the lumen is configured to accept the RF probe (connectors 38a 38b are configured to accept electrical connectors/probes so as to connect to the RF generator and are configured to be disposed within the lumen of the cannula 12 when the shaft 24 is inserted into the cannula), such that an electrode of the inserted RF probe, the tip, and the first and second plurality of the filaments are operable to form a single monopolar RF electrode ([0034]: electrical connectors 38a and 38b can be conveniently coupled to the electrodes 26 via shaft 20 (which is electrically conductive); [0033]: "the array 30 of electrodes 26 and the operative electrode 92 are monopolar electrodes and current will pass from the electrodes 26 and the electrode 92 to the dispersive electrode to thereby deliver ablation energy in a monopolar configuration").

2. However, Young does not disclose the fitting is in fluid communication with the lumen so as to provide a connection for injection of fluid through the fitting.

3. Young'111 teaches a RF device similar to that of Young. Specifically, Young '111 teaches cooling or injecting/irrigating fluids through a plurality of filaments (lumen 208, distal opening 212 of filaments 26 in Figs. and 11) which is in fluid communication with a fluid source ([0044]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the plurality of filaments of Young and provide lumens thereof as

taught by Young '111 as doing so will allow the plurality of filaments to deliver conductive fluid to enhance the electrical characteristic of target tissue, or deliver cooling fluid to cool the body during use ([0044]). It is noted that Young/Young'111 combination provides for the fitting that is in fluid communication with the lumen so as to provide a connection for injection of fluid through the fitting and through the lumen when the fluid is irrigated from the tips of the plurality of filament when the plurality of filaments are disposed within the lumen of the elongate member.

9. Young also discloses a rotational mechanism for deploying the plurality of filaments (handle assembly 28, [0038]: the handle assembly 27 can be configured such that the electrodes 26 can be deployed by rotating the handle portion 28 relative to the handle body 27) between a retracted position and a deployed position relative to the tip. However, Young does not provide in detail, the internal structures of the filament deployment mechanism comprising an actuator interconnected to the plurality of filaments.

10. Hinchliffe teaches a deployment mechanism of a plurality of filaments in an elongated member. Although Hinchliffe specifically teaches that the filaments are used to deliver ablative fluids rather than delivering RF energy, the two are analogous in that the purpose is to ablate tissue and both procedures results in ablative tissue mass. Specifically, Hinchliffe teaches a hub (housing 212 in Figs.13-15) and an elongated member fixed to the hub (receiving needle 250) comprising a plurality of filaments (tines 280), and a tip shaped to pierce tissue (sharp distal tip 151 in Fig. 6). The deployment mechanism comprises an actuator (actuator 230) interconnected to the plurality of filaments, wherein rotation of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein rotation of the actuator in a second direction relative to the hub retracts the plurality

of filaments into the lumen to a retracted position ([0075]), wherein the actuator fits around at least a portion of the hub (the shoulder of the actuator 230 fits around the proximal end of the hub 212), and wherein the actuator is configured to rotate relative to the hub about a central longitudinal axis of the needle (the actuator is positioned along a central axis of the needle 250 as shown in Fig. 13), wherein the actuator is generally tubular (the actuator 230 is generally tubular body). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified manually deploying a plurality of filaments as disclosed by Young/Young'111 combination and provide a deployment mechanism with an actuator as taught by Hinchliffe. Doing so would allow actuation of the plurality of filaments in three positions: 1) retracted position, 2) a first radially deployable position and 3) a second radially deployable position and the plurality of filaments are retained in any one of the three positions ([0012]) to precisely control deployment of filaments.

11. **In regards to claim 7,** Young/Young '111/Hinchliffe combination further discloses each filament of the plurality of filaments has a pre-set bias such that the filament is curved when in the deployed state ([0027]: each electrode 26 has a flared curvilinear profile).

12. **In regards to claim 8,** Young/Young'111/Hinchliffe combination further discloses when each filament of the plurality of filaments is in the deployed position, the filaments extend outwardly from the tip (see Fig. 6, [0027]).

13. **In regards to claim 12,** Young/Young'111/Hinchliffe combination further discloses the tip tapers to a point, and wherein the elongate member and the tip comprises a single unitary structure (electrode 92 tapers to a point as shown in Figs. 5 and 6 and the assembly 4 forms a unitary structure).

14. **In regards to claim 13,** Young/Young'111/Hinchliffe combination further discloses a proximal end of the elongate member is fixed to the hub (the proximal portion of cannula 16 is fixed to hub 29 as shown in Figs. 5 and 6).

15. **In regards to claim 15,** in view of the combination of claim 1, Hinchliffe further teaches that the deployment mechanism (actuator 230) comprises indicia (marker ring 260 with markings, e.g. 3cm, 4cm, 5cm, etc.) of fractional deployment of a plurality of filaments (280) relative to a tip (251) of a needle (250; paragraph [0080]). Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have modified Young/Young '111/Hinchliffe combination to incorporate the teachings of indicia as taught by Hinchliffe to determine the deployment of filaments during a treatment.

16. **In regards to claim 16,** in view of the combination of claim 1, Hinchliffe further teaches detents that are configured to provide a tactile feedback to the user when the filaments are fully retracted, fully deployed and increments in between the fully retracted and fully deployed position of the filaments designating the radial dimension of the ablation zone created by the filaments in the corresponding positions (paragraph [0044]). Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have modified Young/Young'111/Hinchliffe combination to incorporate the teachings of Hinchliffe and incorporate detents that are configured to provide a tactile feedback to the user when the filaments are fully retracted, fully deployed and three increments in between the two positions (third, fourth and fifth positions).

17. **Claims 4 and 5 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Young, Young '111 and Hinchliffe as applied to claim 1, and further in view of Holtz et al. (hereinafter 'Holtz', U.S. PGPub. No. 2010/0049192).**

18. **In regards to claims 4 and 5,** in view of the combination in claim 1, Hinchliffe teaches a deployment mechanism with a slide member (inner tube 270 in Figs. 13-14) coupled to the actuator and fixedly connected to the plurality of filaments (tines 280 are fixedly mounted to inner tube 270), wherein upon rotation of the actuator relative to the slide member and relative to the hub, the actuator moves in tandem relation with the slide member along the central longitudinal axis of the elongate member and the plurality of filaments are advanced or retracted relative to the hub (paragraph [0075]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the deployment mechanism of Hinchliffe for advancement and retraction of the plurality of filaments.

4. However, Young/Young'111/Hinchliffe combination fails to disclose the slide member is limited to a linear motion relative to the hub as the actuator is rotated and further configured to axially advance and retract without rotating relative to the hub.

5. Holtz teaches advancing and retracting a plurality of filaments similar to that of Young using a rotation to linear gearing mechanism within a handle ([0297]). Specifically, Holtz teaches a hub includes a cavity sized to house a protrusion of the slide member (threaded piece 73 acts as a follower to the handle dial 72, moving axially within the handlie dial 72 when it is rotated. The threaded piece 73 is keyed to a feature in the handle grip 71 which it slides within to prevent the threaded piece from rotating with the handle dial 72). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the mechanism of advancing the slide member of Young/Young'111/Hinchliffe combination with the rotation to linear mechanism to advance a plurality of splines as taught by Holtz, thereby arriving at the claimed invention. The advantage of a rotation to linear gearing mechanism is that

precise mechanical advantage can be achieved while making precision fine adjustment to electrode deployment length ([0297]).

6. **Claim 6 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Young, Young '111 and Hinchliffe as applied to claim 1, and further in view of Daniel et al. (hereinafter 'Daniel', U.S. Pat. No. 7,108,696).**

7. **In regard to claim 6,** Young/Young'111/Hinchliffe combination discloses the invention substantially as claimed in claim 1 and discussed above. However, Young/Young '111/Hinchliffe combination does not disclose wherein said lumen is in fluid communication with a fluid port in the tip.

8. Daniel teaches an electrosurgical instrument comprising an electrode tip (distal end structure of needle electrode in Fig. 7F, 8, 11), wherein the electrode tip comprises a fluid port (injection port 115F) in communication with a lumen for cooling the needle electrode (col. 2, ln. 53-65). Injection of electrolyte solution into the target site would enhance conductivity of the target site during applying of RF current to the electrode and/or provide cooling to the electrodes and surrounding tissue (col. 12, ln. 31-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the stem of Young/Young'111/Hinchliffe combination to incorporate a lumen in fluid communication with a fluid port in the tip as taught by Daniel. Doing so would provide enhanced conductivity to the target site or provide cooling to the electrodes and the surrounding tissue when the electrolyte solution or cooling solution are injected through the lumen to the fluid port.

19. **Claims 9-11 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Young, Young '111 and Hinchliffe as applied claim 1, and further in view of Gough et al (hereinafter 'Gough', U.S. PGPub No. 2004/0260282).**

20. **In regard to claims 9-11,** Young/Young'111/Hinchliffe combination discloses the invention substantially as claimed in claim 1 and discussed above. Young further teaches wherein the plurality of filaments consists essentially of two filaments (for example, see Fig. 3). However, Young/Young'111/Hinchliffe combination is silent as to a distal end of each filament defining a point when each filament is in the deployed position, and wherein average of all the points is offset from a central longitudinal axis of the elongate member.

21. Gough teaches a similar device (device 10 in Fig. 6A, 6C, 7 and 8) as that of Young for delivering energy to tissues comprising a needle (introducer 14) and a plurality of filaments (energy delivery device 16', [0013], [0058]). In Fig. 6C, Gough teaches wherein the central lumen of the needle (lumen 14" of primary antenna 14) comprises lumens (16) that are used to introduce filaments (secondary antenna 16). Gough further teaches wherein the lumens are circumferentially offset by an angle in the fully retracted position. Given that Young teaches the plurality of filaments consisting essentially of two filaments that can be positioned non-symmetrically and Gough further teaches wherein the lumens are circumferentially offset by an angle in the fully retracted position, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Young/Bonnette combination to incorporate the teaching of Gough to circumferentially offset by an angle in the fully retracted position to introduce the filaments in a variety of different geometric configurations ([0063]).

22. However, Young/Bonnette/Gough combination is silent as to wherein the plurality of filaments are circumferentially offset by about 120° in the first position. Given that Young is concerned with providing non-symmetric ablation treatment volume ([0005]-[0006], [0028]), it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide wherein the two filaments are circumferentially offset by about 120°, since it

has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

23. With respect to claim 11, it is noted that the plurality of filaments that are offset from the longitudinal axis can be configured to form a lesion having a pyramidal shape.

24. **Claim 14 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Young, Young '111 and Hinchliffe and further in view of Delano et al. (hereinafter 'Delano', U.S. PGPub. No. 2009/0292259).**

25. **In regards to claim 14,** Young/Young'111/Hinchliffe combination discloses the invention substantially as claimed in claim 1 and discussed above. Furthermore, Young further discloses that the tip is a beveled shape which is radially asymmetrical.

26. However, Young/Young'111/Hinchliffe combination fails to disclose wherein the hub comprises an indicator that is oriented to communicate an oritentation fo the asymmetrical tip.

27. Delano teaches a needle device (needle assembly 20 in Fig. 9) comprising a beveled tip (distal tip 23 comprises a bevel 23A as shown in Fig. 9) and a hub (needle hub 4), wherein the hub comprises an indicator that is oriented to communicate an orientation of the asymmetrical tip ([0060]: a first directional indicator 6IND in Fig. 9 corresponds to the orientation of the bevel 23A of the distal tip 23 of the cannula). Therefore, it would have been obvious to one of ordinary skill in the art before the invention was made to modify the hub of Young/Young'111/Hinchliffe combination and incorporate an indicator that corresponds to the orientation of the beveled distal tip as taught by Delano, thereby arriving at the claimed invention. Doing so allows a user to view the visual indicator on the hub and determine the orientation of the asymmetrical/beveled tip when it is positioned in a target tissue.

Response to Arguments

28. Applicant's arguments, see Remarks filed on March 11, 2019, with respect to the rejection(s) of claim(s) 1 under 35 U.S.C. 102(b) as being anticipated by Young (U.S. PGPub. No. 2006/0084965) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Young, Young (U.S. PGPub. No. 2006/0206111), and further in view of Hinchliffe et al. (U.S. PGPub. No. 2002/0143302).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUNHWA KIM whose telephone number is (571)270-1265. The examiner can normally be reached on 9AM-5:30PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOSEPH STOKLOSA can be reached on (571) 272-1213. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EUN HWA KIM/
Primary Examiner, Art Unit 3794
6/14/2019

Notice of References Cited	Application/Control No. 15/098,673	Applicant(s)/Patent Under Reexamination Wright et al.	
	Examiner EUNHWA KIM	Art Unit 3794	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20020143302-A1	10-2002	Hinchliffe, Peter W.J.	A61B18/00	604/272
*	B	US-20040260282-A1	12-2004	Gough, Edward J.	A61B18/1477	606/41
*	C	US-20060206111-A1	09-2006	Young; Kimbolt	A61B18/1477	606/44
*	D	US-20090292259-A1	11-2009	Delano; Peter George	A61B17/3401	604/263
*	E	US-20100049192-A1	02-2010	Holtz; Michael C.	A61B18/1492	606/41
*	F	US-7108696-B2	09-2006	Daniel; Steven A.	A61B18/1477	606/41
	G					
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	J					
	K					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	Art Unit
	EUNHWA KIM	3794

CPC - Searched*		
Symbol	Date	Examiner
A61B18/1477,1467; A61B2018/1253,00577	09/10/2018	EK
A61B2218/001,002,003	06/14/2019	EK

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Assignee & Inventor Search	09/10/2018	EK
See search history printout	09/10/2018	EK
Updated Search (see EAST search history printout)	06/14/2019	EK

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/EUN HWA KIM/ Primary Examiner, Art Unit 3794	

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	**Art Unit**
	EUNHWA KIM	3794

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	09/10/2018	06/14/2019							
	1	✓	✓							
	2		✓							
	3		✓							
	4		✓							
	5		✓							
	6		✓							
	7		✓							
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	14		✓							
	15		✓							
	16		✓							
	17		✓							
	18		N							
	19		N							

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	1	"20190150832"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/14 13:24
L4	16	"20060206111" "20020143302" "20100049192" "7108696".pn. "20040260282" "20090292259"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/14 13:39
L5	652	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2019/06/14 13:44
L6	26	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2019/06/14 13:44
S1	5986	606/41,44.ccls.	US-PGPUB; USPAT	OR	ON	2014/01/29 10:14
S2	501	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:32
S3	110	((ROBERT) near2 (WRIGHT)).INV.	EPO; JPO; DERWENT	OR	ON	2014/01/29 11:33
S4	22	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
S5	3	((SCOTT) near2 (BRANDT)).INV.	EPO; JPO; DERWENT	OR	ON	2014/01/29 11:33
S6	3	S2 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
S7	0	S3 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
S8	2	S4 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:34
S9	0	S5 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:34
S10	373	US-1234567-$.DID. OR US-D372086-$.DID. OR US-4011872-$.DID. OR US-4206761-$.DID. OR US-4206762-$.DID. OR US-4281667-$.DID. OR US-4353371-$.DID. OR US-4375220-$.DID. OR US-4378809-$.DID. OR US-4385636-$.DID. OR US-4411266-$.DID. OR US-4565200-$.DID. OR US-4573980-$.DID. OR US-4583538-$.DID. OR US-4593703-$.DID. OR US-4618978-$.DID. OR US-4646752-$.DID. OR US-4653508-$.DID. OR US-4660568-$.DID. OR US-4676255-$.DID. OR US-4698207-$.DID. OR US-4787886-$.DID. OR US-4796615-$.DID. OR US-4827927-$.DID. OR US-4838265-$.DID. OR US-4886506-$.DID. OR US-4907589-$.DID. OR US-4966597-$.DID. OR US-5010897-$.DID. OR US-5160337-$.DID. OR US-5217457-$.DID. OR US-5230623-$.DID. OR US-5233515-$.DID. OR US-5244462-$.DID. OR US-5257630-$.DID. OR US-5291896-$.DID. OR US-5304114-$.DID. OR US-5304115-$.DID. OR US-5312329-$.DID. OR US-5312391-$.DID. OR US-5318013-$.DID. OR US-5324255-$.DID. OR US-5334183-$.DID. OR US-5342292-$.DID. OR US-5370645-$.DID. OR US-5370675-$.DID. OR US-5372596-$.DID. OR US-5377685-$.DID. OR US-5397301-$.DID. OR US-5401272-$.DID. OR US-5421923-$.DID. OR US-5422567-$.DID. OR US-5423809-$.DID. OR US-5433739-$.DID. OR US-5447417-$.DID. OR US-5458597-$.DID. OR US-5472441-$.DID. OR US-5472442-$.DID. OR US-5474057-$.DID. OR US-5484398-$.DID. OR US-5496312-$.DID. OR US-5507743-$.DID. OR US-5511564-$.DID. OR US-5514129-$.DID. OR US-5536267-$.DID. OR US-5541376-$.DID. OR US-5560358-$.DID. OR US-5562703-$.DID. OR US-5571147-$.DID. OR US-5580665-$.DID. OR US-5599345-$.DID. OR US-5599346-$.DID. OR US-5611709-$.DID. OR US-5613966-$.DID. OR US-5628743-$.DID. OR US-5662111-$.DID. OR US-5662620-$.DID. OR US-5662680-$.DID. OR US-5667488-$.DID. OR US-5669904-$.DID. OR US-5672173-$.DID. OR US-5672174-$.DID. OR US-5683349-$.DID. OR US-5683384-$.DID. OR US-5701575-$.DID. OR US-5720744-$.DID. OR US-5728143-$.DID. OR US-5735847-$.DID. OR US-5738648-$.DID. OR US-5748703-$.DID. OR US-5749689-$.DID. OR US-5755754-$.DID. OR US-5768679-$.DID. OR US-5772659-$.DID. OR US-5778043-$.DID. OR US-5782827-$.DID. OR US-5792146-$.DID. OR US-5797906-$.DID. OR US-5800484-$.DID. OR US-5807309-$.DID. OR US-5810804-$.DID. OR US-5827271-$.DID. OR US-5827276-$.DID. OR US-5848967-$.DID. OR US-5855576-$.DID. OR US-5863290-$.DID. OR US-5868740-$.DID. OR US-5911739-$.DID. OR US-	US-PGPUB; USPAT	OR	ON	2014/01/29 11:37

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S11	4	US-1234567-$.DID. OR US-5507802-$.DID. OR US-7270661-$.DID. OR US-20070287996-$.DID.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:38
S12	20	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$).did.	US-PGPUB; USPAT	OR	ON	2014/01/29 12:00
S13	379	S10 or S11 S12	US-PGPUB; USPAT	OR	ON	2014/01/29 12:00
S14	20	S13 and S12	US-PGPUB; USPAT	OR	ON	2014/01/29 12:19
S15	379	S13 S12	US-	OR	ON	2014/01/29

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			PGPUB; USPAT			12:19
S16	23	S15 and (detent)	US-PGPUB; USPAT	OR	ON	2014/01/29 12:19
S17	100218	"606"/$.ccls.	US-PGPUB; USPAT	OR	ON	2014/01/29 12:21
S18	136	neurotomy	US-PGPUB; USPAT	OR	ON	2014/01/29 12:21
S19	5	"7108696".pn. "7357798".pn. "20090221998".pgnr. "20060217705".pgnr. "200620200121".pgnr. "20090024124".pgnr.	US-PGPUB; USPAT	OR	ON	2014/01/29 12:46
S20	88	US-8292822-$.DID. OR US-5540778-$.DID. OR US-5672375-$.DID. OR US-3918455-$.DID. OR US-4341094-$.DID. OR US-5232442-$.DID. OR US-5304141-$.DID. OR US-5379900-$.DID. OR US-5562685-$.DID. OR US-5709692-$.DID. OR US-20050059964-$.DID. OR US-5226912-$.DID. OR US-5269808-$.DID. OR US-5425746-$.DID. OR US-5437726-$.DID. OR US-5569302-$.DID. OR US-5250247-$.DID. OR US-5507777-$.DID. OR US-5649962-$.DID. OR US-5374278-$.DID. OR US-5639506-$.DID. OR US-5643628-$.DID. OR US-5891247-$.DID. OR US-6031018-$.DID. OR US-6053086-$.DID. OR US-4124153-$.DID. OR US-4282637-$.DID. OR US-4457128-$.DID. OR US-4501133-$.DID. OR US-4907741-$.DID. OR US-5503092-$.DID. OR US-5532657-$.DID. OR US-5648003-$.DID. OR US-5683025-$.DID. OR US-5891166-$.DID. OR US-5897044-$.DID. OR US-5954242-$.DID. OR US-5991957-$.DID. OR US-6035916-$.DID. OR US-6051180-$.DID. OR US-6126676-$.DID. OR US-6270464-$.DID. OR US-6402770-$.DID. OR US-6536482-$.DID. OR US-6699205-$.DID. OR US-6730042-$.DID. OR US-6739024-$.DID. OR US-7761964-$.DID.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2014/02/11 12:24
S21	75	US-5769822-$.DID. OR US-20050288759-$.DID. OR US-4998661-$.DID. OR US-5934275-$.DID. OR US-5133738-$.DID. OR US-5226912-$.DID. OR US-5503092-$.DID. OR US-6536482-$.DID. OR US-20060106405-$.DID. OR US-6803013-$.DID. OR US-20020176734-$.DID. OR US-20070215543-$.DID. OR US-5749846-$.DID. OR US-8206300-$.DID. OR US-8414509-$.DID. OR US-20050004563-$.DID. OR US-20050222565-$.DID. OR US-20050283148-$.DID. OR US-20090131790-$.DID. OR US-3840011-$.DID. OR US-4191054-$.DID. OR US-4269387-$.DID. OR US-4553687-$.DID. OR US-4710176-$.DID. OR US-4755173-$.DID. OR US-4808168-$.DID. OR US-4832690-$.DID. OR US-4833824-$.DID. OR US-5112311-$.DID. OR US-5154698-$.DID. OR US-5239773-$.DID. OR US-5265606-$.DID. OR US-5487739-$.DID. OR US-5542268-$.DID. OR US-5607003-$.DID. OR US-5687739-$.DID. OR US-5713872-$.DID. OR US-5743882-$.DID.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2014/02/11 12:24
S22	50	("20110213356" "20110288540" "5540778" "5672375" "3918455" "4341094" "5232442" "5304141" "5379900" "5562685" "5709692" "20050059964" "5226912" "5269808" "5425746" "5437726" "5569302" "5250247" "5507777" "5649962" "5374278" "5639506" "5643628" "5891247" "6031018" "6053086" "4124153" "4282637" "4457128" "4501133" "4907741" "5503092" "5532657" "5648003" "5683025" "5891166" "5897044" "5954242" "5991957" "6035916" "6051180" "6126676" "6270464" "6402770" "6536482" "6699205" "6730042" "6739024" "7761964" "8292822").pn.	US-PGPUB; USPAT	OR	ON	2014/02/11 12:26
S23	85	S20 S21 S22	US-PGPUB; USPAT	OR	ON	2014/02/11 12:26
S24	85	S20 S21 S22	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/11 12:26
S25	1	"20090221998"	DERWENT	OR	ON	2014/02/11 12:39
S26	259590	a61b2018/0016, "00166", "00196", "00208", "00273", "00279", "0091", "00434", "0044", "1425", "143", "1432", "1465" "1475".cpc.	DERWENT	OR	ON	2014/02/11 12:56
S27	891	a61b2018/0016,00166,00196,00208,00273,00279,0091,00434,0044,1425,143,1432,1465,1475.cpc.	DERWENT	OR	ON	2014/02/11 12:58
S28	5217	a61b2018/0016,00166,00196,00208,00273,00279,0091,00434,0044,1425,143,1432,1465,1475.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/11 12:58
S29	3226	S28 and @py<"2009"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/11 13:00
S30	3	"7108696".pn. "7357798".pn. "20060217705".pgnr. "7108696".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 09:58
S31	3	"7108696".pn. "7357798".pn. "20060217705".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 09:59
S32	2	"7270661".pn. "5507802.pn" "20070287996".pgnr.	US-PGPUB; USPAT; USOCR;	OR	ON	2014/02/12 10:01

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			EPO; JPO			
S33	3	"7270661".pn. "5507802".pn. "20070287996".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:02
S34	50	(actuator actuate actuating) same (helical adj track thread) same (filament electrode) same (hub)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:34
S35	12	(actuator actuate actuating) same (helical adj track thread) same (filament electrode) same (hub) same (advanced advancing deployed deploying deploy retracted retracting retract)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:38
S37	316	(actuator actuate actuating) same (helical adj track thread) same (advanced advancing deployed deploying deploy retracted retracting retract) near3 (filament stylet anchor element)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:41
S38	274031	("600" "606" "607").CLAS.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:45
S39	13082	S38 and filament	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:45
S40	3630	S39 and (actuate actuator actuating)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:46
S41	6	S39 and (hub with thread) and (actuat$3 with thread)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:47
S42	2598	S39 and (rotate rotat$4) same (deployment deploy retract retract$4 advance advancing)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:33
S43	251	S39 and (rotate rotat$4) same (deployment deploy retract retract$4 advance advancing) same (filament)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:34
S44	1	"5964756".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:55
S45	110	S39 and (rotate rotat$4) with (actuate actuating actuated) and (deployment deploy retract retract$4 advance advancing) same (filament)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 12:00
S46	52	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$).did.	US-PGPUB; USPAT	OR	ON	2014/02/12 14:02
S47	49	S46 and (filament antenna electrode)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:04
S48	37500	S46 and (filament antenna electrode) and (single near2 wire) or ("same" near2 wire)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:05
S49	3	S46 and (filament antenna electrode) and ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:05

S50	4674	S38 and (filament antenna electrode) and ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:06
S51	1425	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S52	2	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) with (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S53	4	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) same (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S54	92	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) same2 (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:08
S55	504	S38 and (filament antenna electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:09
S56	258	S38 and (filament antenna electrode) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:09
S57	17	US-6379353-$.DID. OR US-6888919-$.DID. OR US-20020077627-$.DID. OR US-20040024300-$.DID. OR US-20040096033-$.DID. OR US-20040158239-$.DID. OR US-20050261570-$.DID. OR WO-9903397-$.DID. OR WO-0222019-$.DID. OR WO-2005036124-$.DID.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2014/02/12 14:23
S58	0	("2010/0256625").URPN.	USPAT	OR	ON	2014/02/12 14:23
S59	331	(filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:31
S60	258	S38 and(sylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:31
S61	258	S38 and(stylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:32
S62	258	S38 and(stylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:32
S63	1332	(filament electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:33
S64	495	(filament electrode) with (form$3 made built) with (single near2 wire) and S38	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:34
S65	237	S64 not S59	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:34
S66	0	"606"/$.clas. and (helical) near2 (track thread) with (detents) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S67	0	"606"/$.clas. and (helical) near2 (track thread) same (detents) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S68	0	"606"/$.clas. and (track thread) same (detent) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S69	4757	(track thread) same (detent) same (deploy$4 retract$4 advanc$4)	US-	OR	ON	2014/02/12

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			PGPUB; USPAT; USOCR; FPRS; EPO; JPO			14:56
S70	14	(track thread) same (detent) same (indicat$4 alert$4) with (deploy$4 retract$4 advanc$4) same (visual tactile audible)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:57
S71	2	"20060264974".pgnr. "5827276".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 16:33
S72	1332	(filament electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:00
S73	2599	(filament electrode) with (form$3 made built) with (single near2 wire or "same" near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:01
S74	389	S73 and "606"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:01
S75	50	"606"/$.ccls. and (distal near2 (tip end)) near4 (insulat$4) with (partially partial "part of")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:41
S76	0	"606"/$.ccls. and (distal near2 (tip end)) with (insulat$4) with (partially partial "part of") same ("non-adhere" "adhere")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:55
S77	126	"606"/$.ccls. and (distal near2 (tip end)) with (insulat$4 insulate insulated) with (partially partial "part of")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:56
S78	76	S77 not S75	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:56
S79	57	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$ or US-20060264974-$ or US-20020143302-$ or US-20040199179-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$ or US-5827276-$ or US-5855576-$).did.	US-PGPUB; USPAT	OR	ON	2014/02/14 13:07
S80	27	S79 and (distal near2 (tip end point)) with (insulat$4 insulate insulated)	US-PGPUB; USPAT	OR	ON	2014/02/14 13:32
S81	91820	"28" and (needle) and (angle)	US-PGPUB; USPAT	OR	ON	2014/02/19 14:27
S82	5235	a61b2018/0016,00166,00196,00208,00273,00279,0091,00434,0044,1425,143,1432,1465,1475.cpc.	US-PGPUB; USPAT; USOCR;	OR	ON	2014/02/19 14:27

			EPO; JPO			
S83	1645	S82 and (needle) and (angle)	US-PGPUB; USPAT	OR	ON	2014/02/19 14:27
S84	636	S82 and (needle) near2 (tip end point) and (angle)	US-PGPUB; USPAT	OR	ON	2014/02/19 14:27
S85	636	S82 and (needle) near2 (tip end point) and (angle)S84 and @py<"2009"	US-PGPUB; USPAT	OR	ON	2014/02/19 14:28
S86	359	S82 and (needle) near2 (tip end point) and (angle) and @py<"2009"	US-PGPUB; USPAT	OR	ON	2014/02/19 14:28
S87	12924	606/32-52.ccls.	US-PGPUB; USPAT	OR	ON	2014/06/16 10:00
S88	4365	S87 and (monopolar unipolar) and (tine filament wire stem)	US-PGPUB; USPAT	OR	ON	2014/06/16 10:01
S89	4761	S87 and (monopolar unipolar) and (tine filament wire stem needle)	US-PGPUB; USPAT	OR	ON	2014/06/16 10:02
S90	276	S87 and (monopolar unipolar) and (tine filament wire stem needle) and (plurality multiple) with (monopolar)	US-PGPUB; USPAT	OR	ON	2014/06/16 10:06
S91	58	S87 and (monopolar unipolar) and (tine filament wire stem needle) and (plurality multiple) with (monopolar) with (active) near3 (electrode)	US-PGPUB; USPAT	OR	ON	2014/06/16 10:14
S92	58	S87 and (tine filament wire stem needle) and (plurality multiple) with (unipolar monopolar) with (active) near3 (electrode)	US-PGPUB; USPAT	OR	ON	2014/06/16 10:14
S93	72	S87 and (tine filament wire stem needle) and (plurality multiple) with (unipolar monopolar) same (active) near3 (electrode)	US-PGPUB; USPAT	OR	ON	2014/06/16 10:15
S94	76	S87 and (tine filament wire needle stylet) and (plurality multiple) with (unipolar monopolar) same (active) near3 (electrode)	US-PGPUB; USPAT	OR	ON	2014/06/16 10:21
S95	4	S94 not S93	US-PGPUB; USPAT	OR	ON	2014/06/16 10:21
S96	546	S87 and (tine filament wire needle stylet probe) with (plurality multiple) and (unipolar monopolar) same (active) near3 (electrode)	US-PGPUB; USPAT	OR	ON	2014/06/16 10:39
S97	161	S87 and (tine filament wire needle stylet probe) with (plurality multiple) with (single one) same (active) near3 (electrode)	US-PGPUB; USPAT	OR	ON	2014/06/16 10:45
S98	271	(tine filament wire needle stylet probe) with (plurality multiple) with (single one) same (active) near3 (electrode)	US-PGPUB; USPAT	OR	ON	2014/06/16 10:51
S99	110	S98 not S97	US-PGPUB; USPAT	OR	ON	2014/06/16 10:51
S100	435	(plurality multiple) near4 (electrode) with (monopolar)	US-PGPUB; USPAT	OR	ON	2014/06/16 11:02
S101	1	12/940974.app.	US-PGPUB; USPAT	OR	ON	2014/09/17 09:58
S102	3	("2006/0206111").URPN.	USPAT	OR	ON	2014/10/22 11:56
S103	3	("2006/0206111").URPN.	US-PGPUB; USPAT	OR	ON	2014/10/22 11:56
S104	66	606/41.ccls. and young.in.	US-PGPUB; USPAT	OR	ON	2014/10/22 11:56
S105	5544	606/41.ccls. and (time filament stylet)	US-PGPUB; USPAT	OR	ON	2014/10/22 12:07
S106	0	606/41.ccls. and (time filament stylet) with (offset) with (needle trocar)	US-PGPUB; USPAT	OR	ON	2014/10/22 12:07
S107	509	606/41.ccls. and (time filament stylet) with (needle trocar)	US-PGPUB; USPAT	OR	ON	2014/10/22 12:07
S108	309	606/41.ccls. and (time filament stylet) with (needle trocar) and (monopolar unipolar)	US-PGPUB;	OR	ON	2014/10/22 12:31

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			USPAT			
S109	1	12/940974.app.	US-PGPUB; USPAT	OR	ON	2014/10/22 12:42
S110	0	606/41.ccls. and monopolar same bipolar same (larger bigger) with lesion with volume	US-PGPUB; USPAT	OR	ON	2014/10/22 14:05
S111	0	606/41.ccls. and (monopolar unipolar) same bipolar same (larger bigger) with lesion with volume	US-PGPUB; USPAT	OR	ON	2014/10/22 14:05
S112	38	606/41.ccls. and (monopolar unipolar) same bipolar same lesion with volume	US-PGPUB; USPAT	OR	ON	2014/10/22 14:06
S113	402	606/41.ccls. and two near3 (tine filament stylet needle antenna)	US-PGPUB; USPAT	OR	ON	2014/10/22 16:19
S114	0	"2009022800".pgnr.	US-PGPUB; USPAT	OR	ON	2014/10/22 17:02
S115	1	"20090022800".pgnr.	US-PGPUB; USPAT	OR	ON	2014/10/22 17:02
S116	493	606/41.ccls. and two near5 (tine filament stylet needle antenna)	US-PGPUB; USPAT	OR	ON	2014/10/22 17:03
S117	181	606/41.ccls. and two near5 (tine filament stylet needle antenna) same (distal)	US-PGPUB; USPAT	OR	ON	2014/10/22 17:04
S118	0	("2007/0077230").URPN.	USPAT	OR	ON	2014/10/22 19:56
S119	0	("2007/0077230").URPN.	USPAT	OR	ON	2014/10/22 19:56
S120	2	("20040059328" | "20110288540").PN.	US-PGPUB; USPAT	OR	ON	2014/10/23 00:46
S121	5	("20040158239" | "20070112340" | "20080161804" | "20080249392" | "20080269558").PN.	US-PGPUB; USPAT	OR	ON	2014/10/23 00:46
S122	7	S120 S121	US-PGPUB; USPAT	OR	ON	2014/10/23 00:46
S123	0	("2007/0077230").URPN.	USPAT	OR	ON	2014/10/23 00:47
S124	1	12/940974.app.	US-PGPUB; USPAT	OR	ON	2014/11/03 13:33
S125	1	"20060084965".pgnr.	US-PGPUB; USPAT	OR	ON	2014/11/03 14:03
S126	1	"12940974"	US-PGPUB; USPAT	OR	ON	2015/03/04 17:14
S127	2	"20070203486"	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 19:25
S128	1	"15098673"	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 19:40
S129	1	"15098673"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/12 17:35
S130	63	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$ or US-20060264974-$ or US-20020143302-$ or US-20040199179-$ or US-20010012956-$ or US-20060084965-$ or US-20040015161-$).did. or (US-20060089636-$ or US-20090228001-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$ or US-	US-PGPUB; USPAT	OR	OFF	2019/06/12 18:17

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		5827276-$ or US-5855576-$ or US-5741225-$).did.				
S131	49	S130 and fluid	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/12 18:17
S132	79	("4869248" | "4947842" | "5103804").PN. OR ("6123084").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/06/12 21:57
S133	2	"20050020974"	US-PGPUB; USPAT; USOCR	OR	OFF	2019/06/12 22:08
S134	33	a61f2/82 and a61f2250/0001.cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/06/12 23:20
S135	47	("20030004528" | "20040087914" | "4776346" | "4836201" | "4900311" | "4907599" | "4919129" | "5066295" | "5104382" | "5125413" | "5133713" | "5195959" | "5197963" | "5312400" | "5350356" | "5380321" | "5391177" | "5425718" | "5458597" | "5472441" | "5556376" | "5609573" | "5665102" | "6293945" | "6355034" | "6491690" | "6613026" | "6899712").PN. OR ("7198625").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/06/13 09:41
S136	156	a61b2218/001.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/13 10:24
S137	387	a61b2218/003.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/13 10:25
S138	8945	a61b2218/002.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/13 10:27
S139	624	a61b2218/002.cpc. and insert$4 near5 needle	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/13 10:28
S140	75	bloom.in. and a61b18/$5.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/13 15:17
S141	5	"7108696".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/13 16:35
S142	2	"20040260282"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/13 17:51
S143	1259	a61b18/$5.cpc. and rotat$4 with linear	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/13 21:57
S144	90	a61b18/$5.cpc. and rotat$4 with linear with (advanc$4 deploy$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/13 21:58
S145	787	a61b18/$5.cpc. and (orient$6) near5 (distal) near5 tip	US-PGPUB; USPAT;	OR	OFF	2019/06/13 22:23

			USOCR; FPRS; EPO; JPO			
S146	24	a61b18/$5.cpc. and (orient$6) near5 (distal) near5 tip with (indic$4 marker marking)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/13 22:23
S147	29	(a61b18/$5.cpc. a61b2018/$5.cpc.) and (orient$6) near5 (distal) near5 tip with (indic$4 marker marking)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/14 09:55
S148	66	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$ or US-20060264974-$ or US-20020143302-$ or US-20040199179-$ or US-20010012956-$ or US-20060084965-$ or US-20040015161-$).did. or (US-20060089636-$ or US-20090228001-$ or US-20010025178-$ or US-20040215181-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$ or US-5827276-$ or US-5855576-$ or US-5741225-$ or US-7025768-$).did.	US-PGPUB; USPAT	OR	OFF	2019/06/14 10:04
S149	11	S148 and (marking or indicia)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/14 10:05
S150	24	(needle) same (orient$6) near5 (distal) near5 tip with (indic$4 marker marking)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/14 10:08
S151	1	"15098673"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/06/14 11:17

EAST Search History (Interference)

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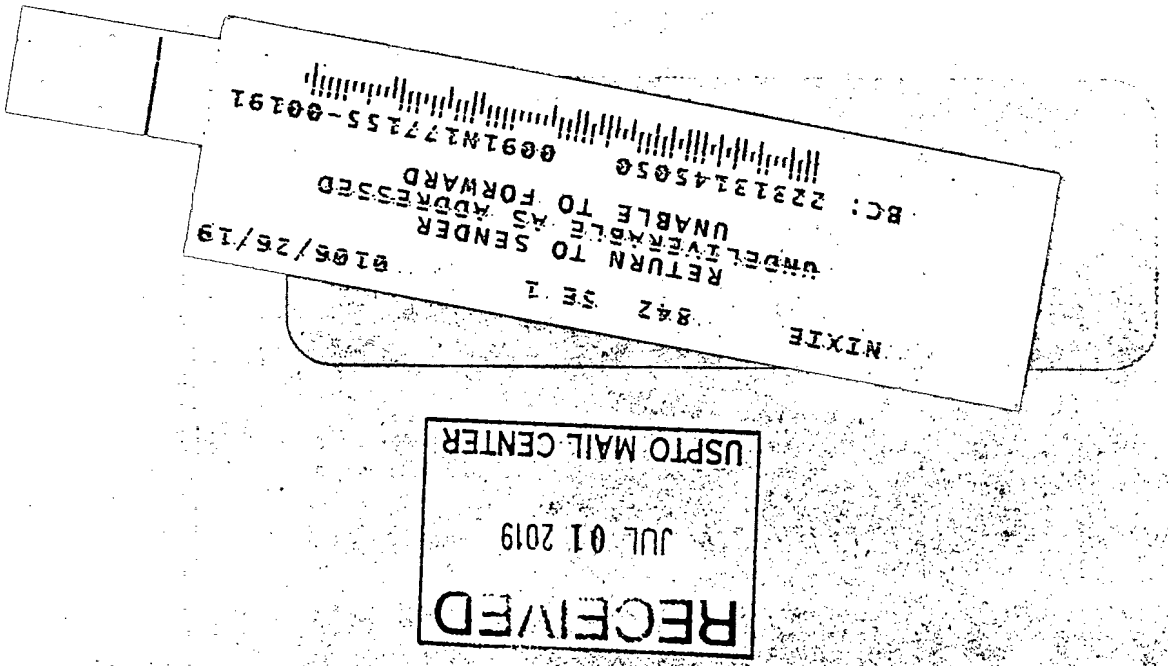
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

148468 7590 06/18/2019

Med Venture Holdings, LLC
2700 S 900 W STE D
Salt Lake City, UT 84119

EXAMINER
KIM, EUN HWA

ART UNIT	PAPER NUMBER
3794	

MAIL DATE	DELIVERY MODE
06/18/2019	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 15/098,673	Applicant(s) Wright et al.	
	Examiner EUNHWA KIM	Art Unit 3794	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-20 is/are pending in the application.

5a) Of the above claim(s) 19-20 is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-18 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 11/29/2016 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

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DETAILED ACTION

1. This action is pursuant to the claims filed on March 11, 2019. Claims 1-20 are pending. Claims 19 and 20 are withdrawn. A final action on the merits of claims 1-18 is as follows.

Notice of Pre-AIA or AIA Status

2. The present application is being examined under the pre-AIA first to invent provisions.

3. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Election/Restrictions

4. Newly submitted claims 19 & 20 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claim 1 the needle does not positively recite the RF probe; as such, the needle and the plurality of filaments can be used as monopolar and/or bipolar RF electrode(s).

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 19 and 20 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

5. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. **Claims 1-3 7, 8, 12, 13, and 15-18 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Young (U.S. PGPub. No. 2006/0084965) in view of Young (hereinafter 'Young'111' U.S. PGPub. No. 2006/0206111), and further in view of Hinchliffe et al. (hereinafter 'Hinchliffe', U.S. PGPub. No. 2002/0143302).**

8. **In regard to independent claims 1 and 17 and dependent claims 2-3 and 18,** Young discloses a needle (tissue ablation system in Figs. 1-7) for insertion into a patient during an RF ablation procedure (abstract), the needle comprising:

a. a hub (handle body 29);

b. an elongate member (elongate cannula 12) fixed to the hub, the elongate member comprising a lumen at an interior thereof (lumen within the shaft 20 which is electrically conductive in Figs. 2, 3, 5 and 6);

c. a tip (distal tip 94) fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient (distal tip is beveled and comprises a point 94 as shown in Figs. 2-7 for tissue piercing);

d. a plurality of filaments within at least a portion of the elongate member (two electrode 26);

e. a fitting (the proximal end 29 of the handle body is capable of receiving shaft 24 [0035]) being configured to allow for insertion of an RF probe into the lumen through the fitting (the proximal end 29 of the handle body is also capable of receiving electrical connectors/wires 38a & 38b disposed within the shaft 24);

f. wherein the lumen is configured to accept the RF probe (connectors 38a 38b are configured to accept electrical connectors/probes so as to connect to the RF generator and are configured to be disposed within the lumen of the cannula 12 when the shaft 24 is inserted into the cannula), such that an electrode of the inserted RF probe, the tip, and the first and second plurality of the filaments are operable to form a single monopolar RF electrode ([0034]: electrical connectors 38a and 38b can be conveniently coupled to the electrodes 26 via shaft 20 (which is electrically conductive); [0033]: "the array 30 of electrodes 26 and the operative electrode 92 are monopolar electrodes and current will pass from the electrodes 26 and the electrode 92 to the dispersive electrode to thereby deliver ablation energy in a monopolar configuration").

2. However, Young does not disclose the fitting is in fluid communication with the lumen so as to provide a connection for injection of fluid through the fitting.

3. Young'111 teaches a RF device similar to that of Young. Specifically, Young '111 teaches cooling or injecting/irrigating fluids through a plurality of filaments (lumen 208, distal opening 212 of filaments 26 in Figs. and 11) which is in fluid communication with a fluid source ([0044]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the plurality of filaments of Young and provide lumens thereof as

taught by Young '111 as doing so will allow the plurality of filaments to deliver conductive fluid to enhance the electrical characteristic of target tissue, or deliver cooling fluid to cool the body during use ([0044]). It is noted that Young/Young'111 combination provides for the fitting that is in fluid communication with the lumen so as to provide a connection for injection of fluid through the fitting and through the lumen when the fluid is irrigated from the tips of the plurality of filament when the plurality of filaments are disposed within the lumen of the elongate member.

9. Young also discloses a rotational mechanism for deploying the plurality of filaments (handle assembly 28, [0038]: the handle assembly 27 can be configured such that the electrodes 26 can be deployed by rotating the handle portion 28 relative to the handle body 27) between a retracted position and a deployed position relative to the tip. However, Young does not provide in detail, the internal structures of the filament deployment mechanism comprising an actuator interconnected to the plurality of filaments.

10. Hinchliffe teaches a deployment mechanism of a plurality of filaments in an elongated member. Although Hinchliffe specifically teaches that the filaments are used to deliver ablative fluids rather than delivering RF energy, the two are analogous in that the purpose is to ablate tissue and both procedures results in ablative tissue mass. Specifically, Hinchliffe teaches a hub (housing 212 in Figs.13-15) and an elongated member fixed to the hub (receiving needle 250) comprising a plurality of filaments (tines 280), and a tip shaped to pierce tissue (sharp distal tip 151 in Fig. 6). The deployment mechanism comprises an actuator (actuator 230) interconnected to the plurality of filaments, wherein rotation of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein rotation of the actuator in a second direction relative to the hub retracts the plurality

of filaments into the lumen to a retracted position ([0075]), wherein the actuator fits around at least a portion of the hub (the shoulder of the actuator 230 fits around the proximal end of the hub 212), and wherein the actuator is configured to rotate relative to the hub about a central longitudinal axis of the needle (the actuator is positioned along a central axis of the needle 250 as shown in Fig. 13), wherein the actuator is generally tubular (the actuator 230 is generally tubular body). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified manually deploying a plurality of filaments as disclosed by Young/Young'111 combination and provide a deployment mechanism with an actuator as taught by Hinchliffe. Doing so would allow actuation of the plurality of filaments in three positions: 1) retracted position, 2) a first radially deployable position and 3) a second radially deployable position and the plurality of filaments are retained in any one of the three positions ([0012]) to precisely control deployment of filaments.

11. **In regards to claim 7,** Young/Young '111/Hinchliffe combination further discloses each filament of the plurality of filaments has a pre-set bias such that the filament is curved when in the deployed state ([0027]: each electrode 26 has a flared curvilinear profile).

12. **In regards to claim 8,** Young/Young'111/Hinchliffe combination further discloses when each filament of the plurality of filaments is in the deployed position, the filaments extend outwardly from the tip (see Fig. 6, [0027]).

13. **In regards to claim 12,** Young/Young'111/Hinchliffe combination further discloses the tip tapers to a point, and wherein the elongate member and the tip comprises a single unitary structure (electrode 92 tapers to a point as shown in Figs. 5 and 6 and the assembly 4 forms a unitary structure).

14. **In regards to claim 13,** Young/Young'111/Hinchliffe combination further discloses a proximal end of the elongate member is fixed to the hub (the proximal portion of cannula 16 is fixed to hub 29 as shown in Figs. 5 and 6).

15. **In regards to claim 15,** in view of the combination of claim 1, Hinchliffe further teaches that the deployment mechanism (actuator 230) comprises indicia (marker ring 260 with markings, e.g. 3cm, 4cm, 5cm, etc.) of fractional deployment of a plurality of filaments (280) relative to a tip (251) of a needle (250; paragraph [0080]). Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have modified Young/Young '111/Hinchliffe combination to incorporate the teachings of indicia as taught by Hinchliffe to determine the deployment of filaments during a treatment.

16. **In regards to claim 16,** in view of the combination of claim 1, Hinchliffe further teaches detents that are configured to provide a tactile feedback to the user when the filaments are fully retracted, fully deployed and increments in between the fully retracted and fully deployed position of the filaments designating the radial dimension of the ablation zone created by the filaments in the corresponding positions (paragraph [0044]). Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have modified Young/Young'111/Hinchliffe combination to incorporate the teachings of Hinchliffe and incorporate detents that are configured to provide a tactile feedback to the user when the filaments are fully retracted, fully deployed and three increments in between the two positions (third, fourth and fifth positions).

17. **Claims 4 and 5 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Young, Young '111 and Hinchliffe as applied to claim 1, and further in view of Holtz et al. (hereinafter 'Holtz', U.S. PGPub. No. 2010/0049192).**

18. **In regards to claims 4 and 5,** in view of the combination in claim 1, Hinchliffe teaches a deployment mechanism with a slide member (inner tube 270 in Figs. 13-14) coupled to the actuator and fixedly connected to the plurality of filaments (tines 280 are fixedly mounted to inner tube 270), wherein upon rotation of the actuator relative to the slide member and relative to the hub, the actuator moves in tandem relation with the slide member along the central longitudinal axis of the elongate member and the plurality of filaments are advanced or retracted relative to the hub (paragraph [0075]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the deployment mechanism of Hinchliffe for advancement and retraction of the plurality of filaments.

4. However, Young/Young'111/Hinchliffe combination fails to disclose the slide member is limited to a linear motion relative to the hub as the actuator is rotated and further configured to axially advance and retract without rotating relative to the hub.

5. Holtz teaches advancing and retracting a plurality of filaments similar to that of Young using a rotation to linear gearing mechanism within a handle ([0297]). Specifically, Holtz teaches a hub includes a cavity sized to house a protrusion of the slide member (threaded piece 73 acts as a follower to the handle dial 72, moving axially within the handlie dial 72 when it is rotated. The threaded piece 73 is keyed to a feature in the handle grip 71 which it slides within to prevent the threaded piece from rotating with the handle dial 72). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the mechanism of advancing the slide member of Young/Young'111/Hinchliffe combination with the rotation to linear mechanism to advance a plurality of splines as taught by Holtz, thereby arriving at the claimed invention. The advantage of a rotation to linear gearing mechanism is that

precise mechanical advantage can be achieved while making precision fine adjustment to electrode deployment length ([0297]).

6. **Claim 6 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Young, Young '111 and Hinchliffe as applied to claim 1, and further in view of Daniel et al. (hereinafter 'Daniel', U.S. Pat. No. 7,108,696).**

7. **In regard to claim 6,** Young/Young'111/Hinchliffe combination discloses the invention substantially as claimed in claim 1 and discussed above. However, Young/Young '111/Hinchliffe combination does not disclose wherein said lumen is in fluid communication with a fluid port in the tip.

8. Daniel teaches an electrosurgical instrument comprising an electrode tip (distal end structure of needle electrode in Fig. 7F, 8, 11), wherein the electrode tip comprises a fluid port (injection port 115F) in communication with a lumen for cooling the needle electrode (col. 2, ln. 53-65). Injection of electrolyte solution into the target site would enhance conductivity of the target site during applying of RF current to the electrode and/or provide cooling to the electrodes and surrounding tissue (col. 12, ln. 31-65). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the stem of Young/Young'111/Hinchliffe combination to incorporate a lumen in fluid communication with a fluid port in the tip as taught by Daniel. Doing so would provide enhanced conductivity to the target site or provide cooling to the electrodes and the surrounding tissue when the electrolyte solution or cooling solution are injected through the lumen to the fluid port.

19. **Claims 9-11 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Young, Young '111 and Hinchliffe as applied claim 1, and further in view of Gough et al (hereinafter 'Gough', U.S. PGPub No. 2004/0260282).**

20. **In regard to claims 9-11,** Young/Young'111/Hinchliffe combination discloses the invention substantially as claimed in claim 1 and discussed above. Young further teaches wherein the plurality of filaments consists essentially of two filaments (for example, see Fig. 3). However, Young/Young'111/Hinchliffe combination is silent as to a distal end of each filament defining a point when each filament is in the deployed position, and wherein average of all the points is offset from a central longitudinal axis of the elongate member.

21. Gough teaches a similar device (device 10 in Fig. 6A, 6C, 7 and 8) as that of Young for delivering energy to tissues comprising a needle (introducer 14) and a plurality of filaments (energy delivery device 16', [0013], [0058]). In Fig. 6C, Gough teaches wherein the central lumen of the needle (lumen 14" of primary antenna 14) comprises lumens (16) that are used to introduce filaments (secondary antenna 16). Gough further teaches wherein the lumens are circumferentially offset by an angle in the fully retracted position. Given that Young teaches the plurality of filaments consisting essentially of two filaments that can be positioned non-symmetrically and Gough further teaches wherein the lumens are circumferentially offset by an angle in the fully retracted position, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Young/Bonnette combination to incorporate the teaching of Gough to circumferentially offset by an angle in the fully retracted position to introduce the filaments in a variety of different geometric configurations ([0063]).

22. However, Young/Bonnette/Gough combination is silent as to wherein the plurality of filaments are circumferentially offset by about 120° in the first position. Given that Young is concerned with providing non-symmetric ablation treatment volume ([0005]-[0006], [0028]), it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide wherein the two filaments are circumferentially offset by about 120°, since it

has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

23. With respect to claim 11, it is noted that the plurality of filaments that are offset from the longitudinal axis can be configured to form a lesion having a pyramidal shape.

24. **Claim 14 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Young, Young '111 and Hinchliffe and further in view of Delano et al. (hereinafter 'Delano', U.S. PGPub. No. 2009/0292259).**

25. **In regards to claim 14,** Young/Young'111/Hinchliffe combination discloses the invention substantially as claimed in claim 1 and discussed above. Furthermore, Young further discloses that the tip is a beveled shape which is radially asymmetrical.

26. However, Young/Young'111/Hinchliffe combination fails to disclose wherein the hub comprises an indicator that is oriented to communicate an oritentation fo the asymmetrical tip.

27. Delano teaches a needle device (needle assembly 20 in Fig. 9) comprising a beveled tip (distal tip 23 comprises a bevel 23A as shown in Fig. 9) and a hub (needle hub 4), wherein the hub comprises an indicator that is oriented to communicate an orientation of the asymmetrical tip ([0060]: a first directional indicator 6IND in Fig. 9 corresponds to the orientation of the bevel 23A of the distal tip 23 of the cannula). Therefore, it would have been obvious to one of ordinary skill in the art before the invention was made to modify the hub of Young/Young'111/Hinchliffe combination and incorporate an indicator that corresponds to the orientation of the beveled distal tip as taught by Delano, thereby arriving at the claimed invention. Doing so allows a user to view the visual indicator on the hub and determine the orientation of the asymmetrical/beveled tip when it is positioned in a target tissue.

