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NOTICE OF ALLOWANCE AND FEE(S) DUE

148468 7590 04/21/2026
Laurence & Phillips IP Law
1050 Connecticut Ave., N.W. Suite 500
Washington, DC 20036

EXAMINER	
KIM, EUN HWA	
ART UNIT	PAPER NUMBER
3794	

DATE MAILED: 04/21/2026

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/378,138	10/09/2023	Robert E. Wright	NBUS.001C1^4	7522

TITLE OF INVENTION: SYSTEMS FOR RADIOFREQUENCY NEUROTOMY

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$516	\$0.00	\$516.00	\$0	07/21/2026

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 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted 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. 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 the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
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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 6 should be completed where appropriate. All further correspondence 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. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

148468 7590 04/21/2026

Laurence & Phillips IP Law
1050 Connecticut Ave., N.W. Suite 500
Washington, DC 20036

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 the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

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18/378,138	10/09/2023	Robert E. Wright	NBUS.001C1^4	7522

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nonprovisional	SMALL	\$516	\$0.00	\$516.00	\$0	07/21/2026

EXAMINER	ART UNIT	CLASS-SUBCLASS
KIM, EUN HWA	3794	606-034000

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/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 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,

1 _____

(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.

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)

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via the USPTO patent electronic filing system ☐ 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.

6. Courtesy Ceremonial Copy

☐ Applicant requests a courtesy ceremonial copy of the electronic patent grant. Applicant understands that the electronic patent grant is the official statutory patent grant.

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. IPR2024-01210

Avanos v. Stratus
Stratus Ex. 2049



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			ART UNIT	PAPER NUMBER
			3794	
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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. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013).

<https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf>

Routine uses of the information in this record may include disclosure to:

- 1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;
- 2) a federal, state, local, or international agency, in response to its request;
- 3) a contractor of the USPTO having need for the information in order to perform a contract;
- 4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;
- 5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;
- 6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
- 7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
- 8) 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));
- 9) the Office of Personnel Management (OPM) for personnel research purposes; and
- 10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Notice of Allowability	Application No. 18/378,138	Applicant(s) Wright et al.	
	Examiner EUNHWA KIM	Art Unit 3794	AIA (First Inventor to File) 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 submitted on March 8, 2026.
☐ 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 2-5 and 8-42. 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) | 5. ☒ Examiner's Amendment/Comment |
| 2. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____. | 6. ☒ Examiner's Statement of Reasons for Allowance |
| 3. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material _____. | 7. ☐ Other _____. |
| 4. ☒ Interview Summary (PTO-413),
Paper No./Mail Date _____. | |

/EUN HWA KIM/
Primary Examiner, Art Unit 3794

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 allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). 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, prosecution in this application has been reopened pursuant to 37 CFR 1.114.

Applicant's submission filed on March 8, 2026 has been entered.

EXAMINER'S AMENDMENT

2. 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 9, 2026.

3. **Replace the claims as follows:**

1. (Cancelled)

2. A radiofrequency neurotomy system comprising:
a radiofrequency probe assembly that comprises:

a radiofrequency probe that comprises a temperature sensor operable to measure temperature at a distal end of the radiofrequency probe; and

a cable; and

a radiofrequency neurotomy needle that comprises:

a first hub;

an elongate member fixedly attached to the first hub, the elongate member comprising a tube that is 16 gauge or smaller and a lumen within the tube, wherein a central longitudinal axis is disposed along a center of the elongate member;

a tip at a distal end of the elongate member shaped to pierce tissue of a patient;

an additional tube that is conductive, a portion of the additional tube being housed in the lumen of the elongate member;

a plurality of filaments movable between a retracted position and a deployed position;

a second hub interconnected to the plurality of filaments; and

an actuator interconnected to the second hub and to the plurality of filaments, wherein rotation of the actuator relative to the first hub in a first direction causes the second hub to move axially to advance the plurality of filaments to the deployed position and rotation of the actuator relative to the first hub in a second direction that is opposite the first direction causes the second hub to move axially to retract the plurality of filaments to the retracted position,

wherein:

the radiofrequency probe is ~~positionable within~~ insertable into the additional tube that is in the lumen of the elongate member;

the plurality of filaments are advanceable to the deployed position without concurrent advancement of the radiofrequency probe relative to the lumen; and

when the radiofrequency probe is ~~positioned within the lumen of the elongate member~~ inserted into the additional tube and is interconnected to a radiofrequency generator via the cable, the radiofrequency probe is configured to transmit radiofrequency energy applied thereto that energizes the additional tube, and the plurality of filaments and the tip are configured to conduct and emanate the radiofrequency energy such that the radiofrequency probe, the tip, and the plurality of filaments form a single radiofrequency electrode.

