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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/329,450	06/05/2023	Ben Merritt	111552.8018.US08	1035

25096 7590 04/30/2024

PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

EXAMINER	
RASSAVONG, ERIC	

ART UNIT	PAPER NUMBER
3781	

NOTIFICATION DATE	DELIVERY MODE
04/30/2024	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentprocurement@perkinscoie.com

Imperative Care v. Inari Medical
US Patent 11,969,333
Imperative Care Ex. 1002

APPLICATION NO.	ISSUE DATE	PATENT NO.
18/329,450	30-Apr-2024	11969333

PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

EGRANT NOTIFICATION

Your electronic patent grant (eGrant) is now available, which can be accessed via Patent Center at https://patentcenter.uspto.gov

The electronic patent grant is the official patent grant under 35 U.S.C. 153. For more information, please visit https://www.uspto.gov/electronicgrants

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/329,450	04/30/2024	11969333	111552.8018.US08	1035

25096 7590 04/10/2024

PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

ISSUE NOTIFICATION

The projected patent number and issue date are specified above. The patent will issue electronically. The electronically issued patent is the official patent grant pursuant to 35 U.S.C. § 153. The patent may be accessed on or after the issue date through Patent Center at https://patentcenter.uspto.gov/. The patent will be available in both the public and the private sides of Patent Center. Further assistance in electronically accessing the patent, or about Patent Center, is available by calling the Patent Electronic Business Center at 1-888-217-9197.

The USPTO is implementing electronic patent issuance with a transition period, during which period the USPTO will mail a ceremonial paper copy of the electronic patent grant to the correspondence address of record. Additional copies of the patent (i.e., certified and presentation copies) may be ordered for a fee from the USPTO's Certified Copy Center at https://certifiedcopycenter.uspto.gov/index.html. The Certified Copy Center may be reached at (800)972-6382.

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 0 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 Center (https://patentcenter.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 Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional inventors):

Ben Merritt, San Clemente, CA;
Jacqueline Macias, Fullerton, CA;
Brian Michael Strauss, San Clemente, CA;
Thomas Tu, Louisville, KY;
John Coleman Thress, Capistrano Beach, CA;

APPLICANT(s) (Please see PATENT CENTER site https://patentcenter.uspto.gov for additional applicants):

Inari Medical, Inc., Irvine, CA;

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 USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/329,450	06/05/2023	Ben Merritt	111552.8018.US08	1035

25096 7590 03/28/2024

PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

EXAMINER	
RASSAVONG, ERIC	

ART UNIT	PAPER NUMBER
3781	

NOTIFICATION DATE	DELIVERY MODE
03/28/2024	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentprocurement@perkinscoie.com

Supplemental ***Notice of Allowability***	**Application No.** 18/329,450	**Applicant(s)** Merritt et al.	
	Examiner ERIC RASSAVONG	**Art Unit** 3781	**AIA (FITF) Status** Yes

-- 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 Printer Rush filed on 03/17/2024.
   ☐ 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 23-60 . 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 _____.

/E.R./ Examiner, Art Unit 3781	/SUSAN S SU/ Primary Examiner, Art Unit 3781

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. 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	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	3781
	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	2018014840	01-18-2018	Panian	
	2.				
	3.				
	4.				
	5.				

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1.					
	2.					
	3.					
	4.					
	5.					

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[5]
		Chinese First Office Action received for CN Application No. 201980067623.1, Applicant: Inari Medical, Inc., Date of Mailing: January 31, 2024, 10 pages.	

EXAMINER SIGNATURE

Examiner Signature	/ERIC RASSAVONG/ (03/25/2024)	Date Considered	03/25/2024

*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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. 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	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	3781
	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

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.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider the listed references. This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information that may be material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, Applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

COPIES OF REFERENCES

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), Applicant has not submitted copies of U.S. patents and U.S. patent applications. Applicant submits herewith copies of foreign patents and non-patent literature in accordance with 37 C.F.R. § 1.98(a)(2).