Response to Arguments

28. Applicant's arguments, see Remarks filed on March 11, 2019, with respect to the rejection(s) of claim(s) 1 under 35 U.S.C. 102(b) as being anticipated by Young (U.S. PGPub. No. 2006/0084965) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Young, Young (U.S. PGPub. No. 2006/0206111), and further in view of Hinchliffe et al. (U.S. PGPub. No. 2002/0143302).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUNHWA KIM whose telephone number is (571)270-1265. The examiner can normally be reached on 9AM-5:30PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOSEPH STOKLOSA can be reached on (571) 272-1213. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EUN HWA KIM/
Primary Examiner, Art Unit 3794
6/14/2019

Notice of References Cited	Application/Control No. 15/098,673	Applicant(s)/Patent Under Reexamination Wright et al.	
	Examiner EUNHWA KIM	Art Unit 3794	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20020143302-A1	10-2002	Hinchliffe, Peter W.J.	A61B18/00	604/272
*	B	US-20040260282-A1	12-2004	Gough, Edward J.	A61B18/1477	606/41
*	C	US-20060206111-A1	09-2006	Young; Kimbolt	A61B18/1477	606/44
*	D	US-20090292259-A1	11-2009	Delano; Peter George	A61B17/3401	604/263
*	E	US-20100049192-A1	02-2010	Holtz; Michael C.	A61B18/1492	606/41
*	F	US-7108696-B2	09-2006	Daniel; Steven A.	A61B18/1477	606/41
	G					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

148468 7590 07/16/2019

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EXAMINER
KIM, EUN HWA

ART UNIT	PAPER NUMBER
3794	

MAIL DATE	DELIVERY MODE
07/16/2019	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Applicant-Initiated Interview Summary	**Application No.** 15/098,673	**Applicant(s)** Wright et al.	
	Examiner EUNHWA KIM	**Art Unit** 3794	**AIA (FITF) Status** No

All participants (applicant, applicants representative, PTO personnel):

(1) EUNHWA KIM.

(2) Daniel Higgs.

(3) Robert Wright.

(4) Bret Boudousquie.

Date of Interview: 12 July 2019.

Type: ☐ Telephonic ☑ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☑ Yes ☐ No.
If Yes, brief description: Video presentation of the animated product & product current used in the market.

Issues Discussed ☐101 ☐112 ☐102 ☑103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1 and 17.

Identification of prior art discussed: See Continuation Sheet.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

See Continuation Sheet.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/EUN HWA KIM/ Primary Examiner, Art Unit 3794	

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Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiners responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicants correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,-
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicants record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiners version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, Interview Record OK on the paper recording the substance of the interview along with the date and the examiners initials.

Continuation of Identification of prior art discussed: Young (U.S. PGPub. No. 2006/0084965) and Young (U.S. PGPub. No. 2006/0206111)

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: An interview included a demonstration of the claimed product (claim 1) and system (claim 17), discussion of the prior art that was cited in the OA.

There was a discussion about a physical contact between the probe and the lumen which allows for an electrical coupling between the probe, the filaments and the tip. Applicant pointed to paragraph [0062] of the specification that the probe is received by the tube (207 in FIg. 3A) and while not clear in the drawing, the probe can extends through the tube to make a contact with the distal tip 201. Applicant further clarified that the RF probe and the fluid are not simultaneously received by the lumen 222. Applicant expressed the intent to incorporate claim language regarding separately accepting RF probe and fluid at different time periods. The examiner explained that the lumen of Young/Young combination is capable of receiving the conductive wires and fluids and such amendment does not appear to overcome the rejection of record. However, there was an agreement that the following subject matter overcomes the rejection of record-the plurality of filaments are within the elongate member when the RF probe is fully withdrawn from the elongate member. Applicant expressed the intent to incorporate said claim limitation in the systems claim 17 or as a dependent form.

Applicant argued that Young/Young combination fails to disclose the fitting that is in fluid communication with the lumen. The examiner explained that the fluid travels through the fitting via an inner lumen and the fluid is capable of being irrigated from the tips of the plurality of filament when the plurality of filaments are disposed within the lumen of the elongate member. There was a discussion of further limiting the fitting so as to overcome the Young/Young'111 combination. For example, applicant inquired about Luer fitting. The examiner explained that such claim amendment appears to overcome the rejection of record, however, further search and/or consideration is required .

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/098,673	Filing Date 04/14/2016	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $40 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $210 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

AMENDMENT	08/19/2019	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 71	Minus	** 20	= 51		x $50 =	2550
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	2550

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/ANNETTE COWAN/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (02-18)
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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	15/098,673	Filing Date	2016-04-14	Docket Number (if applicable)	NBUS.001C1	Art Unit	3794
First Named Inventor	Robert E. Wright			Examiner Name	Eun Hwa Kim		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 602176

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

PTO/SB/30EFS (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Signature of Registered U.S. Patent Practitioner			
Signature	/Daniel C. Higgs/	Date (YYYY-MM-DD)	2019-08-19
Name	Daniel C. Higgs	Registration Number	55265

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Robert E. Wright	)	
Application No.:	15/098,673	)	Art Unit: 3794
Filing Date:	April 14, 2016	)	
Title:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	)	
Examiner:	Eun Hwa Kim	)	
Confirmation No.:	5232	)	
Customer No.:	148468	)	

AMENDMENT AND RESPONSE TO OFFICE ACTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Responsive to the Office Action dated June 18, 2019, the Applicant respectfully requests reconsideration of the pending claims in view of the amendments and remarks herein.

Amendments to the Claims are reflected in the listing of claims which begins on page 2.

Summary of the Interview begins on page 16.

Remarks begin on page 19.

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A needle for insertion into a patient during an RF ablation procedure, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments ~~disposed within at least a portion of the elongate member~~;

an actuator interconnected to the plurality of filaments, wherein rotation of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein rotation of the actuator in a second direction relative to the hub retracts the plurality of filaments ~~into the lumen~~ to a retracted position in which the plurality of filaments are disposed within at least a portion of the elongate member; and

a fitting in fluid communication with the lumen, the fitting being configured ~~so as~~ to provide a connection for injection of fluid through the fitting and through the lumen, the fitting further being configured to allow for insertion of an RF probe that is separate from the needle into the lumen through the fitting,

wherein the lumen is configured to accept the RF probe such that an electrode of the inserted RF probe, the tip, and the ~~first and second~~ plurality of filaments are operable to form a single monopolar RF electrode, and

wherein, when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, the plurality of filaments are movable via the actuator from the retracted position, in which the plurality of filaments

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are disposed within said at least a portion of the elongate member, to the deployed position.

2. (Previously presented) The needle of claim 1, wherein the actuator fits around at least a portion of the hub, and wherein the actuator is configured to rotate relative to the hub about a central longitudinal axis of the needle.

3. (Previously presented) The needle of claim 2, wherein the actuator is generally tubular.

4. (Previously presented) The needle of claim 1, further comprising a slide member coupled to the actuator and fixedly connected to the plurality of filaments, wherein the hub includes a cavity sized to house a protrusion of the slide member, and wherein the slide member is limited to a linear motion relative to the hub as the actuator is rotated.

5. (Previously presented) The needle of claim 4, wherein the slide member is configured to axially advance and retract without rotating relative to the hub.

6. (Previously presented) The needle of claim 1, wherein the tip comprises a fluid port in fluid communication with the lumen such that an anesthetic and/or an image enhancing dye may be introduced into a region around the tip through the fluid port.

7. (Previously presented) The needle of claim 1, wherein each filament of the plurality of filaments has a pre-set bias such that the filament is curved when in the deployed state.

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8. (Previously presented) The needle of claim 1, wherein when each filament of the plurality of filaments is in the deployed position, the filaments extend outwardly from the tip.

9. (Previously presented) The needle of claim 8, wherein each filament comprises a distal end, wherein the distal end of each filament defines a point when each filament is in the deployed position, and wherein an average of all the points is offset from a central longitudinal axis of the elongate member.

10. (Previously presented) The needle of claim 1, wherein the plurality of filaments comprises three filaments, and wherein an angle between each pair of adjacent filaments is 120 degrees when each filament is in the deployed position.

11. (Previously presented) The needle of claim 1, wherein the plurality of filaments are configured to form a lesion having a pyramidal shape.

12. (Previously presented) The needle of claim 1, wherein the tip tapers to a point, and wherein the elongate member and the tip comprise a single unitary structure.

13. (Previously presented) The needle of claim 1, wherein a proximal end of the elongate member is fixed to the hub.

14. (Previously presented) The needle of claim 1, wherein the tip is asymmetrical, and wherein the hub comprises an indicator that is oriented to communicate an orientation of the asymmetrical tip.

15. (Currently amended) The needle of claim 1, wherein the ~~first~~ hub and/or the actuator includes markings to indicate a depth of deployment of the plurality of filaments.

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16. (Currently amended) The needle apparatus of claim 1, wherein the ~~first~~ hub and/or the actuator includes detents to provide a tactile feedback of a position of the plurality of filaments.

17. (Previously presented) A system comprising:

the needle of claim 1; and

the RF probe.

18. (Previously presented) The system of claim 17, wherein the RF probe comprises a cable for use in connecting the RF probe to a radiofrequency generator.

19. (Withdrawn) A method comprising:

inserting the needle of claim 1 into a patient;

rotating the actuator to transition the plurality of filaments from the retracted position to the deployed position; and

operating the RF probe, the tip, and the plurality of filaments as a monopolar electrode.

20. (Withdrawn) The method of claim 19, further comprising inserting the RF probe into the lumen.

21. (New) The system of claim 17, wherein the fitting is configured to be coupled to a fluid source and the lumen is configured to conduct fluid from the fluid source when the RF probe is not positioned within the needle.

22. (New) The needle of claim 1, wherein the fitting is configured to provide a connection to a fluid source for said injection of fluid through the fitting and through the lumen.

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23. (New) The needle of claim 22, wherein the fitting comprises a Luer fitting configured to be connected with the fluid source when the RF probe is fully separated from the needle, such that none of the RF probe is within the needle, the Luer fitting further being configured to separately permit the RF probe to be inserted into the lumen through the Luer fitting when the Luer fitting is not connected with the fluid source.

24. (New) The needle of claim 22, wherein the fitting is configured to be connected with the fluid source and to permit fluid to pass through the fitting and through the lumen when the RF probe is not present within the lumen.

25. (New) The needle of claim 24, and wherein the fitting is further configured to permit the RF probe to be inserted into the lumen through the fitting when the fitting is not connected with the fluid source.

26. (New) The needle of claim 22, wherein the fitting is configured to accept a connector of the fluid source.

27. (New) The needle of claim 26, wherein the fitting comprises a Luer fitting and the connector of the fluid source comprises a Luer fitting.

28. (New) The needle of claim 22, wherein the lumen is configured to deliver fluid through the tip at the distal end of the needle.

29. (New) The needle of claim 28, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip of the needle without passing through an interior of any of the plurality of filaments.

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30. (New) The needle of claim 1, wherein the lumen is configured to deliver fluid through the tip at the distal end of the needle.

31. (New) The needle of claim 1, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

32. (New) The needle of claim 1, wherein the fitting is configured to provide the connection for the injection of fluid through the fitting separately from allowing for insertion of the RF probe into the lumen through the fitting.

33. (New) The needle of claim 1, wherein the fitting is at a proximal end of the needle such that the actuator is positioned distally relative to a proximal end of the fitting.

34. (New) The needle of claim 1, wherein the fitting comprises a Luer fitting.

35. (New) The needle of claim 34, wherein the Luer fitting is at a proximal-most position at a proximal end of the needle.

36. (New) The needle of claim 1, wherein, when the plurality of filaments are in the retracted position, the fitting is configured to connect to a fluid source and to permit fluid from the fluid source to pass through the fitting, through the lumen, and through the tip at the distal end of the needle.

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37. (New) The needle of claim 36, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

38. (New) The needle of claim 36, further comprising tube that is a separate member relative to the elongate member, the tube defining the lumen at the interior of the elongate member.

39. (New) The needle of claim 38, wherein the tube comprises a conductive material.

40. (New) The needle of claim 39, wherein the tube is configured to transport fluid therethrough, and wherein the tube is further configured to separately conduct therethrough RF energy emitted by the RF probe.

41. (New) The needle of claim 40, wherein the tube is further configured to conduct the RF energy into and through the tip and the plurality of filaments.

42. (New) The needle of claim 1, further comprising a tube that is a separate member relative to the elongate member, the tube defining the lumen at the interior of the elongate member.

43. (New) The needle of claim 42, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen defined by the tube and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

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44. (New) The needle of claim 42, wherein the tube comprises a conductive material.

45. (New) The needle of claim 44, wherein the tube is configured to transport fluid therethrough when the RF probe is absent from the lumen, and wherein the tube is further configured to separately conduct therethrough RF energy emitted by the RF probe when the RF probe is present within the lumen.

46. (New) The needle of claim 45, wherein the tube is further configured to conduct the RF energy into and through the tip and the plurality of filaments.

47. (New) The needle of claim 42, wherein the tube is positioned at an interior of the elongate member when the plurality of filaments are in the retracted position.

48. (New) The needle of claim 42, wherein the tube is in fluid communication with the tip at the distal end of the elongate member when the plurality of filaments are in the retracted position.

49. (New) The needle of claim 42, wherein the fluid passes from a fluid source, through the fitting, and through the tube when the fluid source is coupled to the fitting, and wherein the RF probe is separately received within the tube when fluid is not being transported through the tube.

50. (New) The needle of claim 1, wherein a fluid source is coupled with the fitting and fluid is transported through the lumen to a target volume within the patient when the needle is in a first operational state in which the RF probe is fully separated from the needle, such that none of the of the RF probe is within the needle, and wherein

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the lumen accepts the RF probe for delivery of RF energy to the target volume when the needle is in a second operational state in which fluid is not transported through the lumen.

51. (New) A system comprising:

an RF probe that comprises an electrode; and

a needle for insertion into a patient during an RF ablation procedure, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments;

an actuator interconnected to the plurality of filaments, wherein rotation of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position that extends distally beyond the tip, and wherein rotation of the actuator in a second direction relative to the hub retracts the plurality of filaments to a retracted position in which the plurality of filaments are disposed within at least a portion of the elongate member; and

a fitting in fluid communication with the lumen, the fitting being configured to provide a connection for injection of fluid through the fitting and through the lumen, the fitting further being configured to allow for insertion of the RF probe into the lumen through the fitting,

wherein the lumen is configured to accept the RF probe such that the electrode of the inserted RF probe, the tip, and the plurality of filaments are operable to form a single monopolar RF electrode, and

wherein when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle and such that the

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RF probe is neither physically nor electrically connected to the plurality of filaments, the plurality of filaments of the needle are positionable in the retracted position, in which the plurality of filaments are disposed within said at least a portion of the elongate member.

52. (New) The system of claim 51, wherein the needle further comprises a conductive tube that is a separate member relative to the elongate member, the conductive tube defining the lumen at the interior of the elongate member, wherein, when the RF probe is inserted into the lumen defined by the conductive tube, the conductive tube is configured to conduct RF energy emitted by the RF probe through the conductive tube and into and through the tip and the plurality of filaments.

53. (New) The system of claim 52, wherein the fitting is configured to provide a connection to a fluid source for said injection of fluid through the fitting and through the lumen when the RF probe is fully separated from the needle in the non-inserted state, such that none of the RF probe is within the needle.

54. (New) A needle for insertion into a patient during an RF ablation procedure, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments;

an actuator interconnected to the plurality of filaments, wherein rotation of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein rotation of the actuator in a second direction relative to the hub retracts the plurality of filaments to a retracted

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position in which the plurality of filaments are disposed within at least a portion of the elongate member; and

a Luer fitting in fluid communication with the lumen, the Luer fitting being configured to provide a connection to a fluid source for injection of fluid through the Luer fitting and through the lumen, the Luer fitting further being configured to allow for insertion of an RF probe into the lumen through the Luer fitting,

wherein the lumen is configured to accept the RF probe such that an electrode of the inserted RF probe, the tip, and the plurality of filaments are operable to form a single monopolar RF electrode.

55. (New) The needle of claim 54, wherein the Luer fitting is configured to be connected with the fluid source when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, and wherein the Luer fitting is further configured to separately permit the RF probe to be inserted into the lumen through the Luer fitting when the Luer fitting is not connected with the fluid source.

56. (New) The needle of claim 54, wherein the Luer fitting is configured to accept a Luer connector of the fluid source.

57. (New) The needle of claim 54, wherein the lumen is configured to deliver fluid through the tip at the distal end of the needle.

58. (New) The needle of claim 57, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip without passing through an interior of any of the plurality of filaments.

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59. (New) The needle of claim 54, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

60. (New) The needle of claim 54, wherein the Luer fitting is at a proximal end of the needle such that the actuator is positioned distally relative to a proximal end of the Luer fitting.

61. (New) The needle of claim 60, wherein the Luer fitting is at a proximal-most position at the proximal end of the needle.

62. (New) The needle of claim 54, wherein, when the plurality of filaments are in the retracted position and the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, the Luer fitting is configured to connect to the fluid source and to permit fluid from the fluid source to pass through the Luer fitting, through the lumen, and through the tip at the distal end of the needle.

63. (New) The needle of claim 62, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

64. (New) The needle of claim 54, further comprising a tube that is a separate member relative to the elongate member, the tube defining the lumen at the interior of the elongate member.

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65. (New) The needle of claim 64, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen defined by the tube and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

66. (New) The needle of claim 64, wherein the tube comprises a conductive material.

67. (New) The needle of claim 66, wherein the tube is configured to transport fluid therethrough, and wherein the tube is further configured to conduct therethrough RF energy emitted by the RF probe.

68. (New) The needle of claim 67, wherein the tube is further configured to conduct the RF energy into and through the tip and the plurality of filaments.

69. (New) The needle of claim 64, wherein the tube is positioned at an interior of the elongate member when the plurality of filaments are in the retracted position.

70. (New) The needle of claim 64, wherein the tube is in fluid communication with the tip at the distal end of the elongate member when the plurality of filaments are in the retracted position.

71. (New) The needle of claim 64, wherein the fluid passes from the fluid source, through the Luer fitting, and through the tube when the fluid source is coupled to the Luer fitting, and wherein the RF probe is separately received within the tube when fluid is not being transported through the tube.

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72. (New) The needle of claim 54, wherein the fluid source is coupled with the Luer fitting and fluid is transported through the lumen to a target volume within the patient when the needle is in a first operational state in which the RF probe is fully separated from the needle, such that none of the of the RF probe is within the needle, and wherein the lumen accepts the RF probe for delivery of RF energy to the target volume when the needle is in a second operational state in which fluid is not transported through the lumen.

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Summary of the Interview

The Applicant thanks Examiner Kim for the courtesy she extended to the following participants in the WebEx/video conference interview conducted on July 12, 2019: Robert Wright, Bret Boudousquie, and Daniel C. Higgs. The Applicant agrees with the Applicant-Initiated Interview Summary dated July 16, 2019 ("the Summary"), to the extent the Summary is consistent with minor clarifications provided hereafter.

Exhibit/Demonstration

As noted in the Summary, a commercial embodiment was shown, along with a video presentation demonstrating an animated version thereof.

Claims Discussed

Claims 1 and 17 were discussed.

Prior Art Discussed

U.S. Patent Application Publication No. 2006/0084965 of Young ("Young I") and U.S. Patent Application Publication No. 2006/0206111 of Young ("Young II") were discussed.

Principal Proposed Amendments

Amendments such as those set forth in amended claim 1 and new claims 51 and 54 herein were discussed.

Principal Arguments

The Applicant agrees with the identification of the principal arguments provided in the Summary, but wishes to clarify that the arguments were made with respect to certain, but not necessarily all, embodiments disclosed in the Application. Moreover, arguments made with respect to certain claim limitations do not necessarily apply to

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other claims from which such limitations are absent. For example, although there was discussion of an intent to incorporate claim language regarding separately accepting the RF probe and fluid at different time periods, this feature has only been recited in certain newly added dependent claims and is absent from the independent claims, given that it is the Examiner's view that this feature "does not appear to overcome the rejection of record." The Applicant, respectfully, does not acquiesce to the Examiner's reasoning and conclusions regarding this feature. Similarly, the Applicant, respectfully, does not acquiesce to the Examiner's reasoning and conclusions that the combination of Young I and Young II renders obvious a fitting, such as recited in previously presented claim 1, that is in fluid communication with the lumen.

Other Pertinent Matters Discussed

As noted in the Summary, there was a discussion regarding embodiments disclosed in the specification in which a physical contact is established between the probe and the lumen, which allows for an electrical coupling between the probe, the filaments and the tip. By way of illustration, paragraph [0062] and FIGS. 3A, 3B, and 4 were discussed. Moreover, although the specific paragraph(s) from which they were drawn were not explicitly identified during the interview, examples from, e.g., paragraphs [0064] and [0065] were also discussed. In certain (but not all) of such examples, the probe can extend through the tube to make a contact with the distal tip 201. In other examples, as stated in, e.g., paragraph [0064], "the RF probe 401 may be positioned such that the distal end 402 of the RF probe 401 is in the lumen 222 near the tip 201."

Results

The Applicant thanks Examiner Kim for the productive discussion of various proposed amendments. Agreement was reached that each of the following features, in combination with the further limitations previously recited in claim 1, separately and independently overcomes the rejection of record:

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(1) the plurality of filaments are within the elongate member when the RF probe, in its entirety, is absent from the elongate member; and, separately and independently,

(2) the fitting is structurally limited to being a Luer fitting.

In view of the foregoing agreement, claim 1 has been amended and new independent claims 51 and 54 have been added. These claims are constructed as follows:

Claim 1. Limitations pertaining to feature (1), above, are incorporated into amended independent claim 1 herein, in manners such as proposed during the interview.

Claim 51. Limitations pertaining to feature (1), above, have been combined with limitations recited in previously presented claims 1 and 17 to form new independent claim 51 herein.

Claim 54. Limitations pertaining to feature (2), above, have been combined with limitations recited in previously presented claim 1 to form new independent claim 54 herein.

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Remarks

This paper is submitted in response to the Office Action mailed June 18, 2019. Claims 1-20 were pending in the Application, with claims 19-20 having been withdrawn from consideration by way of the Office Action. Claims 1-18 stand rejected. By this paper, claims 1, 15, and 16 are amended and new claims 21-72 are added. The Applicant respectfully submits that all amendments are fully supported by the Application, as originally filed, and that none of the amendments add new matter to the Application.

Elections/Restrictions

Claims 19 and 20 currently stand withdrawn. The Applicant, respectfully, does not acquiesce to the reasoning presented in the Office Action for withdrawal of these claims. Nevertheless, as each of claims 19 and 20 depends from independent claim 1, the Applicant requests rejoinder of these claims upon allowance of claim 1.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-3, 7, 8, 12, 13, and 15-18 stand rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent Application Publication No. 2006/0084965 of Young ("Young I") in view of U.S. Patent Application Publication No. 2006/0206111 of Young ("Young II"), and further in view of U.S. Patent Application Publication No. 2002/0143302 of Hinchliffe et al. ("Hinchliffe"); claims 4 and 5 stand rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Young I, Young II, and Hinchliffe, and further in view of U.S. Patent Application Publication No. 2010/0049192 of Holtz ("Holtz"); claim 6 stands rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Young I, Young II, and Hinchliffe, and further in view of U.S. Patent No. 7,108,696 to Daniel et al. ("Daniel"); claims 9-11 stand rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Young I, Young II, and Hinchliffe, and further in view of U.S. Patent

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Application Publication No. 2004/0260282 of Gough et al. ("Gough"); and claim 14 stands rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Young I, Young II, and Hinchliffe, and further in view of U.S. Patent Application Publication No. 2009/0292259 of Delano et al. ("Delano").

The Applicant respectfully traverses these rejections, and does not acquiesce to the characterizations of the teachings of these references or the propriety of their combinations, as set forth in the Office Action. However, in order to expedite prosecution of the present application, the Applicant has amended independent claim 1.

Claim 1

As amended, independent 1 recites (emphases added):

1. A needle for insertion into a patient during an RF ablation procedure, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments;

an actuator interconnected to the plurality of filaments, wherein rotation of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein rotation of the actuator in a second direction relative to the hub retracts the plurality of filaments to a retracted position in which the plurality of filaments are disposed within at least a portion of the elongate member; and

a fitting in fluid communication with the lumen, the fitting being configured to provide a connection for injection of fluid

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through the fitting and through the lumen, the fitting further being configured to allow for insertion of an RF probe that is separate from the needle into the lumen through the fitting,

wherein the lumen is configured to accept the RF probe such that an electrode of the inserted RF probe, the tip, and the plurality of filaments are operable to form a single monopolar RF electrode, and

wherein, when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, the plurality of filaments are movable via the actuator from the retracted position, in which the plurality of filaments are disposed within said at least a portion of the elongate member, to the deployed position.

The Applicant respectfully submits that Young I, Young II, and Hinchliffe, whether considered individually or in combination, fail to teach or render obvious at least the emphasized portions of amended claim 1. For example, based on the agreement reached in the Examiner Interview conducted on July 12, 2019 ("the Interview," summarized above) regarding the teachings of Young I and Young II, these references do not render obvious at least the limitation: "wherein, when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, the plurality of filaments are movable via the actuator from the retracted position, in which the plurality of filaments are disposed within said at least a portion of the elongate member, to the deployed position," as recited in amended claim 1.

Indeed, as discussed in the Interview, even if the correlation of various components of the devices disclosed in Young I and Young II to various limitations in claim 1, as set forth in the Office Action, were to be accepted as accurate, for the sake of argument, it would not be possible to modify the devices disclosed in Young I or Young II to achieve the needle recited in amended claim 1. For example, the Office

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Action alleges that the shaft 20 of Young I, with electrical connectors/probes accepted therein, corresponds to an RF probe, and further alleges that the electrodes 26 correspond a plurality of filaments. Office Action, pp. 3-4. Young I discloses that the "electrodes 26 [are] carried by the shaft 20" such that "longitudinal translation of the shaft 20 relative to the cannula 12 in a proximal direction 40 deploys the electrode tines 26 from the distal end 14 of the cannula 12 (FIG. 3), and longitudinal translation of the shaft 20 relative to the cannula 12 in a distal direction 42 retracts the electrode tines 26 into the distal end 14 of the cannula 12." ¶¶ [0023], [0024]. Young I discloses further embodiments in which "the electrodes 26 can be deployed by advancing the shaft 20 distally relative to the cannula 12." ¶ [0037]. Young II describes similar devices having like-numbered features. Further, Young I discloses another device in which the "shaft 20 can have a screw-like configuration, which allows the shaft 20 to be distally advanced or proximally retracted by rotation of the shaft 20." ¶ [0038].

In all devices of Young I and Young II, the shaft 20, which the Office Action identifies as a probe, is used to deploy and retract the tines 26, which the Office Action identifies as filaments. It is thus unclear how the devices of Young I and Young II could be modified in a manner in which, "when the RF probe is fully separated from the needle in a non-inserted state . . . the plurality of filaments are disposed within . . . at least a portion of the elongate member" and are "movable . . . to the deployed position." Even if were to be assumed that such a modification is possible, the modification would impermissibly render each device of Young I and Young II unfit for its intended purpose—indeed, the modification would amount to disassembly of the probe assembly 4 by removal of the shaft 20 from the cannula 12. *See* MPEP § 2143.01 (V). Moreover, any such modification would impermissibly change a fundamental principle of operation of each device of Young I and Young II; in particular, the modification would require a tine-deployment mechanism that does not employ the fundamental feature common to every tine-deployment mechanism disclosed in Young I and Young II—namely, movement of the shaft 20 relative to the cannula 12 to deploy the tines 26. *See*

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MPEP § 2143.01 (VI). Based on at least the foregoing reasons, the proposed combination of the teachings of Young I and Young II cannot render amended claim 1 obvious under pre-AIA 35 U.S.C. § 103(a).

The Applicant, respectfully, does not acquiesce to the propriety of combining the teachings of Hinchliffe with those of Young I and Young II, nor does the Applicant concede to the characterizations of the teachings of Hinchliffe set forth in the Office Action. Regardless, Hinchliffe cannot remedy the deficiencies discussed above with respect to Young I and Young II, and thus the Applicant respectfully requests that the rejection of claim 1 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

Claims 2-18

Each of claims 2-18 depends from independent claim 1, and thus is patentable over the cited art for at least the reasons discussed above with respect to amended independent claim 1, as none of Holtz, Daniel, Gough, or Delano can remedy the deficiencies of Young I and Young II. Moreover, the Applicant maintains that at least some of these dependent claims recite additional features that are separately and independently patentable over the references cited in the Office Action. Accordingly, the Applicant respectfully requests that the rejection of claims 2-18 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

New Claims 21-50

Each of claims 21-50 depends from independent claim 1, and thus is patentable over the cited art for at least the reasons discussed above with respect to amended independent claim 1. Moreover, at least some of these dependent claims recite additional features that are separately and independently patentable over the references cited in the Office Action.

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New Claims 51-53

As discussed above in the summary of the Interview, new independent claim 51, is a combination of previously presented claims 1 and 17 and subject matter that the Examiner has indicated will overcome the rejection of record. New claims 52 and 53 depend from claim 51.

New Claims 54-72

As discussed above in the summary of the Interview, new independent claim 54, is a combination of previously presented claim 1 and subject matter that the Examiner has indicated will overcome the rejection of record. New claims 55-72 depend from claim 54.

Conclusion

In view of the foregoing amendments and remarks, the Applicant submits that the Application is in condition for allowance and thus requests the issuance of a Notice of Allowance. Please contact the undersigned attorney in the event that any remaining impediment to the prompt allowance of this application is found that could be clarified by a telephonic interview or may be overcome by an Examiner's Amendment.

DATED this 19th day of August, 2019.

Respectfully submitted,

/Daniel C. Higgs/

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Electronic Patent Application Fee Transmittal

Application Number:	15098673
Filing Date:	14-Apr-2016
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Filer:	Daniel Christopher Higgs
Attorney Docket Number:	NBUS.001C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	2202	52	50	2600
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
RCE- 1ST REQUEST	2801	1	650	650
		Total in USD ($)		**3250**

Electronic Acknowledgement Receipt

EFS ID:	36917615
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	19-AUG-2019
Filing Date:	14-APR-2016
Time Stamp:	19:06:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$3250
RAM confirmation Number	E20198IJ07088097
Deposit Account	602176
Authorized User	Daniel Higgs

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Continued Examination (RCE)	RCE.pdf	1349937 996e0bd7d20d7894436cf19630cec8a2ba4e2640	no	3
Warnings:					
Information:					
2		Amendment.pdf	179916 52db28ca2b52b6763add544d849d46db0f6ef82a	yes	24

Multipart Description/PDF files in .zip description

Document Description	Start	End
Amendment Submitted/Entered with Filing of CPA/RCE	1	1
Claims	2	15
Applicant summary of interview with examiner	16	18
Applicant Arguments/Remarks Made in an Amendment	19	24

Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32285 371b0f3cef5c3ab7e58097df404cea140c9e12a8	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	1562138	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

148468 7590 09/03/2019

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EXAMINER
KIM, EUN HWA

ART UNIT	PAPER NUMBER
3794	

MAIL DATE	DELIVERY MODE
09/03/2019	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 15/098,673	Applicant(s) Wright et al.	
	Examiner EUNHWA KIM	Art Unit 3794	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 8/19/2019.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL.** 2b) ☑ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-72 is/are pending in the application.

5a) Of the above claim(s) 19-20 is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-18 and 21-72 is/are rejected.

8) ☐ Claim(s) _____ is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 11/29/2016 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 19, 2019 has been entered.

2. Claims 1-72 are pending. Claims 19 and 20 are withdrawn from consideration. A first action on the merits of claims 1-18 and 21-72 is as follows.

Notice of Pre-AIA or AIA Status

3. The present application is being examined under the pre-AIA first to invent provisions.

4. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Claim Rejections - 35 USC § 103

5. The following is a quotation of pre-AIA 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under pre-AIA 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. **Claims 1-3, 6-8, 12, 13, 15, 16, 18 and 21-72 rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Edwards et al. (hereinafter 'Edwards', U.S. Pat. No. 5,599,346) in view of Young (U.S. PGPub. No. 2006/0095029), and further in view of Hinchliffe et al. (U.S. PGPub. No. 2002/0143302).**

8. **In regard to independent claims 1, 17, 51, and 54, and claims 2, 3, 6, 18, 21-28, 30, 32, 33, 34-36, 55, 56, 57, 60-62, and 72,** Edwards discloses a system comprising: a needle for insertion into a patient during an RF ablation procedure (treatment apparatus 10 in Fig. 8a), the needle comprising:

a. a hub (proximal end/housing of catheter 12);

b. an elongate member (needle assembly comprising needle 16 and sheath 20 as shown in Fig. 1b; col. 8, ln. 28-30 & col. 9, ln. 1-3) fixed to the hub, the elongate member comprising a lumen at an interior thereof (lumen of needle 16);

c. a tip (distal tip of electrode needle 16) fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient (col. 8, ln. 37-38:

the distal end of the electrode 16 is sharpened and tapered to assist in the introduction of RF treatment apparatus to the desired tissue site);

d. a fitting in fluid communication with the lumen (luer connector 38, see Fig. 10a), the fitting being configured to provide a connection for injection of fluid through the fitting and through the lumen (col. 10, ln. 63-67), the fitting further being configured to allow for insertion of an RF probe that is separate from the needle into the lumen through the fitting (Figure. 7a and 7b illustrates that introducer/RF electrode 18 is capable of being inserted into the catheter 12 and into the lumen of electrode 16; also best shown in Fig. 2; note that the locking cap 32 of introducer 18 engages the luer connector 38; col. 9, ln. 1-3, luer connector 38 is capable of connecting to a fluid source when the RF probe is fully separated from the catheter 12 as shown in Figs. 10a & 10b thus meeting claims 6, 21-28, 30, 32, 34, 35, 55, 56, 57, 62, 72);

e. the RF probe (introducer/RF probe 18 is an electrode as shown in Fig. 1b) comprising an electrode; and

f. a cable for use in connecting the RF probe to a radiofrequency generator (Fig. 1a illustrates that the probe 18 is connected to a cable (not labeled), thus meeting claim 18).

9. However, Edwards fails to disclose a plurality of filaments.

10. Young teaches an ablation device (see Fig. 10) similar to that of Edwards. Edwards teaches deploying a plurality of filaments (filaments 250 and 256) from a catheter body (catheter 216). Young further teaches disposing an RF probe (shaft 224, electrodes 225 and 226) within a lumen (293) connected to the plurality of filaments. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the needle of Edwards and incorporate a plurality of filaments (filaments 250 and 256) and an shaft connected to the

plurality of filaments (shaft 293 and hub 296) in an arrangement as taught by Young, thereby arriving at the claimed invention. Doing so allows for one or more electrodes to extend radially from the distal region of the needle so as to achieve desired energy paths to obtain a desired treated/ablated volume of tissue ([0057]-[0058]).

11. However, Edwards/Young combination does not disclose a filament deployment mechanism comprising an actuator interconnected to the plurality of filaments.

12. Hinchliffe teaches a deployment mechanism (Fig. 14) of a plurality of filaments (tines 280) in an elongated member of an ablation device, wherein the deployment mechanism comprises an actuator (actuator 230 in Fig. 14) connected to an inner tube/shaft (270) similar to that of shaft (293) of Edwards/Young combination. Hinchliffe further teaches that rotation of the actuator relative to a hub (housing 214 and 216) causes deployment or retraction of the plurality of filaments ([0074]-[0075]). The deployment mechanism comprises an actuator (actuator 230) interconnected to the plurality of filaments, wherein rotation of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein rotation of the actuator in a second direction relative to the hub retracts the plurality of filaments into the lumen to a retracted position ([0075]), wherein the actuator fits around at least a portion of the hub (the shoulder of the actuator 230 fits around the proximal end of the hub 212), and wherein the actuator is configured to rotate relative to the hub about a central longitudinal axis of the needle (the actuator is positioned along a central axis of the needle 250 as shown in Fig. 13), wherein the actuator is generally tubular (the actuator 230 is generally tubular body, thus meeting claims 2 and 3).

13. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to modify the engagement between the hub of a needle and the hub of the plurality

of filaments in the Edwards/Young combination and provide a deployment mechanism (external threads 235 and 237 along the actuator 230 and threads 227 and 229 on the housing 214 and 216) as taught by Hinchliffe, thereby arriving at the claimed invention. Doing so would allow actuation of the plurality of filaments in three positions: 1) retracted position, 2) a first radially deployable position and 3) a second radially deployable position and the plurality of filaments are retained in any one of the three positions ([0012]) to precisely control deployment of filaments. Furthermore, it would have been obvious to one of ordinary skill in the art to provide a needle with the plurality of filaments integral with the needle as taught by Hinchliffe to reduce the number of surgical instruments/tools in a surgical system. Thus, the combination meets the claim limitations of claims 33, 36, 60, and 61.

14. Given that Applicant has not claimed the specific electrical connections between the needle, RF probe and the plurality of filaments to an electrosurgical generator and the needle, RF probe, and the plurality of filaments are capable of delivering RF energy to its surrounding tissue, the combination is capable of forming 'a single monopolar RF electrode'.

15. **In regards to claim 7,** Edwards/Young /Hinchliffe combination further discloses each filament of the plurality of filaments has a pre-set bias such that the filament is curved when in the deployed state (Young, [0009]: each electrode 250 and 256 has a flared curvilinear profile). See claim 1 above for obviousness rationale statement.

16. **In regards to claim 8,** Edwards/Young/Hinchliffe combination further discloses when each filament of the plurality of filaments is in the deployed position, the filaments extend outwardly from the tip (Young, see Fig. 9). See claim 1 above for obviousness rationale statement.

17. **In regards to claim 12,** Edwards/Young/Hinchliffe combination further discloses the tip tapers to a point, and wherein the elongate member and the tip comprises a single unitary structure (Edwards, the needle 16 forms a tapered point and the sheath 20 and needle 16 forms a single unitary structure as shown in Fig. 1d).

18. **In regards to claim 13,** Edwards/Young/Hinchliffe combination further discloses a proximal end of the elongate member is fixed to the hub (Edwards, the proximal portion of needle 16 is fixed to hub 12 as shown in Figs. 1).

19. **In regards to claim 15,** in view of the combination of claim 1, Hinchliffe further teaches that the deployment mechanism (actuator 230) comprises indicia (marker ring 260 with markings, e.g. 3cm, 4cm, 5cm, etc.) of fractional deployment of a plurality of filaments (280) relative to a tip (251) of a needle (250; [0080]). Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have modified Edwards/Young /Hinchliffe combination to incorporate the teachings of indicia as taught by Hinchliffe to determine the deployment of filaments during a treatment.

20. **In regards to claim 16,** in view of the combination of claim 1, Hinchliffe further teaches detents that are configured to provide a tactile feedback to the user when the filaments are fully retracted, fully deployed and increments in between the fully retracted and fully deployed position of the filaments designating the radial dimension of the ablation zone created by the filaments in the corresponding positions ([0044]). Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have modified Edwards/Young/Hinchliffe combination to incorporate the teachings of Hinchliffe and incorporate detents that are configured to provide a tactile feedback to the user when the

filaments are fully retracted, fully deployed and three increments in between the two positions (third, fourth and fifth positions).

21. **In regard to claims 29, 31, 37, 58, 59, and 63,** in view of the combination in claim 1, 21, or 54 above, Young discloses that the plurality of filaments are formed from a solid electrically conductive material ([0036], [0039], [0040]). As such, when the Luer fitting of Edwards is fluidly connected to the fluid source for fluid communication, the fluid passes through the lumen of the elongate member and through the tip and the distal end of the needle without passing through an interior lumen of any of the plurality of filaments.

22. **In regard to claims 38-50, 52, 53, and 64-71,** Edwards further teaches a tube (needle 16 in Fig. 1b) is a separate member relative to the elongate member (needle 16 is separate from another element of the elongate member (the sheath 20 as shown in Fig. 1b), the tube defining the lumen at the interior of the elongate member (see Fig. 1b), wherein the tube comprises a conductive material (needle 16 is an electrode for delivering RF current to tissue); wherein the tube is configured to transport fluid therethrough and wherein the tube is further configured to separately conduct therethrough RF energy emitted by the RF probe (col. 10, ln. 63-67), wherein the tube is further configured to conduct the RF energy into and through the tip and the plurality of filaments (given that the lumen of the needle 16 of Edwards is electrically conductive, the filaments of Young that are in contact with the needle 16 of Edwards are capable of conducting RF energy). Furthermore, Edwards teaches a fluid source is coupled with the Leur fitting (luer connector 38, see Fig. 10a; col. 10, ln. 63-67), the fitting is capable of transporting fluid through the lumen when the RF probe is fully separated from the needle (luer connector 38 is capable of connecting to a fluid source when the RF probe 18 is fully separated from the catheter 12 as shown in Figs. 10a & 10b).

23. **Claims 4 and 5 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Edwards, Young, and Hinchliffe as applied to claim 1, and further in view of Holtz et al. (hereinafter 'Holtz', U.S. PGPub. No. 2010/0049192).**

24. **In regards to claims 4 and 5,** in view of the combination in claim 1, Hinchliffe teaches a deployment mechanism with a slide member (inner tube 270 in Figs. 13-14) coupled to the actuator and fixedly connected to the plurality of filaments (tines 280 are fixedly mounted to inner tube 270), wherein upon rotation of the actuator relative to the slide member and relative to the hub, the actuator moves in tandem relation with the slide member along the central longitudinal axis of the elongate member and the plurality of filaments are advanced or retracted relative to the hub (paragraph [0075]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the deployment mechanism of Hinchliffe for advancement and retraction of the plurality of filaments.

25. However, Edwards/Young/Hinchliffe combination fails to disclose the slide member is limited to a linear motion relative to the hub as the actuator is rotated and further configured to axially advance and retract without rotating relative to the hub.

26. Holtz teaches advancing and retracting a plurality of filaments similar to that of Young using a rotation to linear gearing mechanism within a handle ([0297]). Specifically, Holtz teaches a hub includes a cavity sized to house a protrusion of the slide member (threaded piece 73 acts as a follower to the handle dial 72, moving axially within the handle dial 72 when it is rotated. The threaded piece 73 is keyed to a feature in the handle grip 71 which it slides within to prevent the threaded piece from rotating with the handle dial 72). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the mechanism of advancing the slide member of Edwards/Young/Hinchliffe combination with the

rotation to linear mechanism to advance a plurality of splines as taught by Holtz, thereby arriving at the claimed invention. The advantage of a rotation to linear gearing mechanism is that precise mechanical advantage can be achieved while making precision fine adjustment to electrode deployment length ([0297]).

27. **Claims 9-11 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Edwards, Young and Hinchliffe as applied claim 1, and further in view of Gough et al (hereinafter 'Gough', U.S. PGPub No. 2004/0260282).**

28. **In regard to claims 9-11,** Edwards/Young/Hinchliffe combination discloses the invention substantially as claimed in claim 1 and discussed above. Young further teaches wherein the plurality of filaments consists essentially of two filaments (for example, see Fig. 9). However, Young/Young'111/Hinchliffe combination is silent as to a distal end of each filament defining a point when each filament is in the deployed position, and wherein average of all the points is offset from a central longitudinal axis of the elongate member.

29. Gough teaches a similar device (device 10 in Fig. 6A, 6C, 7 and 8) as that of Young for delivering energy to tissues comprising a needle (introducer 14) and a plurality of filaments (energy delivery device 16', [0013], [0058]). In Fig. 6C, Gough teaches wherein the central lumen of the needle (lumen 14" of primary antenna 14) comprises lumens (16) that are used to introduce filaments (secondary antenna 16). Gough further teaches wherein the lumens are circumferentially offset by an angle in the fully retracted position. Given that Young teaches the plurality of filaments consisting essentially of two filaments that can be positioned non-symmetrically and Gough further teaches wherein the lumens are circumferentially offset by an angle in the fully retracted position, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Edwards/Young/Hinchliffe combination to

incorporate the teaching of Gough to circumferentially offset by an angle in the fully retracted position to introduce the filaments in a variety of different geometric configurations ([0063]).

30. However, Edwards/Young/Hinchliffe/Gough combination is silent as to wherein the plurality of filaments are circumferentially offset by about 120° in the first position. Given that Young is concerned with providing non-symmetric ablation treatment volume ([0062]), it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide wherein the two filaments are circumferentially offset by about 120°, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

31. With respect to claim 11, it is noted that the plurality of filaments that are offset from the longitudinal axis can be configured to form a lesion having a pyramidal shape.

32. **Claim 14 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Edwards, Young, and Hinchliffe and further in view of Delano et al. (hereinafter 'Delano', U.S. PGPub. No. 2009/0292259).**

33. **In regards to claim 14,** Edwards/Young/Hinchliffe combination discloses the invention substantially as claimed in claim 1 and discussed above. Furthermore, Edwards further discloses that the tip is a beveled shape which is radially asymmetrical.

34. However, Edwards/Young/Hinchliffe combination fails to disclose wherein the hub comprises an indicator that is oriented to communicate an orientation of the asymmetrical tip.

35. Delano teaches a needle device (needle assembly 20 in Fig. 9) comprising a beveled tip (distal tip 23 comprises a bevel 23A as shown in Fig. 9) and a hub (needle hub 4), wherein the hub comprises an indicator that is oriented to communicate an orientation of the asymmetrical tip ([0060]: a first directional indicator 6IND in Fig. 9 corresponds to the orientation of the bevel

23A of the distal tip 23 of the cannula). Therefore, it would have been obvious to one of ordinary skill in the art before the invention was made to modify the hub of Edwards/Young/Hinchliffe combination and incorporate an indicator that corresponds to the orientation of the beveled distal tip as taught by Delano, thereby arriving at the claimed invention. Doing so allows a user to view the visual indicator on the hub and determine the orientation of the asymmetrical/beveled tip when it is positioned in a target tissue.

Double Patenting

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination

under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

2. Claims 1-72 provisionally rejected on the ground of nonstatutory double patenting as being unpatentable over claims 1-20 of copending Application No. 15/092,945 in view of Young (U.S. PGPub. No. 2006/0095029). In regards to claims 1-72, Application '945 claims a needle apparatus comprising a first hub, an elongate member (claim 1), a tip (claim 1), a plurality of filaments (claim 1), an actuator (claim 1), a fitting (claim 5) and an RF probe (see claim 1).

3. Application '945 is silent as to a second hub coupled to the plurality of filaments.

4. Young teaches a hub (296 in Fig. 10) coupled to the plurality of filaments. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a second hub as taught by Young into the claimed invention of Application '945. Doing so would allow the hub to be connected to the actuator for advancing and retracting the plurality of filaments.

This is a provisional nonstatutory double patenting rejection.