3. The radiofrequency neurotomy system of claim 2, wherein the radiofrequency probe is integrated into the needle.

4. The radiofrequency neurotomy system of claim 3, wherein a distal end of the radiofrequency probe is near the tip when the plurality of filaments and the tip conduct and emanate the radiofrequency energy ~~the radiofrequency neurotomy needle further comprises an additional tube within which the radiofrequency probe is inserted, wherein the additional tube is conductive, and wherein a portion of the additional tube is housed by the elongate member.~~

5. The radiofrequency neurotomy system of claim 2 ~~claim 4~~, wherein the additional tube physically contacts the tip ~~radiofrequency energy is emitted by the radiofrequency probe and is conducted through the additional tube and into and through the plurality of filaments.~~

6. (Cancelled)

7. (Cancelled)

8. The radiofrequency neurotomy system of claim 2 ~~claim 7~~, wherein a distal end of the radiofrequency probe is near the tip when the plurality of filaments and the tip conduct and emanate the radiofrequency energy.

9. The radiofrequency neurotomy system of claim 2, wherein the radiofrequency probe is configured to be inserted into the additional tube lumen of the elongate member ~~lumen of the elongate member~~ during use of the radiofrequency neurotomy needle in the patient, and wherein the radiofrequency probe extends through the first hub when inserted into the additional tube lumen of the elongate member ~~lumen of the elongate member~~.

10. The radiofrequency neurotomy system of claim 2, wherein:
the radiofrequency neurotomy system further comprises a projection;
the actuator comprises a helical track sized to accommodate the projection; and
as the actuator is rotated relative to the first hub, the helical track and the projection, in combination, cause the second hub to move axially.

11. The radiofrequency neurotomy system of claim 10, wherein rotational motion of the actuator relative to the first hub is not transmitted to the second hub.
12. The radiofrequency neurotomy system of claim 2, wherein each filament of the plurality of filaments comprises a distal end that defines a point, and wherein an average of all points of the plurality of filaments is offset from the central longitudinal axis of the elongate member when the plurality of filaments are in the deployed position.
13. The radiofrequency neurotomy system of claim 2, wherein the plurality of filaments are at least partially disposed within the elongate member when in the retracted position.
14. The radiofrequency neurotomy system of claim 13, wherein distal tips of the plurality of filaments extend distally beyond a distal point of the tip when the plurality of filaments are in the deployed position.
15. The radiofrequency neurotomy system of claim 2, wherein a single member runs along at least part of the elongate member and the plurality of filaments are interconnected to the single member.
16. The radiofrequency neurotomy system of claim 15, wherein the plurality of filaments are interconnected to the single member at a position proximal to the tip.
17. The radiofrequency neurotomy system of claim 2, wherein the plurality of filaments exit from the tip at a common location and form a fan-like arrangement as they are deployed.
18. The radiofrequency neurotomy system of claim 2, wherein the plurality of filaments are configured to achieve a lesion having a pyramidal shape when in the deployed position within the patient.
19. The radiofrequency neurotomy system of claim 2, wherein the elongate member and the tip are a single unitary structure.

20. The radiofrequency neurotomy system of claim 2, wherein the radiofrequency probe, the plurality of filaments, and the tip form a monopolar electrode.

21. The radiofrequency neurotomy system of claim 2, wherein the plurality of filaments comprise a shape memory alloy, and wherein a pre-set bias is present in the plurality of filaments such that the plurality of filaments are curved when in the deployed position.

22. The radiofrequency neurotomy system of claim 2, wherein the temperature sensor of the radiofrequency probe assembly comprises a thermocouple.

23. The radiofrequency neurotomy system of claim 2, wherein the radiofrequency probe is insertable into the additional tube lumen of the elongate member after the plurality of filaments have been advanced to the deployed position.