Response to Arguments

36. Applicant's arguments, see Remarks pages 19-24, filed on August 19, 2019, with respect to the rejection(s) of claim(s) 1-3, 7, 8, 12, 13 and 15-18 under 35 U.S.C. 103(a) as being unpatentable over Young (U.S. PGPub. No. 2006/0084965) in view of Young (U.S. PGPub. No. 2006/0206111) and further in view of Hinchliffe (U.S. PGPub. No. 2002/0143302) and dependent claims under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Edwards et al. (hereinafter 'Edwards', U.S. Pat. No. 5,599,346), Young (U.S. PGPub. No. 2006/0095029), and further in view of Hinchliffe et al. (U.S. PGPub. No. 2002/0143302).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUNHWA KIM whose telephone number is (571)270-1265. The examiner can normally be reached on 9AM-5:30PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOSEPH STOKLOSA can be reached on (571) 272-1213. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EUN HWA KIM/
Primary Examiner, Art Unit 3794
8/30/2019

Notice of References Cited	Application/Control No. 15/098,673	Applicant(s)/Patent Under Reexamination Wright et al.	
	Examiner EUNHWA KIM	Art Unit 3794	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-20060095029-A1	05-2006	Young; Kimbolt	A61B18/148	606/41
*	B	US-5599346-A	02-1997	Edwards; Stuart D.	A61N5/045	606/41
	C					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	**Art Unit**
	EUNHWA KIM	3794

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	09/10/2018	06/14/2019	08/30/2019						
	1	✓	✓	✓						
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	42			✓						

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	Examiner	**Art Unit**
	EUNHWA KIM	3794

CLAIM		DATE								
Final	Original	09/10/2018	06/14/2019	08/30/2019						
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
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	Examiner	Art Unit
	EUNHWA KIM	3794

CPC - Searched*		
Symbol	Date	Examiner
A61B18/1477,1467; A61B2018/1253,00577	09/10/2018	EK
A61B2218/001,002,003	06/14/2019	EK

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Assignee & Inventor Search	09/10/2018	EK
See search history printout	09/10/2018	EK
Updated Search (see EAST search history printout)	06/14/2019	EK
Updated Search (see EAST search history printout)	08/30/2019	EK

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/EUN HWA KIM/ Primary Examiner, Art Unit 3794	

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	63	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$ or US-20060264974-$ or US-20020143302-$ or US-20040199179-$ or US-20060095029-$ or US-20040015161-$ or US-20050085804-$).did. or (US-20060084965-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$ or US-5827276-$ or US-5855576-$ or US-6015406-$ or US-8753335-$).did.	US-PGPUB; USPAT	OR	OFF	2019/08/30 10:21
L3	205	(a61b18/$5.cpc. a61b2018/$5.cpc.) and (hypotube) with (needle cannula)	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:01
L4	136	(a61b18/$5.cpc. a61b2018/$5.cpc.) and (tube) near5 conduct$4 near10 (cannula needle trocar)	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:16
L5	1	"15098673"	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:21
L6	2	"20080294162"	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:28
L7	1	"6878147".pn.	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:30
L8	1	"15225945"	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:34
L9	2427	(a61b18/$5.cpc. a61b2018/$5.cpc.) and conduct$4 near10 (cannula needle trocar)	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:45
L10	272	(a61b18/$5.cpc. a61b2018/$5.cpc.) and conduct$4 near5 inner near10 (cannula needle trocar)	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:46
L11	8	"5599346".pn. "20060095029"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/08/30 12:58
L12	659	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2019/08/30 13:00
L13	120	((ROBERT) near2 (WRIGHT)).INV.	EPO; JPO; DERWENT	OR	ON	2019/08/30 13:00
L14	26	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2019/08/30 13:00
L15	5	((SCOTT) near2 (BRANDT)).INV.	EPO; JPO; DERWENT	OR	ON	2019/08/30 13:00
S1	5986	606/41,44.ccls.	US-PGPUB; USPAT	OR	ON	2014/01/29 10:14
S2	501	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:32
S3	110	((ROBERT) near2 (WRIGHT)).INV.	EPO; JPO; DERWENT	OR	ON	2014/01/29 11:33
S4	22	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
S5	3	((SCOTT) near2 (BRANDT)).INV.	EPO; JPO; DERWENT	OR	ON	2014/01/29 11:33

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S6	3	S2 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
S7	0	S3 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
S8	2	S4 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:34
S9	0	S5 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:34
S10	373	US-1234567-$.DID. OR US-D372086-$.DID. OR US-4011872-$.DID. OR US-4206761-$.DID. OR US-4206762-$.DID. OR US-4281667-$.DID. OR US-4353371-$.DID. OR US-4375220-$.DID. OR US-4378809-$.DID. OR US-4385636-$.DID. OR US-4411266-$.DID. OR US-4565200-$.DID. OR US-4573980-$.DID. OR US-4583538-$.DID. OR US-4593703-$.DID. OR US-4618978-$.DID. OR US-4646752-$.DID. OR US-4653508-$.DID. OR US-4660568-$.DID. OR US-4676255-$.DID. OR US-4698207-$.DID. OR US-4787886-$.DID. OR US-4796615-$.DID. OR US-4827927-$.DID. OR US-4838265-$.DID. OR US-4886506-$.DID. OR US-4907589-$.DID. OR US-4966597-$.DID. OR US-5010897-$.DID. OR US-5160337-$.DID. OR US-5217457-$.DID. OR US-5230623-$.DID. OR US-5233515-$.DID. OR US-5244462-$.DID. OR US-5257630-$.DID. OR US-5291896-$.DID. OR US-5304114-$.DID. OR US-5304115-$.DID. OR US-5312329-$.DID. OR US-5312391-$.DID. OR US-5318013-$.DID. OR US-5324255-$.DID. OR US-5334183-$.DID. OR US-5342292-$.DID. OR US-5370645-$.DID. OR US-5370675-$.DID. OR US-5372596-$.DID. 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S11	4	US-1234567-$.DID. OR US-5507802-$.DID. OR US-7270661-$.DID. OR US-20070287996-$.DID.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:38
S12	20	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$).did.	US-PGPUB; USPAT	OR	ON	2014/01/29 12:00
S13	379	S10 or S11 S12	US-PGPUB; USPAT	OR	ON	2014/01/29 12:00
S14	20	S13 and S12	US-PGPUB; USPAT	OR	ON	2014/01/29 12:19
S15	379	S13 S12	US-PGPUB; USPAT	OR	ON	2014/01/29 12:19
S16	23	S15 and (detent)	US-PGPUB; USPAT	OR	ON	2014/01/29 12:19
S17	100218	"606"/$.ccls.	US-PGPUB; USPAT	OR	ON	2014/01/29 12:21
S18	136	neurotomy	US-PGPUB; USPAT	OR	ON	2014/01/29 12:21
S19	5	"7108696".pn. "7357798".pn. "20090221998".pgnr. "20060217705".pgnr. "200620200121".pgnr. "20090024124".pgnr.	US-PGPUB; USPAT	OR	ON	2014/01/29 12:46
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S22	50	("20110213356" "20110288540" "5540778" "5672375" "3918455" "4341094" "5232442" "5304141" "5379900" "5562685" "5709692" "20050059964" "5226912" "5269808" "5425746" "5437726" "5569302" "5250247" "5507777" "5649962" "5374278" "5639506" "5643628" "5891247" "6031018" "6053086" "4124153" "4282637" "4457128" "4501133" "4907741" "5503092" "5532657" "5648003" "5683025" "5891166" "5897044" "5954242" "5991957" "6035916" "6051180" "6126676" "6270464" "6402770" "6536482" "6699205" "6730042" "6739024" "7761964" "8292822").pn.	US-PGPUB; USPAT	OR	ON	2014/02/11 12:26
S23	85	S20 S21 S22	US-PGPUB;	OR	ON	2014/02/11 12:26

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			USPAT			
S24	85	S20 S21 S22	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/11 12:26
S25	1	"20090221998"	DERWENT	OR	ON	2014/02/11 12:39
S26	259590	a61b2018/0016, "00166", "00196", "00208", "00273", "00279", "0091", "00434", "0044", "1425", "143", "1432", "1465" "1475".cpc.	DERWENT	OR	ON	2014/02/11 12:56
S27	891	a61b2018/0016,00166,00196,00208,00273,00279,0091,00434,0044,1425,143,1432,1465,1475.cpc.	DERWENT	OR	ON	2014/02/11 12:58
S28	5217	a61b2018/0016,00166,00196,00208,00273,00279,0091,00434,0044,1425,143,1432,1465,1475.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/11 12:58
S29	3226	S28 and @py<"2009"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/11 13:00
S30	3	"7108696".pn. "7357798".pn. "20060217705".pgnr. "7108696".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 09:58
S31	3	"7108696".pn. "7357798".pn. "20060217705".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 09:59
S32	2	"7270661".pn. "5507802.pn" "20070287996".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:01
S33	3	"7270661".pn. "5507802".pn. "20070287996".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:02
S34	50	(actuator actuate actuating) same (helical adj track thread) same (filament electrode) same (hub)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:34
S35	12	(actuator actuate actuating) same (helical adj track thread) same (filament electrode) same (hub) same (advanced advancing deployed deploying deploy retracted retracting retract)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:38
S37	316	(actuator actuate actuating) same (helical adj track thread) same (advanced advancing deployed deploying deploy retracted retracting retract) near3 (filament stylet anchor element)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:41
S38	274031	("600" "606" "607").CLAS.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:45
S39	13082	S38 and filament	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:45
S40	3630	S39 and (actuate actuator actuating)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:46
S41	6	S39 and (hub with thread) and (actuat$3 with thread)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:47
S42	2598	S39 and (rotate rotat$4) same (deployment deploy retract retract$4 advance advancing)	US-PGPUB;	OR	ON	2014/02/12 11:33

			USPAT; USOCR; EPO; JPO			
S43	251	S39 and (rotate rotat$4) same (deployment deploy retract retract$4 advance advancing) same (filament)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:34
S44	1	"5964756".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:55
S45	110	S39 and (rotate rotat$4) with (actuate actuating actuated) and (deployment deploy retract retract$4 advance advancing) same (filament)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 12:00
S46	52	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$).did.	US-PGPUB; USPAT	OR	ON	2014/02/12 14:02
S47	49	S46 and (filament antenna electrode)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:04
S48	37500	S46 and (filament antenna electrode) and (single near2 wire) or ("same" near2 wire)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:05
S49	3	S46 and (filament antenna electrode) and ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:05
S50	4674	S38 and (filament antenna electrode) and ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:06
S51	1425	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S52	2	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) with (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S53	4	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) same (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S54	92	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) same2 (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:08
S55	504	S38 and (filament antenna electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:09
S56	258	S38 and (filament antenna electrode) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:09
S57	17	US-6379353-$.DID. OR US-6888919-$.DID. OR US-20020077627-$.DID. OR US-20040024300-$.DID. OR US-20040096033-$.DID. OR US-20040158239-$.DID. OR US-20050261570-$.DID. OR WO-9903397-$.DID. OR WO-0222019-$.DID. OR WO-2005036124-$.DID.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2014/02/12 14:23
S58	0	("2010/0256625").URPN.	USPAT	OR	ON	2014/02/12 14:23
S59	331	(filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:31
S60	258	S38 and(sylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:31
S61	258	S38 and(stylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:32
S62	258	S38 and(stylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR;	OR	ON	2014/02/12 14:32

			FPRS; EPO; JPO			
S63	1332	(filament electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:33
S64	495	(filament electrode) with (form$3 made built) with (single near2 wire) and S38	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:34
S65	237	S64 not S59	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:34
S66	0	"606"/$.clas. and (helical) near2 (track thread) with (detents) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S67	0	"606"/$.clas. and (helical) near2 (track thread) same (detents) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S68	0	"606"/$.clas. and (track thread) same (detent) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S69	4757	(track thread) same (detent) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S70	14	(track thread) same (detent) same (indicat$4 alert$4) with (deploy$4 retract$4 advanc$4) same (visual tactile audible)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:57
S71	2	"20060264974".pgnr. "5827276".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 16:33
S72	1332	(filament electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:00
S73	2599	(filament electrode) with (form$3 made built) with (single near2 wire or "same" near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:01
S74	389	S73 and "606"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:01
S75	50	"606"/$.ccls. and (distal near2 (tip end)) near4 (insulat$4) with (partially partial "part of")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:41
S76	0	"606"/$.ccls. and (distal near2 (tip end)) with (insulat$4) with (partially partial "part of") same ("non-adhere" "adhere")	US-PGPUB;	OR	ON	2014/02/14 12:55

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			USPAT; USOCR; FPRS; EPO; JPO			
S77	126	"606"/$.ccls. and (distal near2 (tip end)) with (insulat$4 insulate insulated) with (partially partial "part of")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:56
S78	76	S77 not S75	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:56
S79	57	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$ or US-20060264974-$ or US-20020143302-$ or US-20040199179-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$ or US-5827276-$ or US-5855576-$).did.	US-PGPUB; USPAT	OR	ON	2014/02/14 13:07
S80	27	S79 and (distal near2 (tip end point)) with (insulat$4 insulate insulated)	US-PGPUB; USPAT	OR	ON	2014/02/14 13:32
S81	8	(tip) with (filament stylet tine) with (active adj electrode)	US-PGPUB; USPAT	OR	ON	2014/06/16 15:31
S82	587	("0164184" | "1366756" | "1735271" | "1814791" | "1889609" | "1932258" | "1943543" | "1952617" | "1983669" | "2050904" | "2056377" | "2196171" | "2888928" | "3035580" | "3460539" | "3595239" | "3601126" | "3614414" | "3648001" | "3685518" | "3699967" | "3707149" | "3801766" | "3815604" | "3845771" | "3847153" | "3885569" | "3898991" | "3901242" | "3902494" | "3903891" | "3920021" | "3920022" | "3923063" | "3929137" | "3939839" | "3945375" | "3963030" | "3964487" | "3970088" | "3974833" | "4011872" | "4016881" | "4024467" | "4033351" | "4040426" | "4043342" | "4051855" | "4060088" | "4069827" | "4074718" | "4092986" | "4114623" | "4116198" | "4119102" | "4126137" | "4154240" | "4189685" | "4200104" | "4202337" | "4204549" | "4210152" | "4228800" | "4248231" | "4271837" | "4281373" | "4301802" | "4326529" | "4346332" | "4376263" | "4381007" | "4416277" | "4418692" | "4429698" | "4448198" | "4474179" | "4476862" | "4492231" | "4494541" | "4512338" | "4517976" | "4524770" | "4532924" | "4534347" | "4548207" | "4559943" | "4559951" | "4562838" | "4565200" | "4567890" | "4580557" | "4590934" | "4593691" | "4617927" | "4657015" | "4658819" | "4658820" | "4669468" | "4674499" | "4681122" | "4682596" | "4688569" | "4696668" | "4706667" | "4709698" | "4712544" | "4727874" | "4735201" | "4769005" | "4781175" | "4799480" | "4800899" | "4802476" | "4805616" | "4813429" | "4820298" | "4823791" | "4827927" | "4832048" | "4850353" | "4860744" | "4878493" | "4886074" | "4919129" | "4920978").PN. OR ("4931047" | "4936281" | "4936301" | "4936310" | "4936842" | "4943290" | "4950267" | "4955377" | "4966597" | "4967765" | "4969885" | "4976711" | "4994069" | "4998933" | "5007908" | "5009656" | "5013312" | "5019076" | "5035696" | "5037379" | "5047026" | "5047027" | "5057107" | "5062031" | "5071418" | "5080660" | "5083565" | "5085659" | "5088997" | "5098431" | "5099840" | "5108391" | "5108407" | "5117978" | "5122138" | "5133365" | "5158561" | "5167658" | "5167659" | "5171255" | "5171311" | "5178620" | "5190517" | "5195959" | "5196007" | "5197963" | "5201743" | "5207675" | "5217457" | "5217458" | "5217459" | "5221281" | "5244462" | "5249585" | "5250047" | "5258006" | "5259395" | "5261906" | "5267994" | "5267997" | "5277201" | "5277696" | "5281213" | "5281216" | "5282799" | "5282845" | "5290282" | "5290283" | "5300068" | "5300069" | "5300070" | "5304214" | "5306238" | "5318563" | "5320627" | "5330470" | "5330471" | "5334193" | "5334198" | "5336222" | "5342357" | "5342391" | "5344428" | "5352222" | "5354296" | "5366443" | "5370645" | "5370675" | "5372596" | "5382247" | "5383874" | "5383876" | "5383917" | "5383923" | "5395363" | "5395368" | "5403311" | "5419767" | "5422567" | "5423808" | "5423809" | "5423810" | "5423811" | "5431649" | "5437662" | "5438302" | "5441499" | "5443470" | "5454809" | "5462521" | "5472441" | "5472443" | "5480397" | "5480398" | "5496312" | "5496314" | "5505728" | "5505730" | "5507743" | "5514129" | "5514130" | "5514131" | "5520684" | "5520685" | "5522815").PN. OR ("5531744" | "5536267" | "5540680" | "5540681" | "5540682" | "5540683" | "5540684" | "5540685" | "5542916" | "5542945" | "5545161" | "5545193" | "5549605" | "5554172" | "5555618" | "5556396" | "5556397" | "5558671" | "5562720" | "5569164" | "5569242" | "5569244" | "5569245" | "5575789" | "5578007" | "5582609" | "5582610" | "5584830" | "5591141" | "5599344" | "5599345" | "5599346" | "5599347" | "5599348" | "5599349" | "5603711" | "5603712" | "5607422" | "5609151" | "5609573" | "5611798" | "5620481" | "5624439" | "5626560" | "5626575" | "5626576" | "5626578" | "5628745" | "5628771" | "5630426" | "5633578" | "5634924" | "5672174" | "5683366" | "5693045" | "5697281" | "5697536" | "5697882" | "5697909" | "5700262" | "5766153" | "5810764" | "5843019" | "5860951" | "5871469" | "5873855" | "5888198" | "5891095" | "Re33925").PN. OR ("6015406").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/06/16 15:33
S83	67	("5800482" | "5807395").PN. OR ("6053937").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/01 15:55
S84	1050	"606"/$.ccls. and (bipolar) and (stylet filament) and (trocar needle)	US-PGPUB;	OR	ON	2014/10/01 15:56

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			USPAT; USOCR			
S85	752	"606"/29-41.ccls. and (bipolar) and (stylet filament) and (trocar needle)	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/01 15:57
S86	43	"606"/29-41.ccls. and (bipolar) same (stylet filament antenna) same (trocar needle)	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/02 08:26
S87	2	"7270661".pn. "5507802".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/02 08:32
S88	9	bevel with (stylet filament) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 10:21
S89	1	"20070287996".pgnr.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:00
S90	64	(insulat$6) near4 (point tip) with (needle trocar) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:02
S91	1518	(insulat$6) near4 (point tip end) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:12
S92	7	(partial$6) near2 (cover$4) with (insulat$6) near4 (point tip end) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:12
S93	1	"20070203486".pgnr.	US-PGPUB; USPAT	OR	ON	2014/10/09 10:21
S94	522	bevel$4 with (filament tine)	US-PGPUB; USPAT	OR	ON	2014/10/09 10:28
S95	45	bevel$4 with tip with (filament tine)	US-PGPUB; USPAT	OR	ON	2014/10/09 10:37
S96	299	bevel$4 with tip with (filament tine stylet)	US-PGPUB; USPAT	OR	ON	2014/10/09 10:38
S97	16	bevel$4 with tip with (filament tine stylet) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/09 10:39
S98	1	13/101009.app.	US-PGPUB; USPAT	OR	ON	2014/10/09 10:52
S99	2	"20070203486"	US-PGPUB; USPAT	OR	ON	2015/03/20 13:40
S100	1	"13101009"	US-PGPUB; USPAT	OR	ON	2015/03/20 17:00
S101	0	(stylet filament antenna) with (retract$4) with (offset) with (angle)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:33
S102	19	(stylet filament antenna) with (retract$4) with (offset)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:34
S103	2309	(indicia indicat$4 marking marker) with (rotat$4) with (distal) near5 (tip end)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:47
S104	11	(indicia indicat$4 marking marker) near5 (hub) with (rotat$4) with (distal) near5 (tip end)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:48
S105	89	(indicia indicat$4 marking marker) near5 (hub handle) with (rotat$4) with (distal) near5 (tip end)	US-PGPUB; USPAT	OR	ON	2015/03/23 11:32
S106	2	"20070203486"	US-PGPUB; USPAT	OR	ON	2015/03/23 11:36
S107	1	"13101009"	US-PGPUB; USPAT	OR	ON	2015/03/23 12:41
S108	9	("20010012956" | "20040059328" | "20040158239" | "20060084965" | "20070112340" | "20080161804" | "20080249392" | "20080269558" | "20110213356").PN.	US-PGPUB; USPAT	OR	ON	2015/03/23 12:43

S109	106	("2001/0012956" | "2004/0059328" | "2004/0158239" | "2006/0084965" | "2007/0112340" | "2008/0161804" | "2008/0249392" | "2008/0269558" | "2011/0213356").URPN.	USPAT	OR	ON	2015/03/23 12:43
S110	167	("1653819" | "20010044596" | "20020010491" | "20020055731" | "20020077676" | "20020099323" | "20020138117" | "20020183735" | "20020183740" | "20020193831" | "20030009110" | "20030060856" | "20030088189" | "20030130711" | "20030170898" | "20030195406" | "20030208200" | "20030225360" | "20040019371" | "20040059328" | "20040059389" | "20040146877" | "20040153057" | "20040199159" | "20040243107" | "20040267189" | "20050043726" | "20050049541" | "20050165393" | "20050171523" | "20050171574" | "20050182462" | "20050261672" | "20050288730" | "20060015147" | "20060025760" | "20060079883" | "20060121610" | "20060212078" | "20060217703" | "20060264752" | "20070016183" | "20070043345" | "20070118069" | "20070203486" | "20080052786" | "20080154259" | "20080167649" | "20090062792" | "20090228001" | "20090281477" | "20100049190" | "20100087813" | "20100130975" | "20100222677" | "20110202053" | "20120165813" | "20120310236" | "20130110106" | "4016886" | "4226246" | "4262672" | "4407943" | "4810963" | "4907601" | "4946793" | "5019034" | "5052391" | "5058605" | "5098843" | "5134070" | "5173158" | "5193537" | "5273525" | "5283194" | "5318563" | "5328451" | "5389069" | "5403311" | "5425752" | "5439440" | "5458625" | "5533999" | "5536240" | "5575811" | "5626146" | "5634899" | "5674267" | "5702359" | "5720921" | "5778894" | "5782882" | "5800378" | "5810762" | "5836905" | "5843026" | "5873849" | "5919142" | "5947889" | "5983131" | "5991697" | "5999847" | "6009347" | "6010613" | "6016452").PN. OR ("6041252" | "6055453" | "6068650" | "6085115" | "6090106" | "6102885" | "6106521" | "6109270" | "6122599" | "6132419" | "6159163" | "6208893" | "6210402" | "6212433" | "6216034" | "6219577" | "6241702" | "6261831" | "6278895" | "6300108" | "6326177" | "6347247" | "6349233" | "6351674" | "6387671" | "6403348" | "6470211" | "6482619" | "6493592" | "6500173" | "6526320" | "6562604" | "6607529" | "6611706" | "6613211" | "6627421" | "6653091" | "6669691" | "6692493" | "6697669" | "6697670" | "6702808" | "6795728" | "6801804" | "6865416" | "6881213" | "6892099" | "6912417" | "6927049" | "6962587" | "6972014" | "6994706" | "7053063" | "7063698" | "7130697" | "7211083" | "7267676" | "7387626" | "7455675" | "7771401" | "8511317").PN. OR ("8753335").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:44
S111	273	S109 S110	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:45
S112	2	S111 and (rotat$4) near3 (mechanism) with (advancement advanc$4 deploy$4 retract$4)	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:46
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S114	628	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2018/09/10 20:23
S115	25	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2018/09/10 20:23
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S121	402	S119 and (stylet) and monopolar	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:28
S122	109	S119 and (stylet filaments) with actuat$4	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:41
S123	2	"13101009"	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:43
S124	8841	(A61B2018/1253 or A61B2018/00577).cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:51

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S131	219	("2006/0095029").URPN.	USPAT	OR	OFF	2019/08/30 08:26
S132	198	S131 and deploy$4	USPAT	OR	OFF	2019/08/30 08:26
S133	65	S131 and deploy$4 same (thread$4 helical$4 track$4)	USPAT	OR	OFF	2019/08/30 08:27

8/ 30/ 2019 1:00:48 PM
C:\ Users\ ekim4\ Documents\ EAST\ Workspaces\ 15098673.wsp

Doc Code: ECOMM.AUTH/ECOMM.WTDW
Doc Description: Internet Communications Authorized/Internet Communications Authorization Withdrawn

PTO/SB/439 (11-15)

AUTHORIZATION FOR INTERNET COMMUNICATIONS IN A PATENT APPLICATION OR REQUEST TO WITHDRAW AUTHORIZATION FOR INTERNET COMMUNICATIONS		
	Application No.	15/098,673
	Filing Date	04/14/2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
	Examiner Name	Eun Hwa Kim
	Practitioner Docket No.	NBUS.001C1

To: Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I. To authorize permission for Internet Communications.

☑ Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned and practitioners in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via video conferencing, instant messaging, or electronic mail. I understand that a copy of these communications will be made of record in the application file. (MPEP 502.03)

II. To withdraw authorization for Internet Communications.

☐ The authorization given on _____, to the USPTO to communicate with the undersigned and any practitioner in accordance with 37 CFR 1.33 and 37 CFR 1.34 concerning any subject matter of this application via Internet communications such as video conferencing, instant messaging, or electronic mail is hereby withdrawn. I understand that the withdrawal is effective when approved rather than when received.

I am the

☐ applicant.

☐ attorney or agent of record. Registration number _____.

☑ attorney or agent acting under 37 CFR 1.34. Registration number 55,265.

/Daniel C. Higgs/ — Signature

September 6, 2019 — Date

Daniel C. Higgs — Typed or printed name

(801) 703-1961 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Juristic entities must be represented by a patent practitioner (see 37 CFR 1.31, which is applicable to any paper filed on or after September 16, 2012, that is presented on behalf of a juristic entity, regardless of application filing date). Submit multiple forms if more than one signature is required, see below*.

☐ * Total of _____ forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	37091047
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	06-SEP-2019
Filing Date:	14-APR-2016
Time Stamp:	15:27:58
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Internet Communications Authorized	NBUS001C1_SB0439.pdf	110402 17c8a24f9f133f7a0d6b4c7b38e64531d3abb4be	no	2

Warnings:

Information:	
Total Files Size (in bytes):	110402

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

148468 7590 09/18/2019

Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

EXAMINER
KIM, EUN HWA

ART UNIT	PAPER NUMBER
3794	

MAIL DATE	DELIVERY MODE
09/18/2019	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 271 of 691

Applicant-Initiated Interview Summary	**Application No.** 15/098,673	**Applicant(s)** Wright et al.	
	Examiner EUNHWA KIM	**Art Unit** 3794	**AIA (FITF) Status** No

All participants (applicant, applicants representative, PTO personnel):

(1) EUNHWA KIM. (3) _____.

(2) Dan Higgs. (4) _____.

Date of Interview: 13 September 2019.

Type: ☑ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☑ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☑103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1.

Identification of prior art discussed: See Continuation Sheet.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

See Continuation Sheet.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/EUN HWA KIM/ Primary Examiner, Art Unit 3794	

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 272 of 691

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiners responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicants correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,-
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicants record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiners version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, Interview Record OK on the paper recording the substance of the interview along with the date and the examiners initials.

Continuation of Identification of prior art discussed: Edwards (U.S. Pat. No. 5,599,346), Young (U.S. PGPub. No. 2006/0095029), Hinchliffe (U.S. PGPub. No. 2002/0143302)

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments:

An interview was conducted to discuss the rejection of record.

Applicant argued that Young teaches away from rotating the filaments during advancement of filaments and the combination of Young and Hinchliffe is improper. Examiner suggested explaining the argument during the reply and pointing to parts of the reference that teaches away from providing rotational movement and will further consider the argument once submitted.

Applicant further argued that there would be no motivation to provide a fitting on the proximal portion of the housing (214 and 216) of Hinchliffe. However, Examiner explained that Edwards teaches a hub and a fitting and that the combination is the incorporation of the deployment mechanism of the plurality of filaments. Therefore, this argument does not appear to be persuasive.

Applicant suggested incorporating that the RF probe does not extend all the way through the distal tip of the needle when the filaments extends distal to the distal tip of the needle. Applicant argued that there would be no motivation to modify Young's filaments (250 and 256) so that it extends distal to the distal tip of the probe (214). Examiner explained that such subject matter needs further consideration in view of the combination of the references. However, Examiner was in the position that modifying the position of the filaments is known in the art and would involve routine skill in the art and since the RF probe is retractable into the elongate member, the combination in view of what is known in the prior art, would meet such subject matter.

During the discussion, Examiner suggested incorporating that the distal tip of the needle is closed so that the RF probe does not extend beyond the distal tip of the needle. Examiner explained that such amendment would overcome the Edwards' reference since the RF probe of Edwards' is intended to extend beyond the distal tip of the needle. Applicant expressed the intent to consider the suggestion.

Applicant further suggested further limiting 'operating as a single monopolar electrode' by incorporating that the needle, the RF probe, the filaments are electrically connected. Examiner suggested further limiting the claim to include mechanically connected to clarify that all the elements are physically and electrically connected to form the single monopolar electrode.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Robert E. Wright	
Application No.:	15/098,673	Art Unit: 3794
Filing Date:	April 14, 2016	
Title:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	
Examiner:	Eun Hwa Kim	
Confirmation No.:	5232	
Customer No.:	148468	

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Enclosed for filing in the above-identified application is a PTO/SB/08 Equivalent listing 489 references. Each of these 489 references is of record in U.S. Patent Application No. 12/940,974, titled METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY, filed November 5, 2010 ("the Parent Application"), of which the present application is a continuation.

References Have Already Been Considered

As the present application is a continuation of the Parent Application, the Applicant believes the examiner has already considered the 489 references identified herein with respect to the present application, pursuant to MPEP § 609.02(II).

Accordingly, the Applicant is submitting the present information disclosure statement to ensure these references are ultimately printed on the patent, pursuant to MPEP § 609.2(II).

Copies of All References Omitted

Pursuant to 37 C.F.R. § 1.98(a)(2), copies of U.S. patent application publications and U.S. patents are not required. Accordingly, no copies of reference numbers 1 through 432 are submitted.

Further, pursuant to 37 C.F.R. § 1.98(d), copies of reference numbers 433 through 489 are not required because (1) the Parent Application has been properly identified in this information disclosure statement and is relied on for an earlier effective filing date under 35 U.S.C. § 120, and (2) all information disclosure statements submitted in the Parent Application comply with 37 C.F.R. § 1.98, paragraphs (a) through (c).

Table of U.S. Patent Applications

The Applicant provides the following table to aid the Examiner during prosecution:

Attorney Docket No.	Application No.	Filing Date	Title
NBUS.001A	12/940,974 ***(the Parent Application)***	2010-11-05	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
NBUS.001C1	15/098,673 ***(the Present Application)***	2016-04-14	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
NBUS.004A	13/101,009	2011-05-04	SYSTEMS AND METHODS FOR TISSUE ABLATION
NBUS.004C1	15/092,945	2016-04-07	SYSTEMS AND METHODS FOR TISSUE ABLATION

Copies of these patent applications, including any pending claims, office actions, notices of allowance, and/or other communications, are available through PALM and/or

Petitioner's Exhibit 1007
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PAIR. However, if the Examiner so requests, the Applicant will be happy to provide the Examiner with copies of any applications, pending claims, office actions, notices of allowance, communications, or any other documents, at any time.

DATED this 26th day of September, 2019.

Respectfully submitted,

/Daniel C. Higgs/

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT		
	Application No.	15/098,673
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	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 1 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1.	0372,086	07-23-1996	Grasso et al.	
	2.	RE40,279	04-29-2008	Sluijter et al.	
	3.	RE40,388	06-17-2008	Gines	
	4.	4,011,872	03-15-1977	Kamiya	
	5.	4,206,761	06-10-1980	Cosman	
	6.	4,206,762	06-10-1980	Cosman	
	7.	4,281,667	08-04-1981	Cosman	
	8.	4,353,371	10-12-1982	Cosman	
	9.	4,375,220	03-01-1983	Matvias	
	10.	4,378,809	04-05-1983	Cosman	
	11.	4,385,636	05-31-1983	Cosman	
	12.	4,411,266	10-25-1983	Cosman	
	13.	4,565,200	01-21-1986	Cosman	
	14.	4,573,980	03-04-1986	Karrasch et al.	
	15.	4,583,538	04-22-1986	Onik et al.	
	16.	4,593,703	06-10-1986	Cosman	
	17.	4,618,978	10-21-1986	Cosman	
	18.	4,646,752	03-03-1987	Swann et al.	
	19.	4,653,508	03-31-1987	Cosman	
	20.	4,660,568	04-28-1987	Cosman	
	21.	4,676,255	06-30-1987	Cosman	
	22.	4,698,207	10-06-1987	Bringham et al.	
	23.	4,787,886	11-29-1988	Cosman	
	24.	4,796,615	01-10-1989	Bullock et al.	
	25.	4,827,927	05-09-1989	Newton	
	26.	4,838,265	06-13-1989	Cosman et al.	
	27.	4,886,506	12-12-1989	Lovgren et al.	
	28.	4,907,589	03-13-1990	Cosman	

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	29.	4,966,597	10-30-1990	Cosman	
	30.	5,010,897	04-30-1991	Leveen	
	31.	5,160,337	11-03-1992	Cosman	
	32.	5,217,457	06-08-1993	Delahuerga et al.	
	33.	5,230,623	07-27-1993	Guthrie et al.	
	34.	5,233,515	08-03-1993	Cosman	
	35.	5,244,462	09-14-1993	Delahuerga et al.	
	36.	5,257,630	11-02-1993	Braitman et al.	
	37.	5,291,896	03-08-1994	Fonger et al.	
	38.	5,304,114	04-19-1994	Cosman et al.	
	39.	5,304,115	04-19-1994	Pflueger et al.	
	40.	5,312,329	05-17-1994	Beaty et al.	
	41.	5,312,391	05-17-1994	Wilk	
	42.	5,318,013	06-07-1994	Wilk	
	43.	5,324,255	06-28-1994	Passafaro et al.	
	44.	5,334,183	08-02-1994	Wuchinich	
	45.	5,342,292	08-30-1994	Nita et al.	
	46.	5,370,645	12-06-1994	Klicek et al.	
	47.	5,370,675	12-06-1994	Edwards et al.	
	48.	5,372,596	12-13-1994	Klicek et al.	
	49.	5,377,685	01-03-1995	Kazi et al.	
	50.	5,397,301	03-14-1995	Pflueger et al.	
	51.	5,401,272	03-28-1995	Perkins	
	52.	5,421,923	06-06-1995	Clarke et al.	
	53.	5,422,567	06-06-1995	Matsunaga	
	54.	5,423,809	06-13-1995	Klicek	
	55.	5,433,739	07-18-1995	Sluijter et al.	
	56.	5,447,417	09-05-1995	Kuhl et al.	

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	57.	5,458,597	10-17-1995	Edwards et al.	
	58.	5,472,441	12-05-1995	Edwards et al.	
	59.	5,472,442	12-05-1995	Klicek	
	60.	5,474,057	12-12-1995	Makower et al.	
	61.	5,484,398	01-16-1996	Stoddard	
	62.	5,496,312	03-05-1996	Klicek	
	63.	5,507,743	04-16-1996	Edwards et al.	
	64.	5,511,564	04-30-1996	Wilk	
	65.	5,514,129	05-07-1996	Smith	
	66.	5,536,267	07-16-1996	Edwards et al.	
	67.	5,541,376	07-30-1996	Ladtkow et al.	
	68.	5,560,358	10-01-1996	Arnold et al.	
	69.	5,562,703	10-08-1996	Desai	
	70.	5,571,147	11-05-1996	Sluijter et al.	
	71.	5,580,665	12-03-1996	Taguchi et al.	
	72.	5,599,345	02-04-1997	Edwards et al.	
	73.	5,599,346	02-04-1997	Edwards et al.	
	74.	5,611,709	03-18-1997	McAnulty	
	75.	5,613,966	03-25-1997	Makower et al.	
	76.	5,628,743	05-13-1997	Cimino	
	77.	5,662,111	09-02-1997	Cosman	
	78.	5,662,620	09-02-1997	Lieber et al.	
	79.	5,662,680	09-02-1997	Desai	
	80.	5,667,488	09-16-1997	Lundquist et al.	
	81.	5,669,904	09-23-1997	Platt, Jr. et al.	
	82.	5,672,173	09-30-1997	Gough et al.	
	83.	5,672,174	09-30-1997	Gough et al.	
	84.	5,683,349	11-04-1997	Makower et al.	

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	85.	5,683,384	11-04-1997	Gough et al.	
	86.	5,701,575	12-23-1997	Taguchi et al.	
	87.	5,720,744	02-24-1998	Eggleston et al.	
	88.	5,728,143	03-17-1998	Gough et al.	
	89.	5,735,847	04-07-1998	Gough et al.	
	90.	5,738,648	04-14-1998	Lands et al.	
	91.	5,748,703	05-05-1998	Cosman	
	92.	5,749,689	05-12-1998	Konig	
	93.	5,755,754	05-26-1998	Rudie et al.	
	94.	5,768,679	06-16-1998	Taguchi et al.	
	95.	5,772,659	06-30-1998	Becker et al.	
	96.	5,778,043	07-07-1998	Cosman	
	97.	5,782,827	07-21-1998	Gough et al.	
	98.	5,792,146	08-11-1998	Cosman	
	99.	5,797,906	08-25-1998	Rhum et al.	
	100.	5,800,484	09-01-1998	Gough et al.	
	101.	5,807,309	09-15-1998	Lundquist et al.	
	102.	5,810,804	09-22-1998	Gough et al.	
	103.	5,827,271	10-27-1998	Buysse et al.	
	104.	5,827,276	10-27-1998	LeVeen et al.	
	105.	5,848,967	12-15-1998	Cosman	
	106.	5,855,576	01-05-1999	LeVeen et al.	
	107.	5,863,290	01-26-1999	Gough et al.	
	108.	5,868,740	02-09-1999	LeVeen et al.	
	109.	5,911,739	06-15-1999	Kordis et al.	
	110.	5,913,855	06-22-1999	Gough et al.	
	111.	5,921,992	07-13-1999	Costales et al.	
	112.	5,925,042	07-20-1999	Gough et al.	

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	113.	5,928,229	07-27-1999	Gough et al.	
	114.	5,935,123	08-10-1999	Edwards et al.	
	115.	5,951,547	09-14-1999	Gough et al.	
	116.	5,968,040	10-19-1999	Swanson et al.	
	117.	5,980,517	11-09-1999	Gough	
	118.	5,983,141	11-09-1999	Sluijter et al.	
	119.	6,006,126	12-21-1999	Cosman	
	120.	6,013,076	01-11-2000	Goble et al.	
	121.	6,014,590	01-11-2000	Whayne et al.	
	122.	6,015,406	01-18-2000	Goble et al.	
	123.	6,016,452	01-18-2000	Kasevich	
	124.	6,039,733	03-21-2000	Buysse et al.	
	125.	6,041,260	03-21-2000	Stern et al.	
	126.	6,044,846	04-04-2000	Edwards	
	127.	6,050,992	04-18-2000	Nichols	
	128.	6,053,937	04-25-2000	Edwards et al.	
	129.	6,059,780	05-09-2000	Gough et al.	
	130.	6,068,627	05-30-2000	Orszulak et al.	
	131.	6,071,280	06-06-2000	Edwards et al.	
	132.	6,080,150	06-27-2000	Gough	
	133.	6,090,105	07-18-2000	Zepeda et al.	
	134.	6,106,521	08-22-2000	Blewett et al.	
	135.	6,117,134	09-12-2000	Cunningham et al.	
	136.	6,122,341	09-19-2000	Butler et al.	
	137.	6,129,726	10-10-2000	Edwards et al.	
	138.	6,132,425	10-17-2000	Gough	
	139.	6,139,519	10-31-2000	Blythe	
	140.	6,139,547	10-31-2000	Lontine et al.	

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	141.	6,143,003	11-07-2000	Cosman	
	142.	6,146,380	11-14-2000	Racz et al.	
	143.	6,161,048	12-12-2000	Sluijter et al.	
	144.	6,165,169	12-26-2000	Panescu et al.	
	145.	6,167,295	12-26-2000	Cosman	
	146.	6,179,834	01-30-2001	Buysse et al.	
	147.	6,210,403	04-03-2001	Klicek	
	148.	6,213,999	04-10-2001	Platt, Jr. et al.	
	149.	6,217,554	04-17-2001	Green	
	150.	6,228,080	05-08-2001	Gines	
	151.	6,228,083	05-08-2001	Lands et al.	
	152.	6,231,570	05-15-2001	Tu et al.	
	153.	6,234,178	05-22-2001	Goble et al.	
	154.	6,235,023	05-22-2001	Lee et al.	
	155.	6,241,725	06-05-2001	Cosman	
	156.	6,241,726	06-05-2001	Chia et al.	
	157.	6,246,912	06-12-2001	Sluijter et al.	
	158.	6,251,106	06-26-2001	Becker et al.	
	159.	6,259,952	07-10-2001	Sluijter et al.	
	160.	6,268,200	07-31-2001	Tucker et al.	
	161.	6,275,725	08-14-2001	Cosman	
	162.	6,277,117	08-21-2001	Tetzlaff et al.	
	163.	6,280,441	08-28-2001	Ryan	
	164.	6,312,426	11-06-2001	Goldberg et al.	
	165.	6,330,478	12-11-2001	Lee et al.	
	166.	6,331,180	12-18-2001	Cosman et al.	
	167.	6,334,861	01-01-2002	Chandler et al.	
	168.	6,352,536	03-05-2002	Buysse et al.	

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	169.	6,402,743	06-11-2002	Orszulak et al.	
	170.	6,402,747	06-11-2002	Lindermann et al.	
	171.	6,405,072	06-11-2002	Cosman	
	172.	6,416,520	07-09-2002	Kynast et al.	
	173.	6,419,653	07-16-2002	Edwards et al.	
	174.	6,419,680	07-16-2002	Cosman et al.	
	175.	6,419,798	07-16-2002	Topolkaraev et al.	
	176.	6,425,887	07-30-2002	McGuckin et al.	
	177.	6,440,127	08-27-2002	McGovern et al.	
	178.	6,447,477	09-10-2002	Burney et al.	
	179.	6,447,505	09-10-2002	McGovern et al.	
	180.	6,451,018	09-17-2002	Lands et al.	
	181.	6,454,765	09-24-2002	Leveen et al.	
	182.	6,458,130	10-01-2002	Frazier et al.	
	183.	6,459,769	10-01-2002	Cosman	
	184.	6,464,704	10-15-2002	Schmaltz et al.	
	185.	6,468,273	10-22-2002	Leveen et al.	
	186.	6,471,698	10-29-2002	Edwards et al.	
	187.	6,478,793	11-12-2002	Cosman et al.	
	188.	6,500,175	12-31-2002	Gough et al.	
	189.	6,506,189	01-14-2003	Rittman, III et al.	
	190.	6,517,534	02-11-2003	McGovern et al.	
	191.	6,530,922	03-11-2003	Cosman et al.	
	192.	6,533,987	03-18-2003	Topolkaraev et al.	
	193.	6,551,311	04-22-2003	Lee et al.	
	194.	6,562,033	05-13-2003	Shah et al.	
	195.	6,565,562	05-20-2003	Shah et al.	
	196.	6,569,159	05-27-2003	Edwards et al.	

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	197.	6,575,967	06-10-2003	Leveen et al.	
	198.	6,575,969	06-10-2003	Rittman, III et al.	
	199.	6,585,735	07-01-2003	Frazier et al.	
	200.	6,602,249	08-05-2003	Stoddard et al.	
	201.	6,605,085	08-12-2003	Edwards	
	202.	6,610,054	08-26-2003	Edwards et al.	
	203.	6,622,731	09-23-2003	Daniel et al.	
	204.	6,623,481	09-23-2003	Garbagnati et al.	
	205.	6,632,221	10-14-2003	Edwards et al.	
	206.	6,632,222	10-14-2003	Edwards et al.	
	207.	6,638,275	10-28-2003	McGaffigan et al.	
	208.	6,641,580	11-04-2003	Edwards et al.	
	209.	6,645,201	11-11-2003	Utley et al.	
	210.	6,652,515	11-25-2003	Maguire et al.	
	211.	6,652,516	11-25-2003	Gough	
	212.	6,660,002	12-09-2003	Edwards et al.	
	213.	6,660,362	12-09-2003	Lindsay et al.	
	214.	6,663,624	12-16-2003	Edwards et al.	
	215.	6,669,693	12-30-2003	Friedman	
	216.	6,682,526	01-27-2004	Jones et al.	
	217.	6,682,528	01-27-2004	Frazier et al.	
	218.	6,685,701	02-03-2004	Orszulak et al.	
	219.	6,689,127	02-10-2004	Gough et al.	
	220.	6,690,210	02-10-2004	Hadjizada et al.	
	221.	6,692,490	02-17-2004	Edwards	
	222.	6,706,152	03-16-2004	Burazin et al.	
	223.	6,723,092	04-20-2004	Brown et al.	
	224.	6,743,226	06-01-2004	Cosman et al.	

Examiner Signature	Date Considered

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT		
	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
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U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	225.	6,743,229	06-01-2004	Buysse et al.	
	226.	6,746,570	06-08-2004	Burazin et al.	
	227.	6,749,719	06-15-2004	Burazin et al.	
	228.	6,770,070	08-03-2004	Balbierz	
	229.	6,780,180	08-24-2004	Goble et al.	
	230.	6,803,549	10-12-2004	Yu	
	231.	6,814,712	11-09-2004	Edwards et al.	
	232.	6,837,956	01-04-2005	Cowell et al.	
	233.	6,846,448	01-25-2005	Rymer et al.	
	234.	6,847,848	01-25-2005	Sterzer et al.	
	235.	6,852,091	02-08-2005	Edwards et al.	
	236.	6,866,663	03-15-2005	Edwards et al.	
	237.	6,881,214	04-19-2005	Cosman et al.	
	238.	6,889,089	05-03-2005	Behl et al.	
	239.	6,896,675	05-24-2005	Leung et al.	
	240.	6,932,810	08-23-2005	Ryan	
	241.	6,958,062	10-25-2005	Gough et al.	
	242.	6,958,064	10-25-2005	Rioux et al.	
	243.	6,961,602	11-01-2005	Fuimaono et al.	
	244.	6,964,660	11-15-2005	Maguire et al.	
	245.	6,966,908	11-22-2005	Maguire et al.	
	246.	6,974,455	12-13-2005	Garabedian et al.	
	247.	6,997,925	02-14-2006	Maguire et al.	
	248.	7,025,767	04-11-2006	Schaefer et al.	
	249.	7,033,353	04-25-2006	Stoddard et al.	
	250.	7,044,949	05-16-2006	Orszulak et al.	
	251.	7,048,733	05-23-2006	Hartley et al.	
	252.	7,056,320	06-06-2006	Utley et al.	

Examiner Signature	Date Considered

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U.S. PATENT DOCUMENTS

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	253.	7,074,484	07-11-2006	Topolkaraev et al.	
	254.	7,076,399	07-11-2006	Godara	
	255.	7,087,051	08-08-2006	Bourne et al.	
	256.	7,099,712	08-29-2006	Fuimaono et al.	
	257.	7,108,696	09-19-2006	Daniel et al.	
	258.	7,112,197	09-26-2006	Hartley et al.	
	259.	7,115,124	10-03-2006	Xiao	
	260.	7,138,088	11-21-2006	Wariar et al.	
	261.	7,150,743	12-19-2006	Zvuloni et al.	
	262.	7,150,744	12-19-2006	Edwards et al.	
	263.	7,160,296	01-09-2007	Pearson et al.	
	264.	7,163,536	01-16-2007	Godara	
	265.	7,179,256	02-20-2007	Mest	
	266.	7,179,258	02-20-2007	Buysse et al.	
	267.	7,207,990	04-24-2007	Lands et al.	
	268.	7,258,688	08-21-2007	Shah et al.	
	269.	7,266,414	09-04-2007	Cornelius et al.	
	270.	7,270,660	09-18-2007	Ryan	
	271.	7,270,662	09-18-2007	Visram et al.	
	272.	7,276,064	10-02-2007	Paul et al.	
	273.	7,281,666	10-16-2007	Smith	
	274.	7,294,127	11-13-2007	Leung et al.	
	275.	7,306,596	12-11-2007	Hillier et al.	
	276.	7,311,702	12-25-2007	Tallarida et al.	
	277.	7,340,307	03-04-2008	Maguire et al.	
	278.	7,354,436	04-08-2008	Rioux et al.	
	279.	7,357,798	04-15-2008	Sharps et al.	
	280.	7,371,234	05-13-2008	Young	

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	281.	7,387,626	06-17-2008	Edwards et al.	
	282.	7,387,630	06-17-2008	Mest	
	283.	7,416,549	08-26-2008	Young et al.	
	284.	7,449,020	11-11-2008	Edwards et al.	
	285.	7,468,062	12-23-2008	Oral et al.	
	286.	7,480,533	01-20-2009	Cosman et al.	
	287.	7,517,346	04-14-2009	Sloan et al.	
	288.	7,524,318	04-28-2009	Young et al.	
	289.	7,533,002	05-12-2009	Godara	
	290.	7,549,986	06-23-2009	Rioux et al.	
	291.	7,561,907	07-14-2009	Fuimaono et al.	
	292.	7,593,778	09-22-2009	Chandran et al.	
	293.	7,596,469	09-29-2009	Godara	
	294.	7,615,050	11-10-2009	Cross et al.	
	295.	7,670,336	03-02-2010	Young et al.	
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	297.	7,678,106	03-16-2010	Lee	
	298.	7,699,844	04-20-2010	Utley et al.	
	299.	7,704,248	04-27-2010	Dicarlo	
	300.	7,771,420	08-10-2010	Butty et al.	
	301.	7,794,458	09-14-2010	McIntyre et al.	
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	303.	7,797,049	09-14-2010	Christopherson et al.	
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	305.	7,815,571	10-19-2010	Deckman et al.	
	306.	7,819,869	10-26-2010	Godara et al.	
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	308.	7,824,404	11-02-2010	Godara et al.	

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	309.	7,828,796	11-09-2010	Wong et al.	
	310.	7,874,986	01-25-2011	Deckman et al.	
	311.	7,875,025	01-25-2011	Cockburn et al.	
	312.	7,892,231	02-22-2011	Elliott	
	313.	7,896,874	03-01-2011	Young et al.	
	314.	2002/0026185	02-28-2002	Gough	
	315.	2002/0029037	03-07-2002	Kim	
	316.	2002/0188275	12-12-2002	McGuckin, Jr.	
	317.	2003/0018332	01-23-2003	Schmaltz et al.	
	318.	2003/0078595	04-24-2003	Cosman	
	319.	2004/0006336	01-08-2004	Swanson	
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	321.	2004/0015218	01-22-2004	Finch et al.	
	322.	2004/0100376	05-27-2004	Lye et al.	
	323.	2004/0122482	06-24-2004	Tung et al.	
	324.	2004/0143262	07-22-2004	Visram et al.	
	325.	2004/0176759	09-09-2004	Krishnamurthy et al.	
	326.	2004/0230187	11-18-2004	Lee et al.	
	327.	2004/0260282	12-23-2004	Gough et al.	
	328.	2005/0033279	02-10-2005	Edwards et al.	
	329.	2005/0059964	03-17-2005	Fitz	
	330.	2005/0101944	05-12-2005	Williams	
	331.	2005/0101950	05-12-2005	Gough et al.	
	332.	2005/0165391	07-28-2005	Maguire et al.	
	333.	2005/0171522	08-04-2005	Christopherson	
	334.	2005/0177209	08-11-2005	Leung et al.	
	335.	2005/0177211	08-11-2005	Leung et al.	
	336.	2005/0203503	09-15-2005	Edwards et al.	

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U.S. PATENT DOCUMENTS

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	337.	2005/0234445	10-20-2005	Conquergood et al.	
	338.	2005/0240174	10-27-2005	Pearson et al.	
	339.	2005/0267552	12-01-2005	Conquergood et al.	
	340.	2005/0277918	12-15-2005	Shah et al.	
	341.	2006/0015161	01-19-2006	Longo et al.	
	342.	2006/0089635	04-27-2006	Young et al.	
	343.	2006/0095115	05-04-2006	Bladillah et al.	
	344.	2006/0111702	05-25-2006	Oral et al.	
	345.	2006/0122686	06-08-2006	Gilad et al.	
	346.	2006/0122692	06-08-2006	Gilad et al.	
	347.	2006/0142756	06-29-2006	Davies et al.	
	348.	2006/0173359	08-03-2006	Lin et al.	
	349.	2006/0189972	08-24-2006	Grossman	
	350.	2006/0200121	09-07-2006	Mowery	
	351.	2006/0206127	09-14-2006	Conquergood et al.	
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	353.	2006/0206129	09-14-2006	Conquergood et al.	
	354.	2006/0206130	09-14-2006	Conquergood et al.	
	355.	2006/0206131	09-14-2006	Conquergood et al.	
	356.	2006/0206132	09-14-2006	Conquergood et al.	
	357.	2006/0206133	09-14-2006	Conquergood et al.	
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	359.	2006/0217705	09-28-2006	Godara et al.	
	360.	2006/0247616	11-02-2006	Edwards et al.	
	361.	2006/0259026	11-16-2006	Godara et al.	
	362.	2006/0259027	11-16-2006	Kwan et al.	
	363.	2006/0271036	11-30-2006	Garabedian et al.	
	364.	2007/0006215	01-04-2007	Epstein et al.	

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U.S. PATENT DOCUMENTS

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	365.	2007/0016183	01-18-2007	Lee et al.	
	366.	2007/0027449	02-01-2007	Godara et al.	
	367.	2007/0060921	03-15-2007	Janssen et al.	
	368.	2007/0112342	05-17-2007	Pearson et al.	
	369.	2007/0118191	05-24-2007	Godara	
	370.	2007/0123964	05-31-2007	Davies et al.	
	371.	2007/0156136	07-05-2007	Godara et al.	
	372.	2007/0161905	07-12-2007	Munrow	
	373.	2007/0167943	07-19-2007	Janssen et al.	
	374.	2007/0179380	08-02-2007	Grossman	
	375.	2007/0179491	08-02-2007	Kratoska et al.	
	376.	2007/0185522	08-09-2007	Davies et al.	
	377.	2007/0203402	08-30-2007	Godara et al.	
	378.	2007/0203486	08-30-2007	Young	
	379.	2007/0260234	11-08-2007	Mccullagh et al.	
	380.	2007/0282321	12-06-2007	Shah et al.	
	381.	2008/0015569	01-17-2008	Saadat et al.	
	382.	2008/0033493	02-07-2008	Deckman et al.	
	383.	2008/0045939	02-21-2008	Lee	
	384.	2008/0045940	02-21-2008	Lee	
	385.	2008/0048786	02-28-2008	Feldkamp et al.	
	386.	2008/0065062	03-13-2008	Leung et al.	
	387.	2008/0154259	06-26-2008	Gough et al.	
	388.	2008/0167646	07-10-2008	Godara et al.	
	389.	2008/0167649	07-10-2008	Edwards et al.	
	390.	2008/0208121	08-28-2008	Youssef et al.	
	391.	2008/0228180	09-18-2008	Epstein	
	392.	2008/0228181	09-18-2008	Godara et al.	

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	393.	2008/0269739	10-30-2008	Young et al.	
	394.	2008/0275443	11-06-2008	Oral et al.	
	395.	2009/0024124	01-22-2009	Lefler et al.	
	396.	2009/0054962	02-26-2009	Lefler et al.	
	397.	2009/0099544	04-16-2009	Munrow et al.	
	398.	2009/0131790	05-21-2009	Munrow et al.	
	399.	2009/0138011	05-28-2009	Epstein	
	400.	2009/0187177	07-23-2009	Epstein	
	401.	2009/0187182	07-23-2009	Epstein et al.	
	402.	2009/0187183	07-23-2009	Epstein	
	403.	2009/0198232	08-06-2009	Young et al.	
	404.	2009/0221998	09-03-2009	Epstein et al.	
	405.	2009/0228001	09-10-2009	Pacey	
	406.	2009/0287081	11-19-2009	Grossman et al.	
	407.	2009/0299358	12-03-2009	Lafontaine	
	408.	2010/0004651	01-07-2010	Biyani	
	409.	2010/0042098	02-18-2010	Cross et al.	
	410.	2010/0056926	03-04-2010	Deckman et al.	
	411.	2010/0076303	03-25-2010	McKinley	
	412.	2010/0099980	04-22-2010	Godara et al.	
	413.	2010/0114095	05-06-2010	Janssen et al.	
	414.	2010/0130974	05-27-2010	Young et al.	
	415.	2010/0185082	07-22-2010	Chandran et al.	
	416.	2010/0222677	09-02-2010	Placek et al.	
	417.	5,507,802	04-16-1996	Imran	
	418.	7,270,661	09-18-2007	Dahla et al.	
	419.	2007/0287996	12-13-2007	Rioux	

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	420.	2004/0199179	10-07-2004	Elliott	
	421.	2006/0229645	10-12-2006	Bonnette et al.	
	422.	2004/0158239	08-12-2004	Behl et al.	
	423.	2007/0112340	05-17-2007	Thomas et al.	
	424.	2008/0161804	07-03-2008	Rioux et al.	
	425.	2008/0249392	10-09-2008	Mest	
	426.	2008/0269558	10-30-2008	Yahagi et al.	
	427.	2004/0059328	03-25-2004	Daniel et al.	
	428.	2011/0288540	11-24-2011	Wright et al.	
	429.	2005/0085804	04-21-2005	McGaffigan	
	430.	2002/0143302 A1	10-03-2002	Hinchliffe et al.	
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	432.	2006/0084965 A1	04-20-2006	Young et al.	

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Examiner Initials	Cite No.	Foreign Patent Document *Country Code-Number-Kind Code* Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T[1]
	433.	DE 2124684	11-30-1972	Stadelmayr		
	434.	GB 2423024	08-16-2006	Instrumedical Ltd		
	435.	WO 96/29946	10-03-1996	Board of Regents of the University of Nebraska		
	436.	WO 2011/057157	05-12-2011	Wright		
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	438.	JP2003-527888	09-24-2003	NEOTHERMIA CORPORATION		X - Abs
	439.	WO 97/06739	02-27-1997	ZOMED INT INC.		
	440.	JP2008-516667	05-22-2008	BOSTON SCIENTIFIC SCIMED, INC.		X

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NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[1]
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Examiner Signature	Date Considered

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T[1] - Place a check mark in this area when an English language Translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT		
	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 19 OF 20	Attorney Docket No.	NBUS.001C1

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[1]
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	457.	Boston Scientific, LeVeen® Needle Electrodes; The Choice for Open, Laparoscopic or Percutaneous Radiofrequency Ablation, 2006, in 2 pages.	
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	459.	Diros Technology Inc., OWL Pain Management Sets, http://www.dirostech.com/22.php, (no date), in 3 pages.	
	460.	Diros Technology Inc., OWL Sterile Single Use (Disposable) RF Probes, http://www.dirostech.com/productdetail.php?a=16&b+3, 2007, in 1 page.	
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NON PATENT LITERATURE DOCUMENTS

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	472.	International Search Report and Written Opinion of the International Searching Authority for International Application No. PCT/US2010/055744, mailed on March 1, 2011, in 34 pages.	
	473.	International Preliminary Report on Patentability issued in PCT/US2011/035253, dated November 27, 2012.	
	474.	International Search Report and Written Opinion of the International Searching Authority for International Application No. PCT/US2011/035253 mailed on August 18, 2011.	
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	476.	Patent Examination Report issued in Australian Application No. 2010314930, dated July 26, 2013.	
	477.	Notice of Acceptance issued in Australian Application No. 2010314930, dated October 14, 2013.	
	478.	Notice of Acceptance issued in Australian Application No. 2011256709, dated October 10, 2013.	
	479.	Office Action issued in U.S. Application No. 13/101,009, dated March 6, 2014.	
	480.	Office Action issued in Japanese Application No. 2012-538056, dated May 19, 2014.	
	481.	Supplemental European Search Report and Search Opinion issued in EP Application No. 10829203.8, mailed May 9, 2014.	
	482.	Final Office Action issued in U.S. Application No. 13/101,009, dated July 3, 2014.	
	483.	Supplemental European Search Report and Search Opinion issued in EP Application No. 11783944, dated June 23, 2014.	
	484.	Office Action issued in Japanese Application No. 2013-511205, dated August 4, 2014.	X
	485.	Office Action issued in U.S. Application No. 13/101,009, dated October 17, 2014.	
	486.	Office Action issued in Chinese Application No. 201180035655.7, dated August 25, 2014.	X
	487.	Office Action issued in Korean Application No. 10-2012-7033363, dated December 23, 2014.	X
	488.	Patent Examination Report issued in Australian Application No. 2014200132, dated December 1, 2014.	
	489.	Office Action issued in Japanese Application No. 2012-538056, dated February 2, 2015.	