24. The radiofrequency neurotomy system of claim 2, wherein:
the radiofrequency probe extends through the first hub when the radiofrequency probe is inserted into the additional tube lumen of the elongate member;

the radiofrequency neurotomy needle further comprises a projection and the actuator comprises a helical track sized to accommodate the projection;

as the actuator is rotated relative to the first hub, the helical track and the projection, in combination, cause the second hub to move axially;

rotational motion of the actuator relative to the first hub is not transmitted to the second hub;

each filament of the plurality of filaments comprises a distal end that defines a point, and an average of all points of the plurality of filaments is offset from the central longitudinal axis of the elongate member when the plurality of filaments are in the deployed position;

the plurality of filaments are at least partially disposed within the elongate member when in the retracted position;

the plurality of filaments are configured to achieve a lesion having a pyramidal shape when in the deployed position within the patient;

the plurality of filaments comprise a shape memory alloy; and
a pre-set bias is present in the plurality of filaments such that the plurality of filaments are curved when in the deployed position.

25. The radiofrequency neurotomy system of claim 24, wherein a distal end of the radiofrequency probe is near the tip when the plurality of filaments and the tip conduct and emanate the radiofrequency energy.

26. The radiofrequency neurotomy system of claim 25, wherein distal tips of the plurality of filaments extend distally beyond a distal point of the tip when the plurality of filaments are in the deployed position, and wherein when the radiofrequency neurotomy needle is placed generally perpendicular to a surface of a bone of the patient and the deployed filaments are proximate to the surface, the radiofrequency neurotomy needle is configured to achieve a lesion width along the surface that is wider than what the radiofrequency neurotomy needle would create if the plurality of filaments were not deployed.

27. The radiofrequency neurotomy system of claim 26, wherein the tube of the elongate member is 18 gauge

~~the radiofrequency neurotomy needle further comprises an additional tube within which the radiofrequency probe is inserted;~~

~~the additional tube is conductive;~~

~~a portion of the additional tube is housed by the elongate member; and~~

~~the radiofrequency energy is emitted by the radiofrequency probe and is conducted through the additional tube and into and through the plurality of filaments.~~

28. The radiofrequency neurotomy system of claim 26, wherein a single member runs along at least part of the elongate member and the plurality of filaments are interconnected to the single member at a position proximal to the tip.

29. The radiofrequency neurotomy system of claim 28, wherein the plurality of filaments exit from the tip at a common location and form a fan-like arrangement as they are deployed.

30. The radiofrequency neurotomy system of claim 26, wherein the radiofrequency probe, the plurality of filaments, and the tip form a monopolar electrode.
31. The radiofrequency neurotomy system of claim 26, wherein the radiofrequency probe is integrated into the needle.
32. The radiofrequency neurotomy system of claim 26, wherein the radiofrequency probe is insertable into the additional tube lumen of the elongate member after the plurality of filaments have been advanced to the deployed position within the patient.
33. The radiofrequency neurotomy system of claim 2, wherein the tube of the elongate member is 18 gauge.
34. The radiofrequency neurotomy system of claim 2, wherein the radiofrequency neurotomy needle is sized for use in spinal radiofrequency neurotomy.
35. The radiofrequency neurotomy system of claim 2, wherein when the radiofrequency neurotomy needle is placed generally perpendicular to a surface of a bone of the patient and the deployed filaments are proximate to the surface, the radiofrequency neurotomy needle is configured to achieve a lesion width along the surface that is wider than what the radiofrequency neurotomy needle would create if the plurality of filaments were not deployed.
36. The radiofrequency neurotomy system of claim 14, wherein when the radiofrequency neurotomy needle is placed generally perpendicular to a surface of a bone of the patient and the deployed filaments are proximate to the surface, the radiofrequency neurotomy needle is configured to achieve a lesion width along the surface that is wider than what the radiofrequency neurotomy needle would create if the plurality of filaments were not deployed.
37. The radiofrequency neurotomy system of claim 2, wherein the number of filaments is three.

38. The radiofrequency neurotomy system of claim 37, wherein tips of the three filaments form a polygon that has a centroid when the three filaments are in the deployed position, and wherein the centroid is offset from the central longitudinal axis such that the three filaments are configured to produce a lesion that is offset from the central longitudinal axis.