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Electronic Patent Application Fee Transmittal

Application Number:	15098673
Filing Date:	14-Apr-2016
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Filer:	Daniel Christopher Higgs
Attorney Docket Number:	NBUS.001C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
		Total in USD ($)		**120**

Electronic Acknowledgement Receipt

EFS ID:	37281732
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	26-SEP-2019
Filing Date:	14-APR-2016
Time Stamp:	10:40:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$120
RAM confirmation Number	E20199PA41292308
Deposit Account	602176
Authorized User	Daniel Higgs

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1	Information Disclosure Statement (IDS) Form (SB08)	IDS_NBUS001C1_Parent_Resubmission.pdf	328969 ac985934fd2bb7b799934b8117a71bd8332a14ec	no	23
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2	Fee Worksheet (SB06)	fee-info.pdf	30616 0dcee9f26beebd254089b3192c06fdd442b4d51e	no	2
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5383917		1995-01-24	Desai et al.	
	2	5486161		1996-01-23	Lax et al.	
	3	5749846		1998-05-12	Edwards et al.	
	4	5893847		1999-04-13	Kordis	
	5	6045532		2000-04-04	Eggers et al.	
	6	6105581		2000-08-22	Eggers et al.	
	7	6210406		2001-04-03	Webster	
	8	6216043		2001-04-10	Swanson et al.	

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	9	6221071		2001-04-24	Sherry et al.	
	10	6287304		2001-09-11	Eggers et al.	
	11	6461314		2002-10-08	Pant et al.	
	12	6471695		2002-10-29	Behl	
	13	6699242		2004-03-02	Heggeness	
	14	6740080		2004-05-25	Jain et al.	
	15	6752804		2004-06-22	Simpson et al.	
	16	6962587		2005-11-08	Johsnon et al.	
	17	6989004		2006-01-24	Hinchliffe et al.	
	18	7229438		2007-06-12	Young	
	19	7318822		2008-01-15	Darmos et al.	

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	20	7344533		2008-03-18	Pearson et al.	
	21	7393351		2008-07-01	Woloszko et al.	
	22	7399299		2008-07-15	Daniel et al.	
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	26	7678107		2010-03-16	Young	
	27	7846157		2010-12-07	Kozel	
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	29	8262574		2012-09-11	Placek et al.	
	30	8512330		2013-08-20	Epstein et al.	

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	31	8518037		2013-08-27	Young	
	32	8753335		2014-06-17	Moshe et al.	
	33	9402560		2016-08-02	Organ et al.	
	34	9675406		2017-06-13	Moss et al.	

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	1	20020022864		2002-02-21	Mahvi et al.	
	2	20020133148		2002-09-19	Daniel et al.	
	3	20030199862		2003-10-23	Simpson et al.	
	4	20040064137		2004-04-01	Pellegrino et al.	
	5	20070010809		2007-01-11	Hovda et al.	

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	6	20070213703		2007-09-13	Naam et al.	
	7	20080249523		2008-10-09	McPherson et al.	
	8	20090306604		2009-12-10	Darmos et al.	
	9	20100076340		2010-03-25	Eckstein et al.	
	10	20110184403		2011-07-28	Brannan	
	11	20130096549		2013-04-18	Organ et al.	
	12	20170065334		2017-03-09	Wright et al.	

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	1	2017203754	AU		2017-06-22	Diros Technology Inc.		
	2	1211171	CN	A	1999-03-17	RITA MEDICAL SYSTEMS, INC.		X

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	3	1338909	CN	A	2002-03-06	Transurgical, Inc.		☒
	4	2418844	CN		2001-02-14	LOW TEMPERATURE TECHNOLOGY TESTING CENTER		☒
	5	1645235	EP	B1	2010-11-08	Covidien AG		☐
	6	1059067	EP	B1	2005-04-06	Sherwood Services AG		☐
	7	2003-527888	JP		2003-09-24	NEOTHERMIA CORPORATION		☒
	8	2009-504201	JP		2009-02-05	HALT MEDICAL, INC.		☒
	9	4290894	JP	B2	2009-04-10	ASUROKEA CORP		☒
	10	2001-527428	JP		2001-12-25	VIDAMED, INC.		☒
	11	2004-267759	JP		2004-09-30	Depuy Acromed, Inc.		☒
	12	2013-509966	JP		2013-03-21	Wright et al.		☒
	13	96/04860	WO		1996-02-22	ZOMED INTERNATIONAL, INC.		☐

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	14	96/16606	WO		1996-06-06	VIDAMED, INC.		☐
	15	97/29702	WO		1997-08-21	RITA MEDICAL SYSTEMS, INC.		☐
	16	97/06740	WO		1997-02-27	GOUGH et al.		☐
	17	97/06855	WO		1997-02-27	GOUGH et al.		☐
	18	97/06857	WO		1997-02-27	GOUGH et al.		☐
	19	99/25260	WO		1999-05-27	RITA MEDICAL SYSTEMS, INC.		☐
	20	00/06046	WO		2000-02-10	RADIOTHERAPEUTICS CORPORATION		☐
	21	01/28446	WO		2001-04-26	NEOTHERMIA CORPORATION		☐
	22	01/57655	WO		2001-08-09	BAYLOR COLLEGE OF MEDICINE		☐
	23	02/22032	WO		2002-03-21	RADIOTHERAPEUTICS CORPORATION		☐
	24	02/54941	WO		2002-07-18	RITA MEDICAL SYSTEMS, INC.		☐

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	Attorney Docket Number	NBUS.001C1

	25	2006/044105	WO		2006-04-27	BOSTON SCIENTIFIC SCIMED, INC.		☐
	26	2006/104682	WO		2006-10-05	YOUNG		☐
	27	2007/005830	WO		2007-01-11	HALT MEDICAL, INC.		☐
	28	2008/083044	WO		2008-07-10	BOSTON SCIENTIFIC SCIMED, INC.		☐
	29	2011/113943	WO		2011-09-22	VESALIUS MEDICAL TECHNOLOGIES BVBA		☐
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Attorney Docket Number	NBUS.001C1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Daniel C. Higgs/	Date (YYYY-MM-DD)	2019-09-26
Name/Print	Daniel C. Higgs	Registration Number	55265

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Electronic Patent Application Fee Transmittal

Application Number:	15098673
Filing Date:	14-Apr-2016
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Filer:	Daniel Christopher Higgs
Attorney Docket Number:	NBUS.001C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
		Total in USD ($)		**120**

Electronic Acknowledgement Receipt

EFS ID:	37282035
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	26-SEP-2019
Filing Date:	14-APR-2016
Time Stamp:	10:57:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$120
RAM confirmation Number	E20199PA57402541
Deposit Account	602176
Authorized User	Daniel Higgs

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File Listing:

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1	Information Disclosure Statement (IDS) Form (SB08)	IDS_NBUS001C1_1.pdf	1036820 6f00411dc669cb2a133fd86eef85c3a36bd2356d	no	11
Warnings:					
Information:					
2	Foreign Reference	AU_2017203754.pdf	1694116 6c7e210a430fd534e4151d74495dfa0bfccb73b2	no	44
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3	Foreign Reference	CN_1211171.pdf	2132400 9432018449aa7b20907d79bd3b7c72edaa1503fd	no	59
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14	Foreign Reference	WO_9604860.pdf	1750014 a61196f91b7299675f30bc3f2cc10e2df4fe52af	no	58
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15	Foreign Reference	WO_9616606.pdf	1394306 9d030985fe4dd66cf327dd194e2fcb0f5288c10e	no	30
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16	Foreign Reference	WO_9729702.pdf	1261547 7aa64c23d4237e81d5bcca5fbd7c57dcd82d193a	no	36
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17	Foreign Reference	WO_9706740.pdf	1844810 8d0923c0e9e1811d8389c42b60225fe960d7cebf	no	51
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21	Foreign Reference	WO_0006046.pdf	1682275 44139dc9d2612c322ac3ee8bd9bf6e64195c5c86	no	38
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22	Foreign Reference	WO_0128446.pdf	4692745 d97b11345074b091933fd1dc619cbe2b1cff50ec	no	96
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23	Foreign Reference	WO_0157655.pdf	1210585 f7b62ab334c0ced613d3bbfa910a229b98b1046f	no	29
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24	Foreign Reference	WO_0222032.pdf	2097245 d413d28fa4533ed0bb674157d34c06e4afc5c61d	no	46
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25	Foreign Reference	WO_02054941.pdf	8146661 4495e5b10f865e7526336ab88ee2203e9b6f9e82	no	100
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26	Foreign Reference	WO_06044105.pdf	942912 24781ce6710ff202555b3398c30571f933ddd0ec	no	27
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27	Foreign Reference	WO_06104682.pdf	1415810 dcbc37a95b68f6753eddde8e0e38421ba672236a	no	39
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28	Foreign Reference	WO_07005830.pdf	2250139 6a8bd5b365299cf42b711a7da703a914a2a9851e	no	60
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29	Foreign Reference	WO_08083044.pdf	843463 0836d4451a2d21886dc4cd190dc7777a2cea8970	no	30
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30	Foreign Reference	WO_11113943.pdf	784724 ec6b535b0158d9a8d38c6b8e7a2b1ab610cb0f88	no	66
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31	Foreign Reference	WO_11146243.pdf	5466807 a8477c3627b238e5d021777621f770bbf2d6cb4e	no	121
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32	Fee Worksheet (SB06)	fee-info.pdf	30617 fb074e35dd615f6ce2e0e34cf7a90880a63882b3	no	2
Warnings:					
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National Stage of an International Application under 35 U.S.C. 371

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

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Avanos v. Stratus
Page 322 of 691

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	Examiner Name	Eun Hwa Kim
	Attorney Docket Number	NBUS.001C1

	1	BIOMERICS LLC, Statement of Claim, BIOMERICS LLC v DIROS TECHNOLOGY INC & M MEDICAL PTY LTD, NSD438/2019, FEDERAL COURT OF AUSTRALIA, March 22, 2019, 10 pages.	
	2	DIROS TECHNOLOGY INC, Statement of Cross Claim, BIOMERICS LLC v DIROS TECHNOLOGY INC & M MEDICAL PTY LTD, NSD438/2019, FEDERAL COURT OF AUSTRALIA, May 13, 2019, 5 pages.	
	3	DIROS TECHNOLOGY INC., RF Trident Cannulae, Last Accessed August 20, 2019, available at https://dirostech.com/product-details/rf-tridenttrident-hybrid-cannulae/, 7 pages.	
	4	DIROS TECHNOLOGY INC., RF Trident Hybrid Cannulae, Last Accessed August 20, 2019, available at https://dirostech.com/product-details/rf-trident-hybrid-cannulae/, 10 pages.	
	5	FOOD AND DRUG ADMINISTRATION, 510(k) Summary for Diros OWL Sterile Single Use Trident R.F. Insulated Cannulae Models DTR and DTRH, July 30, 2015, 11 pages.	
	6	AHMED ET AL., Principles of and Advances in Percutaneous Ablation, Radiology, February 2011, pp. 351-369, Vol. 258, No. 2.	
	7	CHEN ET AL., Optimizing Electrode Placement Using Finite-Element Models in Radiofrequency Ablation Treatment Planning, IEEE Transactions on Biomedical Engineering, February 2009, pp. 237-245, Vol. 56, No. 2.	
	8	HAEMMERICH ET AL., Hepatic Bipolar Radio-Frequency Ablation Between Separated Multiprong Electrodes, IEEE Transactions on Biomedical Engineering, October 2001, pp. 1145-1152, Vol. 48, No. 10.	
	9	HAEMMERICH ET AL., Large-Volume Radiofrequency Ablation of ex Vivo Bovine Liver with Multiple Cooled Cluster Electrodes, Radiology, February 2005, pp. 563-568, Vol. 234, No. 2.	
	10	LAESEKE ET AL., Multiple-Electrode RF Ablation Creates Confluent Areas of Necrosis: Results in in vivo Porcine Liver, Radiology, October 2006, pp. 116-124.	
	11	QUARANTA ET AL., FEM Analysis of RF Breast Ablation: Multiprobe versus Cool-tip Electrode, Anticancer Research, 2007, pp. 775-784.	

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	Examiner Name	Eun Hwa Kim
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	12	SCHARF ET AL., Ablation of Persistent Atrial Fibrillation Using Multielectrode Catheters and Duty-Cycled Radiofrequency Energy, Journal of the American College of Cardiology, October 6, 2009, pp. 1450-1456, Vol. 54, No. 15.	
	13	SHIRATO ET AL., Small Hepatocellular Carcinoma: Therapeutic Effectiveness of Percutaneous Radio Frequency Ablation Therapy With a LeVeen Needle Electrode, American Institute of Ultrasound in Medicine, 2002, pp. 67-76.	
	14	IP AUSTRALIA, Patent Examination Report No. 2, Australian Patent Application No. 2014200132, April 8, 2015, 3 pages.	
	15	IP AUSTRALIA, Examination Report No. 1 for standard patent application, Australian Patent Application No. 2015261694, September 27, 2017, 3 pages.	
	16	BRAZILIAN NATIONAL INSTITUTE OF INDUSTRIAL PROPERTY, Search Report, Brazilian Patent Application No. BR112012010199-4, July 23, 2019, 6 pages.	X
	17	CANADIAN INTELLECTUAL PROPERTY OFFICE, Notification of Requisition by the Examiner, Canadian Patent Application No. 2,778,997, June 9, 2017, 7 pages.	☐
	18	CANADIAN INTELLECTUAL PROPERTY OFFICE, Notification of Requisition by the Examiner, Canadian Patent Application No. 2,778,997, May 23, 2019, 5 pages.	☐
	19	INTELLECTUAL PROPERTY INDIA, Examination Report, Indian Patent Application No. 3638/DELNP/2012, March 13, 2019, 5 pages.	☐
	20	JAPAN PATENT OFFICE, Notice of Reasons for Rejection, Japanese Patent Application No. 2012-538056, February 2, 2015, 7 pages.	☒
	21	JAPAN PATENT OFFICE, Notice of Reasons for Rejection, Japanese Patent Application No. 2015-215570, October 24, 2016, 15 pages.	☒
	22	IP AUSTRALIA, Patent Examination Report No. 1, Australian Patent Application No. 2014200126, May 27, 2016, 6 pages.	☐

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	23	CANADIAN INTELLECTUAL PROPRETY OFFICE, Notification of Requisition by the Examiner, Canadian Patent Application No. 2,799,505, March 17, 2017, 5 pages.	☐
	24	CANADIAN INTELLECTUAL PROPRETY OFFICE, Notification of Requisition by the Examiner, Canadian Patent Application No. 2,799,505, April 15, 2019, 10 pages.	☐
	25	CNIPA, NATIONAL INTELLECTUAL PROPERTY ADMINISTRATION, PRC, Office Action, Chinese Patent Application No. 201510151627.1, February 22, 2017, 8 pages.	☐
	26	CNIPA, NATIONAL INTELLECTUAL PROPERTY ADMINISTRATION, PRC, Office Action, Chinese Patent Application No. 201510148998.4, March 2, 2017, 10 pages.	☐
	27	EUROPEAN PATENT OFFICE, Communication Pursuant to Article 94(3) EPC, European Patent Application No. 11 783 944.9 - 1124, February 28, 2018, 4 pages.	☐
	28	ISRAEL PATENT OFFICE, Office Action, Israeli Patent Application No. 222965, May 14, 2015, 3 pages.	☐
	29	INTELLECTUAL PROPERTY INDIA, Examination Report, Indian Patent Application No. 9943/DELNP/2012, July 30, 2019, 6 pages.	☐
	30	JAPAN PATENT OFFICE, Notice of Reasons for Rejection, Japanese Patent Application No. 2013-511205, February 9, 2015, 5 pages.	☒
	31	JAPAN PATENT OFFICE, Decision of Rejection, Japanese Patent Application No. 2013-511205, August 10, 2015, 4 pages.	☒
	32	JAPAN PATENT OFFICE, Appeal No. 2015-21839, Notice of Reasons for Rejection, Japanese Patent Application No. 2013-511205, October 3, 2016, 8 pages.	☒
	33	JAPAN PATENT OFFICE, Notice of Reasons for Rejection, Japanese Patent Application No. 2015-240011, January 4, 2017, 12 pages.	☒

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	34	KOREAN INTELLECTUAL PROPERTY OFFICE, Notice to Submit Response, Korean Patent Application No. 10-2012-7033363, May 4, 2015, 14 pages.	☒
	35	KOREAN INTELLECTUAL PROPERTY OFFICE, Notice to Submit Response, Korean Patent Application No. 10-2015-7004378, September 25, 2017, 13 pages.	☒
	36	MEXICAN INSTITUTE OF INDUSTRIAL PROPERTY, Requirement 1, Mexican Patent Application No. MX/a/2012/013280, February 17, 2015, 4 pages.	☒
	37	MEXICAN INSTITUTE OF INDUSTRIAL PROPERTY, Requirement 2, Mexican Patent Application No. MX/a/2012/013280, May 27, 2015, 8 pages.	☒
	38	UNITED STATES PATENT AND TRADEMARK OFFICE, Office Action, U.S. Patent Application No. 13/101,009, April 6, 2015, 26 pages.	☐
	39	UNITED STATES PATENT AND TRADEMARK OFFICE, Office Action, U.S. Patent Application No. 15/092,945, June 4, 2018, 6 pages.	☐
	40	UNITED STATES PATENT AND TRADEMARK OFFICE, Office Action, U.S. Patent Application No. 15/092,945, March 14, 2019, 15 pages.	☐
	41	UNITED STATES PATENT AND TRADEMARK OFFICE, Applicant-Initiated Interview Summary, U.S. Patent Application No. 15/092,945, August 27, 2019, 4 pages.	☐

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Petitioner's Exhibit 1007
Avanos v. Stratus
Page 326 of 691

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Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Daniel C. Higgs/	Date (YYYY-MM-DD)	2019-09-26
Name/Print	Daniel C. Higgs	Registration Number	55265

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	15098673
Filing Date:	14-Apr-2016
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Filer:	Daniel Christopher Higgs
Attorney Docket Number:	NBUS.001C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
		Total in USD ($)		**120**

Electronic Acknowledgement Receipt

EFS ID:	37282459
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	26-SEP-2019
Filing Date:	14-APR-2016
Time Stamp:	11:20:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$120
RAM confirmation Number	E20199PB21022909
Deposit Account	602176
Authorized User	Daniel Higgs

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IDS_NBUS001C1_2.pdf	1036809 6d770ea48e4c273181ffc354c65fad2843058a78	no	7
Warnings:					
Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
2	Non Patent Literature	Biomerics_Statement_of_Claim.pdf	358321 078c76c9306169260a82bf1452e2b1539ff2e8e9	no	10
Warnings:					
Information:					
3	Non Patent Literature	Diros_Statement_of_Cross_Claim.pdf	119239 03e2710f7d5f8267cecff4978fc775e4af4ad4e3	no	5
Warnings:					
Information:					
4	Non Patent Literature	Diros_RF_Trident.pdf	277626 5bf7dbc93a23ad2d611eb9beab3b0e507359a58a	no	7
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5	Non Patent Literature	Diros_RF_Trident_Hybrid.pdf	315160 80f43b6e0bc2f0e2122a1b00d2a6b725ebf91e2a	no	10
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Information:					

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Information:					
7	Non Patent Literature	Ahmed.pdf	1765793 4f8df6610b871e10b72e2064d4d573e327b6d174	no	19
Warnings:					
Information:					
8	Non Patent Literature	Chen.pdf	1884158 174f7702c3cf7147007174f27e751b03a72909ac	no	9
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Information:					
9	Non Patent Literature	Haemmerich_Hepatic.pdf	332494 914db53b0f2f68f774fdf129ea0e3987a14d9e28	no	8
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Information:					
10	Non Patent Literature	Haemmerich_Large.pdf	487754 afc4ecc73ed32f0d5c926142656dc8e0fe33a6bf	no	6
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Information:					
11	Non Patent Literature	Laeseke.pdf	1573601 58f17419b2e1b98b0aacf22b51fae8d706b5b7bd	no	20
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12	Non Patent Literature	Quaranta.pdf	1285868 82ad78f1f52b3f45e0b99cf899454addb80ff466	no	10
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Information:					

13	Non Patent Literature	Scharf.pdf	792231 c2679b16f949722451c80ce1599525c5dffa29d7	no	7
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14	Non Patent Literature	Shirato.pdf	355375 e5ed506cf6bbb27d6453def9f6b6683b8e730ea3	no	10
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15	Non Patent Literature	NBUS001AUD1_OA2.pdf	165572 ad0306101b2b8de285e1c40f38d5e4cfde6438a7	no	3
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18	Non Patent Literature	NBUS001CA_OA1.pdf	674719 1cbb49b12b18e0c4743cbc804dc1b67cab230ed8	no	7
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21	Non Patent Literature	NBUS001JP_OA.pdf	274860 64ef617a81406149fcb655a390270d89661032ac	no	7
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22	Non Patent Literature	NBUS001JPD1_OA.pdf	345113 83b19546b5b5fb315af63a48ba488f6ef2b8ea96	no	15
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23	Non Patent Literature	NBUS004AUD1_OA1.pdf	203858 8c8987570c910d5e16a864f39acd75badf8fc4ba	no	6
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24	Non Patent Literature	NBUS004CA_OA1.pdf	582043 314ed1e29bf66153416d26172dadb5d58b8430c9	no	5
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25	Non Patent Literature	NBUS004CA_OA2.pdf	1277271 7a0f596cc3bb3375269efacd2fb8e8b24ad415ca	no	10
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27	Non Patent Literature	NBUS004CND2_OA.pdf	939960 124c7c528d17102f524bb98730d2e0c3c6714f0c	no	10
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28	Non Patent Literature	NBUS004EU_OA.pdf	135375 f54ed8a78ada362e95f511cc70b0f265a6b331f7	no	4
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29	Non Patent Literature	NBUS004IL_OA.pdf	313752 f11d20c2f3c151c24e42229f07654aef5c35de27	no	3
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30	Non Patent Literature	NBUS004IN_OA.pdf	149190 4f90a6d0ca4b00213fdb9c1fa959abc1dac1eccb	no	6
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31	Non Patent Literature	NBUS004JP_OA2.pdf	223311 cc4b489bae246341caaaed3e9c891fa91f2e609a	no	5
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32	Non Patent Literature	NBUS004JP_OA2DCSN.pdf	274450 98dcb422297fbbb3474c47c4d181444c937ecd0e	no	4
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34	Non Patent Literature	NBUS004JPD1_OA.pdf	321348 67851148bb1e3d37cd86243ebc29216f444efa71	no	12
Warnings:					
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35	Non Patent Literature	NBUS004KR_OA.pdf	283032 646496b72ddeef800475ef283ea7e249c950be99	no	14
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36	Non Patent Literature	NBUS004KRD1_OA.pdf	282104 fbf1073701e501784cefc8f7d62a90708360dd78	no	13
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37	Non Patent Literature	NBUS004MX_OA1.pdf	754874 8684d4e8361f76902180679b7f72f1452962f06e	no	4
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38	Non Patent Literature	NBUS004MX_OA2.pdf	1724662 ac7ea50b1455e1ac3fed536d1525220c4526849b	no	8
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39	Non Patent Literature	NBUS004US_OA4.PDF	994489 a5c66350dbd2434077aa68d076cdfe045e60d6eb	no	26
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40	Non Patent Literature	NBUS004USC1_OA1.pdf	198476 de2e88c8b2aa60e48dc30e7fd387199a5637c514	no	6
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41	Non Patent Literature	NBUS004USC1_OA2.pdf	660078 4016f2a2c34993092aa3c764951a4b7ffd47e723	no	15
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Information:					
43	Fee Worksheet (SB06)	fee-info.pdf	30617 8b5ea74d19aade3f8deeb960c3c71ceb7af6372e	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	23801449		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

148468 7590 02/14/2020

Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

EXAMINER
KIM, EUN HWA

ART UNIT	PAPER NUMBER
3794	

MAIL DATE	DELIVERY MODE
02/14/2020	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 339 of 691

Applicant-Initiated Interview Summary	**Application No.** 15/098,673	**Applicant(s)** Wright et al.	
	Examiner EUNHWA KIM	**Art Unit** 3794	**AIA (FITF) Status** No

All participants (applicant, applicants representative, PTO personnel):

(1) EUNHWA KIM. (3) _____.

(2) Dan Higgs. (4) _____.

Date of Interview: 11 February 2020.

Type: ☐ Telephonic ☑ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☑ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☑103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: 1.

Identification of prior art discussed: Edwards (U.S. Pat. No. 5,599,346).

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

An interview was conducted to discuss proposed claim amendment. Applicant proposed amending the claim to recite that the RF probe, the needle and the filaments are in physical contact so as to be electrically connected to operate or form a single monopolar electrode. Examiner agreed that such amendment appears to overcome the rejection of record. Applicant intends to submit the discussed claim amendment in the forthcoming submission..

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/EUN HWA KIM/ Primary Examiner, Art Unit 3794	

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 340 of 691

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiners responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicants correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,-
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicants record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiners version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, Interview Record OK on the paper recording the substance of the interview along with the date and the examiners initials.

PTO/AIA/25 (04-13)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION

Docket Number (Optional): NBUS.001C1

In re Application of: Robert E. Wright et al.

Application No.: 15/098,673

Filed: April 14, 2016

For: METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

The applicant, Stratus Medical, LLC, owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending reference Application Number 15/092,945, filed, April 7, 2016, as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the reference application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said reference application, "as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application," in the event that: any such patent granted on the pending reference application expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

Check either box 1 or 2 below, if appropriate.

1. ☑ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☐ The undersigned is an attorney or agent of record. Reg. No. _____

Signature — 2/20/2020 Date

Bret Boudoucq Jr.
Typed or printed name

Chief Executive Officer
Title

801 255 2705
Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) is included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	15098673
Filing Date:	14-Apr-2016
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Filer:	Daniel Christopher Higgs
Attorney Docket Number:	NBUS.001C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
STATUTORY OR TERMINAL DISCLAIMER	2814	1	160	160
		Total in USD ($)		**160**

Electronic Acknowledgement Receipt

EFS ID:	38663917
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	23-FEB-2020
Filing Date:	14-APR-2016
Time Stamp:	14:46:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$160
RAM confirmation Number	E20202ME47408382
Deposit Account	602176
Authorized User	Daniel Higgs

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer Filed	NBUS001C1_Terminal_Disclaimer_Executed.pdf	3334794 3b1306c4df2ee41742827167 4f66aec47401f86f	no	2
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30660 50bcc9088b64578df83440adf7e4db866687370b	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3365454		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

If you wish to add additional Foreign Patent Document citation information please click the Add button Add

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	15098673
	Filing Date	2016-04-14
	First Named Inventor	Robert E. Wright
	Art Unit	3794
	Examiner Name	Eun Hwa Kim
	Attorney Docket Number	NBUS.001C1

	1	EUROPEAN PATENT OFFICE, European Search Report and EPO Form 1703 01.91 TRI for European Patent Application No. EP 18215729.7, September 6, 2019, 5 pages.	
	2	EUROPEAN PATENT OFFICE, Communication Under Rule 71(3) EPC for European Patent Application No. EP 11783944.9, December 18, 2019, 125 pages.	
	3	INSTITUTO NACIONAL DA PROPRIEDADE INDUSTRIAL, Search Report for Brazilian Patent Application No. BR112012029263-3, December 6, 2019, 8 pages.	X
	4	UNITED STATES PATENT AND TRADEMARK OFFICE, Applicant-Initiated Interview Summary for U.S. Patent Application No. 15/092,945, February 18, 2020, 4 pages.	☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 349 of 691

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Daniel C. Higgs/	Date (YYYY-MM-DD)	2020-02-23
Name/Print	Daniel C. Higgs	Registration Number	55265

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	15098673
Filing Date:	14-Apr-2016
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Filer:	Daniel Christopher Higgs
Attorney Docket Number:	NBUS.001C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
		Total in USD ($)		**120**

Electronic Acknowledgement Receipt

EFS ID:	38664000
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	23-FEB-2020
Filing Date:	14-APR-2016
Time Stamp:	17:07:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$120
RAM confirmation Number	E20202MH08198530
Deposit Account	602176
Authorized User	Daniel Higgs

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IDS_NBUS001C1_3.pdf	1034677 4451edb93ade3dfb41141db6ad283a13baf4d4ea	no	4
Warnings:					
Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
2	Non Patent Literature	NBUS001EUD1_OA1.pdf	184618 e2040ed58e25f1fe622b09c081363d0681c59ba2	no	5
Warnings:					
Information:					
3	Non Patent Literature	NBUS004EU_Intention_to_Grant.pdf	5647595 70322cc58b2071fcab1e8f65e2d04b621fe5e945	no	125
Warnings:					
Information:					
4	Non Patent Literature	NBUS004BR_OA.pdf	993007 d176afad6e108cbfaacf3b1160c82f769bf7c716	no	8
Warnings:					
Information:					
5	Non Patent Literature	NBUS004USC1_OA2_Ex_Int_2.pdf	188181 1a642e0c661c85d620d749758beb84b3129b7017	no	4
Warnings:					
Information:					

6	Fee Worksheet (SB06)	fee-info.pdf	30617 0e5978ca0d1280cec8b4017cf74e9390afec3311	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	8078695	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/80 (07-17)
Approved for use through 03/31/2021. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no person is required to respond to a collection of information unless it displays a valid OMB control number

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

[X] Practitioners associated with Customer Number: 148468

OR

[ ] Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

[X] The address associated with Customer Number: 148468

OR

[ ]

Firm or individual name		
Address		
City	State	Zip
Country		
Telephone	Email	

Assignee name and address:
Stratus Medical, LLC
8030 W. Harold Gatty Drive, Salt Lake City, Utah 84116

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of the practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	Date 2/20/2020
Name Bret Boudousquie	Telephone 801-355-3615
Title Chief Executive Officer	

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 C.F.R. § 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
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PTO/AIA/01 (06-12)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 15/098,673

filed on April 14, 2016.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Scott A. Brandt Date (Optional): 2/16/20

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	38664351
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	23-FEB-2020
Filing Date:	14-APR-2016
Time Stamp:	23:56:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73	NBUS_001US1C1_3_73_Statement.pdf	121001 efe43d4d812efad5ed295f459c30f4250b62fdd4	no	3

Warnings:

Information:					
2	Power of Attorney	General_POA_Stratus_Executed.pdf	3310950 0f6994c6c0f46d94bb07ea56e2b378faa1c20d00	no	2
Warnings:					
Information:					
3	Oath or Declaration filed	15_098673_Declaration_Scott_Brandt.pdf	518382 486ca7ccec20903833f47b565f1c868535299f80	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	3950333	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/96 (08-12)
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STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Robert E. Wright et al.

Application No./Patent No.: 15/098,673 Filed/Issue Date: April 14, 2016

Titled: METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

Stratus Medical, LLC, a limited liability company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

B. ☑ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Robert E. Wright and Scott A. Brandt To: Nimbus Concepts, LLC

   The document was recorded in the United States Patent and Trademark Office at Reel 039717, Frame 0072, or for which a copy thereof is attached.

2. From: Nimbus Concepts, LLC To: Biomerics, LLC

   The document was recorded in the United States Patent and Trademark Office at Reel 051813, Frame 0965, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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STATEMENT UNDER 37 CFR 3.73(c)

3. From: Biomerics, LLC To: Stratus Medical, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 051814, Frame 0258, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
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5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
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6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☑ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Daniel C. Higgs/	February 23, 2020
Signature	Date
Daniel C. Higgs	55,265
Printed or Typed Name	Title or Registration Number

Privacy Act Statement

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Robert E. Wright	
Application No.:	15/098,673	Art Unit: 3794
Filing Date:	April 14, 2016	
Title:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	
Examiner:	Eun Hwa Kim	
Confirmation No.:	5232	
Customer No.:	148468	

AMENDMENT AND RESPONSE TO OFFICE ACTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Responsive to the Office Action dated September 3 2019, the Applicant respectfully requests reconsideration of the pending claims in view of the amendments and remarks herein.

Amendments to the Claims are reflected in the listing of claims which begins on page 2.

Summary of the Interviews begins on page 17.

Remarks begin on page 19.

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A system ~~needle for insertion into a patient during an RF ablation procedure, the needle~~ comprising:

an RF probe; and

a needle for insertion into a patient during an RF ablation procedure, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments;

an actuator interconnected to the plurality of filaments, wherein ~~rotation~~ movement of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein ~~rotation~~ movement of the actuator in a second direction relative to the hub retracts the plurality of filaments to a retracted position in which the plurality of filaments are disposed within at least a portion of the elongate member; and

a fitting in fluid communication with the lumen, the fitting being configured to provide a connection for injection of fluid through the fitting and through the lumen, the fitting further being configured to allow for insertion of ~~an~~ the RF probe ~~that is separate from the needle~~ into the lumen through the fitting,

wherein the lumen at the interior of the elongate member is configured to accept the RF probe therein to physically contact a conductive portion of the needle and

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thereby electrically connect the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the plurality of filaments, and such that ~~an electrode of the inserted~~ the RF probe, the tip, and the plurality of filaments ~~are operable to form~~ operate together as a single monopolar RF electrode, and

wherein, when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, the plurality of filaments are movable via the actuator from the retracted position, in which the plurality of filaments are disposed within said at least a portion of the elongate member, to the deployed position.

2. (Currently amended) The system ~~needle~~ of claim 1, wherein the actuator fits around at least a portion of the hub, and wherein the actuator is configured to rotate relative to the hub about a central longitudinal axis of the needle.

3. (Currently amended) The system ~~needle~~ of claim 2, wherein the actuator is generally tubular.

4. (Currently amended) The system ~~needle~~ of claim 1, wherein the needle further ~~comprising~~ comprises a slide member coupled to the actuator and fixedly connected to the plurality of filaments, wherein the hub includes a cavity sized to house a protrusion of the slide member, and wherein the slide member is limited to a linear motion relative to the hub as the actuator is rotated.

5. (Currently amended) The system ~~needle~~ of claim 4, wherein the slide member is configured to axially advance and retract without rotating relative to the hub.

6. (Currently amended) The system ~~needle~~ of claim 1, wherein the tip comprises a fluid port in fluid communication with the lumen such that an anesthetic

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and/or an image enhancing dye may be introduced into a region around the tip through the fluid port.

7. (Currently amended) The system ~~needle~~ of claim 1, wherein each filament of the plurality of filaments has a pre-set bias such that the filament is curved when in the deployed state.

8. (Currently amended) The system ~~needle~~ of claim 1, wherein when each filament of the plurality of filaments is in the deployed position, the filaments extend outwardly from the tip.

9. (Currently amended) The system ~~needle~~ of claim 8, wherein each filament comprises a distal end, wherein the distal end of each filament defines a point when each filament is in the deployed position, and wherein an average of all the points is offset from a central longitudinal axis of the elongate member.

10. (Currently amended) The system ~~needle~~ of claim 1, wherein the plurality of filaments comprises three filaments, and wherein an angle between each pair of adjacent filaments is 120 degrees when each filament is in the deployed position.

11. (Currently amended) The system ~~needle~~ of claim 1, wherein the plurality of filaments are configured to form a lesion having a pyramidal shape.

12. (Currently amended) The system ~~needle~~ of claim 1, wherein the tip tapers to a point, and wherein the elongate member and the tip comprise a single unitary structure.

13. (Currently amended) The system ~~needle~~ of claim 1, wherein a proximal end of the elongate member is fixed to the hub.

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14. (Currently amended) The system ~~needle~~ of claim 1, wherein the tip is asymmetrical, and wherein the hub comprises an indicator that is oriented to communicate an orientation of the asymmetrical tip.

15. (Currently amended) The system ~~needle~~ of claim 1, wherein the hub and/or the actuator includes markings to indicate a depth of deployment of the plurality of filaments.

16. (Currently amended) The system ~~needle apparatus~~ of claim 1, wherein the hub and/or the actuator includes detents to provide a tactile feedback of a position of the plurality of filaments.

17. (Canceled)

18. (Currently amended) The system of claim 1[[17]], wherein the RF probe comprises a cable for use in connecting the RF probe to a radiofrequency generator.

19. (Withdrawn—currently amended) A method of using the system of claim 1, the method comprising:

inserting the needle ~~of claim 1~~ into a patient;

rotating the actuator to transition the plurality of filaments from the retracted position to the deployed position; and

operating the RF probe, the tip, and the plurality of filaments as a monopolar electrode.

20. (Withdrawn—currently amended) The method of claim 19, further comprising inserting the RF probe into the lumen of the needle.

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21. (Currently amended) The system of claim 1[[17]], wherein the fitting is configured to be coupled to a fluid source and the lumen is configured to conduct fluid from the fluid source when the RF probe is not positioned within the needle.

22. (Currently amended) The system ~~needle~~ of claim 1, wherein the fitting is configured to provide a connection to a fluid source for said injection of fluid through the fitting and through the lumen.

23. (Currently amended) The system ~~needle~~ of claim 22, wherein the fitting comprises a Luer fitting configured to be connected with the fluid source when the RF probe is fully separated from the needle, such that none of the RF probe is within the needle, the Luer fitting further being configured to separately permit the RF probe to be inserted into the lumen through the Luer fitting when the Luer fitting is not connected with the fluid source.

24. (Currently amended) The system ~~needle~~ of claim 22, wherein the fitting is configured to be connected with the fluid source and to permit fluid to pass through the fitting and through the lumen when the RF probe is not present within the lumen.

25. (Currently amended) The system ~~needle~~ of claim 24, and wherein the fitting is further configured to permit the RF probe to be inserted into the lumen through the fitting when the fitting is not connected with the fluid source.

26. (Currently amended) The system ~~needle~~ of claim 22, wherein the fitting is configured to accept a connector of the fluid source.

27. (Currently amended) The system ~~needle~~ of claim 26, wherein the fitting comprises a Luer fitting and the connector of the fluid source comprises a Luer fitting.

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28. (Currently amended) The system ~~needle~~ of claim 22, wherein the lumen is configured to deliver fluid through the tip at the distal end of the needle.

29. (Currently amended) The system ~~needle~~ of claim 28, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip of the needle without passing through an interior of any of the plurality of filaments.

30. (Currently amended) The system ~~needle~~ of claim 1, wherein the lumen is configured to deliver fluid through the tip at the distal end of the needle.

31. (Currently amended) The system ~~needle~~ of claim 1, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

32. (Currently amended) The system ~~needle~~ of claim 1, wherein the fitting is configured to provide the connection for the injection of fluid through the fitting separately from allowing for insertion of the RF probe into the lumen through the fitting.

33. (Currently amended) The system ~~needle~~ of claim 1, wherein the fitting is at a proximal end of the needle such that the actuator is positioned distally relative to a proximal end of the fitting.

34. (Currently amended) The system ~~needle~~ of claim 1, wherein the fitting comprises a Luer fitting.

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35. (Currently amended) The system ~~needle~~ of claim 34, wherein the Luer fitting is at a proximal-most position at a proximal end of the needle.

36. (Currently amended) The system ~~needle~~ of claim 1, wherein, when the plurality of filaments are in the retracted position, the fitting is configured to connect to a fluid source and to permit fluid from the fluid source to pass through the fitting, through the lumen, and through the tip at the distal end of the needle.

37. (Currently amended) The system ~~needle~~ of claim 36, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

38. (Currently amended) The system ~~needle~~ of claim 36, further comprising tube that is a separate member relative to the elongate member, the tube defining the lumen at the interior of the elongate member.

39. (Currently amended) The system ~~needle~~ of claim 38, wherein the tube comprises a conductive material, and wherein the conductive portion of the needle comprises the conductive material of the tube.

40. (Currently amended) The system ~~needle~~ of claim 39, wherein the tube is configured to transport fluid therethrough, and wherein the tube is further configured to separately conduct therethrough RF energy emitted by the RF probe.

41. (Currently amended) The system ~~needle~~ of claim 40, wherein the tube is further configured to conduct the RF energy into and through the tip and the plurality of filaments.

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42. (Currently amended) The system ~~needle~~ of claim 1, further comprising a tube that is a separate member relative to the elongate member, the tube defining the lumen at the interior of the elongate member.

43. (Currently amended) The system ~~needle~~ of claim 42, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen defined by the tube and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

44. (Currently amended) The system ~~needle~~ of claim 42, wherein the tube comprises a conductive material, and wherein the conductive portion of the needle comprises the conductive material of the tube.

45. (Currently amended) The system ~~needle~~ of claim 44, wherein the tube is configured to transport fluid therethrough when the RF probe is absent from the lumen, and wherein the tube is further configured to separately conduct therethrough RF energy emitted by the RF probe when the RF probe is present within the lumen.

46. (Currently amended) The system ~~needle~~ of claim 45, wherein the tube is further configured to conduct the RF energy into and through the tip and the plurality of filaments.

47. (Currently amended) The system ~~needle~~ of claim 42, wherein the tube is positioned at an interior of the elongate member when the plurality of filaments are in the retracted position.

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48. (Currently amended) The system ~~needle~~ of claim 42, wherein the tube is in fluid communication with the tip at the distal end of the elongate member when the plurality of filaments are in the retracted position.

49. (Currently amended) The system ~~needle~~ of claim 42, wherein the fluid passes from a fluid source, through the fitting, and through the tube when the fluid source is coupled to the fitting, and wherein the RF probe is separately received within the tube when fluid is not being transported through the tube.

50. (Currently amended) The system ~~needle~~ of claim 1, wherein a fluid source is coupled with the fitting and fluid is transported through the lumen to a target volume within the patient when the ~~needle~~ system is in a first operational state in which the RF probe is fully separated from the needle, such that none of the of the RF probe is within the needle, and wherein the lumen accepts the RF probe for delivery of RF energy to the target volume when the ~~needle~~ system is in a second operational state in which fluid is not transported through the lumen of the needle.

51. (Currently amended) A system comprising:

an RF probe that comprises an electrode; and

a needle for insertion into a patient during an RF ablation procedure, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments;

an actuator interconnected to the plurality of filaments, wherein ~~rotation~~ movement of the actuator in a first direction relative to the hub moves the

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plurality of filaments relative to the tip to a deployed position that extends distally beyond the tip, and wherein ~~rotation~~ movement of the actuator in a second direction relative to the hub retracts the plurality of filaments to a retracted position in which the plurality of filaments are disposed within at least a portion of the elongate member; and

a fitting in fluid communication with the lumen, the fitting being configured to provide a connection for injection of fluid through the fitting and through the lumen, the fitting further being configured to allow for insertion of the RF probe into the lumen through the fitting,

wherein the lumen is configured to accept the RF probe therein such that the electrode of the RF probe physically contacts a conductive portion of the needle and thereby electrically connects the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the plurality of filaments, and such that the electrode of the inserted RF probe, the tip, and the plurality of filaments ~~are operable to form~~ operate together as a single monopolar RF electrode, and

wherein when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle~~ and such that the RF probe is neither physically nor electrically connected to the plurality of filaments~~, the plurality of filaments of the needle are positionable in the retracted position, in which the plurality of filaments are disposed within said at least a portion of the elongate member.

52. (Currently amended) The system of claim 51, wherein the needle further comprises a conductive tube that is a separate member relative to the elongate member, the conductive tube defining the lumen at the interior of the elongate member and further defining the conductive portion of the needle that the electrode of the RF probe physically contacts, wherein, when the RF probe is inserted into the lumen defined by the conductive tube, the conductive tube is configured to conduct RF energy

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emitted by the RF probe through the conductive tube and into and through the tip and the plurality of filaments.

53. (Previously presented) The system of claim 52, wherein the fitting is configured to provide a connection to a fluid source for said injection of fluid through the fitting and through the lumen when the RF probe is fully separated from the needle in the non-inserted state, such that none of the RF probe is within the needle.

54. (Currently amended) A system ~~needle for insertion into a patient during an RF ablation procedure, the needle~~ comprising:

an RF probe; and

a needle for insertion into a patient, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments;

an actuator interconnected to the plurality of filaments, wherein movement ~~rotation~~ of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein movement ~~rotation~~ of the actuator in a second direction relative to the hub retracts the plurality of filaments to a retracted position in which the plurality of filaments are disposed within at least a portion of the elongate member; and

a Luer fitting in fluid communication with the lumen, the Luer fitting being configured to provide a connection to a fluid source for injection of fluid through the Luer fitting and through the lumen, the Luer fitting further being configured to allow for insertion of an RF probe into the lumen through the Luer fitting,

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wherein the lumen at the interior of the elongate member is configured to accept the RF probe therein to physically contact a conductive portion of the needle and thereby electrically connect the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the plurality of filaments, and such that an electrode of the inserted RF probe, the tip, and the plurality of filaments ~~are operable to form~~ operate together as a single monopolar RF electrode.

55. (Currently amended) The system ~~needle~~ of claim 54, wherein the Luer fitting is configured to be connected with the fluid source when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, and wherein the Luer fitting is further configured to separately permit the RF probe to be inserted into the lumen through the Luer fitting when the Luer fitting is not connected with the fluid source.

56. (Currently amended) The system ~~needle~~ of claim 54, wherein the Luer fitting is configured to accept a Luer connector of the fluid source.

57. (Currently amended) The system ~~needle~~ of claim 54, wherein the lumen is configured to deliver fluid through the tip at the distal end of the needle.

58. (Currently amended) The system ~~needle~~ of claim 57, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip without passing through an interior of any of the plurality of filaments.

59. (Currently amended) The system ~~needle~~ of claim 54, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the

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lumen at the interior of the elongate member and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

60. (Currently amended) The system ~~needle~~ of claim 54, wherein the Luer fitting is at a proximal end of the needle such that the actuator is positioned distally relative to a proximal end of the Luer fitting.

61. (Currently amended) The system ~~needle~~ of claim 60, wherein the Luer fitting is at a proximal-most position at the proximal end of the needle.

62. (Currently amended) The system ~~needle~~ of claim 54, wherein, when the plurality of filaments are in the retracted position and the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, the Luer fitting is configured to connect to the fluid source and to permit fluid from the fluid source to pass through the Luer fitting, through the lumen, and through the tip at the distal end of the needle.

63. (Currently amended) The system ~~needle~~ of claim 62, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

64. (Currently amended) The system ~~needle~~ of claim 54, further comprising a tube that is a separate member relative to the elongate member, the tube defining the lumen at the interior of the elongate member.

65. (Currently amended) The system ~~needle~~ of claim 64, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the

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transportation of fluid, and wherein fluid injected through the needle passes through the lumen defined by the tube and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

66. (Currently amended) The system ~~needle~~ of claim 64, wherein the tube comprises a conductive material, and wherein the conductive portion of the needle comprises the conductive material of the tube.

67. (Currently amended) The system ~~needle~~ of claim 66, wherein the tube is configured to transport fluid therethrough, and wherein the tube is further configured to conduct therethrough RF energy emitted by the RF probe.

68. (Currently amended) The system ~~needle~~ of claim 67, wherein the tube is further configured to conduct the RF energy into and through the tip and the plurality of filaments.

69. (Currently amended) The system ~~needle~~ of claim 64, wherein the tube is positioned at an interior of the elongate member when the plurality of filaments are in the retracted position.

70. (Currently amended) The system ~~needle~~ of claim 64, wherein the tube is in fluid communication with the tip at the distal end of the elongate member when the plurality of filaments are in the retracted position.

71. (Currently amended) The system ~~needle~~ of claim 64, wherein the fluid passes from the fluid source, through the Luer fitting, and through the tube when the fluid source is coupled to the Luer fitting, and wherein the RF probe is separately received within the tube when fluid is not being transported through the tube.

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72. (Currently amended) The system ~~needle~~ of claim 54, wherein the fluid source is coupled with the Luer fitting and fluid is transported through the lumen to a target volume within the patient when the system ~~needle~~ is in a first operational state in which the RF probe is fully separated from the needle, such that none of the of the RF probe is within the needle, and wherein the lumen accepts the RF probe for delivery of RF energy to the target volume when the system ~~needle~~ is in a second operational state in which fluid is not transported through the lumen of the needle.

73. (New) The system of claim 1, wherein the conductive portion of the needle is at a distal end of the needle.

74. (New) The system of claim 1, wherein the tip comprises a conductive material and defines a channel, and wherein a distal end of the RF probe is received within the channel of the tip of the needle when the RF probe is fully inserted into the needle.

75. (New) The system of claim 74, wherein the conductive portion of the needle comprises the conductive material of the tip.

76. (New) The system of claim 1, wherein the plurality of filaments extend distally beyond a distal end of the RF probe when the RF probe is fully inserted into needle and when the plurality of filaments are in the deployed position, such that when RF energy is delivered to the RF probe, the plurality of filaments conduct RF energy that emanates from the RF probe beyond the distal end of the RF probe to produce within the patient, during the RF ablation procedure, a lesion that is distally offset from the distal end of the RF probe.

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Summary of the Interviews

The Applicant thanks Examiner Kim for the courtesy she extended to Bret Boudousquie and Daniel C. Higgs in the WebEx/video conference interview conducted on September 13, 2019 ("Interview #1") and in the follow-up WebEx/video conference interview conducted on February 11, 2020 ("Interview #2"). The Applicant agrees with the Applicant-Initiated Interview Summary dated September 18, 2019 ("Summary #1") and with the Applicant-Initiated Interview Summary dated February 14, 2020 ("Summary #2"), to the extent each summary is consistent with the clarifications noted below.

Exhibit/Demonstration

No exhibits or demonstrations were shown or provided in either Interview #1 or Interview #2.

Claims Discussed

Claim 1 was discussed in Interview #1 and in Interview #2.

Prior Art Discussed

U.S. Patent No. 5,599,346 to Edwards ("Edwards"), U.S. Patent Application Publication No. 2006/0095029 of Young, and U.S. Patent Application Publication No. 2002/0143302 of Hinchliffe were discussed in Interview #1. Edwards was discussed in Interview #2.

Principal Proposed Amendments

Various amendments were discussed in Interview #1, as summarized in Summary #1. In Interview #2, amendments to claim 1 were proposed in which the RF probe physically contacts a conductive portion of the needle to electrically connect the RF probe to the tip and the plurality of filaments. To the extent the language regarding

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a "proposed claim amendment" in Summary #2 deviates from the actual language of amended claim 1 herein, the Applicant respectfully submits that the language presented herein supersedes that set forth in Summary #2. The Applicant respectfully submits that the meaning and scope of claim 1 depend on the actual language of this claim; no limitations are implied or should otherwise be read into the claims based on the language in Summary #2.

Principal Arguments

The discussion of the principal arguments made by the Applicant in Interview #1, as set forth in Summary #1, is accurate. The Applicant respectfully notes that it does not necessarily agree with nor acquiesce to the positions the examiner has taken with respect to those arguments, which are also set forth in Summary #1, and expressly reserves the right to pursue its proposed claim amendments and related arguments in one or more future applications.

In Interview #2, the examiner and the Applicant discussed that Edwards does not teach or render obvious a system such as that recited in amended claim 1.

Other Pertinent Matters Discussed

None.

Results

The Applicant thanks Examiner Kim for the productive discussions in Interview #1 and Interview #2. Agreement was reached that claim 1, as amended herein, would overcome the art of record.

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Remarks

This paper is submitted in response to the Office Action mailed September 3, 2019. Claims 1-72 were pending in the Application, with claims 19-20 having been withdrawn from consideration. Claims 1-18 and 21-72 stand rejected. By this paper, claims 1-16, 18-52, and 54-72 are amended and claim 17 is cancelled without prejudice or disclaimer. New claims 73-76 are added. The Applicant respectfully submits that all amendments are fully supported by the Application, as originally filed, and that none of the amendments add new matter to the Application.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-3, 6-8, 12, 13, 15, 16, 18, and 21-72 stand rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,599,346 of Edwards et al. ("Edwards") in view of U.S. Patent Application Publication No. 2006/0095029 of Young ("Young"), and further in view of U.S. Patent Application Publication No. 2002/0143302 of Hinchliffe et al. ("Hinchliffe"); claims 4 and 5 stand rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Edwards, Young, and Hinchliffe, and further in view of U.S. Patent Application Publication No. 2010/0049192 of Holtz ("Holtz"); claims 9-11 stand rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Edwards, Young, and Hinchliffe, and further in view of U.S. Patent Application Publication No. 2004/0260282 of Gough et al. ("Gough"); and claim 14 stands rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Edwards, Young, and Hinchliffe, and further in view of U.S. Patent Application Publication No. 2009/0292259 of Delano et al. ("Delano").

The Applicant respectfully traverses these rejections, and does not acquiesce to the characterizations of the teachings of these references or the propriety of their combinations, as set forth in the Office Action. However, in order to expedite

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prosecution of the present application, the Applicant has amended each of independent claims 1, 51, and 54.

Claim 1

As amended, independent 1 recites (emphases added):

1. A system comprising:

an RF probe; and

a needle for insertion into a patient during an RF ablation procedure, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments;

an actuator interconnected to the plurality of filaments, wherein movement of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein movement of the actuator in a second direction relative to the hub retracts the plurality of filaments to a retracted position in which the plurality of filaments are disposed within at least a portion of the elongate member; and

a fitting in fluid communication with the lumen, the fitting being configured to provide a connection for injection of fluid through the fitting and through the lumen, the fitting further being configured to allow for insertion of the RF probe into the lumen through the fitting,

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wherein the lumen at the interior of the elongate member is configured to accept the RF probe therein to physically contact a conductive portion of the needle and thereby electrically connect the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the plurality of filaments, and such that the RF probe, the tip, and the plurality of filaments operate together as a single monopolar RF electrode, and

wherein, when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, the plurality of filaments are movable via the actuator from the retracted position, in which the plurality of filaments are disposed within said at least a portion of the elongate member, to the deployed position.

The Applicant respectfully submits that Edwards, Young, and Hinchliffe, whether considered individually or in combination, fail to teach or render obvious at least the emphasized portions of amended claim 1. For example, based on the agreement reached in the Examiner Interview conducted on February 11, 2020 ("Interview #2," summarized above) regarding the teachings of Edwards, this reference does not render obvious at least the limitation: "the lumen at the interior of the elongate member is configured to accept the RF probe therein to physically contact a conductive portion of the needle and thereby electrically connect the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the plurality of filaments, and such that the RF probe, the tip, and the plurality of filaments operate together as a single monopolar RF electrode," as recited in combination with the remainder of amended claim 1. Young and Hinchliffe likewise fail to teach or render obvious amended claim 1, including the foregoing limitation. The Applicant thus respectfully requests that the rejection of claim 1 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

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Claims 2-16, 18, and 21-50

Each of claims 2-16, 18, and 21-50 depends from amended claim 1, and thus is patentable over the cited art for at least the reasons discussed above with respect to claim 1, as none of Holtz, Gough, or Delano can remedy the deficiencies of Edwards, Young, and Hinchliffe. Moreover, the Applicant maintains that at least some of these dependent claims recite additional features that are separately and independently patentable over the references cited in the Office Action. Accordingly, the Applicant respectfully requests that the rejection of claims 2-16, 18, and 21-50 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

Claim 51

As amended, independent 51 recites (emphases added):

> 51. A system comprising:
>
> an RF probe that comprises an electrode; and
>
> a needle for insertion into a patient during an RF ablation procedure, the needle comprising:
>
> a hub;
>
> an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;
>
> a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;
>
> a plurality of filaments;
>
> an actuator interconnected to the plurality of filaments, wherein movement of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position that extends distally beyond the tip, and wherein movement of the actuator in a second direction relative to the hub retracts the plurality of filaments to a retracted position in which the

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plurality of filaments are disposed within at least a portion of the elongate member; and

a fitting in fluid communication with the lumen, the fitting being configured to provide a connection for injection of fluid through the fitting and through the lumen, the fitting further being configured to allow for insertion of the RF probe into the lumen through the fitting,

wherein the lumen is configured to accept the RF probe therein such that the electrode of the RF probe physically contacts a conductive portion of the needle and thereby electrically connects the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the plurality of filaments, and such that the electrode of the inserted RF probe, the tip, and the plurality of filaments operate together as a single monopolar RF electrode, and

wherein when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, the plurality of filaments of the needle are positionable in the retracted position, in which the plurality of filaments are disposed within said at least a portion of the elongate member.

The Applicant respectfully submits that Edwards, Young, and Hinchliffe, whether considered individually or in combination, fail to teach or render obvious at least the emphasized portions of amended claim 51. For example, based on the agreement reached in Interview #2 regarding the teachings of Edwards, this reference does not render obvious at least the limitation: "the lumen is configured to accept the RF probe therein such that the electrode of the RF probe physically contacts a conductive portion of the needle and thereby electrically connects the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the

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plurality of filaments, and such that the electrode of the inserted RF probe, the tip, and the plurality of filaments operate together as a single monopolar RF electrode," as recited in combination with the remainder of amended claim 51. Young and Hinchliffe likewise fail to teach or render obvious amended claim 51, including the foregoing limitation. The Applicant thus respectfully requests that the rejection of claim 51 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

Claims 52 and 53

Each of claims 52 and 53 depends from amended claim 51, and thus is patentable over the cited art for at least the reasons discussed above with respect to claim 51. Moreover, the Applicant maintains that at least some of these dependent claims recite additional features that are separately and independently patentable over the references cited in the Office Action. Accordingly, the Applicant respectfully requests that the rejection of claims 52 and 53 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

Claim 54

As amended, independent 54 recites (emphases added):

> 54. A system comprising:
>
> an RF probe; and
>
> a needle for insertion into a patient, the needle comprising:
>
> a hub;
>
> an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;
>
> a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;
>
> a plurality of filaments;

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an actuator interconnected to the plurality of filaments, wherein movement of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein movement of the actuator in a second direction relative to the hub retracts the plurality of filaments to a retracted position in which the plurality of filaments are disposed within at least a portion of the elongate member; and

a Luer fitting in fluid communication with the lumen, the Luer fitting being configured to provide a connection to a fluid source for injection of fluid through the Luer fitting and through the lumen, the Luer fitting further being configured to allow for insertion of an RF probe into the lumen through the Luer fitting,

wherein the lumen at the interior of the elongate member is configured to accept the RF probe therein to physically contact a conductive portion of the needle and thereby electrically connect the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the plurality of filaments, and such that an electrode of the inserted RF probe, the tip, and the plurality of filaments operate together as a single monopolar RF electrode.

The Applicant respectfully submits that Edwards, Young, and Hinchliffe, whether considered individually or in combination, fail to teach or render obvious at least the emphasized portions of amended claim 54. For example, based on the agreement reached in Interview #2 regarding the teachings of Edwards, this reference does not render obvious at least the limitation: “the lumen at the interior of the elongate member is configured to accept the RF probe therein to physically contact a conductive portion of the needle and thereby electrically connect the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the

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plurality of filaments, and such that an electrode of the inserted RF probe, the tip, and the plurality of filaments operate together as a single monopolar RF electrode," as recited in combination with the remainder of amended claim 54. Young and Hinchliffe likewise fail to teach or render obvious amended claim 54, including the foregoing limitation. The Applicant thus respectfully requests that the rejection of claim 54 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

Claims 55-72

Each of claims 55-72 depends from amended claim 54, and thus is patentable over the cited art for at least the reasons discussed above with respect to claim 54. Moreover, the Applicant maintains that at least some of these dependent claims recite additional features that are separately and independently patentable over the references cited in the Office Action. Accordingly, the Applicant respectfully requests that the rejection of claims 55-72 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

New Claims 73-76

Each of new claims 73-76 depends from amended claim 1, and thus is patentable over the cited art for at least the reasons discussed above with respect to claim 1. Moreover, at least some of these dependent claims recite additional features that are separately and independently patentable over the references cited in the Office Action.

Request for Rejoinder

Claims 19 and 20 currently stand withdrawn. As each of claims 19 and 20 depends from independent claim 1, and thus includes every limitation of this claim, the Applicant respectfully requests rejoinder of these claims upon allowance of claim 1.

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Double Patenting – Terminal Disclaimer

Claims 1-72 stand provisionally rejected on the ground of nonstatutory double patenting as allegedly being unpatentable over claims 1-20 of copending Application No. 15/092,945 in view of Young. The Applicant respectfully traverses this rejection. In an effort to expedite prosecution of the present application, however, the Applicant has previously filed, on February 23, 2020, a Terminal Disclaimer to Obviate a Provisional Double Patenting Rejection over a Pending "Reference" Application with respect to U.S. Patent Application No. 15/092,945.

Conclusion

In view of the foregoing amendments and remarks, the Applicant submits that the Application is in condition for allowance and thus requests the issuance of a Notice of Allowance. Please contact the undersigned attorney in the event that any remaining impediment to the prompt allowance of this application is found that could be clarified by a telephonic interview or may be overcome by an Examiner's Amendment.

DATED this 24th day of February, 2020.

Respectfully submitted,

/Daniel C. Higgs/

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Electronic Patent Application Fee Transmittal

Application Number:	15098673
Filing Date:	14-Apr-2016
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Filer:	Daniel Christopher Higgs
Attorney Docket Number:	NBUS.001C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	2202	3	50	150
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Extension - 3 months with $0 paid	2253	1	700	700
Miscellaneous:				
			Total in USD ($)	**850**

Electronic Acknowledgement Receipt

EFS ID:	38664730
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	24-FEB-2020
Filing Date:	14-APR-2016
Time Stamp:	06:58:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$850
RAM confirmation Number	E20202N758499306
Deposit Account	602176
Authorized User	Daniel Higgs

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	Extension.pdf	148465 6ea73c84786de429a2609f3eb74c165366e4c211	no	2
Warnings:					
Information:					
2		Amendment.pdf	182403 55b362ea94e6785c0cf3c8ca21ceffb0cc270d38	yes	27

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	16
Applicant summary of interview with examiner	17	18
Applicant Arguments/Remarks Made in an Amendment	19	27

Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32678 20bd146c5c0163d39073d4b169f872e81aa62a71	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	363546	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/22 (03-13)
Approved for use through 11/30/2020. OMB 0651-0031
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional): NBUS.001C1

Application Number: 12/098,673

Filed: April 14, 2016

For: METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

Art Unit: 3794

Examiner: Eun Hwa Kim

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	Micro Entity Fee	
☐ One month (37 CFR 1.17(a)(1))	$200	$100	$50	$
☐ Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$
☑ Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$ 700
☐ Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐ Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 602176.

☑ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.

☐ attorney or agent of record. Registration number _____.

☑ attorney or agent acting under 37 CFR 1.34. Registration number 55,265.

/Daniel C. Higgs/ — Signature

February 24, 2020 — Date

Daniel C. Higgs — Typed or printed name

(801) 703-1961 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☐ * Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/098,673	Filing Date 04/14/2016	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $40 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $210 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	02/24/2020	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 75	Minus	** 71	= 4		x $50 =	200
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	200

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/MARCUS D MONROE/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Application Number	Application/Control No.	Applicant(s)/Patent under Reexamination	
* 15/098,673 *	15/098,673	Wright et al.	
	Examiner	**Art Unit**	
	KIM, EUN HWA	3794	

Document Code - DISQ	**Internal Document - DO NOT MAIL**

TERMINAL DISCLAIMER	☐ APPROVED	☑ DISAPPROVED
Date Filed: **23 February 2020**	**This patent is subject to a Terminal Disclaimer**	

Approved/Disapproved by:

/FELICIA D ROBERTS/

Technology Center: OPLC

Telephone: (571)272-0550

See Continuation Sheet

Petitioner's Exhibit 1007
Avanos v. Stratus
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Continuation of Approved/Disapproved Comments: The terminal disclaimer identifies a party who is not the applicant (only for applications filed on or after September 16, 2012; See FP 14.26.10):

For cases filed on/after 9/16/12, 37 CFR 1.321 specifies that the applicant can disclaim, and the terminal disclaimer must specify the extent of the applicant's ownership.

To remedy this:

A request under 37 CFR 1.46(c) to change the applicant needs to be filed, which is (1) a request, signed by a 1.33(b) party, (2) a corrected ADS (37 CFR 1.76(c)) that identifies the "new" applicant in the applicant information, and is underlined since it is new, and (3) a 3.73(c) statement showing chain of title to the new applicant. Along with the § 1.46(c) request we need a POA that gives power to the attorney who is signing the TD, along with another copy of the TD, unless they file a TD that is signed by the applicant.

Please make corrections as suggested above and also resubmit the TD. (No new fee required)

Document Description: Application Data Sheet to update/correct info
Doc Code: ADS.CORR

CORRECTED ADS FORM

Application Number	15098673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

Inventor Information

****If no data is shown, no data has been corrected****

	Data of Record	Updated Data
Order Number		
Name		
Residence Information		
Residency		
City		
State		
Country of Residence		
Mailing Address of Inventor		
Address 1		
Address 2		
City,State/Province, Postal Code		
Country		

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 403 of 691

Application Information

	Data of Record	Updated Data
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	
Attorney Docket Number	NBUS.001C1	
Entity Type	Small	

Domestic Benefit/National Stage Information

****If no data is shown, no data has been corrected****

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121,365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S. C. 119(e) or 120, and 37 CFR 1.78(a).

		Data of Record	Updated Data
	Prior Application Status		
	Application Number		
	Continuity Type		
	Prior Application Number		
	Filing Date (YYYY-MM-DD)		
	Patent Number		
	Issue Date (YYYY-MM-DD)		

Foreign Priority Information

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 404 of 691

Document Description: Application Data Sheet to update/correct info
Doc Code: ADS.CORR

****If no data is shown, no data has been corrected****

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

		Data of Record	Updated Data
	Application Number		
	Country		
	Filing Date		
	Access Code		

Applicant Information

****If no data is shown, no data has been corrected****
Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

	Data of Record	Updated Data
Applicant Type	ASG	
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is		
Name of the Deceased or Legally Incapacitated Inventor		
Applicant is an Organization	Yes	
Name		
Organization Name	~~Nimbus Concepts, LLC~~	Stratus Medical, LLC
Address 1		595 S. Riverwoods Parkway
Address 2		Suite 400

City,State/Province,Postal Code	~~Denver CO~~	Logan UT 84321
Country		US
Phone Number		
Fax Number		
Email Address		dhiggs@medventureholdings.com

Assignee Information including Non-Applicant Assignee Information

****If no data is shown, no data has been corrected****
Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office

	Data of Record	Updated Data
Order		1
Applicant is an Organization		Yes
Name		
Organization Name		Stratus Medical, LLC
Mailing Address		
Address 1		595 S. Riverwoods Parkway
Address 2		
City,State/Province,Postal Code		Logan UT 84321
Country		US
Phone Number		
Fax Number		
Email Address		dhiggs@medventureholdings.com

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 406 of 691

Signature

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Daniel C. Higgs/	Registration Number	55265
First Name	Daniel	Last Name	Higgs

Petitioner's Exhibit 1007
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PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Stratus Medical, LLC

Application No./Patent No.: 15/098,673 Filed/Issue Date: April 14, 2016

Titled: METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

Stratus Medical, LLC, a limited liability company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached.

B. ☑ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Robert E. Wright and Scott A. Brandt To: Nimbus Concepts, LLC

   The document was recorded in the United States Patent and Trademark Office at
   Reel 039717, Frame 0072, or for which a copy thereof is attached.

2. From: Nimbus Concepts, LLC To: Biomerics, LLC

   The document was recorded in the United States Patent and Trademark Office at
   Reel 051813, Frame 0965, or for which a copy thereof is attached.

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)

3. From: Biomerics, LLC To: Stratus Medical, LLC

The document was recorded in the United States Patent and Trademark Office at
Reel 051814, Frame 0258, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☑ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Daniel C. Higgs/	February 24, 2020
Signature	Date
Daniel C. Higgs	55,265
Printed or Typed Name	Title or Registration Number

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	38673644
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	24-FEB-2020
Filing Date:	14-APR-2016
Time Stamp:	16:33:19
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet to update/ correct info	CorrectedADS.pdf	66902 cec52cc124404303411aabc3c7a48759566 6efe4	no	5

Warnings:

Information:					
2	Assignee showing of ownership per 37 CFR 3.73	NBUS_001US1C1_3_73_Statement.pdf	120966 26bfeba8d9aa88b21c7fe8aeba23048a4cf6314f	no	3
Warnings:					
Information:					
		Total Files Size (in bytes):	187868		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1

CONFIRMATION NO. 5232

148468
Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

POA ACCEPTANCE LETTER

OC000000114989129

Date Mailed: 02/26/2020

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 02/23/2020.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at **(571) 272-4000** or **(571) 272-4200** or **1-888-786-0101**.

/qtran/

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/098,673	04/14/2016	3794	3550	NBUS.001C1	1	1

CONFIRMATION NO. 5232

148468
Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

CORRECTED FILING RECEIPT

OC000000114973058

Date Mailed: 02/26/2020

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Robert E. Wright, Denver, CO;
Scott A. Brandt, Denver, CO;

Applicant(s)

Stratus Medical, LLC, Logan, UT;

Assignment For Published Patent Application

Stratus Medical, LLC, Logan, UT

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 12/940,974 11/05/2010 ABN
which claims benefit of 61/280,557 11/05/2009
and claims benefit of 61/347,351 05/21/2010

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 04/27/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/098,673**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

** **SMALL ENTITY** **

Title

METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

Preliminary Class

606

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

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countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

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The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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Doc Code: DIST.E.FILE **Document Description: Electronic Terminal Disclaimer - Filed**	PTO/SB/25 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**TERMINAL DISCLAIMER TO OBVIATE A PROVISIONAL DOUBLE PATENTING REJECTION OVER A PENDING "REFERENCE" APPLICATION**
Application Number	15098673
Filing Date	14-Apr-2016
First Named Inventor	Robert Wright
Attorney Docket Number	NBUS.001C1
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

☒ Filing of terminal disclaimer does not obviate requirement for response under 37 CFR 1.111 to outstanding Office Action

☒ This electronic Terminal Disclaimer is not being used for a Joint Research Agreement.

Owner	Percent Interest
Stratus Medical, LLC	100%

The owner(s) of percent interest listed above in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of any patent granted on pending reference Application Number(s)

15092945 filed on 04/07/2016

as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and any patent granted on the reference application are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term of any patent granted on said reference application, "as the term of any patent granted on said reference application may be shortened by any terminal disclaimer filed prior to the grant of any patent on the pending reference application," in the event that any such patent granted on the pending reference application: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321, has all claims canceled by a reexamination certificate, is reissued, or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

◯ Terminal disclaimer fee under 37 CFR 1.20(d) is included with Electronic Terminal Disclaimer request.

◉ I certify, in accordance with 37 CFR 1.4(d)(4), that the terminal disclaimer fee under 37 CFR 1.20(d) required for this terminal disclaimer has already been paid in the above-identified application.	
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am: ◉ An attorney or agent registered to practice before the Patent and Trademark Office who is of record in this application Registration Number 55265 ◯ A sole inventor ◯ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors as evidenced by the power of attorney in the application ◯ A joint inventor; all of whom are signing this request	
Signature	/Daniel C. Higgs/
Name	Daniel C. Higgs

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

Doc Code: DISQ.E.FILE
Document Description: Electronic Terminal Disclaimer – Approved

Application No.: 15098673

Filing Date: 14-Apr-2016

Applicant/Patent under Reexamination: Wright

Electronic Terminal Disclaimer filed on February 28, 2020

☒ APPROVED

This patent is subject to a terminal disclaimer

☐ DISAPPROVED

Approved/Disapproved by: Electronic Terminal Disclaimer automatically approved by EFS-Web

U.S. Patent and Trademark Office

Electronic Acknowledgement Receipt

EFS ID:	38722270
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	28-FEB-2020
Filing Date:	14-APR-2016
Time Stamp:	12:24:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Terminal Disclaimer-Filed (Electronic)	eTerminal-Disclaimer.pdf	32674 ea745b5bff632e3491fafcc923dedc7a46ccc1d8	no	2

Warnings:

Information:	
Total Files Size (in bytes):	32674

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

148468 7590 03/19/2020

Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

EXAMINER
KIM, EUN HWA

ART UNIT	PAPER NUMBER
3794	

MAIL DATE	DELIVERY MODE
03/19/2020	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 15/098,673	Applicant(s) Wright et al.	
	Examiner EUNHWA KIM	Art Unit 3794	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 2/24/2020.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-16,18-50,54-72 and 74-76 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☑ Claim(s) 51-53 is/are allowed.

7) ☑ Claim(s) 1-16,18-50,54-72 and 74-76 is/are rejected.

8) ☑ Claim(s) 73 is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☑ The drawing(s) filed on 11/29/2016 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☑ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

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DETAILED ACTION

1. This action is pursuant to the claims filed on February 24, 2020. Claims 1-16 and 18-76 are pending. Claim 17 is cancelled. Claims 19 and 20 are withdrawn. A final action on the merits of claims 1-16 and 18-76 is as follows.

Notice of Pre-AIA or AIA Status

2. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Terminal Disclaimer

3. The terminal disclaimer filed on February 28, 2020 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of **U.S. Application No. 15/092,945** has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102 of this title, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103 are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 1-3, 6-8, 12, 13, 15, 16, 18, 21-50, 54-72, 74 & 75 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Tullis et al. (hereinafter 'Tullis', U.S. Pat. No. 7,918,852) in view of Young (U.S. PGPub. No. 2006/0095029), and further in view of Hinchliffe et al. (U.S. PGPub. No. 2002/0143302).**

7. **In regard to independent claims 1 & 54, and claims 2, 3, 6, 18, 21-28, 30, 32, 33, 34-36, 55, 56, 57, 60-62, and 72,** Tullis discloses a system (Fig. 2), comprising:

a. an RF probe (electrode assembly 36 in Fig. 2); and

b. a needle (cannula 28 in Fig. 2) for insertion into a patient during an RF ablation procedure, the needle comprising:

a. a hub (coupling assembly 44);

b. an elongate member (body 29) fixed to the hub, the elongate member comprising a lumen at an interior thereof (lumen of body 29);

c. a tip (distal end 58) fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient (col. 5, ln. 41-43: cannula 28 is best suited to pierce and penetrate skin and tissue);

d. a fitting in fluid communication with the lumen (col. 16, ln. 38-48: leading end of the syringe 32 against the bore 72 so that therapeutic fluid/anesthetic is inserted into the through bore 57 of the cannula body 29; it is noted that connection between a syringe and a cannula like that of Tullis necessarily provides for a Leur fitting which is interpreted as connection between round male and female interlocking tubes, slightly tapered to hold together, commonly between hypodermic syringe tips and needles so as to provide a leak-free connection between the two instruments), the fitting being configured to provide a connection for injection of fluid through the fitting and through the lumen (see Fig. 4), the fitting further being configured to allow for insertion of an RF probe that is separate from the needle into the lumen through the fitting (see Fig. 5), wherein the lumen at the interior of the elongate member is configured to accept the RF probe therein to physically contact a conductive portion of the needle and thereby electrically connect the RF probe to the tip, such that energy emitted by the RF probe passes through the tip (col. 5, ln. 25: "cannula 28… utilize monopolar cannula when electrically active"; Fig. 12 illustrates that terminal 140 of the electrode assembly 38 contacts the contact pad 93 of the terminal 86 in the cannula 28 causes electrical connection; col. 15, ln. 60-col. 16, ln. 8; Figs. 5 & 6 meets the claims 6, 21-28, 30, 32, 34, 35, 55, 56, 57, 62, 72),

e. a cable for use in connecting the RF probe to a radiofrequency generator (Fig. 2 illustrates that the probe 36 is connected to a cable 114, thus meeting claim 18).

8. However, Tullis fails to disclose a plurality of filaments.

9. Young teaches an ablation device (see Fig. 10) similar to that of Tullis and deploying a plurality of filaments (filaments 250 and 256) from a catheter body (catheter 216). Young further teaches disposing an RF probe (shaft 224, electrodes 225 and 226) within a lumen (293) that is

connected to the plurality of filaments so that the RF probe electrically connects both the cannula and the plurality of filaments to an RF source ([0043],[0045] & [0052]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the needle of Tullis and incorporate a plurality of filaments (filaments 250 and 256) and a shaft connected to the plurality of filaments (shaft 293 and hub 296) in an arrangement as taught by Young, thereby arriving at the claimed invention. Doing so allows for one or more electrodes to extend radially from the distal region of the needle so as to achieve desired energy paths and obtain a desired ablation tissue volume ([0057]-[0058]).

10. However, Tullis/Young combination does not disclose a filament deployment mechanism comprising an actuator interconnected to the plurality of filaments.

11. Hinchliffe teaches a deployment mechanism (Fig. 14) of a plurality of filaments (tines 280) in an elongated member of an ablation device, wherein the deployment mechanism comprises an actuator (actuator 230 in Fig. 14) connected to an inner tube/shaft (270) similar to that of shaft (293) of Tullis/Young combination. Hinchliffe further teaches that rotation of the actuator relative to a hub (housing 214 and 216) causes deployment or retraction of the plurality of filaments ([0074]-[0075]). The deployment mechanism comprises an actuator (actuator 230) interconnected to the plurality of filaments, wherein rotation of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein rotation of the actuator in a second direction relative to the hub retracts the plurality of filaments into the lumen to a retracted position ([0075]), wherein the actuator fits around at least a portion of the hub (the shoulder of the actuator 230 fits around the proximal end of the hub 212), and wherein the actuator is configured to rotate relative to the hub about a central longitudinal axis of the needle (the actuator is positioned along a central axis of

the needle 250 as shown in Fig. 13), wherein the actuator is generally tubular (the actuator 230 is generally tubular body, thus meeting claims 2 and 3).

12. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to modify the engagement between the hub of a needle and the hub of the plurality of filaments in the Tullis/Young combination and provide a deployment mechanism (external threads 235 and 237 along the actuator 230 and threads 227 and 229 on the housing 214 and 216) as taught by Hinchliffe, thereby arriving at the claimed invention. Doing so would allow actuation of the plurality of filaments in three positions: 1) retracted position, 2) a first radially deployable position and 3) a second radially deployable position and the plurality of filaments are retained in any one of the three positions ([0012]) to precisely control deployment of filaments. Furthermore, it would have been obvious to one of ordinary skill in the art to provide a needle with the plurality of filaments integral with the needle as taught by Hinchliffe to reduce the number of surgical instruments/tools in a surgical system. Thus, the combination meets the claim limitations of claims 33, 36, 60, and 61.

13. Tullis discloses that the needle in combination with the RF probe operate in a monopolar mode (col. 21, ln. 58-60: “a monopolar electrode assembly”) and Young further teaches that the needle and the plurality of filaments operate in a monopolar mode (col. 4, ln. 1-7: electrode assembly 4 comprising the electrode 92 and electrodes 26 deliver ablation energy in a monopolar configuration). Taken together, Tullis/Young contemplates that RF probe, the plurality of filaments and the needle form ‘a single monopolar RF electrode’ as claimed.

14. **In regards to claim 7,** Tullis/Young/Hinchliffe combination further discloses each filament of the plurality of filaments has a pre-set bias such that the filament is curved when in

the deployed state (Young, [0009]: each electrode 250 and 256 has a flared curvilinear profile). See claim 1 above for obviousness rationale statement.

15. **In regards to claim 8,** Tullis/Young/Hinchliffe combination further discloses when each filament of the plurality of filaments is in the deployed position, the filaments extend outwardly from the tip (Young, see Fig. 9). See claim 1 above for obviousness rationale statement.

16. **In regards to claim 12,** Tullis/Young/Hinchliffe combination further discloses the tip tapers to a point, and wherein the elongate member and the tip comprises a single unitary structure (Tullis, see Fig. 15).

17. **In regards to claim 13,** Tullis/Young/Hinchliffe combination further discloses a proximal end of the elongate member is fixed to the hub (Tullis, the proximal portion of needle is fixed to member 44).

18. **In regards to claim 15,** in view of the combination of claim 1, Hinchliffe further teaches that the deployment mechanism (actuator 230) comprises indicia (marker ring 260 with markings, e.g. 3cm, 4cm, 5cm, etc.) of fractional deployment of a plurality of filaments (280) relative to a tip (251) of a needle (250; [0080]). Therefore, it would have been obvious to one of ordinary skilled in the art at the time the invention was made to have modified Tullis/Young/Hinchliffe combination to incorporate the teachings of indicia as taught by Hinchliffe to determine the deployment of filaments during a treatment.

19. **In regards to claim 16,** in view of the combination of claim 1, Hinchliffe further teaches detents that are configured to provide a tactile feedback to the user when the filaments are fully retracted, fully deployed and increments in between the fully retracted and fully deployed position of the filaments designating the radial dimension of the ablation zone created by the filaments in the corresponding positions ([0044]). Therefore, it would have been obvious to one

of ordinary skilled in the art at the time the invention was made to have modified Tullis/Young/Hinchliffe combination to incorporate the teachings of Hinchliffe and incorporate detents that are configured to provide a tactile feedback to the user when the filaments are fully retracted, fully deployed and three increments in between the two positions (third, fourth and fifth positions).

20. **In regard to claims 29, 31, 37, 58, 59, and 63,** in view of the combination in claim 1, 21, or 54 above, Young discloses that the plurality of filaments are formed from a solid electrically conductive material ([0036], [0039], [0040]). As such, when the Luer fitting of Tullis is fluidly connected to the fluid source for fluid communication, the fluid passes through the lumen of the elongate member and through the tip and the distal end of the needle without passing through an interior lumen of any of the plurality of filaments.

21. **In regard to claims 38, 42 & 64,** Tullis further discloses a tube (cannula 28 comprises inner tube 48 and insulating sleeve 52 in the monopolar electrode assembly, see col. 21, ln. 58-64) that is a separate member relative to the elongate member (insulating sleeve 52 is separate from the inner tube 48), the tube defining the lumen at the interior of the elongate member (tube 48 defines the lumen of the cannula 28).

22. **In regard to claims 39, 44, 66, 74 and 75,** Tullis discloses wherein the tip comprises a conductive material and defines a channel (col. 9, ln. 11-13& col. 21, ln. 58-64: inner tube 48 is formed from stainless steel) and wherein a distal end of the RF probe is fully inserted into the needle (see Fig. 5). Furthermore, Tullis discloses that the channel/tube is formed from stainless steel (col. 9, ln. 11-13& col. 21, ln. 58-64: inner tube 48 is formed from stainless steel).

23. However, Tullis is silent as to the conductive material of the conductive portion/terminal 86 of the needle. Tullis teaches that conductive materials such as stainless steel or memory metal

such as a nickel-titanium alloy may be used for mating terminals (col. 10, ln. 8-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the terminal 86 with a conductive material such as stainless steel so that the material of the inner tube 48 and the terminal 96 are formed from the same conductive material, thereby arriving at the claimed invention. Selecting a known conductive material such as stainless steel or memory metals as taught by Tullis in a medical instrument for delivering energy, sensing physiological signals or forming electrical connections involves routine skilled in the art and a predictable result would ensue.

24. **In regard to claims 40, 41, 45-50 and 67-72,** Tullis further discloses wherein the tube is configured to transport fluid therethrough, and wherein the tube is further configured to separately conduct therethrough RF energy emitted by the RF probe (conductive inner tube 48 of Tullis is configured to receive assembly 36 so that when the assembly 36 is electrically connected to the terminal 86, the inner tube 48 emits RF energy; furthermore, the inner tube 48 is capable of receiving anesthetics as shown in Fig. 4). Therefore, the inner tube 48 of Tullis is capable of conducting RF energy into and through the tip of the cannula 29 and the combination of Tullis/Young/Hinchliffe provides for the plurality of filaments to be electrically connected to the cannula.

25. **In regard to claims 43 & 65,** see the rejection of claim 29 above.

26. **Claims 4 and 5 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Tullis, Young, and Hinchliffe as applied to claim 1, and further in view of Holtz et al. (hereinafter 'Holtz', U.S. PGPub. No. 2010/0049192).**

27. **In regards to claims 4 and 5,** in view of the combination in claim 1, Hinchliffe teaches a deployment mechanism with a slide member (inner tube 270 in Figs. 13-14) coupled to the

actuator and fixedly connected to the plurality of filaments (tines 280 are fixedly mounted to inner tube 270), wherein upon rotation of the actuator relative to the slide member and relative to the hub, the actuator moves in tandem relation with the slide member along the central longitudinal axis of the elongate member and the plurality of filaments are advanced or retracted relative to the hub (paragraph [0075]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have combined the deployment mechanism of Hinchliffe for advancement and retraction of the plurality of filaments.

28. However, Tullis/Young/Hinchliffe combination fails to disclose the slide member is limited to a linear motion relative to the hub as the actuator is rotated and further configured to axially advance and retract without rotating relative to the hub.

29. Holtz teaches advancing and retracting a plurality of filaments similar to that of Young using a rotation to linear gearing mechanism within a handle ([0297]). Specifically, Holtz teaches a hub includes a cavity sized to house a protrusion of the slide member (threaded piece 73 acts as a follower to the handle dial 72, moving axially within the handle dial 72 when it is rotated. The threaded piece 73 is keyed to a feature in the handle grip 71 which it slides within to prevent the threaded piece from rotating with the handle dial 72). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the mechanism of advancing the slide member of Tullis/Young/Hinchliffe combination with the rotation to linear mechanism to advance a plurality of splines as taught by Holtz, thereby arriving at the claimed invention. The advantage of a rotation to linear gearing mechanism is that precise mechanical advantage can be achieved while making precision fine adjustment to electrode deployment length ([0297]).

30. **Claims 9-11 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Tullis, Young and Hinchliffe as applied claim 1, and further in view of Gough et al (hereinafter 'Gough', U.S. PGPub No. 2004/0260282).**

31. **In regard to claims 9-11,** Tullis/Young/Hinchliffe combination discloses the invention substantially as claimed in claim 1 and discussed above. Young further teaches wherein the plurality of filaments consists essentially of two filaments (for example, see Fig. 9). However, Young/Young'111/Hinchliffe combination is silent as to a distal end of each filament defining a point when each filament is in the deployed position, and wherein average of all the points is offset from a central longitudinal axis of the elongate member.

32. Gough teaches a similar device (device 10 in Fig. 6A, 6C, 7 and 8) as that of Young for delivering energy to tissues comprising a needle (introducer 14) and a plurality of filaments (energy delivery device 16', [0013], [0058]). In Fig. 6C, Gough teaches wherein the central lumen of the needle (lumen 14" of primary antenna 14) comprises lumens (16) that are used to introduce filaments (secondary antenna 16). Gough further teaches wherein the lumens are circumferentially offset by an angle in the fully retracted position. Given that Young teaches the plurality of filaments consisting essentially of two filaments that can be positioned non-symmetrically and Gough further teaches wherein the lumens are circumferentially offset by an angle in the fully retracted position, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Tullis/Young/Hinchliffe combination to incorporate the teaching of Gough to circumferentially offset by an angle in the fully retracted position to introduce the filaments in a variety of different geometric configurations ([0063]).

33. However, Tullis/Young/Hinchliffe/Gough combination is silent as to wherein the plurality of filaments are circumferentially offset by about 120° in the first position. Given that

Young is concerned with providing non-symmetric ablation treatment volume ([0062]), it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide wherein the two filaments are circumferentially offset by about 120°, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

34. With respect to claim 11, it is noted that the plurality of filaments that are offset from the longitudinal axis can be configured to form a lesion having a pyramidal shape.

35. **Claim 14 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Tullis, Young, and Hinchliffe and further in view of Delano et al. (hereinafter 'Delano', U.S. PGPub. No. 2009/0292259).**

36. **In regards to claim 14,** Tullis/Young/Hinchliffe combination discloses the invention substantially as claimed in claim 1 and discussed above. Furthermore, Tullis further discloses that the tip is a beveled shape which is radially asymmetrical.

37. However, Tullis/Young/Hinchliffe combination fails to disclose wherein the hub comprises an indicator that is oriented to communicate an orientation of the asymmetrical tip.

38. Delano teaches a needle device (needle assembly 20 in Fig. 9) comprising a beveled tip (distal tip 23 comprises a bevel 23A as shown in Fig. 9) and a hub (needle hub 4), wherein the hub comprises an indicator that is oriented to communicate an orientation of the asymmetrical tip ([0060]: a first directional indicator 6IND in Fig. 9 corresponds to the orientation of the bevel 23A of the distal tip 23 of the cannula). Therefore, it would have been obvious to one of ordinary skill in the art before the invention was made to modify the hub of Tullis/Young/Hinchliffe combination and incorporate an indicator that corresponds to the orientation of the beveled distal tip as taught by Delano, thereby arriving at the claimed invention. Doing so allows a user to view

the visual indicator on the hub and determine the orientation of the asymmetrical/beveled tip when it is positioned in a target tissue.

39. **Claim 76 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Tullis, Young, and Hinchliffe and further in view of Young (hereinafter 'Young '965', U.S. PGPub. No. 20060084965).**

40. **In regards to claim 76,** Tullis/Young/Hinchliffe combination further discloses the invention substantially as claimed in claim 1 and discussed above.

41. However, Tullis/Young/Hinchliffe combination does not disclose wherein the plurality of filaments extend distally beyond a distal end of the RF probe when the RF probe is fully inserted into needle and as claimed in claim 76.

42. Young'965 teaches providing a plurality of filaments (filaments 26 in Fig. 7B-7D) that extend distally beyond a distal end of a needle (12 in Fig. 7B-7D). Therefore, it would have been obvious to one of ordinary skill in the art before the effective filing date of the invention to modify the plurality of filaments of Tullis/Young/Hinchliffe combination so that it extends beyond the distal tip of the needle as taught by Young'965, thereby arriving at the claimed invention. Doing so allows for the plurality of filaments to create increased lesion sizes or to create lesions at different sites within a treatment region ([0040]-[0042]). It is noted that the combination of Tullis/Young/Hinchliffe/Young'965 provides for the plurality of filaments that extend distally beyond a distal end of the RF probe since the plurality of filaments extend distally beyond the needle tip. Furthermore, claim 1 discusses the electrical pathway established between the needle, RF probe and the plurality of filaments and that the combination of Tullis/Young/Hinchliffe/Young'965 is capable of providing a lesion that is distally offset from

the distal end of the RF probe, needle and the plurality of filaments since ablation current travels beyond the distal tips of the plurality of filaments.

Allowable Subject Matter

43. **Claim 73 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.**

44. **In regards to claim 73,** Tullis fails to disclose that the conductive portion is at a distal end of the needle. Tullis only teaches that the proximal portion of the RF probe (electrical connector 140 in assembly 36 in Figs. 10 and 12) establishes electrical connection with the proximal portion of the needle (terminal 86 of the cannula 28 abuts connector 140 of the assembly as shown in Figs. 10 & 12). While Tullis does disclose an additional electrical connection between the inner tube (48 in Fig. 15) and the electrically conductive surface of the RF probe (col. 15, ln. 47-58), it is only used for a bipolar configuration (col. 10, ln. col. 15, ln. 40-48; see Fig. 15 wherein the conductive path 71 illustrates the current path between active electrode 62 and second electrode 68 as shown in Fig. 15). As such, there would be no motivation to modify the insulated RF probe (insulative shell 122 in Fig. 17) intended to be used for monopolar configuration to be conductive as doing so teaches away from its intended use. Therefore, claims 73 is allowable.

45. **Claims 51-53 are allowed.**

46. **In regards to claim 51,** Tullis fails to disclose the system as claimed; specifically, *the RF probe comprising an electrode… and wherein the lumen is configured to accept the RF probe therein such that the electrode of the RF probe physically contacts a conductive portion of the needle and thereby electrically connects the RF probe to the tip and the plurality of filaments,*

such that energy emitted by the RF probe passes through the tip and the plurality of filaments, and such that the electrode of the inserted RF probe, the tip and the plurality of filaments operate together as a single monopolar RF electrode. Tullis fails to disclose a RF probe (Fig. 17) comprising an electrode. While Tullis does teach that the RF probe electrically connects the electrode (tube 48) of the cannula to an energy source through mating/abutment of the pin (86) of the cannula and the contact (140) of the RF probe (col. 21, ln. 58-col. 22, ln. 23), Tullis only teaches that the RF probe comprises a temperature transducer (120 in Fig. 17) and an insulating housing surrounding the transducer (shell 122). In an alternate embodiment, Tullis does disclose that the RF probe comprises a conductive outer shell (col. 15, ln. 46-65) and further discloses that a contact established between the inner conductive tube (48) of the cannula and the outer wall of the shell (122) allows for the distal end of the inner tube (48) to operate as one of the active electrode in a bipolar mode (see Fig. 14; col. 15, ln. 40-col. 16, ln. 8). However, there would be no motivation to modify the RF probe comprising only a temperature transducer with an insulative shell in the monopolar configuration of Tullis so that it comprises a conductive shell since doing so would teach away from the intended use of Tullis' RF assembly. Accordingly, claims 52 and 53 are allowed as being dependent on independent claim 51.

Response to Arguments

47. Applicant's arguments filed on February 24, 2020 with respect to the rejection(s) of claim(s) 1-3, 6-8, 12, 13, 15, 16, 18 and 21-72 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. Independent claim 51 and their dependent claims 52 and 53 are allowable.

48. However, upon further consideration, a new ground(s) of rejection of independent claims 1 and 54 and their dependent claims is made in view of Tullis et al. (U.S. Pat. No. 7,918,852) in above Office action.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

49. Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUNHWA KIM whose telephone number is (571)270-1265. The examiner can normally be reached on 9AM-5:30PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOSEPH STOKLOSA can be reached on (571) 272-1213. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see https://ppair-my.uspto.gov/pair/PrivatePair. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EUN HWA KIM/
Primary Examiner, Art Unit 3794
3/17/2020

Notice of References Cited	Application/Control No. 15/098,673	Applicant(s)/Patent Under Reexamination Wright et al.	
	Examiner EUNHWA KIM	Art Unit 3794	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-7918852-B2	04-2011	Tullis; Philip James	A61B18/1477	606/41
	B					
	C					
	D					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
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	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	X	

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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	Art Unit
	EUNHWA KIM	3794

CPC - Searched*		
Symbol	Date	Examiner
A61B18/1477,1467; A61B2018/1253,00577	09/10/2018	EK
A61B2218/001,002,003	06/14/2019	EK

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Assignee & Inventor Search	09/10/2018	EK
See search history printout	09/10/2018	EK
Updated Search (see EAST search history printout)	06/14/2019	EK
Updated Search (see EAST search history printout)	08/30/2019	EK
Updated Search (see EAST search history printout)	03/17/2020	Ek

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/EUN HWA KIM/ Primary Examiner, Art Unit 3794	

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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	Art Unit
	EUNHWA KIM	3794

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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CLAIMS

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	09/10/2018	06/14/2019	08/30/2019	03/17/2020					
	1	✓	✓	✓	✓					
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	**Art Unit**
	EUNHWA KIM	3794

CLAIM		DATE								
Final	Original	09/10/2018	06/14/2019	08/30/2019	03/17/2020					
	43			✓	✓					
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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

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First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

	1	EUROPEAN PATENT OFFICE, European Search Report and EPO Form 1703 01.91 TRI for European Patent Application No. EP 18215729.7, September 6, 2019, 5 pages.	
	2	EUROPEAN PATENT OFFICE, Communication Under Rule 71(3) EPC for European Patent Application No. EP 11783944.9, December 18, 2019, 125 pages.	
	3	INSTITUTO NACIONAL DA PROPRIEDADE INDUSTRIAL, Search Report for Brazilian Patent Application No. BR112012029263-3, December 6, 2019, 8 pages.	X
	4	UNITED STATES PATENT AND TRADEMARK OFFICE, Applicant-Initiated Interview Summary for U.S. Patent Application No. 15/092,945, February 18, 2020, 4 pages.	☐

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EXAMINER SIGNATURE

Examiner Signature	/EUN HWA KIM/	Date Considered	03/17/2020

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Avanos v. Stratus

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Daniel C. Higgs/	Date (YYYY-MM-DD)	2020-02-23
Name/Print	Daniel C. Higgs	Registration Number	55265

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Petitioner's Exhibit 1007
Avanos v. Stratus

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.K./

Privacy Act Statement

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Petitioner's Exhibit 1007
Avanos v. Stratus
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.K./

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
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L2	26	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2020/03/17 13:53
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S4	22	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
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S26	259590	a61b2018/0016, "00166", "00196", "00208", "00273", "00279", "0091", "00434", "0044", "1425", "143", "1432", "1465" "1475".cpc.	DERWENT	OR	ON	2014/02/11 12:56
S27	891	a61b2018/0016,00166,00196,00208,00273,00279,0091,00434,0044,1425,143,1432,1465,1475.cpc.	DERWENT	OR	ON	2014/02/11 12:58
S28	5217	a61b2018/0016,00166,00196,00208,00273,00279,0091,00434,0044,1425,143,1432,1465,1475.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/11 12:58
S29	3226	S28 and @py<"2009"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/11 13:00
S30	3	"7108696".pn. "7357798".pn. "20060217705".pgnr. "7108696".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 09:58
S31	3	"7108696".pn. "7357798".pn. "20060217705".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 09:59
S32	2	"7270661".pn. "5507802.pn" "20070287996".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:01
S33	3	"7270661".pn. "5507802".pn. "20070287996".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:02
S34	50	(actuator actuate actuating) same (helical adj track thread) same (filament electrode) same (hub)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:34

S35	12	(actuator actuate actuating) same (helical adj track thread) same (filament electrode) same (hub) same (advanced advancing deployed deploying deploy retracted retracting retract)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:38
S37	316	(actuator actuate actuating) same (helical adj track thread) same (advanced advancing deployed deploying deploy retracted retracting retract) near3 (filament stylet anchor element)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:41
S38	274031	("600" "606" "607").CLAS.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:45
S39	13082	S38 and filament	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:45
S40	3630	S39 and (actuate actuator actuating)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:46
S41	6	S39 and (hub with thread) and (actuat$3 with thread)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:47
S42	2598	S39 and (rotate rotat$4) same (deployment deploy retract retract$4 advance advancing)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:33
S43	251	S39 and (rotate rotat$4) same (deployment deploy retract retract$4 advance advancing) same (filament)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:34
S44	1	"5964756".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:55
S45	110	S39 and (rotate rotat$4) with (actuate actuating actuated) and (deployment deploy retract retract$4 advance advancing) same (filament)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 12:00
S46	52	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$).did.	US-PGPUB; USPAT	OR	ON	2014/02/12 14:02
S47	49	S46 and (filament antenna electrode)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:04
S48	37500	S46 and (filament antenna electrode) and (single near2 wire) or ("same" near2 wire)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:05
S49	3	S46 and (filament antenna electrode) and ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:05
S50	4674	S38 and (filament antenna electrode) and ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:06
S51	1425	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S52	2	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) with (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S53	4	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) same (actuator actuating actuate)	US-PGPUB;	OR	ON	2014/02/12 14:07

			USPAT			
S54	92	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) same2 (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:08
S55	504	S38 and (filament antenna electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:09
S56	258	S38 and (filament antenna electrode) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:09
S57	17	US-6379353-$.DID. OR US-6888919-$.DID. OR US-20020077627-$.DID. OR US-20040024300-$.DID. OR US-20040096033-$.DID. OR US-20040158239-$.DID. OR US-20050261570-$.DID. OR WO-9903397-$.DID. OR WO-0222019-$.DID. OR WO-2005036124-$.DID.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2014/02/12 14:23
S58	0	("2010/0256625").URPN.	USPAT	OR	ON	2014/02/12 14:23
S59	331	(filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:31
S60	258	S38 and(sylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:31
S61	258	S38 and(stylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:32
S62	258	S38 and(stylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:32
S63	1332	(filament electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:33
S64	495	(filament electrode) with (form$3 made built) with (single near2 wire) and S38	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:34
S65	237	S64 not S59	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:34
S66	0	"606"/$.clas. and (helical) near2 (track thread) with (detents) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S67	0	"606"/$.clas. and (helical) near2 (track thread) same (detents) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S68	0	"606"/$.clas. and (track thread) same (detent) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S69	4757	(track thread) same (detent) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S70	14	(track thread) same (detent) same (indicat$4 alert$4) with (deploy$4 retract$4 advanc$4) same (visual tactile audible)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:57

S71	2	"20060264974".pgnr. "5827276".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 16:33
S72	1332	(filament electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:00
S73	2599	(filament electrode) with (form$3 made built) with (single near2 wire or "same" near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:01
S74	389	S73 and "606"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:01
S75	50	"606"/$.ccls. and (distal near2 (tip end)) near4 (insulat$4) with (partially partial "part of")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:41
S76	0	"606"/$.ccls. and (distal near2 (tip end)) with (insulat$4) with (partially partial "part of") same ("non-adhere" "adhere")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:55
S77	126	"606"/$.ccls. and (distal near2 (tip end)) with (insulat$4 insulate insulated) with (partially partial "part of")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:56
S78	76	S77 not S75	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:56
S79	57	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$ or US-20060264974-$ or US-20020143302-$ or US-20040199179-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$ or US-5827276-$ or US-5855576-$).did.	US-PGPUB; USPAT	OR	ON	2014/02/14 13:07
S80	27	S79 and (distal near2 (tip end point)) with (insulat$4 insulate insulated)	US-PGPUB; USPAT	OR	ON	2014/02/14 13:32
S81	8	(tip) with (filament stylet tine) with (active adj electrode)	US-PGPUB; USPAT	OR	ON	2014/06/16 15:31
S82	587	("0164184" | "1366756" | "1735271" | "1814791" | "1889609" | "1932258" | "1943543" | "1952617" | "1983669" | "2050904" | "2056377" | "2196171" | "2888928" | "3035580" | "3460539" | "3595239" | "3601126" | "3614414" | "3648001" | "3685518" | "3699967" | "3707149" | "3801766" | "3815604" | "3845771" | "3847153" | "3885569" | "3898991" | "3901242" | "3902494" | "3903891" | "3920021" | "3920022" | "3923063" | "3929137" | "3939839" | "3945375" | "3963030" | "3964487" | "3970088" | "3974833" | "4011872" | "4016881" | "4024467" | "4033351" | "4040426" | "4043342" | "4051855" | "4060088" | "4069827" | "4074718" | "4092986" | "4114623" | "4116198" | "4119102" | "4126137" | "4154240" | "4189685" | "4200104" | "4202337" | "4204549" | "4210152" | "4228800" | "4248231" | "4271837" | "4281373" | "4301802" | "4326529" | "4346332" | "4376263" | "4381007" | "4416277" | "4418692" | "4429698" | "4448198" | "4474179" | "4476862" | "4492231" | "4494541" | "4512338" | "4517976" | "4524770" | "4532924" | "4534347" | "4548207" | "4559943" | "4559951" | "4562838" | "4565200" | "4567890" | "4580557" | "4590934" | "4593691" | "4617927" | "4657015" | "4658819" | "4658820" | "4669468" | "4674499" | "4681122" | "4682596" | "4688569" | "4696668" | "4706667" | "4709698" | "4712544" | "4727874" | "4735201" | "4769005" | "4781175" | "4799480" | "4800899" | "4802476" | "4805616" | "4813429" | "4820298" | "4823791" | "4827927" | "4832048" | "4850353"	US-PGPUB; USPAT; USOCR	OR	ON	2014/06/16 15:33

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		| "4860744" | "4878493" | "4886074" | "4919129" | "4920978").PN. OR ("4931047" | "4936281" | "4936301" | "4936310" | "4936842" | "4943290" | "4950267" | "4955377" | "4966597" | "4967765" | "4969885" | "4976711" | "4994069" | "4998933" | "5007908" | "5009656" | "5013312" | "5019076" | "5035696" | "5037379" | "5047026" | "5047027" | "5057107" | "5062031" | "5071418" | "5080660" | "5083565" | "5085659" | "5088997" | "5098431" | "5099840" | "5108391" | "5108407" | "5117978" | "5122138" | "5133365" | "5158561" | "5167658" | "5167659" | "5171255" | "5171311" | "5178620" | "5190517" | "5195959" | "5196007" | "5197963" | "5201743" | "5207675" | "5217457" | "5217458" | "5217459" | "5221281" | "5244462" | "5249585" | "5250047" | "5258006" | "5259395" | "5261906" | "5267994" | "5267997" | "5277201" | "5277696" | "5281213" | "5281216" | "5282799" | "5282845" | "5290282" | "5290283" | "5300068" | "5300069" | "5300070" | "5304214" | "5306238" | "5318563" | "5320627" | "5330470" | "5330471" | "5334193" | "5334198" | "5336222" | "5342357" | "5342391" | "5344428" | "5352222" | "5354296" | "5366443" | "5370645" | "5370675" | "5372596" | "5382247" | "5383874" | "5383876" | "5383917" | "5383923" | "5395363" | "5395368" | "5403311" | "5419767" | "5422567" | "5423808" | "5423809" | "5423810" | "5423811" | "5431649" | "5437662" | "5438302" | "5441499" | "5443470" | "5454809" | "5462521" | "5472441" | "5472443" | "5480397" | "5480398" | "5496312" | "5496314" | "5505728" | "5505730" | "5507743" | "5514129" | "5514130" | "5514131" | "5520684" | "5520685" | "5522815").PN. OR ("5531744" | "5536267" | "5540680" | "5540681" | "5540682" | "5540683" | "5540684" | "5540685" | "5542916" | "5542945" | "5545161" | "5545193" | "5549605" | "5554172" | "5555618" | "5556396" | "5556397" | "5558671" | "5562720" | "5569164" | "5569242" | "5569244" | "5569245" | "5575789" | "5578007" | "5582609" | "5582610" | "5584830" | "5591141" | "5599344" | "5599345" | "5599346" | "5599347" | "5599348" | "5599349" | "5603711" | "5603712" | "5607422" | "5609151" | "5609573" | "5611798" | "5620481" | "5624439" | "5626560" | "5626575" | "5626576" | "5626578" | "5628745" | "5628771" | "5630426" | "5633578" | "5634924" | "5672174" | "5683366" | "5693045" | "5697281" | "5697536" | "5697882" | "5697909" | "5700262" | "5766153" | "5810764" | "5843019" | "5860951" | "5871469" | "5873855" | "5888198" | "5891095" | "Re33925").PN. OR ("6015406").URPN.				
S83	67	("5800482" | "5807395").PN. OR ("6053937").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/01 15:55
S84	1050	"606"/$.ccls. and (bipolar) and (stylet filament) and (trocar needle)	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/01 15:56
S85	752	"606"/29-41.ccls. and (bipolar) and (stylet filament) and (trocar needle)	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/01 15:57
S86	43	"606"/29-41.ccls. and (bipolar) same (stylet filament antenna) same (trocar needle)	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/02 08:26
S87	2	"7270661".pn. "5507802".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/02 08:32
S88	9	bevel with (stylet filament) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 10:21
S89	1	"20070287996".pgnr.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:00
S90	64	(insulat$6) near4 (point tip) with (needle trocar) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:02
S91	1518	(insulat$6) near4 (point tip end) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:12
S92	7	(partial$6) near2 (cover$4) with (insulat$6) near4 (point tip end) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:12
S93	1	"20070203486".pgnr.	US-PGPUB; USPAT	OR	ON	2014/10/09 10:21
S94	522	bevel$4 with (filament tine)	US-PGPUB; USPAT	OR	ON	2014/10/09 10:28
S95	45	bevel$4 with tip with (filament tine)	US-PGPUB; USPAT	OR	ON	2014/10/09 10:37
S96	299	bevel$4 with tip with (filament tine stylet)	US-PGPUB; USPAT	OR	ON	2014/10/09 10:38
S97	16	bevel$4 with tip with (filament tine stylet) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/09 10:39
S98	1	13/101009.app.	US-PGPUB; USPAT	OR	ON	2014/10/09 10:52
S99	2	"20070203486"	US-	OR	ON	2015/03/20