39. The radiofrequency neurotomy system of claim 2, wherein adjacent filaments are positioned about 120 degrees apart from each other about the central longitudinal axis.

40. The radiofrequency neurotomy system of claim 2, wherein each of the plurality of filaments is curved away from the central longitudinal axis when in the deployed position.

41. The radiofrequency neurotomy system of claim 2 ~~claim 7~~, wherein the additional tube comprises an additional lumen that is configured to transport fluid from a fluid source and is configured to subsequently accept the radiofrequency probe therein.

42. The radiofrequency neurotomy system of claim 41, where a maximum cross-dimension of the additional lumen is less than about 0.85 millimeters.

REASONS FOR ALLOWANCE

4. The following is the reasons for allowance mailed out in January 30, 2026.

Racz et al. (hereinafter ‘Racz’, U.S. PGPub. No. 6,146,380) discloses a radiofrequency neurotomy system (Fig. 1) comprising:

- a radiofrequency probe assembly (an electrical probe 52 in Fig. 2B) that comprises a radiofrequency probe (probe shaft 54) that comprises a temperature sensor operable to measure temperature at a distal end of the radiofrequency probe (col. 5, ln. 28-30: “the probe tip 56 [of the probe shaft 54] comprises a temperature sensor”) and a cable (cable extending between the hub 52 and generator 58);

- a first hub (hub 44);

- an elongate member (shaft 34) fixedly attached to the first hub, the elongate member comprising a tube that is 16 gauge or smaller (col. 8, ln. 10-15: “Various sized electrodes [of the electrode shaft 34] can be made, from extremely small gauges (e.g., 30 gauge) to much larger sizes (e.g., 10 gauge)”, which means that depending upon the size of the electrode shaft 34, it is possible to arrive at the tube being 16 gauge or smaller) and a lumen within the tube (col. 5, ln. 44-45; “an internal lumen defined by the electrode shaft 34”) and a central longitudinal axis disposed along a center of the elongate member (pointed tip 40);

- wherein: the radiofrequency probe is positioned within the lumen of the elongate member (see Fig. 1).

However, Racz fails to disclose a plurality of filaments movable between a retracted position and a deployed position.

Zerfas et al. (hereinafter ‘Zerfas’, U.S. Pat. No. 9,078,678) discloses a plurality of filaments (electrode tines 26 in Fig. 1-3) disposed at a distal tip of a shaft (20) disposed within an elongate member (cannula 12) configured to be movable between a retracted position (Fig. 2) and a deployed position (Fig. 3). Zerfas further discloses that the plurality of filaments comprises a hub (handle member 28) connected to an RF generator via an electrical connector (38). Given that Zerfas discloses inserting the shaft (20) within a lumen of the elongate member (cannula shaft 12), there would be no motivation to modify Racz to incorporate the plurality of filament assembly of Zerfas, since the radiofrequency probe assembly (probe 52) of Racz and the radiofrequency probe assembly (probe 26) of Racz are equivalents and there is no motivation to combine the two equivalents into a single embodiment as disclosed in the claimed invention.

Lee (U.S. PGPub. No. 2007/0006215) discloses an RF ablation device comprising an elongate member (cannula 16 in Fig. 1) comprising a shaft (12) and a tip (trocar point 14) configured to pierce tissue of a patient. Lee further discloses a plurality of filaments (stylets 22) configured to be movable between a retracted position (see Fig. 3) and a deployed position (see Fig. 7) in its respective lumens. Specifically, Lee discloses that the plurality of filaments are used to deliver RF energy and operate to ablation adjacent tissue ([0092]). Attention is directed to Lee’s disclosure that the elongate member, cannula, and specifically its distal tip, are intended not to be used as an electrode as Lee discloses that the material of the distal tip is either made with a plastic material or metal covered with a plastic insulating layer ([0091]). Therefore, there would be no motivation to modify Lee, as a primary reference, to incorporate the RF probe assembly of Racz, so that the plurality of filaments, the radiofrequency probe and the tip form a single radiofrequency electrode as required in independent claim 2.

Alternatively, there would be no motivation to modify Racz device and incorporate the plurality of filaments of Lee, as doing so would require a substantial structural arrangement since Lee discloses that one of the filaments extends from the central lumen of the elongate member (see Fig. 5, labeled as 62 in Fig. 33) and to combine the RF probe assembly with the central filament of Lee would require a substantial structural arrangement.