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			PGPUB; USPAT			13:40
S100	1	"13101009"	US-PGPUB; USPAT	OR	ON	2015/03/20 17:00
S101	0	(stylet filament antenna) with (retract$4) with (offset) with (angle)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:33
S102	19	(stylet filament antenna) with (retract$4) with (offset)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:34
S103	2309	(indicia indicat$4 marking marker) with (rotat$4) with (distal) near5 (tip end)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:47
S104	11	(indicia indicat$4 marking marker) near5 (hub) with (rotat$4) with (distal) near5 (tip end)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:48
S105	89	(indicia indicat$4 marking marker) near5 (hub handle) with (rotat$4) with (distal) near5 (tip end)	US-PGPUB; USPAT	OR	ON	2015/03/23 11:32
S106	2	"20070203486"	US-PGPUB; USPAT	OR	ON	2015/03/23 11:36
S107	1	"13101009"	US-PGPUB; USPAT	OR	ON	2015/03/23 12:41
S108	9	("20010012956" | "20040059328" | "20040158239" | "20060084965" | "20070112340" | "20080161804" | "20080249392" | "20080269558" | "20110213356").PN.	US-PGPUB; USPAT	OR	ON	2015/03/23 12:43
S109	106	("2001/0012956" | "2004/0059328" | "2004/0158239" | "2006/0084965" | "2007/0112340" | "2008/0161804" | "2008/0249392" | "2008/0269558" | "2011/0213356").URPN.	USPAT	OR	ON	2015/03/23 12:43
S110	167	("1653819" | "20010044596" | "20020010491" | "20020055731" | "20020077676" | "20020099323" | "20020138117" | "20020183735" | "20020183740" | "20020193831" | "20030009110" | "20030060856" | "20030088189" | "20030130711" | "20030170898" | "20030195406" | "20030208200" | "20030225360" | "20040019371" | "20040059328" | "20040059389" | "20040146877" | "20040153057" | "20040199159" | "20040243107" | "20040267189" | "20050043726" | "20050049541" | "20050165393" | "20050171523" | "20050171574" | "20050182462" | "20050261672" | "20050288730" | "20060015147" | "20060025760" | "20060079883" | "20060121610" | "20060212078" | "20060217703" | "20060264752" | "20070016183" | "20070043345" | "20070118069" | "20070203486" | "20080052786" | "20080154259" | "20080167649" | "20090062792" | "20090228001" | "20090281477" | "20100049190" | "20100087813" | "20100130975" | "20100222677" | "20110202053" | "20120165813" | "20120310236" | "20130110106" | "4016886" | "4226246" | "4262672" | "4407943" | "4810963" | "4907601" | "4946793" | "5019034" | "5052391" | "5058605" | "5098843" | "5134070" | "5173158" | "5193537" | "5273525" | "5283194" | "5318563" | "5328451" | "5389069" | "5403311" | "5425752" | "5439440" | "5458625" | "5533999" | "5536240" | "5575811" | "5626146" | "5634899" | "5674267" | "5702359" | "5720921" | "5778894" | "5782882" | "5800378" | "5810762" | "5836905" | "5843026" | "5873849" | "5919142" | "5947889" | "5983131" | "5991697" | "5999847" | "6009347" | "6010613" | "6016452").PN. OR ("6041252" | "6055453" | "6068650" | "6085115" | "6090106" | "6102885" | "6106521" | "6109270" | "6122599" | "6132419" | "6159163" | "6208893" | "6210402" | "6212433" | "6216034" | "6219577" | "6241702" | "6261831" | "6278895" | "6300108" | "6326177" | "6347247" | "6349233" | "6351674" | "6387671" | "6403348" | "6470211" | "6482619" | "6493592" | "6500173" | "6526320" | "6562604" | "6607529" | "6611706" | "6613211" | "6627421" | "6653091" | "6669691" | "6692493" | "6697669" | "6697670" | "6702808" | "6795728" | "6801804" | "6865416" | "6881213" | "6892099" | "6912417" | "6927049" | "6962587" | "6972014" | "6994706" | "7053063" | "7063698" | "7130697" | "7211083" | "7267676" | "7387626" | "7455675" | "7771401" | "8511317").PN. OR ("8753335").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:44
S111	273	S109 S110	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:45
S112	2	S111 and (rotat$4) near3 (mechanism) with (advancement advanc$4 deploy$4 retract$4)	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:46
S113	3	S111 and (rotat$4) near3 (mechanism) same(advancement advanc$4 deploy$4 retract$4)	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:46
S114	628	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2018/09/10 20:23
S115	25	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2018/09/10 20:23
S116	0	((("NIMBUS") near3 ("CONCEPTS") near3 ("LLC"))).AS,AANM.	USPAT	OR	OFF	2018/09/10 20:23
S117	2	"20060084965"	US-PGPUB;	OR	OFF	2018/09/10 20:25

			USPAT; USOCR			
S118	66	("20040158239" | "20050080409" | "20050107781" | "20060217702" | "3174851" | "3351463" | "3753700" | "5472441" | "5507743" | "5536267" | "5827276" | "5855576" | "6090105").PN. OR ("7229438").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:25
S119	5060	(A61B18/1477 or A61B2018/1467).cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:28
S120	739	S119 and (stylet)	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:28
S121	402	S119 and (stylet) and monopolar	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:28
S122	109	S119 and (stylet filaments) with actuat$4	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:41
S123	2	"13101009"	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:43
S124	8841	(A61B2018/1253 or A61B2018/00577).cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:51
S125	1129	S124 and (stylet filament)	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:51
S126	1	"5364351".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 21:18
S127	175	("5672173" | "5697536" | "5814066" | "5827276" | "6033401" | "6241725" | "6264651" | "6302898" | "6478793" | "6562059" | "6602248").PN. OR ("7108696").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/08/29 10:26
S128	451	("3987795" | "3991770" | "4033351" | "4043342" | "4121592" | "4237898" | "4289135" | "4303636" | "4346715" | "4411266" | "4565200" | "4574782" | "4586490" | "4660571" | "4763671" | "4800899" | "4838265" | "4907589" | "4920978" | "4931047" | "4940064" | "4945912" | "4976680" | "4976711" | "5003991" | "5009656" | "5013312" | "5015227" | "5026959" | "5047027" | "5057107" | "5059199" | "5067952" | "5071419" | "5078717" | "5080660" | "5084045" | "5085659" | "5100423" | "5115818" | "5125928" | "5128147" | "5183455" | "5190539" | "5197466" | "5197963" | "5205289" | "5207675" | "5215103" | "5217458" | "5246438" | "5251645" | "5252922" | "5267994" | "5277696" | "5281213" | "5290286" | "5300068" | "5304214" | "5336222" | "5365926" | "5385544" | "5397339" | "5403311" | "5411025").PN. OR ("5599346").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/08/29 10:52
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S130	2	"5599346".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/08/29 11:57
S131	219	("2006/0095029").URPN.	USPAT	OR	OFF	2019/08/30 08:26
S132	198	S131 and deploy$4	USPAT	OR	OFF	2019/08/30 08:26
S133	65	S131 and deploy$4 same (thread$4 helical$4 track$4)	USPAT	OR	OFF	2019/08/30 08:27
S134	63	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$ or US-20060264974-$ or US-20020143302-$ or US-20040199179-$ or US-20060095029-$ or US-20040015161-$ or US-20050085804-$).did. or (US-20060084965-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-	US-PGPUB; USPAT	OR	OFF	2019/08/30 10:21

Petitioner's Exhibit 1007
Avanos v. Stratus

		5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$ or US-5827276-$ or US-5855576-$ or US-6015406-$ or US-8753335-$).did.				
S135	205	(a61b18/$5.cpc. a61b2018/$5.cpc.) and (hypotube) with (needle cannula)	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:01
S136	136	(a61b18/$5.cpc. a61b2018/$5.cpc.) and (tube) near5 conduct$4 near10 (cannula needle trocar)	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:16
S137	1	"15098673"	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:21
S138	2	"20080294162"	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:28
S139	1	"6878147".pn.	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:30
S140	1	"15225945"	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:34
S141	2427	(a61b18/$5.cpc. a61b2018/$5.cpc.) and conduct$4 near10 (cannula needle trocar)	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:45
S142	272	(a61b18/$5.cpc. a61b2018/$5.cpc.) and conduct$4 near5 inner near10 (cannula needle trocar)	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:46
S143	8	"5599346".pn. "20060095029"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2019/08/30 12:58
S144	659	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2019/08/30 13:00
S145	120	((ROBERT) near2 (WRIGHT)).INV.	EPO; JPO; DERWENT	OR	ON	2019/08/30 13:00
S146	26	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2019/08/30 13:00
S147	5	((SCOTT) near2 (BRANDT)).INV.	EPO; JPO; DERWENT	OR	ON	2019/08/30 13:00
S148	1	"7918852".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2020/03/16 14:34
S149	86	("20020019596" | "20020065541" | "20040116793" | "3946738" | "3964487" | "3980085" | "4003380" | "4043342" | "4116198" | "4126137" | "4188927" | "4214804" | "4245649" | "4474179" | "4476862" | "4483338" | "4565200" | "4590934" | "4651734" | "4655226" | "4674499" | "4685459" | "4727874" | "4844063" | "4907585" | "4907589" | "4955377" | "4966597" | "5007908" | "5009656" | "5019076" | "5267997" | "5342357" | "5383874" | "5403311" | "5433739" | "5651780" | "5697281" | "5697536" | "5697882" | "5697909" | "5827280" | "5843019" | "5888198" | "5891095" | "5902272" | "6004319" | "6056746" | "6066134" | "6106524" | "6146380" | "6149620" | "6159194" | "6193715" | "6312408" | "6312428" | "6379350" | "6416508" | "6506189" | "6582441" | "6632220" | "6837884").PN. OR ("7918852").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/03/16 16:44
S150	788	("4813429" | "4907589" | "5191883" | "5281213" | "5281218").PN. OR ("5433739").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/03/16 17:11
S151	4	"20040158239"	US-PGPUB; USPAT; USOCR	OR	OFF	2020/03/16 18:05
S152	6	"20070112340" "20080161804" "20080249392"	US-PGPUB; USPAT; USOCR	OR	OFF	2020/03/16 18:06
S153	130	(behl.in. epstein.in.) and 606/$5.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/03/16 19:17
S154	16	"11429921" "11173928"	US-PGPUB; USPAT;	OR	OFF	2020/03/16 19:19

			USOCR			
S155	2	"20020095080"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2020/03/16 22:54

3/17/2020 1:54:17 PM
C:\Users\ekim4\Documents\EAST\Workspaces\15098673.wsp

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 15/098,673	Filing Date 04/14/2016	☐ To be Mailed

ENTITY: ☐ LARGE ☑ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A		N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A		N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*		x $40 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $210 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).				
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))					
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT	03/28/2020	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 74	Minus	** 75	= 0		x $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0		x $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)			
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=		x $0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=		x $0 =	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
							TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/DEBRA A SAVOY/
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".	
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.	

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PTO/AIA/01 (06-12)
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DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 15/098,673

filed on April 14, 2016

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Robert E. Wright Date (Optional): _____

Signature: _____

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	38998757
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	28-MAR-2020
Filing Date:	14-APR-2016
Time Stamp:	17:33:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	15_098673_Declaration_Wright.pdf	486240 f61615f3151482a75d3382ddd51d43183c9fd32d	no	2

Warnings:

Information:	
Total Files Size (in bytes):	486240

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: A.NE.AFCP
Document Description: After Final Consideration Pilot Program Request

PTO/SB/434 (05-13)

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0

Practitioner Docket No.:	Application No.:	Filing Date:
NBUS.001C1	15/098,673	April 14, 2016
First Named Inventor:	**Title:**	
Robert E. Wright	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.

1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (*e.g.*, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).
2. The above-identified application contains an outstanding final rejection.
3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.
4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.
5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.
6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).
7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]
8. By filing this certification and request, applicant acknowledges the following:
    - Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.
    - The examiner will verify that the AFCP 2.0 submission is compliant, *i.e.*, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:
        - The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, by mailing an advisory action.
        - If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.
            - The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.
            - If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.

Signature	Date
/Daniel C. Higgs/	March 28, 2020
Name (Print/Typed)	**Practitioner Registration No.**
Daniel C. Higgs	55,265

***Note**: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.*

☐ * Total of _____ forms are submitted.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Robert E. Wright	)	
Application No.:	15/098,673	)	Art Unit: 3794
Filing Date:	April 14, 2016	)	
Title:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	)	
Examiner:	Eun Hwa Kim	)	
Confirmation No.:	5232	)	
Customer No.:	148468	)	

AMENDMENT AND RESPONSE TO OFFICE ACTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Responsive to the Office Action dated March 19, 2020, the Applicant respectfully requests reconsideration of the pending claims in view of the amendments and remarks herein.

Amendments to the Claims are reflected in the listing of claims which begins on page 2.

Remarks begin on page 17.

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A system comprising:

an RF probe; and

a needle for insertion into a patient during an RF ablation procedure, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments;

an actuator interconnected to the plurality of filaments, wherein movement of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein movement of the actuator in a second direction relative to the hub retracts the plurality of filaments to a retracted position in which the plurality of filaments are disposed within at least a portion of the elongate member; and

a fitting in fluid communication with the lumen, the fitting being configured to provide a connection for injection of fluid through the fitting and through the lumen, the fitting further being configured to allow for insertion of the RF probe into the lumen through the fitting,

wherein the lumen at the interior of the elongate member is configured to accept the RF probe therein to physically contact a conductive portion of the needle and thereby electrically connect the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the plurality of

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filaments, and such that the RF probe, the tip, and the plurality of filaments operate together as a single monopolar RF electrode,

wherein the conductive portion of the needle is at a distal end of the needle, and

wherein, when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, the plurality of filaments are movable via the actuator from the retracted position, in which the plurality of filaments are disposed within said at least a portion of the elongate member, to the deployed position.

2. (Previously presented) The system of claim 1, wherein the actuator fits around at least a portion of the hub, and wherein the actuator is configured to rotate relative to the hub about a central longitudinal axis of the needle.

3. (Previously presented) The system of claim 2, wherein the actuator is generally tubular.

4. (Previously presented) The system of claim 1, wherein the needle further comprises a slide member coupled to the actuator and fixedly connected to the plurality of filaments, wherein the hub includes a cavity sized to house a protrusion of the slide member, and wherein the slide member is limited to a linear motion relative to the hub as the actuator is rotated.

5. (Previously presented) The system of claim 4, wherein the slide member is configured to axially advance and retract without rotating relative to the hub.

6. (Previously presented) The system of claim 1, wherein the tip comprises a fluid port in fluid communication with the lumen such that an anesthetic and/or an image enhancing dye may be introduced into a region around the tip through the fluid port.

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7. (Previously presented) The system of claim 1, wherein each filament of the plurality of filaments has a pre-set bias such that the filament is curved when in the deployed state.

8. (Previously presented) The system of claim 1, wherein when each filament of the plurality of filaments is in the deployed position, the filaments extend outwardly from the tip.

9. (Previously presented) The system of claim 8, wherein each filament comprises a distal end, wherein the distal end of each filament defines a point when each filament is in the deployed position, and wherein an average of all the points is offset from a central longitudinal axis of the elongate member.

10. (Previously presented) The system of claim 1, wherein the plurality of filaments comprises three filaments, and wherein an angle between each pair of adjacent filaments is 120 degrees when each filament is in the deployed position.

11. (Previously presented) The system of claim 1, wherein the plurality of filaments are configured to form a lesion having a pyramidal shape.

12. (Previously presented) The system of claim 1, wherein the tip tapers to a point, and wherein the elongate member and the tip comprise a single unitary structure.

13. (Previously presented) The system of claim 1, wherein a proximal end of the elongate member is fixed to the hub.

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14. (Previously presented) The system of claim 1, wherein the tip is asymmetrical, and wherein the hub comprises an indicator that is oriented to communicate an orientation of the asymmetrical tip.

15. (Previously presented) The system of claim 1, wherein the hub and/or the actuator includes markings to indicate a depth of deployment of the plurality of filaments.

16. (Previously presented) The system of claim 1, wherein the hub and/or the actuator includes detents to provide a tactile feedback of a position of the plurality of filaments.

17. (Canceled)

18. (Previously presented) The system of claim 1, wherein the RF probe comprises a cable for use in connecting the RF probe to a radiofrequency generator.

19. (Withdrawn—currently amended) A method ~~of using the system of claim 1, the method~~ comprising:

using the system of claim 1, wherein said using comprises:

inserting the needle into a patient;

rotating the actuator to transition the plurality of filaments from the retracted position to the deployed position; and

operating the RF probe, the tip, and the plurality of filaments as a monopolar electrode.

20. (Withdrawn—currently amended) The method of claim 19, wherein said using further ~~comprising~~ comprises inserting the RF probe into the lumen of the needle.

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21. (Previously presented) The system of claim 1, wherein the fitting is configured to be coupled to a fluid source and the lumen is configured to conduct fluid from the fluid source when the RF probe is not positioned within the needle.

22. (Previously presented) The system of claim 1, wherein the fitting is configured to provide a connection to a fluid source for said injection of fluid through the fitting and through the lumen.

23. (Previously presented) The system of claim 22, wherein the fitting comprises a Luer fitting configured to be connected with the fluid source when the RF probe is fully separated from the needle, such that none of the RF probe is within the needle, the Luer fitting further being configured to separately permit the RF probe to be inserted into the lumen through the Luer fitting when the Luer fitting is not connected with the fluid source.

24. (Previously presented) The system of claim 22, wherein the fitting is configured to be connected with the fluid source and to permit fluid to pass through the fitting and through the lumen when the RF probe is not present within the lumen.

25. (Previously presented) The system of claim 24, and wherein the fitting is further configured to permit the RF probe to be inserted into the lumen through the fitting when the fitting is not connected with the fluid source.

26. (Previously presented) The system of claim 22, wherein the fitting is configured to accept a connector of the fluid source.

27. (Previously presented) The system of claim 26, wherein the fitting comprises a Luer fitting and the connector of the fluid source comprises a Luer fitting.

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28. (Previously presented) The system of claim 22, wherein the lumen is configured to deliver fluid through the tip at the distal end of the needle.

29. (Previously presented) The system of claim 28, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip of the needle without passing through an interior of any of the plurality of filaments.

30. (Previously presented) The system of claim 1, wherein the lumen is configured to deliver fluid through the tip at the distal end of the needle.

31. (Previously presented) The system of claim 1, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

32. (Previously presented) The system of claim 1, wherein the fitting is configured to provide the connection for the injection of fluid through the fitting separately from allowing for insertion of the RF probe into the lumen through the fitting.

33. (Previously presented) The system of claim 1, wherein the fitting is at a proximal end of the needle such that the actuator is positioned distally relative to a proximal end of the fitting.

34. (Previously presented) The system of claim 1, wherein the fitting comprises a Luer fitting.

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35. (Previously presented) The system of claim 34, wherein the Luer fitting is at a proximal-most position at a proximal end of the needle.

36. (Previously presented) The system of claim 1, wherein, when the plurality of filaments are in the retracted position, the fitting is configured to connect to a fluid source and to permit fluid from the fluid source to pass through the fitting, through the lumen, and through the tip at the distal end of the needle.

37. (Previously presented) The system of claim 36, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

38. (Previously presented) The system of claim 36, further comprising tube that is a separate member relative to the elongate member, the tube defining the lumen at the interior of the elongate member.

39. (Previously presented) The system of claim 38, wherein the tube comprises a conductive material, and wherein the conductive portion of the needle comprises the conductive material of the tube.

40. (Previously presented) The system of claim 39, wherein the tube is configured to transport fluid therethrough, and wherein the tube is further configured to separately conduct therethrough RF energy emitted by the RF probe.

41. (Previously presented) The system of claim 40, wherein the tube is further configured to conduct the RF energy into and through the tip and the plurality of filaments.

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42. (Previously presented) The system of claim 1, further comprising a tube that is a separate member relative to the elongate member, the tube defining the lumen at the interior of the elongate member.

43. (Previously presented) The system of claim 42, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen defined by the tube and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

44. (Previously presented) The system of claim 42, wherein the tube comprises a conductive material, and wherein the conductive portion of the needle comprises the conductive material of the tube.

45. (Previously presented) The system of claim 44, wherein the tube is configured to transport fluid therethrough when the RF probe is absent from the lumen, and wherein the tube is further configured to separately conduct therethrough RF energy emitted by the RF probe when the RF probe is present within the lumen.

46. (Previously presented) The system of claim 45, wherein the tube is further configured to conduct the RF energy into and through the tip and the plurality of filaments.

47. (Previously presented) The system of claim 42, wherein the tube is positioned at an interior of the elongate member when the plurality of filaments are in the retracted position.

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48. (Previously presented) The system of claim 42, wherein the tube is in fluid communication with the tip at the distal end of the elongate member when the plurality of filaments are in the retracted position.

49. (Previously presented) The system of claim 42, wherein the fluid passes from a fluid source, through the fitting, and through the tube when the fluid source is coupled to the fitting, and wherein the RF probe is separately received within the tube when fluid is not being transported through the tube.

50. (Previously presented) The system of claim 1, wherein a fluid source is coupled with the fitting and fluid is transported through the lumen to a target volume within the patient when the system is in a first operational state in which the RF probe is fully separated from the needle, such that none of the of the RF probe is within the needle, and wherein the lumen accepts the RF probe for delivery of RF energy to the target volume when the system is in a second operational state in which fluid is not transported through the lumen of the needle.

51. (Previously presented) A system comprising:

an RF probe that comprises an electrode; and

a needle for insertion into a patient during an RF ablation procedure, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments;

an actuator interconnected to the plurality of filaments, wherein movement of the actuator in a first direction relative to the hub moves the plurality of

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filaments relative to the tip to a deployed position that extends distally beyond the tip, and wherein movement of the actuator in a second direction relative to the hub retracts the plurality of filaments to a retracted position in which the plurality of filaments are disposed within at least a portion of the elongate member; and

a fitting in fluid communication with the lumen, the fitting being configured to provide a connection for injection of fluid through the fitting and through the lumen, the fitting further being configured to allow for insertion of the RF probe into the lumen through the fitting,

wherein the lumen is configured to accept the RF probe therein such that the electrode of the RF probe physically contacts a conductive portion of the needle and thereby electrically connects the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the plurality of filaments, and such that the electrode of the inserted RF probe, the tip, and the plurality of filaments operate together as a single monopolar RF electrode, and

wherein when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, the plurality of filaments of the needle are positionable in the retracted position, in which the plurality of filaments are disposed within said at least a portion of the elongate member.

52. (Previously presented) The system of claim 51, wherein the needle further comprises a conductive tube that is a separate member relative to the elongate member, the conductive tube defining the lumen at the interior of the elongate member and further defining the conductive portion of the needle that the electrode of the RF probe physically contacts, wherein, when the RF probe is inserted into the lumen defined by the conductive tube, the conductive tube is configured to conduct RF energy emitted by the RF probe through the conductive tube and into and through the tip and the plurality of filaments.

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53. (Previously presented) The system of claim 52, wherein the fitting is configured to provide a connection to a fluid source for said injection of fluid through the fitting and through the lumen when the RF probe is fully separated from the needle in the non-inserted state, such that none of the RF probe is within the needle.

54. (Currently amended) A system comprising:

an RF probe; and

a needle for insertion into a patient, the needle comprising:

a hub;

an elongate member fixed to the hub, the elongate member comprising a lumen at an interior thereof;

a tip fixed to the elongate member at a distal end of the needle, wherein the tip is shaped to pierce tissue of the patient;

a plurality of filaments;

an actuator interconnected to the plurality of filaments, wherein movement of the actuator in a first direction relative to the hub moves the plurality of filaments relative to the tip to a deployed position distally beyond the tip, and wherein movement of the actuator in a second direction relative to the hub retracts the plurality of filaments to a retracted position in which the plurality of filaments are disposed within at least a portion of the elongate member; and

a Luer fitting in fluid communication with the lumen, the Luer fitting being configured to provide a connection to a fluid source for injection of fluid through the Luer fitting and through the lumen, the Luer fitting further being configured to allow for insertion of an RF probe into the lumen through the Luer fitting,

wherein the lumen at the interior of the elongate member is configured to accept the RF probe therein to physically contact a conductive portion of the needle and thereby electrically connect the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the plurality of

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filaments, and such that an electrode of the inserted RF probe, the tip, and the plurality of filaments operate together as a single monopolar RF electrode,

wherein the conductive portion of the needle is at a distal end of the needle.

55. (Previously presented) The system of claim 54, wherein the Luer fitting is configured to be connected with the fluid source when the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, and wherein the Luer fitting is further configured to separately permit the RF probe to be inserted into the lumen through the Luer fitting when the Luer fitting is not connected with the fluid source.

56. (Previously presented) The system of claim 54, wherein the Luer fitting is configured to accept a Luer connector of the fluid source.

57. (Previously presented) The system of claim 54, wherein the lumen is configured to deliver fluid through the tip at the distal end of the needle.

58. (Previously presented) The system of claim 57, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip without passing through an interior of any of the plurality of filaments.

59. (Previously presented) The system of claim 54, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

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60. (Previously presented) The system of claim 54, wherein the Luer fitting is at a proximal end of the needle such that the actuator is positioned distally relative to a proximal end of the Luer fitting.

61. (Previously presented) The system of claim 60, wherein the Luer fitting is at a proximal-most position at the proximal end of the needle.

62. (Previously presented) The system of claim 54, wherein, when the plurality of filaments are in the retracted position and the RF probe is fully separated from the needle in a non-inserted state, such that none of the RF probe is within the needle, the Luer fitting is configured to connect to the fluid source and to permit fluid from the fluid source to pass through the Luer fitting, through the lumen, and through the tip at the distal end of the needle.

63. (Previously presented) The system of claim 62, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen at the interior of the elongate member and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

64. (Previously presented) The system of claim 54, further comprising a tube that is a separate member relative to the elongate member, the tube defining the lumen at the interior of the elongate member.

65. (Previously presented) The system of claim 64, wherein each filament of the plurality of filaments is devoid of any lumen therethrough for the transportation of fluid, and wherein fluid injected through the needle passes through the lumen defined by the tube and through the tip at the distal end of the needle without passing through an interior of any of the plurality of filaments.

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66. (Previously presented) The system of claim 64, wherein the tube comprises a conductive material, and wherein the conductive portion of the needle comprises the conductive material of the tube.

67. (Previously presented) The system of claim 66, wherein the tube is configured to transport fluid therethrough, and wherein the tube is further configured to conduct therethrough RF energy emitted by the RF probe.

68. (Previously presented) The system of claim 67, wherein the tube is further configured to conduct the RF energy into and through the tip and the plurality of filaments.

69. (Previously presented) The system of claim 64, wherein the tube is positioned at an interior of the elongate member when the plurality of filaments are in the retracted position.

70. (Previously presented) The system of claim 64, wherein the tube is in fluid communication with the tip at the distal end of the elongate member when the plurality of filaments are in the retracted position.

71. (Previously presented) The system of claim 64, wherein the fluid passes from the fluid source, through the Luer fitting, and through the tube when the fluid source is coupled to the Luer fitting, and wherein the RF probe is separately received within the tube when fluid is not being transported through the tube.

72. (Previously presented) The system of claim 54, wherein the fluid source is coupled with the Luer fitting and fluid is transported through the lumen to a target volume within the patient when the system is in a first operational state in which the RF

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probe is fully separated from the needle, such that none of the of the RF probe is within the needle, and wherein the lumen accepts the RF probe for delivery of RF energy to the target volume when the system is in a second operational state in which fluid is not transported through the lumen of the needle.

73. (Canceled)

74. (Previously presented) The system of claim 1, wherein the tip comprises a conductive material and defines a channel, and wherein a distal end of the RF probe is received within the channel of the tip of the needle when the RF probe is fully inserted into the needle.

75. (Previously presented) The system of claim 74, wherein the conductive portion of the needle comprises the conductive material of the tip.

76. (Previously presented) The system of claim 1, wherein the plurality of filaments extend distally beyond a distal end of the RF probe when the RF probe is fully inserted into needle and when the plurality of filaments are in the deployed position, such that when RF energy is delivered to the RF probe, the plurality of filaments conduct RF energy that emanates from the RF probe beyond the distal end of the RF probe to produce within the patient, during the RF ablation procedure, a lesion that is distally offset from the distal end of the RF probe.

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Remarks

This paper is submitted in response to the Office Action mailed March 19, 2020. Claims 1-16 and 18-76 were pending in the Application, with claims 19-20 having been withdrawn from consideration. Claims 51-53 stand allowed, claim 73 stands objected to, and claims 1-16, 18-50, 54-72, and 74-76 stand rejected. By this paper, claims 1, 19, 20, and 54 are amended, claim 73 is cancelled, and claims 19 and 20 remain withdrawn with rejoinder thereof requested, as further discussed below. The Applicant respectfully submits that all amendments are fully supported by the Application, as originally filed, and that none of the amendments add new matter to the Application.

Allowance of Claims 51-53

The Applicant thanks Examiner Kim for allowing claims 51-53.

Objection to Claim 73

The Applicant additionally thanks Examiner Kim for indicating that claim 73 would be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims. As previously presented, claim 73 depended directly from claim 1. By this paper, claim 73 is cancelled and the limitations thereof are incorporated into independent claim 1. Additionally, the limitations of claim 73 are also incorporated into independent claim 54.

Claim Rejections Under 35 U.S.C. § 103

Claims 1-3, 6-8, 12, 13, 15, 16, 18, 21-50, 54-72, 74, and 75 stand rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 7,918,852 to Tullis et al. ("Tullis") in view of U.S. Patent Application Publication No. 2006/0095029 of Young ("Young '029"), and further in view of U.S. Patent Application Publication No. 2002/0143302 of Hinchliffe et al. ("Hinchliffe"); claims 4 and 5 stand rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Tullis,

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Young '029, and Hinchliffe, and further in view of U.S. Patent Application Publication No. 2010/0049192 of Holtz ("Holtz"); claims 9-11 stand rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Tullis, Young '029, and Hinchliffe, and further in view of U.S. Patent Application Publication No. 2004/0260282 of Gough et al. ("Gough"); claim 14 stands rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Edwards, Young '029, and Hinchliffe, and further in view of U.S. Patent Application Publication No. 2009/0292259 of Delano et al. ("Delano"); and claim 76 stands rejected under pre-AIA 35 U.S.C. § 103(a) as allegedly being unpatentable over Tullis, Young '029, and Hinchliffe, and further in view of U.S. Patent Application Publication No. 2006/0084965 of Young ("Young '965").

The Applicant respectfully traverses these rejections and does not acquiesce to the characterizations of the teachings of these references or the propriety of their combinations, as set forth in the Office Action. However, in order to expedite prosecution of the present application, the Applicant has amended each of independent claims 1 and 54 to include the limitations of claim 73. The Applicant thus respectfully requests that the rejections of claims 1-3, 6-8, 12, 13, 15, 16, 18, 21-50, 54-72, 74, and 75 be withdrawn.

Request for Rejoinder

Claims 19 and 20 currently stand withdrawn. As each of claims 19 and 20 depends from independent claim 1, and thus includes every limitation of this claim, the Applicant respectfully requests rejoinder of these claims upon allowance of claim 1.

General Comments Regarding Reasoning for Allowance

The Office Action includes reasoning ("Reasoning") regarding the allowability of claims 51-53 and 73. The Applicant again thanks Examiner Kim for her diligent review of the application and agrees that these claims are allowable. To preserve the Applicant's position for the record, however, the Applicant respectfully notes that it takes no position regarding patentability other than positions taken during prosecution to

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secure allowance of the claims. Therefore, the Reasoning should not be attributed to the Applicant as an indication of the basis for Applicant's belief that the claims are patentable. To the extent that the Reasoning summarizes or paraphrases the claims or any portion thereof, or otherwise deviates from the language of the claims, the Applicant respectfully submits that the meaning and scope of the claims depend on the actual language of the claims. Furthermore, to the extent that the Reasoning refers to only selected portions of a claim, the Applicant points out that the claims may contain additional limitations other than those mentioned in the Reasoning, and that patentability is measured against a claim as a whole, not just selected limitations. Other limitations alone or in combination may provide distinguishing aspects over the prior art. To the extent that the Reasoning suggests that the mentioned limitations have any special prominence, the Applicant respectfully disagrees. In addition, the dependent claims may include limitations that provide further reasons for their patentability.

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Conclusion

In view of the foregoing amendments and remarks, the Applicant submits that the Application is in condition for allowance and thus requests the issuance of a Notice of Allowance. Please contact the undersigned attorney in the event that any remaining impediment to the prompt allowance of this application is found that could be clarified by a telephonic interview or may be overcome by an Examiner's Amendment.

DATED this 28th day of March, 2020.

Respectfully submitted,

/Daniel C. Higgs/

Daniel C. Higgs
Attorney for Applicant
Registration No. 55,265

MED VENTURE HOLDINGS, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, Utah 84116
(801) 703-1961

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Electronic Acknowledgement Receipt

EFS ID:	38998885
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	28-MAR-2020
Filing Date:	14-APR-2016
Time Stamp:	20:27:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	After Final Consideration Program Request	NBUS001C1_AfterFinalRequest.pdf	226133 4fee2c049bd1bca7d94219be8c4a4c9dd6090358	no	2

Warnings:

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Avanos v. Stratus
Page 487 of 691

Information:					
2		NBUS001C1_RTOA4.pdf	155811 30abefd35b3ce093a3be5f3d9a552cad75fc3b4f	yes	20

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response After Final Action	1	1
	Claims	2	16
	Applicant Arguments/Remarks Made in an Amendment	17	20

Warnings:	
Information:	
Total Files Size (in bytes):	381944

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

148468 7590 04/09/2020
Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

EXAMINER
KIM, EUN HWA

ART UNIT	PAPER NUMBER
3794	

DATE MAILED: 04/09/2020

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

TITLE OF INVENTION: METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	07/09/2020

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

148468 7590 04/09/2020

Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

TITLE OF INVENTION: METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	07/09/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
KIM, EUN HWA	3794	606-041000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑ Issue Fee ❑ Publication Fee (if required) ❑ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

148468 7590 04/09/2020

Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

EXAMINER
KIM, EUN HWA

ART UNIT	PAPER NUMBER
3794	

DATE MAILED: 04/09/2020

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 15/098,673	Applicant(s) Wright et al.	
	Examiner EUNHWA KIM	Art Unit 3794	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to claims filed on 4/3/2020.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-16,18-72 and 74-76 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☑ Interview Summary (PTO-413), Paper No./Mail Date. 20200402.
5. ☑ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☑ Other PTO 2323.

/EUN HWA KIM/
Primary Examiner, Art Unit 3794

Petitioner's Exhibit 1007
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EXAMINER'S AMENDMENT

Election/Restrictions

1. Claim 1 is allowable. The restriction requirement between inventions I and II, as set forth in the Office action mailed on June 18, 2019, has been reconsidered in view of the allowability of claims to the elected invention pursuant to MPEP § 821.04(a). **The restriction requirement is hereby withdrawn as to any claim that requires all the limitations of an allowable claim.** Specifically, the restriction requirement of June 18, 2019 is withdrawn. Claims 19 and 20, directed to a method withdrawn from further consideration because it require all the limitations of an allowable generic linking claim as required by 37 CFR 1.141.

2. In view of the above noted withdrawal of the restriction requirement, applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in an interview with **Dan Higgs on April 7, 2020.**

4. The application has been amended as follows:

5. **Rejoin claims 19-20.**

Reasons for Allowance

6. **Claims 1-16, 18-72 and 73-76 are allowed.**

7. The following is an examiner's statement of reasons for allowance: During the search of the prior art, Tullis et al. (hereinafter 'Tullis', U.S. Pat. No. 7,918,852) in view of Young (U.S. PGPub. No. 2006/0095029), and further in view of Hinchliffe et al. (U.S. PGPub. No. 2002/0143302) were found to be pertinent to the claimed invention. Specifically, Tullis was found to be the closest prior art.

8. **In regards to independent claim 1,** Tullis fails to disclose that the conductive portion is at a distal end of the needle. Tullis only teaches that the proximal portion of the RF probe (electrical connector 140 in assembly 36 in Figs. 10 and 12) establishes electrical connection with the proximal portion of the needle (terminal 86 of the cannula 28 abuts connector 140 of the assembly as shown in Figs. 10 & 12). While Tullis does disclose an additional electrical connection between the inner tube (48 in Fig. 15) and the electrically conductive surface of the RF probe (col. 15, ln. 47-58), it is only used for a bipolar configuration (col. 10, ln. col. 15, ln. 40-48; see Fig. 15 wherein the conductive path 71 illustrates the current path between active electrode 62 and second electrode 68 as shown in Fig. 15). As such, there would be no motivation to modify the insulated RF probe (insulative shell 122 in Fig. 17) intended to be used for monopolar configuration to be conductive as doing so teaches away from its intended use. Similar allowable subject matter has been recited in independent claim 54 and is therefore allowable. Accordingly, claims 2-50 & 74-76 and claims 55-72 are allowed as being dependent upon independent claim 1 and 54, respectively.

9. **In regards to independent claim 51**, Tullis fails to disclose the system as claimed; specifically, *the RF probe comprising an electrode… and wherein the lumen is configured to accept the RF probe therein such that the electrode of the RF probe physically contacts a conductive portion of the needle and thereby electrically connects the RF probe to the tip and the plurality of filaments, such that energy emitted by the RF probe passes through the tip and the plurality of filaments, and such that the electrode of the inserted RF probe, the tip and the plurality of filaments operate together as a single monopolar RF electrode.* Tullis fails to disclose a RF probe (Fig. 17) comprising an electrode. While Tullis does teach that the RF probe electrically connects the electrode (tube 48) of the cannula to an energy source through mating/abutment of the pin (86) of the cannula and the contact (140) of the RF probe (col. 21, ln. 58-col. 22, ln. 23), Tullis only teaches that the RF probe comprises a temperature transducer (120 in Fig. 17) and an insulating housing surrounding the transducer (shell 122). In an alternate embodiment, Tullis does disclose that the RF probe comprises a conductive outer shell (col. 15, ln. 46-65) and further discloses that a contact established between the inner conductive tube (48) of the cannula and the outer wall of the shell (122) allows for the distal end of the inner tube (48) to operate as one of the active electrode in a bipolar mode (see Fig. 14; col. 15, ln. 40-col. 16, ln. 8). However, there would be no motivation to modify the RF probe comprising only a temperature transducer with an insulative shell in the monopolar configuration of Tullis so that it comprises a conductive shell since doing so would teach away from the intended use of Tullis' RF assembly. Accordingly, claims 52 and 53 are allowed as being dependent on independent claim 51.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EUNHWA KIM whose telephone number is (571)270-1265. The examiner can normally be reached on 9AM-5:30PM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOSEPH STOKLOSA can be reached on (571) 272-1213. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see https://ppair-my.uspto.gov/pair/PrivatePair. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/EUN HWA KIM/
Primary Examiner, Art Unit 3794
4/7/2020

Examiner-Initiated Interview Summary	**Application No.** 15/098,673	**Applicant(s)** Wright et al.	
	Examiner EUNHWA KIM	**Art Unit** 3794	**AIA (FITF) Status** No

All participants (applicant, applicant's representative, PTO personnel):

(1) EUNHWA KIM. (3) _____.

(2) Dan Higgs. (4) _____.

Date of Interview: 06 April 2020.

Type: ☑ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☑ No.
If Yes, brief description: _____.

Issues Discussed ☐ 101 ☐ 112 ☐ 102 ☐ 103 ☑ Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: _____.

Identification of prior art discussed: _____.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

An interview was conducted under AFCP 2.0. Examiner stated that the claims are in condition for allowance and that the withdrawn claims 19-20 will be rejoined..

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/EUN HWA KIM/ Primary Examiner, Art Unit 3794	

Petitioner's Exhibit 1007
Avanos v. Stratus
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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	**Art Unit**
	EUNHWA KIM	3794

CPC						
Symbol					**Type**	**Version**
A61B	/	18	/	1477	F	2013-01-01
A61B	/	18	/	1206	I	2013-01-01
A61B	/	2018	/	00434	A	2013-01-01
A61B	/	2018	/	00821	A	2013-01-01
A61B	/	2090	/	3762	A	2016-02-01
A61B	/	2018	/	00875	A	2013-01-01
A61B	/	2018	/	00595	A	2013-01-01
A61B	/	2090	/	376	A	2013-01-01
A61B	/	2018	/	00577	A	2013-01-01
A61B	/	2018	/	00642	A	2013-01-01
A61B	/	2018	/	00791	A	2013-01-01
A61B	/	2018	/	1253	A	2013-01-01
A61B	/	2018	/	126	A	2013-01-01
A61B	/	2018	/	1467	A	2013-01-01

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	74	
/EUN HWA KIM/ Primary Examiner, Art Unit 3794	06 April 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2A

U.S. Patent and Trademark Office

Part of Paper No.: 20200402

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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	**Art Unit**
	EUNHWA KIM	3794

INTERNATIONAL CLASSIFICATION				
CLAIMED				
A61B	/	18	/	14

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	74	
/EUN HWA KIM/ Primary Examiner, Art Unit 3794	06 April 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2A

Petitioner's Exhibit 1007
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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	**Art Unit**
	EUNHWA KIM	3794

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	11	11	18	21	28	31	38	41	53	51	63	61	73	71
2	2	12	12	19	22	29	32	39	42	54	52	64	62	74	72
3	3	13	13	20	23	30	33	40	43	55	53	65	63	-	73
4	4	14	14	21	24	31	34	41	44	56	54	66	64	48	74
5	5	15	15	22	25	32	35	42	45	57	55	67	65	49	75
6	6	16	16	23	26	33	36	43	46	58	56	68	66	50	76
7	7	-	17	24	27	34	37	44	47	59	57	69	67		
8	8	17	18	25	28	35	38	45	48	60	58	70	68		
9	9	51	19	26	29	36	39	46	49	61	59	71	69		
10	10	52	20	27	30	37	40	47	50	62	60	72	70		

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 74	
/EUN HWA KIM/ Primary Examiner, Art Unit 3794 (Primary Examiner)	06 April 2020 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2A

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AFCP 2.0 Decision

Application No.	Applicant(s)	
15/098,673	Wright et al.	
Examiner	**Art Unit**	**AIA (FITF) Status**
EUNHWA KIM	3794	No

This is in response to the After Final Consideration Pilot request filed 03 April 2020.

1. **Improper Request** – The AFCP 2.0 request is improper for the following reason(s) and the after final amendment submitted with the request will be treated under pre-pilot procedure.

   ☐ An AFCP 2.0 request form PTO/SB/434 (or equivalent document) was not submitted.

   ☐ A non-broadening amendment to at least one independent claim was not submitted.

   ☐ The request is not the first proper AFCP 2.0 request submitted in response to the most recent final rejection.

   ☐ Other: _____

2. **Proper Request**

   A. After final amendment submitted with the request will not be treated under AFCP 2.0.
   The after final amendment cannot be reviewed and a search conducted within the guidelines of the pilot program.

   ☐ The after final amendment will be treated under pre-pilot procedure.

   B. Updated search and/or completed additional consideration.
   The examiner performed an updated search and/or completed additional consideration of the after final amendment within the time authorized for the pilot program. The result(s) of the updated search and/or completed additional consideration are:

   ☐ 1. All of the rejections in the most recent final Office action are overcome and a Notice of Allowance is issued herewith.

   ☐ 2. The after final amendment would not overcome all of the rejections in the most recent final Office action . See attached interview summary for further details.

   ☐ 3. The after final amendment was reviewed, and it raises a new issue(s). See attached interview summary for further details.

   ☐ 4. The after final amendment raises new issues, but would overcome all of the rejections in the most recent final Office action. A decision on determining allowability could not be made within the guidelines of the pilot. See attached interview summary for further details, including any newly discovered prior art.

   ☑ 5. Other: See Continuation Sheet

   Examiner Note: Please attach an interview summary when necessary as described above.

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Continuation of Proper Request- B. 5. Other: All the rejections in the most recent final Office actions are overcome and a Notice of Allowance is issued herewith. Withdrawn claims are allowed.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	Art Unit
	EUNHWA KIM	3794

CPC - Searched*		
Symbol	Date	Examiner
A61B18/1477,1467; A61B2018/1253,00577	09/10/2018	EK
A61B2218/001,002,003	06/14/2019	EK

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Assignee & Inventor Search	09/10/2018	EK
See search history printout	09/10/2018	EK
Updated Search (see EAST search history printout)	06/14/2019	EK
Updated Search (see EAST search history printout)	08/30/2019	EK
Updated Search (see EAST search history printout)	03/17/2020	Ek

/EUN HWA KIM/ Primary Examiner, Art Unit 3794	

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	Art Unit
	EUNHWA KIM	3794

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
see EAST search history printout	see EAST search history printout	04/06/2020	EK

/EUN HWA KIM/ Primary Examiner, Art Unit 3794	

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	"15098673"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2020/04/06 18:41
L2	673	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2020/04/06 18:46
L3	26	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2020/04/06 18:46
L4	695	2 3	US-PGPUB; USPAT	OR	ON	2020/04/06 18:46
L5	47	4 and filaments	US-PGPUB; USPAT	OR	ON	2020/04/06 18:47
S1	5986	606/41,44.ccls.	US-PGPUB; USPAT	OR	ON	2014/01/29 10:14

S2	501	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:32
S3	110	((ROBERT) near2 (WRIGHT)).INV.	EPO; JPO; DERWENT	OR	ON	2014/01/29 11:33
S4	22	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
S5	3	((SCOTT) near2 (BRANDT)).INV.	EPO; JPO; DERWENT	OR	ON	2014/01/29 11:33
S6	3	S2 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
S7	0	S3 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:33
S8	2	S4 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:34
S9	0	S5 and "606".CLAS.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:34
S10	373	US-1234567-$.DID. OR US-D372086-$.DID. OR US-4011872-$.DID. OR US-4206761-$.DID. OR US-4206762-$.DID. OR US-4281667-$.DID. OR US-4353371-$.DID. OR US-4375220-$.DID. OR US-4378809-$.DID. OR US-4385636-$.DID. OR US-4411266-$.DID. OR US-4565200-$.DID. OR US-4573980-$.DID.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:37

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S11	4	US-1234567-$.DID. OR US-5507802-$.DID. OR US-7270661-$.DID. OR US-20070287996-$.DID.	US-PGPUB; USPAT	OR	ON	2014/01/29 11:38
S12	20	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$).did.	US-PGPUB; USPAT	OR	ON	2014/01/29 12:00
S13	379	S10 or S11 S12	US-PGPUB; USPAT	OR	ON	2014/01/29 12:00
S14	20	S13 and S12	US-PGPUB; USPAT	OR	ON	2014/01/29 12:19
S15	379	S13 S12	US-PGPUB; USPAT	OR	ON	2014/01/29 12:19

S16	23	S15 and (detent)	US-PGPUB; USPAT	OR	ON	2014/01/29 12:19
S17	100218	"606"/$.ccls.	US-PGPUB; USPAT	OR	ON	2014/01/29 12:21
S18	136	neurotomy	US-PGPUB; USPAT	OR	ON	2014/01/29 12:21
S19	5	"7108696".pn. "7357798".pn. "20090221998".pgnr. "20060217705".pgnr. "200620200121".pgnr. "20090024124".pgnr.	US-PGPUB; USPAT	OR	ON	2014/01/29 12:46
S20	88	US-8292822-$.DID. OR US-5540778-$.DID. OR US-5672375-$.DID. OR US-3918455-$.DID. OR US-4341094-$.DID. OR US-5232442-$.DID. OR US-5304141-$.DID. OR US-5379900-$.DID. OR US-5562685-$.DID. OR US-5709692-$.DID. OR US-20050059964-$.DID. OR US-5226912-$.DID. OR US-5269808-$.DID. OR US-5425746-$.DID. OR US-5437726-$.DID. OR US-5569302-$.DID. OR US-5250247-$.DID. OR US-5507777-$.DID. OR US-5649962-$.DID. OR US-5374278-$.DID. OR US-5639506-$.DID. OR US-5643628-$.DID. OR US-5891247-$.DID. OR US-6031018-$.DID. OR US-6053086-$.DID. OR US-4124153-$.DID. OR US-4282637-$.DID. OR US-4457128-$.DID. OR US-4501133-$.DID. OR US-4907741-$.DID. OR US-5503092-$.DID. OR US-5532657-$.DID. OR US-5648003-$.DID. OR US-5683025-$.DID. OR US-5891166-$.DID. OR US-5897044-$.DID. OR US-5954242-$.DID. OR US-5991957-$.DID. OR US-6035916-$.DID. OR US-6051180-$.DID. OR US-6126676-$.DID. OR US-6270464-$.DID. OR US-6402770-$.DID. OR US-6536482-$.DID. OR US-6699205-$.DID. OR US-6730042-$.DID. OR US-6739024-$.DID. OR US-7761964-$.DID.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2014/02/11 12:24
S21	75	US-5769822-$.DID. OR US-20050288759-$.DID. OR US-4998661-$.DID. OR US-5934275-$.DID. OR US-5133738-$.DID. OR US-5226912-$.DID. OR US-5503092-$.DID. OR US-6536482-$.DID. OR US-20060106405-$.DID. OR US-6803013-$.DID. OR US-20020176734-$.DID. OR US-20070215543-$.DID. OR US-5749846-$.DID. OR US-8206300-$.DID. OR US-	US-PGPUB; USPAT; EPO; JPO;	OR	ON	2014/02/11 12:24

		8414509-$.DID. OR US-20050004563-$.DID. OR US-20050222565-$.DID. OR US-20050283148-$.DID. OR US-20090131790-$.DID. OR US-3840011-$.DID. OR US-4191054-$.DID. OR US-4269387-$.DID. OR US-4553687-$.DID. OR US-4710176-$.DID. OR US-4755173-$.DID. OR US-4808168-$.DID. OR US-4832690-$.DID. OR US-4833824-$.DID. OR US-5112311-$.DID. OR US-5154698-$.DID. OR US-5239773-$.DID. OR US-5265606-$.DID. OR US-5487739-$.DID. OR US-5542268-$.DID. OR US-5607003-$.DID. OR US-5687739-$.DID. OR US-5713872-$.DID. OR US-5743882-$.DID.	DERWENT			
S22	50	("20110213356" "20110288540" "5540778" "5672375" "3918455" "4341094" "5232442" "5304141" "5379900" "5562685" "5709692" "20050059964" "5226912" "5269808" "5425746" "5437726" "5569302" "5250247" "5507777" "5649962" "5374278" "5639506" "5643628" "5891247" "6031018" "6053086" "4124153" "4282637" "4457128" "4501133" "4907741" "5503092" "5532657" "5648003" "5683025" "5891166" "5897044" "5954242" "5991957" "6035916" "6051180" "6126676" "6270464" "6402770" "6536482" "6699205" "6730042" "6739024" "7761964" "8292822").pn.	US-PGPUB; USPAT	OR	ON	2014/02/11 12:26
S23	85	S20 S21 S22	US-PGPUB; USPAT	OR	ON	2014/02/11 12:26
S24	85	S20 S21 S22	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/11 12:26
S25	1	"20090221998"	DERWENT	OR	ON	2014/02/11 12:39

S26	259590	a61b2018/0016, "00166", "00196", "00208", "00273", "00279", "0091", "00434", "0044", "1425", "143", "1432", "1465" "1475".cpc.	DERWENT	OR	ON	2014/02/11 12:56
S27	891	a61b2018/0016,00166,00196,00208,00273,00279,0091,00434, 0044,1425,143,1432,1465,1475.cpc.	DERWENT	OR	ON	2014/02/11 12:58
S28	5217	a61b2018/0016,00166,00196,00208,00273,00279,0091,00434, 0044,1425,143,1432,1465,1475.cpc.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/11 12:58
S29	3226	S28 and @py<"2009"	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/11 13:00
S30	3	"7108696".pn. "7357798".pn. "20060217705".pgnr. "7108696".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 09:58
S31	3	"7108696".pn. "7357798".pn. "20060217705".pgnr.	US-PGPUB; USPAT; USOCR;	OR	ON	2014/02/12 09:59

			EPO; JPO			
S32	2	"7270661".pn. "5507802.pn" "20070287996".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:01
S33	3	"7270661".pn. "5507802".pn. "20070287996".pgnr.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:02
S34	50	(actuator actuate actuating) same (helical adj track thread) same (filament electrode) same (hub)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:34
S35	12	(actuator actuate actuating) same (helical adj track thread) same (filament electrode) same (hub) same (advanced advancing deployed deploying deploy retracted retracting retract)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:38

S37	316	(actuator actuate actuating) same (helical adj track thread) same (advanced advancing deployed deploying deploy retracted retracting retract) near3 (filament stylet anchor element)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:41
S38	274 031	("600" "606" "607").CLAS.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:45
S39	130 82	S38 and filament	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:45
S40	363 0	S39 and (actuate actuator actuating)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 10:46
S41	6	S39 and (hub with thread) and (actuat$3 with thread)	US-PGPUB; USPAT; USOC	OR	ON	2014/02/12 10:47

			R; EPO; JPO			
S42	2598	S39 and (rotate rotat$4) same (deployment deploy retract retract$4 advance advancing)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:33
S43	251	S39 and (rotate rotat$4) same (deployment deploy retract retract$4 advance advancing) same (filament)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:34
S44	1	"5964756".pn.	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 11:55
S45	110	S39 and (rotate rotat$4) with (actuate actuating actuated) and (deployment deploy retract retract$4 advance advancing) same (filament)	US-PGPUB; USPAT; USOCR; EPO; JPO	OR	ON	2014/02/12 12:00

S46	52	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$).did.	US-PGPUB; USPAT	OR	ON	2014/02/12 14:02
S47	49	S46 and (filament antenna electrode)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:04
S48	37500	S46 and (filament antenna electrode) and (single near2 wire) or ("same" near2 wire)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:05
S49	3	S46 and (filament antenna electrode) and ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:05
S50	4674	S38 and (filament antenna electrode) and ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:06
S51	1425	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire))	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07

S52	2	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) with (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S53	4	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) same (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:07
S54	92	S38 and (filament antenna electrode) with ((single near2 wire) or ("same" near2 wire)) same2 (actuator actuating actuate)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:08
S55	504	S38 and (filament antenna electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:09
S56	258	S38 and (filament antenna electrode) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:09
S57	17	US-6379353-$.DID. OR US-6888919-$.DID. OR US-20020077627-$.DID. OR US-20040024300-$.DID. OR US-20040096033-$.DID. OR US-20040158239-$.DID. OR US-20050261570-$.DID. OR WO-9903397-$.DID. OR WO-0222019-$.DID. OR WO-2005036124-$.DID.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	ON	2014/02/12 14:23
S58	0	("2010/0256625").URPN.	USPAT	OR	ON	2014/02/12 14:23
S59	331	(filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:31

S60	258	S38 and(sylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:31
S61	258	S38 and(stylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT	OR	ON	2014/02/12 14:32
S62	258	S38 and(stylet filament antenna electrode array) with (form$3 made built) with (single near2 wire) same (control$4 deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:32
S63	1332	(filament electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:33
S64	495	(filament electrode) with (form$3 made built) with (single near2 wire) and S38	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:34

S65	237	S64 not S59	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:34
S66	0	"606"/$.clas. and (helical) near2 (track thread) with (detents) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S67	0	"606"/$.clas. and (helical) near2 (track thread) same (detents) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S68	0	"606"/$.clas. and (track thread) same (detent) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56

S69	4757	(track thread) same (detent) same (deploy$4 retract$4 advanc$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:56
S70	14	(track thread) same (detent) same (indicat$4 alert$4) with (deploy$4 retract$4 advanc$4) same (visual tactile audible)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 14:57
S71	2	"20060264974".pgnr. "5827276".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/12 16:33
S72	1332	(filament electrode) with (form$3 made built) with (single near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:00