5. After the Notice of Allowability, the following IPR decisions on the parent patents have been submitted.

a. IPR2024-01210 (Patent 10,736,688) JUDGEMENT, Determining All Challenged Claims Unpatentable

b. IPR2024-01212 (Patent 10,925,664) JUDGEMENT: Final Written Decision, Determining All Challenged Claims Unpatentable

c. IPR2024-01211 (Patent 10,736,688) JUDGEMENT, Determining All Challenged Claims Unpatentable

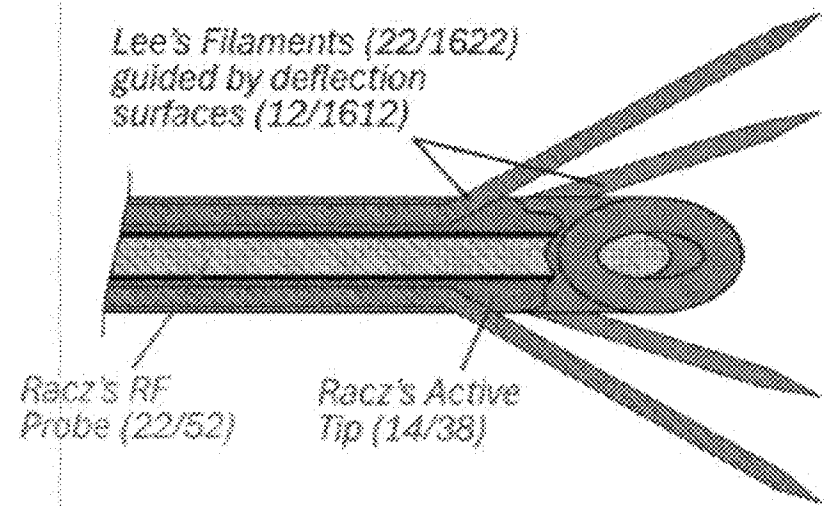
d. IPR2024-01209 (Patent 10,966,782) JUDGEMENT, Determining All Challenged Claims Unpatentable

6. The IPR decisions all state that Racz (U.S. Pat. No. 6,146,380), Fitz (U.S. PGPub. No. 2005/0059964) and Lee (U.S. PGPub. No. 2007/0016183) would have been obvious over the

above listed parent patents. The examiner notes that the instant claimed invention and the parent claimed invention are not distinct inventions.

7. IPR decisions cite that Racz discloses “an apparatus for pain relief that delivers electrical stimulation pulses or high-frequency signals to the vicinity of a neural structure via an electrical needle or cannula.” Racz specifically teaches that a cannula 10 further accommodates an electrode probe 22 such that an external signal generator 28 is connected to the cannula via the probe 22 (IPR2024-01209, pg. 17-18). Fitz is relied upon as a teaching reference to disclose that a known problem with a single-tip RF neurotomy device is “that they do not allow for adequate coverage of the target area,” and that to address inadequate coverage in a single-tip neurotomy devices, Fitz discloses “an introducer used to deploy a set of electrodes” (see IPR2024-01209, pg. 20, ¶2-4). Lee discloses a plurality of filaments/stylets 22 positioned around the perimeter of tip 14 and extend outwardly in a “cone” orientation and that the stylet 22 “may be connected to suitable advancement and retraction mechanism” and the ends of the exposed stylets transmit RF energy to define an ablation volume (see IPR2024-01209, pg. 22-23).

8. In essence, the IPR decisions all determined that the proposed modification of Racz and Lee addresses all the structural limitations including 1) active tip (14/38), 2) RF probe (22/52) and 3) a plurality of filaments (22/1662) as presented below and a POSA would have modified Racz to include Lee’s filaments.



*Dr. Tucker Declaration at ¶143 (showing one example
of how a POSA would modify Racz to include Lee's filaments)*

9.