S73	2599	(filament electrode) with (form$3 made built) with (single near2 wire or "same" near2 wire)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:01
S74	389	S73 and "606"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:01
S75	50	"606"/$.ccls. and (distal near2 (tip end)) near4 (insulat$4) with (partially partial "part of")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:41
S76	0	"606"/$.ccls. and (distal near2 (tip end)) with (insulat$4) with (partially partial "part of") same ("non-adhere" "adhere")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:55

S77	126	"606"/$.ccls. and (distal near2 (tip end)) with (insulat$4 insulate insulated) with (partially partial "part of")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:56
S78	76	S77 not S75	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	ON	2014/02/14 12:56
S79	57	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or US-20060217705-$ or US-20010018586-$ or US-20010031941-$ or US-20060206130-$ or US-20060206129-$ or US-20060206111-$ or US-20070016183-$ or US-20070077230-$ or US-20080161804-$ or US-20070287996-$ or US-20090105640-$ or US-20060229645-$ or US-20060264974-$ or US-20020143302-$ or US-20040199179-$).did. or (US-2994324-$ or US-5599346-$ or US-5683384-$ or US-5728143-$ or US-5735847-$ or US-5782827-$ or US-5800484-$ or US-5810804-$ or US-5863290-$ or US-5913855-$ or US-5925042-$ or US-5928229-$ or US-5951547-$ or US-6053937-$ or US-6092528-$ or US-6254598-$ or US-6958062-$ or US-6132425-$ or US-6129726-$ or US-5672173-$ or US-7108696-$ or US-7357798-$ or US-5687739-$ or US-5749846-$ or US-2022065-$ or US-5995875-$).did. or (US-6123084-$ or US-6245070-$ or US-7198625-$ or US-7270661-$ or US-5507802-$ or US-6638275-$ or US-5827276-$ or US-5855576-$).did.	US-PGPUB; USPAT	OR	ON	2014/02/14 13:07
S80	27	S79 and (distal near2 (tip end point)) with (insulat$4 insulate insulated)	US-PGPU	OR	ON	2014/02/14 13:32

			B; USPAT			
S81	8	(tip) with (filament stylet tine) with (active adj electrode)	US-PGPUB; USPAT	OR	ON	2014/06/16 15:31
S82	587	("0164184" | "1366756" | "1735271" | "1814791" | "1889609" | "1932258" | "1943543" | "1952617" | "1983669" | "2050904" | "2056377" | "2196171" | "2888928" | "3035580" | "3460539" | "3595239" | "3601126" | "3614414" | "3648001" | "3685518" | "3699967" | "3707149" | "3801766" | "3815604" | "3845771" | "3847153" | "3885569" | "3898991" | "3901242" | "3902494" | "3903891" | "3920021" | "3920022" | "3923063" | "3929137" | "3939839" | "3945375" | "3963030" | "3964487" | "3970088" | "3974833" | "4011872" | "4016881" | "4024467" | "4033351" | "4040426" | "4043342" | "4051855" | "4060088" | "4069827" | "4074718" | "4092986" | "4114623" | "4116198" | "4119102" | "4126137" | "4154240" | "4189685" | "4200104" | "4202337" | "4204549" | "4210152" | "4228800" | "4248231" | "4271837" | "4281373" | "4301802" | "4326529" | "4346332" | "4376263" | "4381007" | "4416277" | "4418692" | "4429698" | "4448198" | "4474179" | "4476862" | "4492231" | "4494541" | "4512338" | "4517976" | "4524770" | "4532924" | "4534347" | "4548207" | "4559943" | "4559951" | "4562838" | "4565200" | "4567890" | "4580557" | "4590934" | "4593691" | "4617927" | "4657015" | "4658819" | "4658820" | "4669468" | "4674499" | "4681122" | "4682596" | "4688569" | "4696668" | "4706667" | "4709698" | "4712544" | "4727874" | "4735201" | "4769005" | "4781175" | "4799480" | "4800899" | "4802476" | "4805616" | "4813429" | "4820298" | "4823791" | "4827927" | "4832048" | "4850353" | "4860744" | "4878493" | "4886074" | "4919129" | "4920978").PN. OR ("4931047" | "4936281" | "4936301" | "4936310" | "4936842" | "4943290" | "4950267" | "4955377" | "4966597" | "4967765" | "4969885" | "4976711" | "4994069" | "4998933" | "5007908" | "5009656" | "5013312" | "5019076" | "5035696" | "5037379" | "5047026" | "5047027" | "5057107" | "5062031" | "5071418" | "5080660" | "5083565" | "5085659" | "5088997" | "5098431" | "5099840" | "5108391" | "5108407" | "5117978" | "5122138" | "5133365" | "5158561" | "5167658" | "5167659" | "5171255" | "5171311" | "5178620" | "5190517" | "5195959" | "5196007" | "5197963" | "5201743" | "5207675" | "5217457" | "5217458" | "5217459" | "5221281" | "5244462" | "5249585" | "5250047" | "5258006" | "5259395" | "5261906" | "5267994" | "5267997" | "5277201" | "5277696" | "5281213" |	US-PGPUB; USPAT; USOCR	OR	ON	2014/06/16 15:33

		"5281216" | "5282799" | "5282845" | "5290282" | "5290283" | "5300068" | "5300069" | "5300070" | "5304214" | "5306238" | "5318563" | "5320627" | "5330470" | "5330471" | "5334193" | "5334198" | "5336222" | "5342357" | "5342391" | "5344428" | "5352222" | "5354296" | "5366443" | "5370645" | "5370675" | "5372596" | "5382247" | "5383874" | "5383876" | "5383917" | "5383923" | "5395363" | "5395368" | "5403311" | "5419767" | "5422567" | "5423808" | "5423809" | "5423810" | "5423811" | "5431649" | "5437662" | "5438302" | "5441499" | "5443470" | "5454809" | "5462521" | "5472441" | "5472443" | "5480397" | "5480398" | "5496312" | "5496314" | "5505728" | "5505730" | "5507743" | "5514129" | "5514130" | "5514131" | "5520684" | "5520685" | "5522815").PN. OR ("5531744" | "5536267" | "5540680" | "5540681" | "5540682" | "5540683" | "5540684" | "5540685" | "5542916" | "5542945" | "5545161" | "5545193" | "5549605" | "5554172" | "5555618" | "5556396" | "5556397" | "5558671" | "5562720" | "5569164" | "5569242" | "5569244" | "5569245" | "5575789" | "5578007" | "5582609" | "5582610" | "5584830" | "5591141" | "5599344" | "5599345" | "5599346" | "5599347" | "5599348" | "5599349" | "5603711" | "5603712" | "5607422" | "5609151" | "5609573" | "5611798" | "5620481" | "5624439" | "5626560" | "5626575" | "5626576" | "5626578" | "5628745" | "5628771" | "5630426" | "5633578" | "5634924" | "5672174" | "5683366" | "5693045" | "5697281" | "5697536" | "5697882" | "5697909" | "5700262" | "5766153" | "5810764" | "5843019" | "5860951" | "5871469" | "5873855" | "5888198" | "5891095" | "Re33925").PN. OR ("6015406").URPN.				
S83	67	("5800482" | "5807395").PN. OR ("6053937").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/01 15:55
S84	1050	"606"/$.ccls. and (bipolar) and (stylet filament) and (trocar needle)	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/01 15:56

S85	752	"606"/29-41.ccls. and (bipolar) and (stylet filament) and (trocar needle)	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/01 15:57
S86	43	"606"/29-41.ccls. and (bipolar) same (stylet filament antenna) same (trocar needle)	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/02 08:26
S87	2	"7270661".pn. "5507802".pn.	US-PGPUB; USPAT; USOCR	OR	ON	2014/10/02 08:32
S88	9	bevel with (stylet filament) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 10:21
S89	1	"20070287996".pgnr.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:00
S90	64	(insulat$6) near4 (point tip) with (needle trocar) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:02
S91	1518	(insulat$6) near4 (point tip end) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:12

S92	7	(partial$6) near2 (cover$4) with (insulat$6) near4 (point tip end) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/02 11:12
S93	1	"20070203486".pgnr.	US-PGPUB; USPAT	OR	ON	2014/10/09 10:21
S94	522	bevel$4 with (filament tine)	US-PGPUB; USPAT	OR	ON	2014/10/09 10:28
S95	45	bevel$4 with tip with (filament tine)	US-PGPUB; USPAT	OR	ON	2014/10/09 10:37
S96	299	bevel$4 with tip with (filament tine stylet)	US-PGPUB; USPAT	OR	ON	2014/10/09 10:38
S97	16	bevel$4 with tip with (filament tine stylet) and 606/41.ccls.	US-PGPUB; USPAT	OR	ON	2014/10/09 10:39
S98	1	13/101009.app.	US-PGPUB; USPAT	OR	ON	2014/10/09 10:52
S99	2	"20070203486"	US-PGPUB; USPAT	OR	ON	2015/03/20 13:40
S100	1	"13101009"	US-PGPUB; USPAT	OR	ON	2015/03/20 17:00

S101	0	(stylet filament antenna) with (retract$4) with (offset) with (angle)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:33
S102	19	(stylet filament antenna) with (retract$4) with (offset)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:34
S103	2309	(indicia indicat$4 marking marker) with (rotat$4) with (distal) near5 (tip end)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:47
S104	11	(indicia indicat$4 marking marker) near5 (hub) with (rotat$4) with (distal) near5 (tip end)	US-PGPUB; USPAT	OR	ON	2015/03/23 10:48
S105	89	(indicia indicat$4 marking marker) near5 (hub handle) with (rotat$4) with (distal) near5 (tip end)	US-PGPUB; USPAT	OR	ON	2015/03/23 11:32
S106	2	"20070203486"	US-PGPUB; USPAT	OR	ON	2015/03/23 11:36
S107	1	"13101009"	US-PGPUB; USPAT	OR	ON	2015/03/23 12:41
S108	9	("20010012956" | "20040059328" | "20040158239" | "20060084965" | "20070112340" | "20080161804" | "20080249392" | "20080269558" | "20110213356").PN.	US-PGPUB; USPAT	OR	ON	2015/03/23 12:43
S109	106	("2001/0012956" | "2004/0059328" | "2004/0158239" | "2006/0084965" | "2007/0112340" | "2008/0161804" | "2008/0249392" | "2008/0269558" | "2011/0213356").URPN.	USPAT	OR	ON	2015/03/23 12:43

S110	167	("1653819" | "20010044596" | "20020010491" | "20020055731" | "20020077676" | "20020099323" | "20020138117" | "20020183735" | "20020183740" | "20020193831" | "20030009110" | "20030060856" | "20030088189" | "20030130711" | "20030170898" | "20030195406" | "20030208200" | "20030225360" | "20040019371" | "20040059328" | "20040059389" | "20040146877" | "20040153057" | "20040199159" | "20040243107" | "20040267189" | "20050043726" | "20050049541" | "20050165393" | "20050171523" | "20050171574" | "20050182462" | "20050261672" | "20050288730" | "20060015147" | "20060025760" | "20060079883" | "20060121610" | "20060212078" | "20060217703" | "20060264752" | "20070016183" | "20070043345" | "20070118069" | "20070203486" | "20080052786" | "20080154259" | "20080167649" | "20090062792" | "20090228001" | "20090281477" | "20100049190" | "20100087813" | "20100130975" | "20100222677" | "20110202053" | "20120165813" | "20120310236" | "20130110106" | "4016886" | "4226246" | "4262672" | "4407943" | "4810963" | "4907601" | "4946793" | "5019034" | "5052391" | "5058605" | "5098843" | "5134070" | "5173158" | "5193537" | "5273525" | "5283194" | "5318563" | "5328451" | "5389069" | "5403311" | "5425752" | "5439440" | "5458625" | "5533999" | "5536240" | "5575811" | "5626146" | "5634899" | "5674267" | "5702359" | "5720921" | "5778894" | "5782882" | "5800378" | "5810762" | "5836905" | "5843026" | "5873849" | "5919142" | "5947889" | "5983131" | "5991697" | "5999847" | "6009347" | "6010613" | "6016452").PN. OR ("6041252" | "6055453" | "6068650" | "6085115" | "6090106" | "6102885" | "6106521" | "6109270" | "6122599" | "6132419" | "6159163" | "6208893" | "6210402" | "6212433" | "6216034" | "6219577" | "6241702" | "6261831" | "6278895" | "6300108" | "6326177" | "6347247" | "6349233" | "6351674" | "6387671" | "6403348" | "6470211" | "6482619" | "6493592" | "6500173" | "6526320" | "6562604" | "6607529" | "6611706" | "6613211" | "6627421" | "6653091" | "6669691" | "6692493" | "6697669" | "6697670" | "6702808" | "6795728" | "6801804" | "6865416" | "6881213" | "6892099" | "6912417" | "6927049" | "6962587" | "6972014" | "6994706" | "7053063" | "7063698" | "7130697" | "7211083" | "7267676" | "7387626" | "7455675" | "7771401" | "8511317").PN. OR ("8753335").URPN.	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:44

S111	273	S109 S110	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:45
S112	2	S111 and (rotat$4) near3 (mechanism) with (advancement advanc$4 deploy$4 retract$4)	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:46
S113	3	S111 and (rotat$4) near3 (mechanism) same(advancement advanc$4 deploy$4 retract$4)	US-PGPUB; USPAT; USOCR	OR	ON	2015/03/23 12:46
S114	628	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2018/09/10 20:23
S115	25	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2018/09/10 20:23
S116	0	((("NIMBUS") near3 ("CONCEPTS") near3 ("LLC"))).AS,AANM.	USPAT	OR	OFF	2018/09/10 20:23
S117	2	"20060084965"	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:25

S118	66	("20040158239" | "20050080409" | "20050107781" | "20060217702" | "3174851" | "3351463" | "3753700" | "5472441" | "5507743" | "5536267" | "5827276" | "5855576" | "6090105").PN. OR ("7229438").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:25
S119	5060	(A61B18/1477 or A61B2018/1467).cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:28
S120	739	S119 and (stylet)	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:28
S121	402	S119 and (stylet) and monopolar	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:28
S122	109	S119 and (stylet filaments) with actuat$4	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:41
S123	2	"13101009"	US-PGPUB; USPAT;	OR	OFF	2018/09/10 20:43

			USOCR			
S124	8841	(A61B2018/1253 or A61B2018/00577).cpc.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:51
S125	1129	S124 and (stylet filament)	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 20:51
S126	1	"5364351".pn.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/09/10 21:18
S127	175	("5672173" | "5697536" | "5814066" | "5827276" | "6033401" | "6241725" | "6264651" | "6302898" | "6478793" | "6562059" | "6602248").PN. OR ("7108696").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2019/08/29 10:26
S128	451	("3987795" | "3991770" | "4033351" | "4043342" | "4121592" | "4237898" | "4289135" | "4303636" | "4346715" | "4411266" | "4565200" | "4574782" | "4586490" | "4660571" | "4763671" | "4800899" | "4838265" | "4907589" | "4920978" | "4931047" | "4940064" | "4945912" | "4976680" | "4976711" | "5003991" | "5009656" | "5013312" | "5015227" | "5026959" | "5047027" | "5057107" | "5059199" | "5067952" | "5071419" | "5078717" | "5080660" | "5084045" | "5085659" | "5100423" | "5115818" | "5125928" | "5128147" | "5183455" | "5190539" | "5197466" | "5197963" | "5205289" | "5207675" | "5215103" | "5217458" | "5246438" | "5251645" | "5252922" | "5267994" | "5277696" |	US-PGPUB; USPAT; USOCR	OR	OFF	2019/08/29 10:52

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S131	219	("2006/0095029").URPN.	USPAT	OR	OFF	2019/08/30 08:26
S132	198	S131 and deploy$4	USPAT	OR	OFF	2019/08/30 08:26
S133	65	S131 and deploy$4 same (thread$4 helical$4 track$4)	USPAT	OR	OFF	2019/08/30 08:27
S134	63	(US-20040260282-$ or US-20050101950-$ or US-20060189972-$ or US-20060206133-$ or US-20060206132-$ or US-20060206131-$ or US-20090221998-$ or US-20090024124-$ or	US-PGPU	OR	OFF	2019/08/30 10:21

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S135	205	(a61b18/$5.cpc. a61b2018/$5.cpc.) and (hypotube) with (needle cannula)	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:01
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S139	1	"6878147".pn.	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:30

S140	1	"15225945"	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:34
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S142	272	(a61b18/$5.cpc. a61b2018/$5.cpc.) and conduct$4 near5 inner near10 (cannula needle trocar)	US-PGPUB; USPAT	OR	OFF	2019/08/30 11:46
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S144	659	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2019/08/30 13:00
S145	120	((ROBERT) near2 (WRIGHT)).INV.	EPO; JPO; DERWENT	OR	ON	2019/08/30 13:00
S146	26	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2019/08/30 13:00
S147	5	((SCOTT) near2 (BRANDT)).INV.	EPO; JPO; DERWENT	OR	ON	2019/08/30 13:00

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S152	6	"20070112340" "20080161804" "20080249392"	US-PGPUB; USPAT	OR	OFF	2020/03/16 18:06

			; USOCR			
S153	130	(behl.in. epstein.in.) and 606/$5.ccls.	US-PGPUB; USPAT; USOCR	OR	OFF	2020/03/16 19:17
S154	16	"11429921" "11173928"	US-PGPUB; USPAT; USOCR	OR	OFF	2020/03/16 19:19
S155	2	"20020095080"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO	OR	OFF	2020/03/16 22:54
S156	673	((ROBERT) near2 (WRIGHT)).INV.	US-PGPUB; USPAT	OR	ON	2020/03/17 13:53
S157	26	((SCOTT) near2 (BRANDT)).INV.	US-PGPUB; USPAT	OR	ON	2020/03/17 13:53
S158	15	(US-15796806-$ | US-55503426-$ | US-5961471-$ | US-6245064-$ | US-6424861-$ | US-7051569-$ | US-7111502-$ | US-7182509-$ | US-7204122-$ | US-7297123-$ | US-7344679-$	US-PGPUB; USPAT	OR	ON	2020/03/17 14:31

		| US-7395103-$ | US-7574902-$ | US-7762718-$ | US-7905134-$ | US-7908906-$ | US-8020433-$).DID.				

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L6	207705	(filaments probe).clm.	US-PGPUB; USPAT	OR	ON	2020/04/06 18:47
L7	462	(filaments and probe).clm.	US-PGPUB; USPAT	OR	ON	2020/04/06 18:47
L8	88	(filaments and probe and electrode).clm.	US-PGPUB; USPAT	OR	ON	2020/04/06 18:47
L9	70	(filaments and probe).clm. and (a61b18/$5.cpc. a61b2018/$5.cpc.)	US-PGPUB; USPAT	OR	ON	2020/04/06 18:50
L10	2	"20060084965"	US-PGPUB; USPAT	OR	ON	2020/04/06 18:59
L11	4	"20070006215" "7108696".pn. "6989004".pn.	US-PGPUB; USPAT	OR	ON	2020/04/06 19:06
L12	46	("20020022864" | "20020133148" | "20030199862" | "20040064137" | "20070010809" | "20070213703" | "20080249523" | "20090306604" | "20100076340" | "20110184403" | "20130096549" | "20170065334" | "5383917" | "5486161" | "5749846" | "5893847" | "6045532" | "6105581" | "6210406" | "6216043" | "6221071" | "6287304" | "6461314" | "6471695" | "6699242" | "6740080" | "6752804" | "6962587" | "6989004" | "7229438" | "7318822" |	US-PGPUB; USPAT	OR	ON	2020/04/06 19:12

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4/6/2020 7:15:32 PM
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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5383917		1995-01-24	Desai et al.	
	2	5486161		1996-01-23	Lax et al.	
	3	5749846		1998-05-12	Edwards et al.	
	4	5893847		1999-04-13	Kordis	
	5	6045532		2000-04-04	Eggers et al.	
	6	6105581		2000-08-22	Eggers et al.	
	7	6210406		2001-04-03	Webster	
	8	6216043		2001-04-10	Swanson et al.	

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	9	6221071		2001-04-24	Sherry et al.	
	10	6287304		2001-09-11	Eggers et al.	
	11	6461314		2002-10-08	Pant et al.	
	12	6471695		2002-10-29	Behl	
	13	6699242		2004-03-02	Heggeness	
	14	6740080		2004-05-25	Jain et al.	
	15	6752804		2004-06-22	Simpson et al.	
	16	6962587		2005-11-08	Johsnon et al.	
	17	6989004		2006-01-24	Hinchliffe et al.	
	18	7229438		2007-06-12	Young	
	19	7318822		2008-01-15	Darmos et al.	

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	20	7344533		2008-03-18	Pearson et al.	
	21	7393351		2008-07-01	Woloszko et al.	
	22	7399299		2008-07-15	Daniel et al.	
	23	7416549		2008-08-26	Young et al.	
	24	7419487		2008-09-02	Johnson et al.	
	25	7458971		2008-12-02	Zerfas et al.	
	26	7678107		2010-03-16	Young	
	27	7846157		2010-12-07	Kozel	
	28	7896871		2011-03-01	Bhushan et al.	
	29	8262574		2012-09-11	Placek et al.	
	30	8512330		2013-08-20	Epstein et al.	

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	31	8518037		2013-08-27	Young	
	32	8753335		2014-06-17	Moshe et al.	
	33	9402560		2016-08-02	Organ et al.	
	34	9675406		2017-06-13	Moss et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20020022864		2002-02-21	Mahvi et al.	
	2	20020133148		2002-09-19	Daniel et al.	
	3	20030199862		2003-10-23	Simpson et al.	
	4	20040064137		2004-04-01	Pellegrino et al.	
	5	20070010809		2007-01-11	Hovda et al.	

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	6	20070213703		2007-09-13	Naam et al.	
	7	20080249523		2008-10-09	McPherson et al.	
	8	20090306604		2009-12-10	Darmos et al.	
	9	20100076340		2010-03-25	Eckstein et al.	
	10	20110184403		2011-07-28	Brannan	
	11	20130096549		2013-04-18	Organ et al.	
	12	20170065334		2017-03-09	Wright et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2017203754	AU		2017-06-22	Diros Technology Inc.		
	2	1211171	CN	A	1999-03-17	RITA MEDICAL SYSTEMS, INC.		X

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	3	1338909	CN	A	2002-03-06	Transurgical, Inc.		☒
	4	2418844	CN		2001-02-14	LOW TEMPERATURE TECHNOLOGY TESTING CENTER		☒
	5	1645235	EP	B1	2010-11-08	Covidien AG		☐
	6	1059067	EP	B1	2005-04-06	Sherwood Services AG		☐
	7	2003-527888	JP		2003-09-24	NEOTHERMIA CORPORATION		☒
	8	2009-504201	JP		2009-02-05	HALT MEDICAL, INC.		☒
	9	4290894	JP	B2	2009-04-10	ASUROKEA CORP		☒
	10	2001-527428	JP		2001-12-25	VIDAMED, INC.		☒
	11	2004-267759	JP		2004-09-30	Depuy Acromed, Inc.		☒
	12	2013-509966	JP		2013-03-21	Wright et al.		☒
	13	96/04860	WO		1996-02-22	ZOMED INTERNATIONAL, INC.		☐

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	Examiner Name	Eun Hwa Kim
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	14	96/16606	WO		1996-06-06	VIDAMED, INC.		☐
	15	97/29702	WO		1997-08-21	RITA MEDICAL SYSTEMS, INC.		☐
	16	97/06740	WO		1997-02-27	GOUGH et al.		☐
	17	97/06855	WO		1997-02-27	GOUGH et al.		☐
	18	97/06857	WO		1997-02-27	GOUGH et al.		☐
	19	99/25260	WO		1999-05-27	RITA MEDICAL SYSTEMS, INC.		☐
	20	00/06046	WO		2000-02-10	RADIOTHERAPEUTICS CORPORATION		☐
	21	01/28446	WO		2001-04-26	NEOTHERMIA CORPORATION		☐
	22	01/57655	WO		2001-08-09	BAYLOR COLLEGE OF MEDICINE		☐
	23	02/22032	WO		2002-03-21	RADIOTHERAPEUTICS CORPORATION		☐
	24	02/54941	WO		2002-07-18	RITA MEDICAL SYSTEMS, INC.		☐

Petitioner's Exhibit 1007
Avanos v. Stratus

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Attorney Docket Number	NBUS.001C1

	25	2006/044105	WO		2006-04-27	BOSTON SCIENTIFIC SCIMED, INC.		☐
	26	2006/104682	WO		2006-10-05	YOUNG		☐
	27	2007/005830	WO		2007-01-11	HALT MEDICAL, INC.		☐
	28	2008/083044	WO		2008-07-10	BOSTON SCIENTIFIC SCIMED, INC.		☐
	29	2011/113943	WO		2011-09-22	VESALIUS MEDICAL TECHNOLOGIES BVBA		☐
	30	2011/146243	WO		2011-11-24	NIMBUS CONCEPTS, LLC		☐

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Examiner Signature	/EUN HWA KIM/	Date Considered	04/06/2020

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	Art Unit	3794
	Examiner Name	Eun Hwa Kim
	Attorney Docket Number	NBUS.001C1

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Daniel C. Higgs/	Date (YYYY-MM-DD)	2019-09-26
Name/Print	Daniel C. Higgs	Registration Number	55265

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Petitioner's Exhibit 1007
Avanos v. Stratus

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.K./

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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Avanos v. Stratus
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PATENT APPLICATION
Docket No.: NBUS.001C1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Robert E. Wright	
Application No.:	15/098,673	Art Unit: 3794
Filing Date:	April 14, 2016	
Title:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	
Examiner:	Eun Hwa Kim	
Confirmation No.:	5232	
Customer No.:	148468	

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Enclosed for filing in the above-identified application is a PTO/SB/08 Equivalent listing 489 references. Each of these 489 references is of record in U.S. Patent Application No. 12/940,974, titled METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY, filed November 5, 2010 ("the Parent Application"), of which the present application is a continuation.

References Have Already Been Considered

As the present application is a continuation of the Parent Application, the Applicant believes the examiner has already considered the 489 references identified herein with respect to the present application, pursuant to MPEP § 609.02(II).

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Accordingly, the Applicant is submitting the present information disclosure statement to ensure these references are ultimately printed on the patent, pursuant to MPEP § 609.2(II).

Copies of All References Omitted

Pursuant to 37 C.F.R. § 1.98(a)(2), copies of U.S. patent application publications and U.S. patents are not required. Accordingly, no copies of reference numbers 1 through 432 are submitted.

Further, pursuant to 37 C.F.R. § 1.98(d), copies of reference numbers 433 through 489 are not required because (1) the Parent Application has been properly identified in this information disclosure statement and is relied on for an earlier effective filing date under 35 U.S.C. § 120, and (2) all information disclosure statements submitted in the Parent Application comply with 37 C.F.R. § 1.98, paragraphs (a) through (c).

Table of U.S. Patent Applications

The Applicant provides the following table to aid the Examiner during prosecution:

Attorney Docket No.	Application No.	Filing Date	Title
NBUS.001A	12/940,974 ***(the Parent Application)***	2010-11-05	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
NBUS.001C1	15/098,673 ***(the Present Application)***	2016-04-14	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
NBUS.004A	13/101,009	2011-05-04	SYSTEMS AND METHODS FOR TISSUE ABLATION
NBUS.004C1	15/092,945	2016-04-07	SYSTEMS AND METHODS FOR TISSUE ABLATION

Copies of these patent applications, including any pending claims, office actions, notices of allowance, and/or other communications, are available through PALM and/or

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PAIR. However, if the Examiner so requests, the Applicant will be happy to provide the Examiner with copies of any applications, pending claims, office actions, notices of allowance, communications, or any other documents, at any time.

DATED this 26th day of September, 2019.

Respectfully submitted,

/Daniel C. Higgs/

Daniel C. Higgs
Attorney for Applicant
Registration No. 55,265

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PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT		
	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 1 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	1.	0372,086	07-23-1996	Grasso et al.	
	2.	RE40,279	04-29-2008	Sluijter et al.	
	3.	RE40,388	06-17-2008	Gines	
	4.	4,011,872	03-15-1977	Kamiya	
	5.	4,206,761	06-10-1980	Cosman	
	6.	4,206,762	06-10-1980	Cosman	
	7.	4,281,667	08-04-1981	Cosman	
	8.	4,353,371	10-12-1982	Cosman	
	9.	4,375,220	03-01-1983	Matvias	
	10.	4,378,809	04-05-1983	Cosman	
	11.	4,385,636	05-31-1983	Cosman	
	12.	4,411,266	10-25-1983	Cosman	
	13.	4,565,200	01-21-1986	Cosman	
	14.	4,573,980	03-04-1986	Karrasch et al.	
	15.	4,583,538	04-22-1986	Onik et al.	
	16.	4,593,703	06-10-1986	Cosman	
	17.	4,618,978	10-21-1986	Cosman	
	18.	4,646,752	03-03-1987	Swann et al.	
	19.	4,653,508	03-31-1987	Cosman	
	20.	4,660,568	04-28-1987	Cosman	
	21.	4,676,255	06-30-1987	Cosman	
	22.	4,698,207	10-06-1987	Bringham et al.	
	23.	4,787,886	11-29-1988	Cosman	
	24.	4,796,615	01-10-1989	Bullock et al.	
	25.	4,827,927	05-09-1989	Newton	
	26.	4,838,265	06-13-1989	Cosman et al.	
	27.	4,886,506	12-12-1989	Lovgren et al.	
	28.	4,907,589	03-13-1990	Cosman	

Examiner Signature	Date Considered

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 2 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	29.	4,966,597	10-30-1990	Cosman	
	30.	5,010,897	04-30-1991	Leveen	
	31.	5,160,337	11-03-1992	Cosman	
	32.	5,217,457	06-08-1993	Delahuerga et al.	
	33.	5,230,623	07-27-1993	Guthrie et al.	
	34.	5,233,515	08-03-1993	Cosman	
	35.	5,244,462	09-14-1993	Delahuerga et al.	
	36.	5,257,630	11-02-1993	Braitman et al.	
	37.	5,291,896	03-08-1994	Fonger et al.	
	38.	5,304,114	04-19-1994	Cosman et al.	
	39.	5,304,115	04-19-1994	Pflueger et al.	
	40.	5,312,329	05-17-1994	Beaty et al.	
	41.	5,312,391	05-17-1994	Wilk	
	42.	5,318,013	06-07-1994	Wilk	
	43.	5,324,255	06-28-1994	Passafaro et al.	
	44.	5,334,183	08-02-1994	Wuchinich	
	45.	5,342,292	08-30-1994	Nita et al.	
	46.	5,370,645	12-06-1994	Klicek et al.	
	47.	5,370,675	12-06-1994	Edwards et al.	
	48.	5,372,596	12-13-1994	Klicek et al.	
	49.	5,377,685	01-03-1995	Kazi et al.	
	50.	5,397,301	03-14-1995	Pflueger et al.	
	51.	5,401,272	03-28-1995	Perkins	
	52.	5,421,923	06-06-1995	Clarke et al.	
	53.	5,422,567	06-06-1995	Matsunaga	
	54.	5,423,809	06-13-1995	Klicek	
	55.	5,433,739	07-18-1995	Sluijter et al.	
	56.	5,447,417	09-05-1995	Kuhl et al.	

Examiner Signature	Date Considered

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	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 3 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

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	57.	5,458,597	10-17-1995	Edwards et al.	
	58.	5,472,441	12-05-1995	Edwards et al.	
	59.	5,472,442	12-05-1995	Klicek	
	60.	5,474,057	12-12-1995	Makower et al.	
	61.	5,484,398	01-16-1996	Stoddard	
	62.	5,496,312	03-05-1996	Klicek	
	63.	5,507,743	04-16-1996	Edwards et al.	
	64.	5,511,564	04-30-1996	Wilk	
	65.	5,514,129	05-07-1996	Smith	
	66.	5,536,267	07-16-1996	Edwards et al.	
	67.	5,541,376	07-30-1996	Ladtkow et al.	
	68.	5,560,358	10-01-1996	Arnold et al.	
	69.	5,562,703	10-08-1996	Desai	
	70.	5,571,147	11-05-1996	Sluijter et al.	
	71.	5,580,665	12-03-1996	Taguchi et al.	
	72.	5,599,345	02-04-1997	Edwards et al.	
	73.	5,599,346	02-04-1997	Edwards et al.	
	74.	5,611,709	03-18-1997	McAnulty	
	75.	5,613,966	03-25-1997	Makower et al.	
	76.	5,628,743	05-13-1997	Cimino	
	77.	5,662,111	09-02-1997	Cosman	
	78.	5,662,620	09-02-1997	Lieber et al.	
	79.	5,662,680	09-02-1997	Desai	
	80.	5,667,488	09-16-1997	Lundquist et al.	
	81.	5,669,904	09-23-1997	Platt, Jr. et al.	
	82.	5,672,173	09-30-1997	Gough et al.	
	83.	5,672,174	09-30-1997	Gough et al.	
	84.	5,683,349	11-04-1997	Makower et al.	

Examiner Signature	Date Considered

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT		
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	First Named Inventor	Robert E. Wright
	Art Unit	3794
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SHEET 4 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

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	85.	5,683,384	11-04-1997	Gough et al.	
	86.	5,701,575	12-23-1997	Taguchi et al.	
	87.	5,720,744	02-24-1998	Eggleston et al.	
	88.	5,728,143	03-17-1998	Gough et al.	
	89.	5,735,847	04-07-1998	Gough et al.	
	90.	5,738,648	04-14-1998	Lands et al.	
	91.	5,748,703	05-05-1998	Cosman	
	92.	5,749,689	05-12-1998	Konig	
	93.	5,755,754	05-26-1998	Rudie et al.	
	94.	5,768,679	06-16-1998	Taguchi et al.	
	95.	5,772,659	06-30-1998	Becker et al.	
	96.	5,778,043	07-07-1998	Cosman	
	97.	5,782,827	07-21-1998	Gough et al.	
	98.	5,792,146	08-11-1998	Cosman	
	99.	5,797,906	08-25-1998	Rhum et al.	
	100.	5,800,484	09-01-1998	Gough et al.	
	101.	5,807,309	09-15-1998	Lundquist et al.	
	102.	5,810,804	09-22-1998	Gough et al.	
	103.	5,827,271	10-27-1998	Buysse et al.	
	104.	5,827,276	10-27-1998	LeVeen et al.	
	105.	5,848,967	12-15-1998	Cosman	
	106.	5,855,576	01-05-1999	LeVeen et al.	
	107.	5,863,290	01-26-1999	Gough et al.	
	108.	5,868,740	02-09-1999	LeVeen et al.	
	109.	5,911,739	06-15-1999	Kordis et al.	
	110.	5,913,855	06-22-1999	Gough et al.	
	111.	5,921,992	07-13-1999	Costales et al.	
	112.	5,925,042	07-20-1999	Gough et al.	

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	113.	5,928,229	07-27-1999	Gough et al.	
	114.	5,935,123	08-10-1999	Edwards et al.	
	115.	5,951,547	09-14-1999	Gough et al.	
	116.	5,968,040	10-19-1999	Swanson et al.	
	117.	5,980,517	11-09-1999	Gough	
	118.	5,983,141	11-09-1999	Sluijter et al.	
	119.	6,006,126	12-21-1999	Cosman	
	120.	6,013,076	01-11-2000	Goble et al.	
	121.	6,014,590	01-11-2000	Whayne et al.	
	122.	6,015,406	01-18-2000	Goble et al.	
	123.	6,016,452	01-18-2000	Kasevich	
	124.	6,039,733	03-21-2000	Buysse et al.	
	125.	6,041,260	03-21-2000	Stern et al.	
	126.	6,044,846	04-04-2000	Edwards	
	127.	6,050,992	04-18-2000	Nichols	
	128.	6,053,937	04-25-2000	Edwards et al.	
	129.	6,059,780	05-09-2000	Gough et al.	
	130.	6,068,627	05-30-2000	Orszulak et al.	
	131.	6,071,280	06-06-2000	Edwards et al.	
	132.	6,080,150	06-27-2000	Gough	
	133.	6,090,105	07-18-2000	Zepeda et al.	
	134.	6,106,521	08-22-2000	Blewett et al.	
	135.	6,117,134	09-12-2000	Cunningham et al.	
	136.	6,122,341	09-19-2000	Butler et al.	
	137.	6,129,726	10-10-2000	Edwards et al.	
	138.	6,132,425	10-17-2000	Gough	
	139.	6,139,519	10-31-2000	Blythe	
	140.	6,139,547	10-31-2000	Lontine et al.	

Examiner Signature	Date Considered

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PTO/SB/08 Equivalent

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	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 6 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

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	141.	6,143,003	11-07-2000	Cosman	
	142.	6,146,380	11-14-2000	Racz et al.	
	143.	6,161,048	12-12-2000	Sluijter et al.	
	144.	6,165,169	12-26-2000	Panescu et al.	
	145.	6,167,295	12-26-2000	Cosman	
	146.	6,179,834	01-30-2001	Buysse et al.	
	147.	6,210,403	04-03-2001	Klicek	
	148.	6,213,999	04-10-2001	Platt, Jr. et al.	
	149.	6,217,554	04-17-2001	Green	
	150.	6,228,080	05-08-2001	Gines	
	151.	6,228,083	05-08-2001	Lands et al.	
	152.	6,231,570	05-15-2001	Tu et al.	
	153.	6,234,178	05-22-2001	Goble et al.	
	154.	6,235,023	05-22-2001	Lee et al.	
	155.	6,241,725	06-05-2001	Cosman	
	156.	6,241,726	06-05-2001	Chia et al.	
	157.	6,246,912	06-12-2001	Sluijter et al.	
	158.	6,251,106	06-26-2001	Becker et al.	
	159.	6,259,952	07-10-2001	Sluijter et al.	
	160.	6,268,200	07-31-2001	Tucker et al.	
	161.	6,275,725	08-14-2001	Cosman	
	162.	6,277,117	08-21-2001	Tetzlaff et al.	
	163.	6,280,441	08-28-2001	Ryan	
	164.	6,312,426	11-06-2001	Goldberg et al.	
	165.	6,330,478	12-11-2001	Lee et al.	
	166.	6,331,180	12-18-2001	Cosman et al.	
	167.	6,334,861	01-01-2002	Chandler et al.	
	168.	6,352,536	03-05-2002	Buysse et al.	

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	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
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U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	169.	6,402,743	06-11-2002	Orszulak et al.	
	170.	6,402,747	06-11-2002	Lindermann et al.	
	171.	6,405,072	06-11-2002	Cosman	
	172.	6,416,520	07-09-2002	Kynast et al.	
	173.	6,419,653	07-16-2002	Edwards et al.	
	174.	6,419,680	07-16-2002	Cosman et al.	
	175.	6,419,798	07-16-2002	Topolkaraev et al.	
	176.	6,425,887	07-30-2002	McGuckin et al.	
	177.	6,440,127	08-27-2002	McGovern et al.	
	178.	6,447,477	09-10-2002	Burney et al.	
	179.	6,447,505	09-10-2002	McGovern et al.	
	180.	6,451,018	09-17-2002	Lands et al.	
	181.	6,454,765	09-24-2002	Leveen et al.	
	182.	6,458,130	10-01-2002	Frazier et al.	
	183.	6,459,769	10-01-2002	Cosman	
	184.	6,464,704	10-15-2002	Schmaltz et al.	
	185.	6,468,273	10-22-2002	Leveen et al.	
	186.	6,471,698	10-29-2002	Edwards et al.	
	187.	6,478,793	11-12-2002	Cosman et al.	
	188.	6,500,175	12-31-2002	Gough et al.	
	189.	6,506,189	01-14-2003	Rittman, III et al.	
	190.	6,517,534	02-11-2003	McGovern et al.	
	191.	6,530,922	03-11-2003	Cosman et al.	
	192.	6,533,987	03-18-2003	Topolkaraev et al.	
	193.	6,551,311	04-22-2003	Lee et al.	
	194.	6,562,033	05-13-2003	Shah et al.	
	195.	6,565,562	05-20-2003	Shah et al.	
	196.	6,569,159	05-27-2003	Edwards et al.	

Examiner Signature	Date Considered

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT		
	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
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U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	197.	6,575,967	06-10-2003	Leveen et al.	
	198.	6,575,969	06-10-2003	Rittman, III et al.	
	199.	6,585,735	07-01-2003	Frazier et al.	
	200.	6,602,249	08-05-2003	Stoddard et al.	
	201.	6,605,085	08-12-2003	Edwards	
	202.	6,610,054	08-26-2003	Edwards et al.	
	203.	6,622,731	09-23-2003	Daniel et al.	
	204.	6,623,481	09-23-2003	Garbagnati et al.	
	205.	6,632,221	10-14-2003	Edwards et al.	
	206.	6,632,222	10-14-2003	Edwards et al.	
	207.	6,638,275	10-28-2003	McGaffigan et al.	
	208.	6,641,580	11-04-2003	Edwards et al.	
	209.	6,645,201	11-11-2003	Utley et al.	
	210.	6,652,515	11-25-2003	Maguire et al.	
	211.	6,652,516	11-25-2003	Gough	
	212.	6,660,002	12-09-2003	Edwards et al.	
	213.	6,660,362	12-09-2003	Lindsay et al.	
	214.	6,663,624	12-16-2003	Edwards et al.	
	215.	6,669,693	12-30-2003	Friedman	
	216.	6,682,526	01-27-2004	Jones et al.	
	217.	6,682,528	01-27-2004	Frazier et al.	
	218.	6,685,701	02-03-2004	Orszulak et al.	
	219.	6,689,127	02-10-2004	Gough et al.	
	220.	6,690,210	02-10-2004	Hadjizada et al.	
	221.	6,692,490	02-17-2004	Edwards	
	222.	6,706,152	03-16-2004	Burazin et al.	
	223.	6,723,092	04-20-2004	Brown et al.	
	224.	6,743,226	06-01-2004	Cosman et al.	

Examiner Signature	Date Considered

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	First Named Inventor	Robert E. Wright
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U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	225.	6,743,229	06-01-2004	Buysse et al.	
	226.	6,746,570	06-08-2004	Burazin et al.	
	227.	6,749,719	06-15-2004	Burazin et al.	
	228.	6,770,070	08-03-2004	Balbierz	
	229.	6,780,180	08-24-2004	Goble et al.	
	230.	6,803,549	10-12-2004	Yu	
	231.	6,814,712	11-09-2004	Edwards et al.	
	232.	6,837,956	01-04-2005	Cowell et al.	
	233.	6,846,448	01-25-2005	Rymer et al.	
	234.	6,847,848	01-25-2005	Sterzer et al.	
	235.	6,852,091	02-08-2005	Edwards et al.	
	236.	6,866,663	03-15-2005	Edwards et al.	
	237.	6,881,214	04-19-2005	Cosman et al.	
	238.	6,889,089	05-03-2005	Behl et al.	
	239.	6,896,675	05-24-2005	Leung et al.	
	240.	6,932,810	08-23-2005	Ryan	
	241.	6,958,062	10-25-2005	Gough et al.	
	242.	6,958,064	10-25-2005	Rioux et al.	
	243.	6,961,602	11-01-2005	Fuimaono et al.	
	244.	6,964,660	11-15-2005	Maguire et al.	
	245.	6,966,908	11-22-2005	Maguire et al.	
	246.	6,974,455	12-13-2005	Garabedian et al.	
	247.	6,997,925	02-14-2006	Maguire et al.	
	248.	7,025,767	04-11-2006	Schaefer et al.	
	249.	7,033,353	04-25-2006	Stoddard et al.	
	250.	7,044,949	05-16-2006	Orszulak et al.	
	251.	7,048,733	05-23-2006	Hartley et al.	
	252.	7,056,320	06-06-2006	Utley et al.	

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	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
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U.S. PATENT DOCUMENTS

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	253.	7,074,484	07-11-2006	Topolkaraev et al.	
	254.	7,076,399	07-11-2006	Godara	
	255.	7,087,051	08-08-2006	Bourne et al.	
	256.	7,099,712	08-29-2006	Fuimaono et al.	
	257.	7,108,696	09-19-2006	Daniel et al.	
	258.	7,112,197	09-26-2006	Hartley et al.	
	259.	7,115,124	10-03-2006	Xiao	
	260.	7,138,088	11-21-2006	Wariar et al.	
	261.	7,150,743	12-19-2006	Zvuloni et al.	
	262.	7,150,744	12-19-2006	Edwards et al.	
	263.	7,160,296	01-09-2007	Pearson et al.	
	264.	7,163,536	01-16-2007	Godara	
	265.	7,179,256	02-20-2007	Mest	
	266.	7,179,258	02-20-2007	Buysse et al.	
	267.	7,207,990	04-24-2007	Lands et al.	
	268.	7,258,688	08-21-2007	Shah et al.	
	269.	7,266,414	09-04-2007	Cornelius et al.	
	270.	7,270,660	09-18-2007	Ryan	
	271.	7,270,662	09-18-2007	Visram et al.	
	272.	7,276,064	10-02-2007	Paul et al.	
	273.	7,281,666	10-16-2007	Smith	
	274.	7,294,127	11-13-2007	Leung et al.	
	275.	7,306,596	12-11-2007	Hillier et al.	
	276.	7,311,702	12-25-2007	Tallarida et al.	
	277.	7,340,307	03-04-2008	Maguire et al.	
	278.	7,354,436	04-08-2008	Rioux et al.	
	279.	7,357,798	04-15-2008	Sharps et al.	
	280.	7,371,234	05-13-2008	Young	

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	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
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U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	281.	7,387,626	06-17-2008	Edwards et al.	
	282.	7,387,630	06-17-2008	Mest	
	283.	7,416,549	08-26-2008	Young et al.	
	284.	7,449,020	11-11-2008	Edwards et al.	
	285.	7,468,062	12-23-2008	Oral et al.	
	286.	7,480,533	01-20-2009	Cosman et al.	
	287.	7,517,346	04-14-2009	Sloan et al.	
	288.	7,524,318	04-28-2009	Young et al.	
	289.	7,533,002	05-12-2009	Godara	
	290.	7,549,986	06-23-2009	Rioux et al.	
	291.	7,561,907	07-14-2009	Fuimaono et al.	
	292.	7,593,778	09-22-2009	Chandran et al.	
	293.	7,596,469	09-29-2009	Godara	
	294.	7,615,050	11-10-2009	Cross et al.	
	295.	7,670,336	03-02-2010	Young et al.	
	296.	7,670,337	03-02-2010	Young	
	297.	7,678,106	03-16-2010	Lee	
	298.	7,699,844	04-20-2010	Utley et al.	
	299.	7,704,248	04-27-2010	Dicarlo	
	300.	7,771,420	08-10-2010	Butty et al.	
	301.	7,794,458	09-14-2010	McIntyre et al.	
	302.	7,794,459	09-14-2010	Faure	
	303.	7,797,049	09-14-2010	Christopherson et al.	
	304.	7,799,021	09-21-2010	Leung et al.	
	305.	7,815,571	10-19-2010	Deckman et al.	
	306.	7,819,869	10-26-2010	Godara et al.	
	307.	7,819,871	10-26-2010	Paul et al.	
	308.	7,824,404	11-02-2010	Godara et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
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U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	309.	7,828,796	11-09-2010	Wong et al.	
	310.	7,874,986	01-25-2011	Deckman et al.	
	311.	7,875,025	01-25-2011	Cockburn et al.	
	312.	7,892,231	02-22-2011	Elliott	
	313.	7,896,874	03-01-2011	Young et al.	
	314.	2002/0026185	02-28-2002	Gough	
	315.	2002/0029037	03-07-2002	Kim	
	316.	2002/0188275	12-12-2002	McGuckin, Jr.	
	317.	2003/0018332	01-23-2003	Schmaltz et al.	
	318.	2003/0078595	04-24-2003	Cosman	
	319.	2004/0006336	01-08-2004	Swanson	
	320.	2004/0015176	01-22-2004	Cosman	
	321.	2004/0015218	01-22-2004	Finch et al.	
	322.	2004/0100376	05-27-2004	Lye et al.	
	323.	2004/0122482	06-24-2004	Tung et al.	
	324.	2004/0143262	07-22-2004	Visram et al.	
	325.	2004/0176759	09-09-2004	Krishnamurthy et al.	
	326.	2004/0230187	11-18-2004	Lee et al.	
	327.	2004/0260282	12-23-2004	Gough et al.	
	328.	2005/0033279	02-10-2005	Edwards et al.	
	329.	2005/0059964	03-17-2005	Fitz	
	330.	2005/0101944	05-12-2005	Williams	
	331.	2005/0101950	05-12-2005	Gough et al.	
	332.	2005/0165391	07-28-2005	Maguire et al.	
	333.	2005/0171522	08-04-2005	Christopherson	
	334.	2005/0177209	08-11-2005	Leung et al.	
	335.	2005/0177211	08-11-2005	Leung et al.	
	336.	2005/0203503	09-15-2005	Edwards et al.	

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	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
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U.S. PATENT DOCUMENTS

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	337.	2005/0234445	10-20-2005	Conquergood et al.	
	338.	2005/0240174	10-27-2005	Pearson et al.	
	339.	2005/0267552	12-01-2005	Conquergood et al.	
	340.	2005/0277918	12-15-2005	Shah et al.	
	341.	2006/0015161	01-19-2006	Longo et al.	
	342.	2006/0089635	04-27-2006	Young et al.	
	343.	2006/0095115	05-04-2006	Bladillah et al.	
	344.	2006/0111702	05-25-2006	Oral et al.	
	345.	2006/0122686	06-08-2006	Gilad et al.	
	346.	2006/0122692	06-08-2006	Gilad et al.	
	347.	2006/0142756	06-29-2006	Davies et al.	
	348.	2006/0173359	08-03-2006	Lin et al.	
	349.	2006/0189972	08-24-2006	Grossman	
	350.	2006/0200121	09-07-2006	Mowery	
	351.	2006/0206127	09-14-2006	Conquergood et al.	
	352.	2006/0206128	09-14-2006	Conquergood et al.	
	353.	2006/0206129	09-14-2006	Conquergood et al.	
	354.	2006/0206130	09-14-2006	Conquergood et al.	
	355.	2006/0206131	09-14-2006	Conquergood et al.	
	356.	2006/0206132	09-14-2006	Conquergood et al.	
	357.	2006/0206133	09-14-2006	Conquergood et al.	
	358.	2006/0206134	09-14-2006	Conquergood et al.	
	359.	2006/0217705	09-28-2006	Godara et al.	
	360.	2006/0247616	11-02-2006	Edwards et al.	
	361.	2006/0259026	11-16-2006	Godara et al.	
	362.	2006/0259027	11-16-2006	Kwan et al.	
	363.	2006/0271036	11-30-2006	Garabedian et al.	
	364.	2007/0006215	01-04-2007	Epstein et al.	

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	365.	2007/0016183	01-18-2007	Lee et al.	
	366.	2007/0027449	02-01-2007	Godara et al.	
	367.	2007/0060921	03-15-2007	Janssen et al.	
	368.	2007/0112342	05-17-2007	Pearson et al.	
	369.	2007/0118191	05-24-2007	Godara	
	370.	2007/0123964	05-31-2007	Davies et al.	
	371.	2007/0156136	07-05-2007	Godara et al.	
	372.	2007/0161905	07-12-2007	Munrow	
	373.	2007/0167943	07-19-2007	Janssen et al.	
	374.	2007/0179380	08-02-2007	Grossman	
	375.	2007/0179491	08-02-2007	Kratoska et al.	
	376.	2007/0185522	08-09-2007	Davies et al.	
	377.	2007/0203402	08-30-2007	Godara et al.	
	378.	2007/0203486	08-30-2007	Young	
	379.	2007/0260234	11-08-2007	Mccullagh et al.	
	380.	2007/0282321	12-06-2007	Shah et al.	
	381.	2008/0015569	01-17-2008	Saadat et al.	
	382.	2008/0033493	02-07-2008	Deckman et al.	
	383.	2008/0045939	02-21-2008	Lee	
	384.	2008/0045940	02-21-2008	Lee	
	385.	2008/0048786	02-28-2008	Feldkamp et al.	
	386.	2008/0065062	03-13-2008	Leung et al.	
	387.	2008/0154259	06-26-2008	Gough et al.	
	388.	2008/0167646	07-10-2008	Godara et al.	
	389.	2008/0167649	07-10-2008	Edwards et al.	
	390.	2008/0208121	08-28-2008	Youssef et al.	
	391.	2008/0228180	09-18-2008	Epstein	
	392.	2008/0228181	09-18-2008	Godara et al.	

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	394.	2008/0275443	11-06-2008	Oral et al.	
	395.	2009/0024124	01-22-2009	Lefler et al.	
	396.	2009/0054962	02-26-2009	Lefler et al.	
	397.	2009/0099544	04-16-2009	Munrow et al.	
	398.	2009/0131790	05-21-2009	Munrow et al.	
	399.	2009/0138011	05-28-2009	Epstein	
	400.	2009/0187177	07-23-2009	Epstein	
	401.	2009/0187182	07-23-2009	Epstein et al.	
	402.	2009/0187183	07-23-2009	Epstein	
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Examiner Signature	Date Considered

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 16 OF 20	Attorney Docket No.	NBUS.001C1

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SHEET 19 OF 20	Attorney Docket No.	NBUS.001C1

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SHEET 20 OF 20	Attorney Docket No.	NBUS.001C1

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	476.	Patent Examination Report issued in Australian Application No. 2010314930, dated July 26, 2013.	
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Examiner Signature	/EUN HWA KIM/	Date Considered	04/06/2020

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OK TO ENTER: /E.K/

PATENT APPLICATION
Docket No.: NBUS.001C1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Robert E. Wright	
Application No.:	15/098,673	Art Unit: 3794
Filing Date:	April 14, 2016	
Title:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	
Examiner:	Eun Hwa Kim	
Confirmation No.:	5232	
Customer No.:	148468	

AMENDMENT AND RESPONSE TO OFFICE ACTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Responsive to the Office Action dated March 19, 2020, the Applicant respectfully requests reconsideration of the pending claims in view of the amendments and remarks herein.

Amendments to the Claims are reflected in the listing of claims which begins on page 2.