10. However, the IPR decision does not specifically address “*when the radiofrequency probe is positioned within the lumen of the elongate member and is interconnected to a radiofrequency generator via the cable, the radiofrequency probe is configured to transmit radiofrequency energy applied thereto, and the plurality of filaments and the tip are configured to conduct and emanate the radiofrequency energy such that the radiofrequency probe, the tip, and the plurality of filaments form a single radiofrequency electrode*” of independent claim 2 and similarly recited in Patents ‘782 (for example, in independent claim 1, “*wherein the filament and the tip are configured to transmit radiofrequency energy from the radiofrequency probe and operate together as the single electrode in a monopolar mode...*”), recited in patent ‘688 (for example, in independent claim 1, “*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”), recited in patent ‘664 (for example, in independent claim 1, “A method comprising... inserting a radiofrequency probe into the lumen of the needle such that the radiofrequency probe contacts a conductive portion of the needle at a distal end of the needle to thereby establish an electrically conductive path from the radiofrequency probe to the filament; and operating the radiofrequency probe, the tip, and the filament as a monopolar electrode, with radiofrequency energy from the radiofrequency probe being conducted to the filament through the electrically conductive path and transmitted by the filament”)

11. The IPR decisions merely refer to the declaration testimony of Dr. Tucker that “a POSA would have been motivated to implement deployable filaments on the distal tip (14/38) of Racz’s electrode cannula (10/33)” of the proposed combination, as he “would have recognized that the Fitz/Lee technique would improve the energy coverage area of Racz’s single-tip device.”

12. Lee clearly discloses that the plurality of filaments are energized by its respective conductors and these conductors are also axially advanceable and retractable via an actuating mechanism ([0015]-[0016], [0081], [0098]). Similarly, other references disclose that a plurality of filaments are energized by its respective conductors (Imran, U.S. Pat. No. 5,507,802; push-pull shaft 36 advancing and retracting a plurality of filaments 26, Fig. 3; LeVeen et al., U.S. Pat. No. 5,827,276; plurality of filaments 28 electrically connected to a plurality of wires 24 in Fig. 1; Young et al., U.S. PGPub. No. 2006/0095029; a plurality of filaments 26 electrically connected to its respective separate wires (not shown), [0043]; Bhargav et al., 2009/0318905, filaments 51-57 each connected to its own wires and selectively connects to the positive or negative electrical polarity of an RF generator, col. 10, ln. 6-29).

13. Therefore, all presented IPR decisions do not address how the combination resolves the plurality of filaments comprising its respective conductors coupled to its actuating mechanism of

Lee is replaced with the radiofrequency probe of Racz, such that the radiofrequency probe of Racz is configured to transmit the radiofrequency energy to the plurality of filaments. Even if one of ordinary skill in the art would know how to do so structurally, there is clearly no motivation to remove the respective conductors of the plurality of filaments of Lee so that the plurality of filaments are energized only via the radiofrequency probe.

14. As a matter of fact, it is desirable to connect the plurality of filaments with its respective conductors so that each of the plurality of filaments can be selectively energized depending upon the clinical needs (Bhargav et al., 2009/0318905, filaments 51-57 each connected to its own wires and selectively connects to the positive or negative electrical polarity of an RF generator, col. 10, ln. 6-29). The examiner notes that there is clearly a gap between the Racz/Lee combination and the claimed invention of independent claim 2 and the claimed inventions of the parent patents.

15. However, in order to advance prosecution, the examiner notes that the newly added limitation of independent 2, previously dependent claim 27, reciting in part, “*an additional tube within which the radiofrequency probe is inserted; the additional tube is conductive; a portion of the additional tube is housed by the elongate member; and the radiofrequency energy is emitted by the radiofrequency probe and is conducted through the additional tube and into and through the plurality of filaments*” overcomes the combination of Racz and Lee combination.

16. For example, in Patent 10,966,782, independent claim 1 recites, “an elongate member comprising a lumen configured to accept the radiofrequency probe therein such that the radiofrequency probe physically contacts and is electrically connected to [a] conductive portion [at a distal end of the radiofrequency neurotomy needle], the tip being at a distal end of the elongate member; a filament electrically connected to the conductive portion and the tip due to

physical contact of conductive materials at the distal end of the radiofrequency neurotomy needle such that the filament and the tip operate together as a single electrode...” dependent claim 7 recites “wherein the needle further comprises a tube that is separate from the elongate member” and dependent claim 8 recites “wherein the tube comprises the conductive portion of the needle”.

17. The “[the] tube comprising the conductive portion of the needle” of dependent claim 8 in Patent ‘782 is an equivalent structure to “[the] additional tube within which the radiofrequency probe is inserted... and is conductive” of independent claim 2 of the instant claimed invention.

18. The following is a statement from the IPR2024-01209 decision on page 51 with respect to dependent claims 2-27, which includes the determination of obviousness of dependent claim 8 of Patent ‘782.

2. Claims 2-27

Petitioner offers a detailed explanation as to how the combination of Racz, Fitz, and Lee also teaches each limitation of claims 2 through 27 supported by the testimony of Dr. Tucker. See Pet. 48-67; Ex. 1031 ¶¶181-220. Patent Owner does not challenge this showing apart from the arguments regarding Racz’s modified device that we have previously addressed and found unpersuasive. See PO Resp. 32-59; *supra* Section II.D.

We have reviewed the Petitioner’s assertion and evidence and determine that Petitioner has shown by a preponderance of the evidence that claims 2-27 would have been obvious over Racz, Fitz, and Lee.

19. Similar statement about the equivalent structure of “the additional tube” has been made in the other IPR decisions which is not cited for the purposes of conciseness. The IPR decisions do not necessarily offer any explanation of how the combination of Racz and Lee provides for the “[the] tube comprising the conductive portion of the needle” of dependent claim 8.

20. Providing a conductive tube within an elongate member of a medical device as a return electrode of a bipolar device is known in the art (see return electrode 68 in body 29 in Fig. 15 of Tullis et al., U.S. Pat. No. 7,918,852).

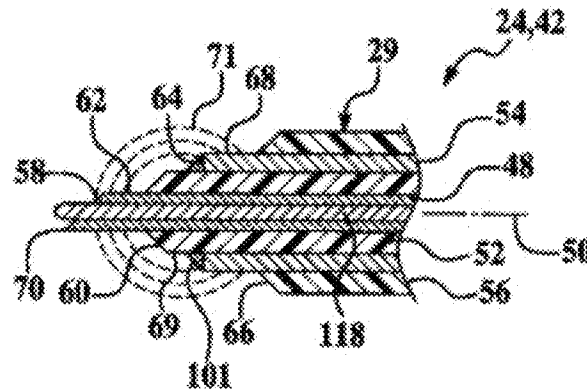


FIG. 15

21.

22. However, even if a return electrode was incorporated into Racz/Lee combination, it would fail to operate as claimed which includes, *“the radiofrequency energy is emitted by the radiofrequency probe and is conducted through the additional tube and into and through the plurality of filaments”* as required in independent claim 2.

23. Therefore, it is the examiner’s position that Racz/Lee combination clearly fails to disclose the additional tube as required in independent claim 2 and all its dependent claims are allowable over Racz/Lee combination.

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.”

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 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 at (571) 272-1213. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/EUN HWA KIM/
Primary Examiner, Art Unit 3794
4/9/2026

<i>Examiner-Initiated Interview Summary</i>	Application No. 18/378,138	Applicant(s) Wright et al.		
	Examiner EUNHWA KIM	Art Unit 3794	AIA (First Inventor to File) Status No	Page 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	Title	Type
EUNHWA KIM	Primary Examiner	Telephonic
Dan Higgs	Attorney of Record	
Matthew Philips	Attorney	

Date of Interview: 08 April 2026

Issues Discussed:

Proposed Amendment(s)

There was a discussion that in light of IPR decisions that were submitted under the IDS, incorporating dependent claim 27 would place the case in condition for allowance. A full record of claim amendments agreed upon can be found in NOA.

/EUN HWA KIM/ Primary Examiner, Art Unit 3794	
<p>Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04</p> <p>Please further see: MPEP 713.04 Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b) 37 CFR § 1.2 Business to be transacted in writing</p>	

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.

Notice of References Cited	Application/Control No. 18/378,138		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 YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-5507802-A	1996-04-16	Imran; Mir A.	A61N1/05	607/128
*	B	US-5827276-A	1998-10-27	LeVeen; Robert F.	A61B18/1477	606/49
*	C	US-20060095029-A1	2006-05-04	Young; Kimbolt	A61B18/148	606/41
*	D	US-20090318905-A1	2009-12-24	Bhargav; Shaily	A61B18/14	606/1
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