Remarks begin on page 17.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Petitioner's Exhibit 1007
Avanos v. Stratus

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.H.K/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

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SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Daniel C. Higgs/	Date (YYYY-MM-DD)	2019-09-26
Name/Print	Daniel C. Higgs	Registration Number	55265

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Avanos v. Stratus

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Avanos v. Stratus
Page 583 of 691

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

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	Examiner Name	Eun Hwa Kim
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	1	IP AUSTRALIA, Examination Report No. 1 for Standard Patent Application for Australian Patent Application No. 2019200358, dated 20 April 2020, 3 pages.
	2	CANADIAN INTELLECTUAL PROPERTY OFFICE, Office Action for Canadian Patent Application No. 2,778,997, dated 15 May 2020, 3 pages.

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Electronic Patent Application Fee Transmittal

Application Number:	15098673
Filing Date:	14-Apr-2016
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Filer:	Daniel Christopher Higgs
Attorney Docket Number:	NBUS.001C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
		Total in USD ($)		**120**

Electronic Acknowledgement Receipt

EFS ID:	39630224
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	04-JUN-2020
Filing Date:	14-APR-2016
Time Stamp:	16:32:43
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$120
RAM confirmation Number	E202064G33429842
Deposit Account	602176
Authorized User	Daniel Higgs

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37 CFR 1.20 (Post Issuance fees)

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IDS_NBUS001C1_4.pdf	1034430 c56e341db33d81db4a1f455ea51a49f5ab4f6e55	no	4
Warnings:					
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2	Non Patent Literature	NBUS001AUD3_OA1.pdf	121204 5b861cc1de07ba916b9d274826b9e0f8eb201820	no	3
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3	Non Patent Literature	NBUS001CA_OA3.pdf	2570979 b27ae228c0f79b60cc9446a3b01d19d54e2f5c2a	no	3
Warnings:					
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4	Fee Worksheet (SB06)	fee-info.pdf	30617 c7c5d9188ada1db579590888f76159a6eb6986a4	no	2
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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1	DAVID LAWSON MORRIS, Affidavit Submitted in Federal Court of Australia Case No. NSD 438 of 2019, dated 17 April 2020, 29 pages.
	2	SUSANNE MONICA HANTOS, Affidavit Submitted in Federal Court of Australia Case No. NSD 438 of 2019, dated 21 April 2020, 765 pages.
	3	PETER DARMOS, Affidavit Submitted in Federal Court of Australia Case No. NSD 438 of 2019, dated 21 April 2020, 716 pages.
	4	WILLIAM SAMUAL HUNTER, Affidavit Submitted in Federal Court of Australia Case No. NSD 438 of 2019, dated 6 April 2020, 158 pages.
	5	DANIEL CHRISTOPHER HIGGS, Affidavit Submitted in Federal Court of Australia Case No. NSD 438 of 2019, dated 6 April 2020, 26 pages.
	6	CANADIAN INTELLECTUAL PROPERTY OFFICE, Office Action for Canadian Patent Application No. 2,799,505, dated 8 April 2020, 4 pages.
	7	EUROPEAN PATENT OFFICE, Decision to Grant a European Patent Pursuant to Article 97(1) EPC for European Patent Application No. 11783944.9, dated 28 May 2020, 2 pages.
	8	UNITED STATES PATENT AND TRADEMARK OFFICE, Notice of Allowance for U.S. Patent Application No. 15/092,945, dated 16 March 2020, 16 pages.

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	15098673
Filing Date:	14-Apr-2016
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Filer:	Daniel Christopher Higgs
Attorney Docket Number:	NBUS.001C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
		Total in USD ($)		**120**

Electronic Acknowledgement Receipt

EFS ID:	39631400
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	04-JUN-2020
Filing Date:	14-APR-2016
Time Stamp:	17:33:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$120
RAM confirmation Number	E202064H34261073
Deposit Account	602176
Authorized User	Daniel Higgs

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	IDS_NBUS001C1_5.pdf	1034950 8abcbaa6fa1002588a7364439d80055cb9154902	no	4
Warnings:					
Information:					
A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.					
2	Non Patent Literature	Affidavit_of_David_Morris.pdf	15137824 aa6c50d5a22935c55ba0269850d13c0e3eea9566	no	29
Warnings:					
Information:					
3	Non Patent Literature	Affidavit_of_Susanne_Hantos_Part_1.pdf	18006260 dc48cd8bb87566b01c6b9fdf55854bceff713d4c	no	380
Warnings:					
Information:					
4	Non Patent Literature	Affidavit_of_Susanne_Hantos_Part_2.pdf	17543712 ccfb12b12534d1bb1e643be67264fcafbf8c3526	no	385
Warnings:					
Information:					
5	Non Patent Literature	Affidavit_of_Peter_Darmos_Part_1.pdf	17831996 37248f55c9654f21acc6c7b6a07603dc83b7a846	no	300
Warnings:					
Information:					

6	Non Patent Literature	Affidavit_of_Peter_Darmos_Part_2.pdf	15815904 a01c66a865258afe4b3e72337f7acfe5793c21c7	no	416
Warnings:					
Information:					
7	Non Patent Literature	Affidavit_of_William_Hunter.pdf	8970777 0ecf382d7053a2dc07405c135129151276a0cd35	no	158
Warnings:					
Information:					
8	Non Patent Literature	Affidavit_of_Daniel_Higgs.pdf	2875944 892270ee29644e44887987d7e3b51c431a2ccf98	no	26
Warnings:					
Information:					
9	Non Patent Literature	NBUS004CA_OA3.pdf	3261144 a57bf7e26dd9c7f1648713a02bcb508b9677ee35	no	4
Warnings:					
Information:					
10	Non Patent Literature	NBUS004EU_Decision_to_Grant.pdf	99910 40ea743bdcdda3b1d02186a63fe4c67122686035	no	2
Warnings:					
Information:					
11	Non Patent Literature	NBUS004USC1_NOA.pdf	765482 ce3b83c16fe68ec95cbd93154140ab914b2a493e	no	16
Warnings:					
Information:					
12	Fee Worksheet (SB06)	fee-info.pdf	30617 270ec5cbe1c563a64f67bbb63e3fd72036959a45	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	101374520	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Robert E. Wright	
Application No.:	15/098,673	Art Unit: 3794
Filing Date:	April 14, 2016	
Title:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	
Examiner:	Eun Hwa Kim	
Confirmation No.:	5232	
Customer No.:	148468	

AMENDMENT PURSUANT TO 37 C.F.R. § 1.312

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

In reply to the Notice of Allowability that issued on April 9, 2020 in the above-identified application, and pursuant to 37 C.F.R. § 1.312, the Applicant respectfully submits the present amendment.

Amendments to the Specification begin on page 2.

Remarks begin on page 3.

Amendments to the Specification

Please replace the title of the Application at the top of first page of the specification with the following amended title:

METHODS AND SYSTEMS FOR ~~SPINAL~~ RADIO FREQUENCY NEUROTOMY

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 604 of 691

Remarks

The Applicant respectfully requests that the title of the Application be amended as shown on the preceding page.

Comments on Statement of Reasons for Allowance

The Notice of Allowability dated April 9, 2020, included the examiner's Statement of Reasons for Allowance ("Statement"). The Applicant thanks the examiner for her diligent review of the application and agrees that the claims are allowable. However, the Applicant takes no position regarding patentability other than positions taken during prosecution. Therefore, the examiner's Statement should not be attributed to the Applicant as an indication of the basis for Applicant's belief that the claims are patentable. To the extent the Statement summarizes or paraphrases the claims, or otherwise deviates from the language of the claims, the Applicant respectfully submits that the meaning and scope of the claims depend on the actual language of the claims. To the extent the Statement refers to only selected portions of a claim, the Applicant notes that the claims may contain additional limitations other than those mentioned in the Statement, and that patentability is measured against a claim as a whole, not just selected limitations. Other limitations alone or in combination may provide distinguishing aspects over the prior art. To the extent the Statement suggests that the mentioned limitations have any special prominence, the Applicant does not necessarily agree. Further, the dependent claims may include additional limitations that may also provide further reasons for patentability.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 605 of 691

Conclusion

The Applicant respectfully submits that the Application remains in condition for allowance. Please contact the undersigned attorney in the event of any remaining impediment to prompt issuance.

DATED this 4th day of June, 2020.

Respectfully submitted,

/Daniel C. Higgs/

Daniel C. Higgs
Attorney for Applicant
Registration No. 55,265

MED VENTURE MANAGEMENT, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, Utah 84116
(801) 703-1961

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 606 of 691

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

148468 7590 04/09/2020
Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

TITLE OF INVENTION: METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	07/09/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
KIM, EUN HWA	3794	606-041000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Med Venture Management, LLC
2 Daniel C. Higgs
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Stratus Medical, LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Salt Lake City, Utah

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 602176

5. **Change in Entity Status** (from status indicated above)

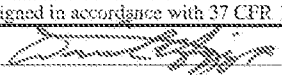
☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature  Date June 4, 2020

Typed or printed name Daniel C. Higgs Registration No. 55,265

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Petitioner's Exhibit 1007
Avanos v. Stratus
Page 607 of 691

Electronic Patent Application Fee Transmittal

Application Number:	15098673
Filing Date:	14-Apr-2016
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Filer:	Daniel Christopher Higgs
Attorney Docket Number:	NBUS.001C1

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	2501	1	500	500

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**500**

Electronic Acknowledgement Receipt

EFS ID:	39633528
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	04-JUN-2020
Filing Date:	14-APR-2016
Time Stamp:	22:01:34
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$500
RAM confirmation Number	E202064M02533522
Deposit Account	602176
Authorized User	Daniel Higgs

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		NBUS001C1_312_Amendment.pdf	93545 941bfa7aa9a5cdb84eae86cdece6366982998141	yes	4
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment after Notice of Allowance (Rule 312)		1	1	
	Specification		2	2	
	Applicant Arguments/Remarks Made in an Amendment		3	4	
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	NBUS001C1_Form_PTOL_85.pdf	1570865 f3423292c8e8598648f7576a22c90816118c8207	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30544 75e1e6437fe2f27712d748dc18d8491727f75c75	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1694954		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 — Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City		State/Province		Country of Residence	

Mailing Address of Inventor:

Address 1	
Address 2	

City		State/Province	
Postal Code		Country i	

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number		
Email Address		Add Email Remove Email

Application Information:

Title of the Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY		
Attorney Docket Number	NBUS.001C1	Small Entity Status Claimed	☒
Application Type			
Subject Matter			
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)	

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PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number			

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 614 of 691

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 615 of 691

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:	
If the Applicant is an Organization check here.	☒
Organization Name	Stratus Medical, LLC

Mailing Address Information For Applicant:

Address 1	~~595 S. Riverwoods Parkway~~ 6030 W. Harold Gatty Dr.		
Address 2	~~Suite 400~~		
City	~~Logan~~ Salt Lake City	**State/Province**	Utah
Country	US	Postal Code	~~84321~~ 84116
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☒

Organization Name	Stratus Medical, LLC

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	~~595 S. Riverwoods Parkway~~ 6030 W. Harold Gatty Dr.		
Address 2	~~Suite 400~~		
City	~~Logan~~ Salt Lake City	**State/Province**	Utah
Country i	US	Postal Code	~~84321~~ 84116
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Daniel C. Higgs/			Date (YYYY-MM-DD)	2020-06-08
First Name	Daniel	Last Name	Higgs	Registration Number	55,265

Additional Signature may be generated within this form by selecting the Add button.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	39648451
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	08-JUN-2020
Filing Date:	14-APR-2016
Time Stamp:	01:08:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	CorrectedADS.pdf	214140 2022d133efb4b99947947f3473899818b20ff134	no	8

Warnings:

Information:	
This is not an USPTO supplied ADS fillable form	
Total Files Size (in bytes):	214140

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Robert E. Wright	
Application No.:	15/098,673	Art Unit: 3794
Filing Date:	April 14, 2016	
Title:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	
Examiner:	Eun Hwa Kim	
Confirmation No.:	5232	
Customer No.:	148468	

Request for Corrected Filing Receipt

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

The Applicant hereby respectfully requests the issuance of a Corrected Filing Receipt in the above-identified application ("the Application"). Further, the Applicant wishes to ensure that the forthcoming patent issuing from the Application will correctly identify on the cover page thereof that ***each of*** the ***Applicant*** and the ***Assignee*** of the patent is:

Stratus Medical, LLC, Salt Lake City, Utah.

Submitted herewith is an amended version of the most recently issued Corrected Filing Receipt in the Application, mailed on February 26, 2020, showing the desired

change. In particular, the residence of both the Applicant and the Assignee should be changed from "Logan, UT" to "Salt Lake City, UT."

Also submitted herewith is an annotated copy of the form PTOL-85 filed by the Applicant on June 4, 2020, which indicates that the residence of the Assignee is Salt Lake City, UT. Additionally, the Applicant submits herewith an annotated copy of the Notice of Recordation that issued relative to the Application on June 5, 2020 (based on a filing that preceded payment of the issue fee), that likewise indicates the residence of the Assignee is Salt Lake City, UT.

The Applicant respectfully notes that both the Assignee and the Applicant are the same entity. Accordingly, the foregoing timely and appropriate updates to the residence information of the Assignee apply equally to the Applicant.

Finally, to confirm all of the foregoing, the Applicant has previously filed on even date herewith a Corrected Application Data Sheet that properly lists the Salt Lake City, UT residence information for Stratus Medical, LLC. Again, Stratus Medical, LLC is both the Applicant and Assignee of the Application. For completeness, an annotated copy of this previously submitted Application Data Sheet is included herewith.

Petitioner's Exhibit 1007
Avanos v. Stratus
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Please contact the undersigned attorney if there are any questions regarding or impediments to the present request.

Kind regards.

DATED this 8th day of June, 2020.

Respectfully submitted,

/Daniel C. Higgs/

Daniel C. Higgs
Attorney for Applicant
Registration No. 55,265

MED VENTURE HOLDINGS, LLC
6030 W. Harold Gatty Drive
Salt Lake City, Utah 84116
(801) 703-1961

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 625 of 691

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/098,673	04/14/2016	3794	3550	NBUS.001C1	1	1

CONFIRMATION NO. 5232

CORRECTED FILING RECEIPT

148468
Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

Date Mailed: 02/26/2020

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Robert E. Wright, Denver, CO;
Scott A. Brandt, Denver, CO;

Applicant(s)

Stratus Medical, LLC, ~~Logan, UT;~~ Salt Lake City, UT

Assignment For Published Patent Application

Stratus Medical, LLC, ~~Logan, UT~~ Salt Lake City, UT

Power of Attorney: None

Domestic Priority data as claimed by applicant

This application is a CON of 12/940,974 11/05/2010 ABN
which claims benefit of 61/280,557 11/05/2009
and claims benefit of 61/347,351 05/21/2010

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 626 of 691

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 04/27/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/098,673**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No
** **SMALL ENTITY** **
Title

METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

Preliminary Class

606

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

Petitioner's Exhibit 1007
Avanos v. Stratus
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countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

Petitioner's Exhibit 1007
Avanos v. Stratus
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technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 629 of 691

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

148468 7590 04/09/2020
Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)

(Signature)

(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

TITLE OF INVENTION: METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	07/09/2020

EXAMINER	ART UNIT	CLASS-SUBCLASS
KIM, EUN HWA	3794	606-041000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Med Venture Management, LLC
2 Daniel C. Higgs
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE	(B) RESIDENCE: (CITY and STATE OR COUNTRY)
Stratus Medical, LLC	Salt Lake City, Utah

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☒ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 602176

5. **Change in Entity Status** (from status indicated above)

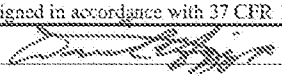
☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature  Date June 4, 2020

Typed or printed name Daniel C. Higgs Registration No. 55,265

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Petitioner's Exhibit 1007
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Page 630 of 691

UNITED STATES PATENT AND TRADEMARK OFFICE
UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

JUNE 5, 2020

PTAS

DANIEL C. HIGGS
6030 W. HAROLD GATTY DR.
SALT LAKE CITY, UT 84116

506090794

UNITED STATES PATENT AND TRADEMARK OFFICE
NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT RECORDATION BRANCH OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE COPY IS AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER REFERENCED BELOW.

PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE ASSIGNMENT RECORDATION BRANCH AT 571-272-3350. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, MAIL STOP: ASSIGNMENT RECORDATION BRANCH, P.O. BOX 1450, ALEXANDRIA, VA 22313.

RECORDATION DATE: 06/04/2020

REEL/FRAME: 052837/0846
NUMBER OF PAGES: 9

BRIEF: CORRECTIVE ASSIGNMENT TO CORRECT THE ADDRESS OF THE ASSIGNEE PREVIOUSLY RECORDED ON REEL 052040 FRAME 0943. ASSIGNOR(S) HEREBY CONFIRMS THE ASSIGNMENT TO STRATUS OF THE PATENTS AND PATENT APPLICATIONS SET FORTH ON SCHEDULE 1 (US 15/092,945 AND US 15/098,673).

DOCKET NUMBER: NBUS

ASSIGNOR:
BIOMERICS, LLC

DOC DATE: 12/23/2019

ASSIGNEE:
STRATUS MEDICAL, LLC
6030 W. HAROLD GATTY DR.
SALT LAKE CITY, UTAH 84116

APPLICATION NUMBER: 15092945
PATENT NUMBER:
TITLE: SYSTEMS AND METHODS FOR TISSUE ABLATION

FILING DATE: 04/07/2016
ISSUE DATE:

APPLICATION NUMBER: 15098673
PATENT NUMBER:
TITLE: METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

FILING DATE: 04/14/2016
ISSUE DATE:

ASSIGNMENT RECORDATION BRANCH
PUBLIC RECORDS DIVISION

PTO/AIA/14 (02-18)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City		State/Province		Country of Residence	

Mailing Address of Inventor:

Address 1	
Address 2	

City		State/Province	
Postal Code		Country i	

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number		
Email Address		Add Email Remove Email

Application Information:

Title of the Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	
Attorney Docket Number	NBUS.001C1	Small Entity Status Claimed ☒
Application Type		
Subject Matter		

Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)	

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number			

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.

Petitioner's Exhibit 1007
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)[i] the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country[i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

PTO/AIA/14 (02-18)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

◉ Assignee	○ Legal Representative under 35 U.S.C. 117	○ Joint Inventor
○ Person to whom the inventor is obligated to assign.	○ Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	Stratus Medical, LLC		
Mailing Address Information For Applicant:			
Address 1	~~595 S. Riverwoods Parkway~~ 6030 W. Harold Gatty Dr.		
Address 2	~~Suite 400~~		
City	~~Logan~~ Salt Lake City	**State/Province**	Utah
Country	US	Postal Code	~~84321~~ 84116
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button.

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

If the Assignee or Non-Applicant Assignee is an Organization check here. ☒

Organization Name	Stratus Medical, LLC		
Mailing Address Information For Assignee including Non-Applicant Assignee:			
Address 1	~~595 S. Riverwoods Parkway~~ 6030 W. Harold Gatty Dr.		
Address 2	~~Suite 400~~		
City	~~Logan~~ Salt Lake City	**State/Province**	Utah
Country i	US	Postal Code	~~84321~~ 84116
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). **However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).**

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Daniel C. Higgs/			Date (YYYY-MM-DD)	2020-06-08
First Name	Daniel	Last Name	Higgs	Registration Number	55,265

Additional Signature may be generated within this form by selecting the Add button.

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 638 of 691

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	NBUS.001C1
	Application Number	15/098,673
Title of Invention	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	39656691
Application Number:	15098673
International Application Number:	
Confirmation Number:	5232
Title of Invention:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
First Named Inventor/Applicant Name:	Robert E. Wright
Customer Number:	148468
Filer:	Daniel Christopher Higgs
Filer Authorized By:	
Attorney Docket Number:	NBUS.001C1
Receipt Date:	08-JUN-2020
Filing Date:	14-APR-2016
Time Stamp:	15:54:38
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for Corrected Filing Receipt	NBUS001C1_Request_for_Corrected_Filing_Receipt_w_Attachments.pdf	3065959 706b338ba85268e9d38c01f243a9211a46e3cdf5	no	18

Warnings:

Information:	
Total Files Size (in bytes):	3065959

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/098,673	04/14/2016	3794	3550	NBUS.001C1	1	1

CONFIRMATION NO. 5232

CORRECTED FILING RECEIPT

148468
Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

OC000000117607234

Date Mailed: 06/09/2020

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Robert E. Wright, Denver, CO;
Scott A. Brandt, Denver, CO;

Applicant(s)

Stratus Medical, LLC, Salt Lake City, UT;

Assignment For Published Patent Application

Stratus Medical, LLC, Salt Lake City, UT

Power of Attorney: The patent practitioners associated with Customer Number 148468

Domestic Priority data as claimed by applicant

This application is a CON of 12/940,974 11/05/2010 ABN
which claims benefit of 61/280,557 11/05/2009
and claims benefit of 61/347,351 05/21/2010

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 643 of 691

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 04/27/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/098,673**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

** **SMALL ENTITY** **

Title

METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY

Preliminary Class

606

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 644 of 691

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

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This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

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NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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Petitioner's Exhibit 1007
Avanos v. Stratus
Page 645 of 691

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Petitioner's Exhibit 1007
Avanos v. Stratus
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United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	04/14/2016	Robert E. Wright	NBUS.001C1	5232

148468 7590 06/15/2020

Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

EXAMINER
KIM, EUN HWA

ART UNIT	PAPER NUMBER
3794	

MAIL DATE	DELIVERY MODE
06/15/2020	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Supplemental ***Notice of Allowability***	**Application No.** 15/098,673	**Applicant(s)** Wright et al.	
	Examiner EUNHWA KIM	**Art Unit** 3794	**AIA (FITF) Status** No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to IDS filed on 3/28/2020.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-16,18-72 and 74-76 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/EUN HWA KIM/
Primary Examiner, Art Unit 3794

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 648 of 691

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	**Art Unit**
	EUNHWA KIM	3794

CPC						
Symbol					**Type**	**Version**
A61B	/	18	/	1477	F	2013-01-01
A61B	/	18	/	1206	I	2013-01-01
A61B	/	2018	/	00434	A	2013-01-01
A61B	/	2018	/	00821	A	2013-01-01
A61B	/	2090	/	3762	A	2016-02-01
A61B	/	2018	/	00875	A	2013-01-01
A61B	/	2018	/	00595	A	2013-01-01
A61B	/	2090	/	376	A	2013-01-01
A61B	/	2018	/	00577	A	2013-01-01
A61B	/	2018	/	00642	A	2013-01-01
A61B	/	2018	/	00791	A	2013-01-01
A61B	/	2018	/	1253	A	2013-01-01
A61B	/	2018	/	126	A	2013-01-01
A61B	/	2018	/	1467	A	2013-01-01

CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	74	
/EUN HWA KIM/ Primary Examiner, Art Unit 3794	11 June 2020	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	2A

U.S. Patent and Trademark Office

Part of Paper No.: 20200611

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Avanos v. Stratus
Page 649 of 691

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	**Art Unit**
	EUNHWA KIM	3794

INTERNATIONAL CLASSIFICATION					
CLAIMED					
A61B	/	18	/	14	

NON-CLAIMED					
	/		/		

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE (Assistant Examiner) (Date)	**Total Claims Allowed:** 74	
/EUN HWA KIM/ Primary Examiner, Art Unit 3794 (Primary Examiner) 11 June 2020 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2A

U.S. Patent and Trademark Office Part of Paper No.: 20200611

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 650 of 691

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	**Art Unit**
	EUNHWA KIM	3794

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	11	11	18	21	28	31	38	41	53	51	63	61	73	71
2	2	12	12	19	22	29	32	39	42	54	52	64	62	74	72
3	3	13	13	20	23	30	33	40	43	55	53	65	63	-	73
4	4	14	14	21	24	31	34	41	44	56	54	66	64	48	74
5	5	15	15	22	25	32	35	42	45	57	55	67	65	49	75
6	6	16	16	23	26	33	36	43	46	58	56	68	66	50	76
7	7	-	17	24	27	34	37	44	47	59	57	69	67		
8	8	17	18	25	28	35	38	45	48	60	58	70	68		
9	9	51	19	26	29	36	39	46	49	61	59	71	69		
10	10	52	20	27	30	37	40	47	50	62	60	72	70		

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 74	
/EUN HWA KIM/ Primary Examiner, Art Unit 3794 (Primary Examiner)	11 June 2020 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 2A

Petitioner's Exhibit 1007
Avanos v. Stratus
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	Art Unit
	EUNHWA KIM	3794

CPC - Searched*		
Symbol	Date	Examiner
A61B18/1477,1467; A61B2018/1253,00577	09/10/2018	EK
A61B2218/001,002,003	06/14/2019	EK

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
Assignee & Inventor Search	09/10/2018	EK
See search history printout	09/10/2018	EK
Updated Search (see EAST search history printout)	06/14/2019	EK
Updated Search (see EAST search history printout)	08/30/2019	EK
Updated Search (see EAST search history printout)	03/17/2020	Ek
Updated Search (NPLs considered in IDS)	06/11/2020	EK

/EUN HWA KIM/ Primary Examiner, Art Unit 3794	

Petitioner's Exhibit 1007
Avanos v. Stratus
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	15/098,673	Wright et al.
	Examiner	Art Unit
	EUNHWA KIM	3794

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
see EAST search history printout	see EAST search history printout	04/06/2020	EK

/EUN HWA KIM/ Primary Examiner, Art Unit 3794	

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 653 of 691

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1							

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

Petitioner's Exhibit 1007
Avanos v. Stratus

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.K./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

	1	IP AUSTRALIA, Examination Report No. 1 for Standard Patent Application for Australian Patent Application No. 2019200358, dated 20 April 2020, 3 pages.
	2	CANADIAN INTELLECTUAL PROPERTY OFFICE, Office Action for Canadian Patent Application No. 2,778,997, dated 15 May 2020, 3 pages.

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/EUN HWA KIM/	Date Considered	06/11/2020

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Petitioner's Exhibit 1007
Avanos v. Stratus

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

X That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

X The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Daniel C. Higgs/	Date (YYYY-MM-DD)	2020-06-04
Name/Print	Daniel C. Higgs	Registration Number	55265

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Avanos v. Stratus

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The information provided by you in this form will be subject to the following routine uses:

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Petitioner's Exhibit 1007
Avanos v. Stratus

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PATENT APPLICATION
Docket No.: NBUS.001C1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Robert E. Wright	
Application No.:	15/098,673	Art Unit: 3794
Filing Date:	April 14, 2016	
Title:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	
Examiner:	Eun Hwa Kim	
Confirmation No.:	5232	
Customer No.:	148468	

AMENDMENT PURSUANT TO 37 C.F.R. § 1.312

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

In reply to the Notice of Allowability that issued on April 9, 2020 in the above-identified application, and pursuant to 37 C.F.R. § 1.312, the Applicant respectfully submits the present amendment.

Amendments to the Specification begin on page 2.

Remarks begin on page 3.

Amendments to the Specification

Please replace the title of the Application at the top of first page of the specification with the following amended title:

METHODS AND SYSTEMS FOR ~~SPINAL~~ RADIO FREQUENCY NEUROTOMY

Petitioner's Exhibit 1007
Avanos v. Stratus
Page 659 of 691

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

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Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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	1							

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

Petitioner's Exhibit 1007
Avanos v. Stratus

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.K./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

	1	DAVID LAWSON MORRIS, Affidavit Submitted in Federal Court of Australia Case No. NSD 438 of 2019, dated 17 April 2020, 29 pages.	
	2	SUSANNE MONICA HANTOS, Affidavit Submitted in Federal Court of Australia Case No. NSD 438 of 2019, dated 21 April 2020, 765 pages.	
	3	PETER DARMOS, Affidavit Submitted in Federal Court of Australia Case No. NSD 438 of 2019, dated 21 April 2020, 716 pages.	
	4	WILLIAM SAMUAL HUNTER, Affidavit Submitted in Federal Court of Australia Case No. NSD 438 of 2019, dated 6 April 2020, 158 pages.	
	5	DANIEL CHRISTOPHER HIGGS, Affidavit Submitted in Federal Court of Australia Case No. NSD 438 of 2019, dated 6 April 2020, 26 pages.	
	6	CANADIAN INTELLECTUAL PROPERTY OFFICE, Office Action for Canadian Patent Application No. 2,799,505, dated 8 April 2020, 4 pages.	
	7	EUROPEAN PATENT OFFICE, Decision to Grant a European Patent Pursuant to Article 97(1) EPC for European Patent Application No. 11783944.9, dated 28 May 2020, 2 pages.	
	8	UNITED STATES PATENT AND TRADEMARK OFFICE, Notice of Allowance for U.S. Patent Application No. 15/092,945, dated 16 March 2020, 16 pages.	

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/EUN HWA KIM/	Date Considered	06/11/2020

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

Petitioner's Exhibit 1007
Avanos v. Stratus

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /EHK/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	15098673
Filing Date	2016-04-14
First Named Inventor	Robert E. Wright
Art Unit	3794
Examiner Name	Eun Hwa Kim
Attorney Docket Number	NBUS.001C1

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Daniel C. Higgs/	Date (YYYY-MM-DD)	2020-06-04
Name/Print	Daniel C. Higgs	Registration Number	55265

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Avanos v. Stratus

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Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Petitioner's Exhibit 1007
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.K./

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
15/098,673	04/14/2016	3794	3550	NBUS.001C1	1	1

CONFIRMATION NO. 5232

CORRECTED FILING RECEIPT

148468
Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

OC000000117788800

Date Mailed: 06/16/2020

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Robert E. Wright, Denver, CO;
Scott A. Brandt, Denver, CO;

Applicant(s)

Stratus Medical, LLC, Salt Lake City, UT;

Assignment For Published Patent Application

Stratus Medical, LLC, Salt Lake City, UT

Power of Attorney: The patent practitioners associated with Customer Number 148468

Domestic Priority data as claimed by applicant

This application is a CON of 12/940,974 11/05/2010 ABN
which claims benefit of 61/280,557 11/05/2009
and claims benefit of 61/347,351 05/21/2010

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 04/27/2016

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/098,673**

Projected Publication Date: Not Applicable

Non-Publication Request: No

Early Publication Request: No

** **SMALL ENTITY** **

Title

METHODS AND SYSTEMS FOR RADIO FREQUENCY NEUROTOMY

Preliminary Class

606

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

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countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

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PATENT APPLICATION
Docket No.: NBUS.001C1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor:	Robert E. Wright	
Application No.:	15/098,673	Art Unit: 3794
Filing Date:	April 14, 2016	
Title:	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY	
Examiner:	Eun Hwa Kim	
Confirmation No.:	5232	
Customer No.:	148468	

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Commissioner:

Enclosed for filing in the above-identified application is a PTO/SB/08 Equivalent listing 489 references. Each of these 489 references is of record in U.S. Patent Application No. 12/940,974, titled METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY, filed November 5, 2010 ("the Parent Application"), of which the present application is a continuation.

References Have Already Been Considered

As the present application is a continuation of the Parent Application, the Applicant believes the examiner has already considered the 489 references identified herein with respect to the present application, pursuant to MPEP § 609.02(II).

Petitioner's Exhibit 1007
Avanos v. Stratus

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.H.K/

Accordingly, the Applicant is submitting the present information disclosure statement to ensure these references are ultimately printed on the patent, pursuant to MPEP § 609.2(II).

Copies of All References Omitted

Pursuant to 37 C.F.R. § 1.98(a)(2), copies of U.S. patent application publications and U.S. patents are not required. Accordingly, no copies of reference numbers 1 through 432 are submitted.

Further, pursuant to 37 C.F.R. § 1.98(d), copies of reference numbers 433 through 489 are not required because (1) the Parent Application has been properly identified in this information disclosure statement and is relied on for an earlier effective filing date under 35 U.S.C. § 120, and (2) all information disclosure statements submitted in the Parent Application comply with 37 C.F.R. § 1.98, paragraphs (a) through (c).

Table of U.S. Patent Applications

The Applicant provides the following table to aid the Examiner during prosecution:

Attorney Docket No.	Application No.	Filing Date	Title
NBUS.001A	12/940,974 ***(the Parent Application)***	2010-11-05	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
NBUS.001C1	15/098,673 ***(the Present Application)***	2016-04-14	METHODS AND SYSTEMS FOR SPINAL RADIO FREQUENCY NEUROTOMY
NBUS.004A	13/101,009	2011-05-04	SYSTEMS AND METHODS FOR TISSUE ABLATION
NBUS.004C1	15/092,945	2016-04-07	SYSTEMS AND METHODS FOR TISSUE ABLATION

Copies of these patent applications, including any pending claims, office actions, notices of allowance, and/or other communications, are available through PALM and/or

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Avanos v. Stratus
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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.N./

PAIR. However, if the Examiner so requests, the Applicant will be happy to provide the Examiner with copies of any applications, pending claims, office actions, notices of allowance, communications, or any other documents, at any time.

DATED this 26th day of September, 2019.

Respectfully submitted,

/Daniel C. Higgs/

Daniel C. Higgs
Attorney for Applicant
Registration No. 55,265

MED VENTURE HOLDINGS, LLC
6030 W. Harold Gatty Drive
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Petitioner's Exhibit 1007
Avanos v. Stratus
Page 670 of 691

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT		
	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 1 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
/E.K/	1.	0372,086 D372,086	07-23-1996	Grasso et al.	
	2.	RE40,279	04-29-2008	Sluijter et al.	
	3.	RE40,388	06-17-2008	Gines	
	4.	4,011,872	03-15-1977	Kamiya	
	5.	4,206,761	06-10-1980	Cosman	
	6.	4,206,762	06-10-1980	Cosman	
	7.	4,281,667	08-04-1981	Cosman	
	8.	4,353,371	10-12-1982	Cosman	
	9.	4,375,220	03-01-1983	Matvias	
	10.	4,378,809	04-05-1983	Cosman	
	11.	4,385,636	05-31-1983	Cosman	
	12.	4,411,266	10-25-1983	Cosman	
	13.	4,565,200	01-21-1986	Cosman	
	14.	4,573,980	03-04-1986	Karrasch et al.	
	15.	4,583,538	04-22-1986	Onik et al.	
	16.	4,593,703	06-10-1986	Cosman	
	17.	4,618,978	10-21-1986	Cosman	
	18.	4,646,752	03-03-1987	Swann et al.	
	19.	4,653,508	03-31-1987	Cosman	
	20.	4,660,568	04-28-1987	Cosman	
	21.	4,676,255	06-30-1987	Cosman	
	22.	4,698,207	10-06-1987	Bringham et al.	
	23.	4,787,886	11-29-1988	Cosman	
	24.	4,796,615	01-10-1989	Bullock et al.	
	25.	4,827,927	05-09-1989	Newton	
	26.	4,838,265	06-13-1989	Cosman et al.	
	27.	4,886,506	12-12-1989	Lovgren et al.	
	28.	4,907,589	03-13-1990	Cosman	

Examiner Signature	Date Considered

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] - Place a check mark in this area when an English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.K/

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT		
	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 2 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	29.	4,966,597	10-30-1990	Cosman	
	30.	5,010,897	04-30-1991	Leveen	
	31.	5,160,337	11-03-1992	Cosman	
	32.	5,217,457	06-08-1993	Delahuerga et al.	
	33.	5,230,623	07-27-1993	Guthrie et al.	
	34.	5,233,515	08-03-1993	Cosman	
	35.	5,244,462	09-14-1993	Delahuerga et al.	
	36.	5,257,630	11-02-1993	Braitman et al.	
	37.	5,291,896	03-08-1994	Fonger et al.	
	38.	5,304,114	04-19-1994	Cosman et al.	
	39.	5,304,115	04-19-1994	Pflueger et al.	
	40.	5,312,329	05-17-1994	Beaty et al.	
	41.	5,312,391	05-17-1994	Wilk	
	42.	5,318,013	06-07-1994	Wilk	
	43.	5,324,255	06-28-1994	Passafaro et al.	
	44.	5,334,183	08-02-1994	Wuchinich	
	45.	5,342,292	08-30-1994	Nita et al.	
	46.	5,370,645	12-06-1994	Klicek et al.	
	47.	5,370,675	12-06-1994	Edwards et al.	
	48.	5,372,596	12-13-1994	Klicek et al.	
	49.	5,377,685	01-03-1995	Kazi et al.	
	50.	5,397,301	03-14-1995	Pflueger et al.	
	51.	5,401,272	03-28-1995	Perkins	
	52.	5,421,923	06-06-1995	Clarke et al.	
	53.	5,422,567	06-06-1995	Matsunaga	
	54.	5,423,809	06-13-1995	Klicek	
	55.	5,433,739	07-18-1995	Sluijter et al.	
	56.	5,447,417	09-05-1995	Kuhl et al.	

Examiner Signature	Date Considered

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] - Place a check mark in this area when an English language Translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.H.K/

PTO/SB/08 Equivalent

INFORMATION DISCLOSURE STATEMENT BY APPLICANT		
	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 3 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	57.	5,458,597	10-17-1995	Edwards et al.	
	58.	5,472,441	12-05-1995	Edwards et al.	
	59.	5,472,442	12-05-1995	Klicek	
	60.	5,474,057	12-12-1995	Makower et al.	
	61.	5,484,398	01-16-1996	Stoddard	
	62.	5,496,312	03-05-1996	Klicek	
	63.	5,507,743	04-16-1996	Edwards et al.	
	64.	5,511,564	04-30-1996	Wilk	
	65.	5,514,129	05-07-1996	Smith	
	66.	5,536,267	07-16-1996	Edwards et al.	
	67.	5,541,376	07-30-1996	Ladtkow et al.	
	68.	5,560,358	10-01-1996	Arnold et al.	
	69.	5,562,703	10-08-1996	Desai	
	70.	5,571,147	11-05-1996	Sluijter et al.	
	71.	5,580,665	12-03-1996	Taguchi et al.	
	72.	5,599,345	02-04-1997	Edwards et al.	
	73.	5,599,346	02-04-1997	Edwards et al.	
	74.	5,611,709	03-18-1997	McAnulty	
	75.	5,613,966	03-25-1997	Makower et al.	
	76.	5,628,743	05-13-1997	Cimino	
	77.	5,662,111	09-02-1997	Cosman	
	78.	5,662,620	09-02-1997	Lieber et al.	
	79.	5,662,680	09-02-1997	Desai	
	80.	5,667,488	09-16-1997	Lundquist et al.	
	81.	5,669,904	09-23-1997	Platt, Jr. et al.	
	82.	5,672,173	09-30-1997	Gough et al.	
	83.	5,672,174	09-30-1997	Gough et al.	
	84.	5,683,349	11-04-1997	Makower et al.	

Examiner Signature	Date Considered

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT		
	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
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U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
	85.	5,683,384	11-04-1997	Gough et al.	
	86.	5,701,575	12-23-1997	Taguchi et al.	
	87.	5,720,744	02-24-1998	Eggleston et al.	
	88.	5,728,143	03-17-1998	Gough et al.	
	89.	5,735,847	04-07-1998	Gough et al.	
	90.	5,738,648	04-14-1998	Lands et al.	
	91.	5,748,703	05-05-1998	Cosman	
	92.	5,749,689	05-12-1998	Konig	
	93.	5,755,754	05-26-1998	Rudie et al.	
	94.	5,768,679	06-16-1998	Taguchi et al.	
	95.	5,772,659	06-30-1998	Becker et al.	
	96.	5,778,043	07-07-1998	Cosman	
	97.	5,782,827	07-21-1998	Gough et al.	
	98.	5,792,146	08-11-1998	Cosman	
	99.	5,797,906	08-25-1998	Rhum et al.	
	100.	5,800,484	09-01-1998	Gough et al.	
	101.	5,807,309	09-15-1998	Lundquist et al.	
	102.	5,810,804	09-22-1998	Gough et al.	
	103.	5,827,271	10-27-1998	Buysse et al.	
	104.	5,827,276	10-27-1998	LeVeen et al.	
	105.	5,848,967	12-15-1998	Cosman	
	106.	5,855,576	01-05-1999	LeVeen et al.	
	107.	5,863,290	01-26-1999	Gough et al.	
	108.	5,868,740	02-09-1999	LeVeen et al.	
	109.	5,911,739	06-15-1999	Kordis et al.	
	110.	5,913,855	06-22-1999	Gough et al.	
	111.	5,921,992	07-13-1999	Costales et al.	
	112.	5,925,042	07-20-1999	Gough et al.	

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U.S. PATENT DOCUMENTS

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	113.	5,928,229	07-27-1999	Gough et al.	
	114.	5,935,123	08-10-1999	Edwards et al.	
	115.	5,951,547	09-14-1999	Gough et al.	
	116.	5,968,040	10-19-1999	Swanson et al.	
	117.	5,980,517	11-09-1999	Gough	
	118.	5,983,141	11-09-1999	Sluijter et al.	
	119.	6,006,126	12-21-1999	Cosman	
	120.	6,013,076	01-11-2000	Goble et al.	
	121.	6,014,590	01-11-2000	Whayne et al.	
	122.	6,015,406	01-18-2000	Goble et al.	
	123.	6,016,452	01-18-2000	Kasevich	
	124.	6,039,733	03-21-2000	Buysse et al.	
	125.	6,041,260	03-21-2000	Stern et al.	
	126.	6,044,846	04-04-2000	Edwards	
	127.	6,050,992	04-18-2000	Nichols	
	128.	6,053,937	04-25-2000	Edwards et al.	
	129.	6,059,780	05-09-2000	Gough et al.	
	130.	6,068,627	05-30-2000	Orszulak et al.	
	131.	6,071,280	06-06-2000	Edwards et al.	
	132.	6,080,150	06-27-2000	Gough	
	133.	6,090,105	07-18-2000	Zepeda et al.	
	134.	6,106,521	08-22-2000	Blewett et al.	
	135.	6,117,134	09-12-2000	Cunningham et al.	
	136.	6,122,341	09-19-2000	Butler et al.	
	137.	6,129,726	10-10-2000	Edwards et al.	
	138.	6,132,425	10-17-2000	Gough	
	139.	6,139,519	10-31-2000	Blythe	
	140.	6,139,547	10-31-2000	Lontine et al.	

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	141.	6,143,003	11-07-2000	Cosman	
	142.	6,146,380	11-14-2000	Racz et al.	
	143.	6,161,048	12-12-2000	Sluijter et al.	
	144.	6,165,169	12-26-2000	Panescu et al.	
	145.	6,167,295	12-26-2000	Cosman	
	146.	6,179,834	01-30-2001	Buysse et al.	
	147.	6,210,403	04-03-2001	Klicek	
	148.	6,213,999	04-10-2001	Platt, Jr. et al.	
	149.	6,217,554	04-17-2001	Green	
	150.	6,228,080	05-08-2001	Gines	
	151.	6,228,083	05-08-2001	Lands et al.	
	152.	6,231,570	05-15-2001	Tu et al.	
	153.	6,234,178	05-22-2001	Goble et al.	
	154.	6,235,023	05-22-2001	Lee et al.	
	155.	6,241,725	06-05-2001	Cosman	
	156.	6,241,726	06-05-2001	Chia et al.	
	157.	6,246,912	06-12-2001	Sluijter et al.	
	158.	6,251,106	06-26-2001	Becker et al.	
	159.	6,259,952	07-10-2001	Sluijter et al.	
	160.	6,268,200	07-31-2001	Tucker et al.	
	161.	6,275,725	08-14-2001	Cosman	
	162.	6,277,117	08-21-2001	Tetzlaff et al.	
	163.	6,280,441	08-28-2001	Ryan	
	164.	6,312,426	11-06-2001	Goldberg et al.	
	165.	6,330,478	12-11-2001	Lee et al.	
	166.	6,331,180	12-18-2001	Cosman et al.	
	167.	6,334,861	01-01-2002	Chandler et al.	
	168.	6,352,536	03-05-2002	Buysse et al.	

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	169.	6,402,743	06-11-2002	Orszulak et al.	
	170.	6,402,747	06-11-2002	Lindermann et al.	
	171.	6,405,072	06-11-2002	Cosman	
	172.	6,416,520	07-09-2002	Kynast et al.	
	173.	6,419,653	07-16-2002	Edwards et al.	
	174.	6,419,680	07-16-2002	Cosman et al.	
	175.	6,419,798	07-16-2002	Topolkaraev et al.	
	176.	6,425,887	07-30-2002	McGuckin et al.	
	177.	6,440,127	08-27-2002	McGovern et al.	
	178.	6,447,477	09-10-2002	Burney et al.	
	179.	6,447,505	09-10-2002	McGovern et al.	
	180.	6,451,018	09-17-2002	Lands et al.	
	181.	6,454,765	09-24-2002	Leveen et al.	
	182.	6,458,130	10-01-2002	Frazier et al.	
	183.	6,459,769	10-01-2002	Cosman	
	184.	6,464,704	10-15-2002	Schmaltz et al.	
	185.	6,468,273	10-22-2002	Leveen et al.	
	186.	6,471,698	10-29-2002	Edwards et al.	
	187.	6,478,793	11-12-2002	Cosman et al.	
	188.	6,500,175	12-31-2002	Gough et al.	
	189.	6,506,189	01-14-2003	Rittman, III et al.	
	190.	6,517,534	02-11-2003	McGovern et al.	
	191.	6,530,922	03-11-2003	Cosman et al.	
	192.	6,533,987	03-18-2003	Topolkaraev et al.	
	193.	6,551,311	04-22-2003	Lee et al.	
	194.	6,562,033	05-13-2003	Shah et al.	
	195.	6,565,562	05-20-2003	Shah et al.	
	196.	6,569,159	05-27-2003	Edwards et al.	

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U.S. PATENT DOCUMENTS

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	197.	6,575,967	06-10-2003	Leveen et al.	
	198.	6,575,969	06-10-2003	Rittman, III et al.	
	199.	6,585,735	07-01-2003	Frazier et al.	
	200.	6,602,249	08-05-2003	Stoddard et al.	
	201.	6,605,085	08-12-2003	Edwards	
	202.	6,610,054	08-26-2003	Edwards et al.	
	203.	6,622,731	09-23-2003	Daniel et al.	
	204.	6,623,481	09-23-2003	Garbagnati et al.	
	205.	6,632,221	10-14-2003	Edwards et al.	
	206.	6,632,222	10-14-2003	Edwards et al.	
	207.	6,638,275	10-28-2003	McGaffigan et al.	
	208.	6,641,580	11-04-2003	Edwards et al.	
	209.	6,645,201	11-11-2003	Utley et al.	
	210.	6,652,515	11-25-2003	Maguire et al.	
	211.	6,652,516	11-25-2003	Gough	
	212.	6,660,002	12-09-2003	Edwards et al.	
	213.	6,660,362	12-09-2003	Lindsay et al.	
	214.	6,663,624	12-16-2003	Edwards et al.	
	215.	6,669,693	12-30-2003	Friedman	
	216.	6,682,526	01-27-2004	Jones et al.	
	217.	6,682,528	01-27-2004	Frazier et al.	
	218.	6,685,701	02-03-2004	Orszulak et al.	
	219.	6,689,127	02-10-2004	Gough et al.	
	220.	6,690,210	02-10-2004	Hadjizada et al.	
	221.	6,692,490	02-17-2004	Edwards	
	222.	6,706,152	03-16-2004	Burazin et al.	
	223.	6,723,092	04-20-2004	Brown et al.	
	224.	6,743,226	06-01-2004	Cosman et al.	

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	225.	6,743,229	06-01-2004	Buysse et al.	
	226.	6,746,570	06-08-2004	Burazin et al.	
	227.	6,749,719	06-15-2004	Burazin et al.	
	228.	6,770,070	08-03-2004	Balbierz	
	229.	6,780,180	08-24-2004	Goble et al.	
	230.	6,803,549	10-12-2004	Yu	
	231.	6,814,712	11-09-2004	Edwards et al.	
	232.	6,837,956	01-04-2005	Cowell et al.	
	233.	6,846,448	01-25-2005	Rymer et al.	
	234.	6,847,848	01-25-2005	Sterzer et al.	
	235.	6,852,091	02-08-2005	Edwards et al.	
	236.	6,866,663	03-15-2005	Edwards et al.	
	237.	6,881,214	04-19-2005	Cosman et al.	
	238.	6,889,089	05-03-2005	Behl et al.	
	239.	6,896,675	05-24-2005	Leung et al.	
	240.	6,932,810	08-23-2005	Ryan	
	241.	6,958,062	10-25-2005	Gough et al.	
	242.	6,958,064	10-25-2005	Rioux et al.	
	243.	6,961,602	11-01-2005	Fuimaono et al.	
	244.	6,964,660	11-15-2005	Maguire et al.	
	245.	6,966,908	11-22-2005	Maguire et al.	
	246.	6,974,455	12-13-2005	Garabedian et al.	
	247.	6,997,925	02-14-2006	Maguire et al.	
	248.	7,025,767	04-11-2006	Schaefer et al.	
	249.	7,033,353	04-25-2006	Stoddard et al.	
	250.	7,044,949	05-16-2006	Orszulak et al.	
	251.	7,048,733	05-23-2006	Hartley et al.	
	252.	7,056,320	06-06-2006	Utley et al.	

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	253.	7,074,484	07-11-2006	Topolkaraev et al.	
	254.	7,076,399	07-11-2006	Godara	
	255.	7,087,051	08-08-2006	Bourne et al.	
	256.	7,099,712	08-29-2006	Fuimaono et al.	
	257.	7,108,696	09-19-2006	Daniel et al.	
	258.	7,112,197	09-26-2006	Hartley et al.	
	259.	7,115,124	10-03-2006	Xiao	
	260.	7,138,088	11-21-2006	Wariar et al.	
	261.	7,150,743	12-19-2006	Zvuloni et al.	
	262.	7,150,744	12-19-2006	Edwards et al.	
	263.	7,160,296	01-09-2007	Pearson et al.	
	264.	7,163,536	01-16-2007	Godara	
	265.	7,179,256	02-20-2007	Mest	
	266.	7,179,258	02-20-2007	Buysse et al.	
	267.	7,207,990	04-24-2007	Lands et al.	
	268.	7,258,688	08-21-2007	Shah et al.	
	269.	7,266,414	09-04-2007	Cornelius et al.	
	270.	7,270,660	09-18-2007	Ryan	
	271.	7,270,662	09-18-2007	Visram et al.	
	272.	7,276,064	10-02-2007	Paul et al.	
	273.	7,281,666	10-16-2007	Smith	
	274.	7,294,127	11-13-2007	Leung et al.	
	275.	7,306,596	12-11-2007	Hillier et al.	
	276.	7,311,702	12-25-2007	Tallarida et al.	
	277.	7,340,307	03-04-2008	Maguire et al.	
	278.	7,354,436	04-08-2008	Rioux et al.	
	279.	7,357,798	04-15-2008	Sharps et al.	
	280.	7,371,234	05-13-2008	Young	

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	281.	7,387,626	06-17-2008	Edwards et al.	
	282.	7,387,630	06-17-2008	Mest	
	283.	7,416,549	08-26-2008	Young et al.	
	284.	7,449,020	11-11-2008	Edwards et al.	
	285.	7,468,062	12-23-2008	Oral et al.	
	286.	7,480,533	01-20-2009	Cosman et al.	
	287.	7,517,346	04-14-2009	Sloan et al.	
	288.	7,524,318	04-28-2009	Young et al.	
	289.	7,533,002	05-12-2009	Godara	
	290.	7,549,986	06-23-2009	Rioux et al.	
	291.	7,561,907	07-14-2009	Fuimaono et al.	
	292.	7,593,778	09-22-2009	Chandran et al.	
	293.	7,596,469	09-29-2009	Godara	
	294.	7,615,050	11-10-2009	Cross et al.	
	295.	7,670,336	03-02-2010	Young et al.	
	296.	7,670,337	03-02-2010	Young	
	297.	7,678,106	03-16-2010	Lee	
	298.	7,699,844	04-20-2010	Utley et al.	
	299.	7,704,248	04-27-2010	Dicarlo	
	300.	7,771,420	08-10-2010	Butty et al.	
	301.	7,794,458	09-14-2010	McIntyre et al.	
	302.	7,794,459	09-14-2010	Faure	
	303.	7,797,049	09-14-2010	Christopherson et al.	
	304.	7,799,021	09-21-2010	Leung et al.	
	305.	7,815,571	10-19-2010	Deckman et al.	
	306.	7,819,869	10-26-2010	Godara et al.	
	307.	7,819,871	10-26-2010	Paul et al.	
	308.	7,824,404	11-02-2010	Godara et al.	

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	First Named Inventor	Robert E. Wright
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(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 12 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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	317.	2003/0018332	01-23-2003	Schmaltz et al.	
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	321.	2004/0015218	01-22-2004	Finch et al.	
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Examiner Signature	Date Considered

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT		
	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
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	338.	2005/0240174	10-27-2005	Pearson et al.	
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	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 14 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

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	365.	2007/0016183	01-18-2007	Lee et al.	
	366.	2007/0027449	02-01-2007	Godara et al.	
	367.	2007/0060921	03-15-2007	Janssen et al.	
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	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 15 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 16 OF 20	Attorney Docket No.	NBUS.001C1

U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	Document Number *Number - Kind Code (if known)* Example: 1,234,567 B1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear
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Examiner Signature	Date Considered

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT		
	Application No.	15/098,673
	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 17 OF 20	Attorney Docket No.	NBUS.001C1

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Examiner Initials	Cite No.	Foreign Patent Document *Country Code-Number-Kind Code* Example: JP 1234567 A1	Publication Date MM-DD-YYYY	Name of Patentee or Applicant	Pages, Columns, Lines Where Relevant Passages or Relevant Figures Appear	T[1]
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Examiner Signature	Date Considered

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	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 18 OF 20	Attorney Docket No.	NBUS.001C1

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[1]
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Examiner Signature	Date Considered

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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	Filing Date	April 14, 2016
	First Named Inventor	Robert E. Wright
	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 19 OF 20	Attorney Docket No.	NBUS.001C1

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[1]
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	Art Unit	3794
(Multiple sheets used when necessary)	Examiner	Eun Hwa Kim
SHEET 20 OF 20	Attorney Docket No.	NBUS.001C1

NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[1]
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Examiner Signature	/EUN HWA KIM/	Date Considered	04/06/2020

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/098,673	08/11/2020	10736688	NBUS.001C1	5232

148468 7590 07/22/2020

Med Venture Management, LLC
6030 W. Harold Gatty Dr.
Salt Lake City, UT 84116

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 392 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

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