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	/Matthew S. Williams/	Date (YYYY-MM-DD)	2024-02-26
Name/Print	Matthew S. Williams	Registration Number	77,516

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.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

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
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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
18/329,450	06/05/2023	3781	4100	111552.8018.US08	22	4

CONFIRMATION NO. 1035

UPDATED FILING RECEIPT

25096
PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

OC000000069605034

Date Mailed: 03/13/2024

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)

Ben Merritt, San Clemente, CA;
Jacqueline Macias, Fullerton, CA;
Brian Michael Strauss, San Clemente, CA;
Thomas Tu, Louisville, KY;
John Coleman Thress, Capistrano Beach, CA;
Paul Lubock, Monarch Beach, CA;

Applicant(s)

Inari Medical, Inc., Irvine, CA;

Power of Attorney: The patent practitioners associated with Customer Number 25096

Domestic Priority data as claimed by applicant

This application is a CON of 18/167,757 02/10/2023
which is a CON of 17/976,711 10/28/2022
which is a CON of 17/865,315 07/14/2022 PAT 11,642,209
which is a CON of 16/536,185 08/08/2019 PAT 11,559,382
which claims benefit of 62/718,269 08/13/2018
and claims benefit of 62/718,248 08/13/2018

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: 06/26/2023

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/329,450**

Projected Publication Date: 10/05/2023

Non-Publication Request: No

Early Publication Request: No

Title

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

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).

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 technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/329,450	06/05/2023	Ben Merritt	111552.8018.US08

CONFIRMATION NO. 1035

25096
PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

37 CFR 1.48 ACKNOWLEDGEMENT LETTER

OC000000069605037

Date Mailed: 03/13/2024

NOTICE OF ACCEPTANCE OF REQUEST UNDER 37 CFR 1.48(a)

This is in response to the applicant's request under 37 CFR 1.48(a) submitted on 03/11/2024.

The request under 37 CFR 1.48(a) to correct the inventorship, to correct or update the name of an inventor, or to correct the order of names of joint inventors is accepted.

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**.

/hsarwari/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Ben Merritt et al.

Application No.: 18/329,450 | Confirmation No.: 1035

Filed: June 5, 2023 | Art Unit: 3781

For: SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS | Examiner: Eric Rassavong

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

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

Dear Commissioner:

In the Notice of Allowability mailed March 1, 2024, the Examiner allowed claims 23–60. The Applicant acknowledges Examiner's statements of Reasons for Allowance of the above-referenced patent application and agrees that the claimed subject matter is patentable. However, the Applicant takes no position regarding the Reasons for Allowance presented by the Examiner other than the positions the Applicant may have previously taken during prosecution. Therefore, the Examiner's Reasons for Allowance should not be attributed to the Applicant as an indication of the basis for Applicant's belief that the claims are patentable. Furthermore, the Applicant respectfully asserts that there may also be additional reasons for patentability of the claimed subject matter not explicitly stated in this record and the Applicant does not waive its rights to such arguments by not further addressing such reasons herein.

Dated: March 11, 2024

Respectfully submitted,

By __/Matthew S. Williams/_____
Matthew S. Williams
Registration No.: 77,516

Perkins Coie LLP
P.O. Box 1247
Seattle, WA 98111-1247
Phone: (206) 359-3343
Fax: (206) 359-7198

Attorneys for Applicant

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**03/11/2024 07:27:36 PM Z ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	64639854	FILING DATE	06/05/2023
CUSTOMER #	25096	FIRST NAMED INVENTOR	Ben Merritt
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2024.3.11 Comments - 111552.8018.US08.pdf	2	Miscellaneous Incoming Letter	97 KB
2024-3-11 Issue Fee Transmittal - 111552.8018.US08.pdf	2	Issue Fee Payment (PTO-85B)	237 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
2024.3.11 Comments - 111552.8018.US08.pdf	137894C065F1EF8A619B709F61FE033D771132258FB903771B E01A26A28D911A26944300011DD06C93B727042560885FE91A 6CE2A41A33B2AA3C075B40A56E5B

2024-3-11 Issue Fee Transmittal - 111552.8018.US08.pdf	E8BFB7383A89FDF1DB48137E7CA2E52AEEDC7D339BF07CF E07611B5D83EFDE45F1BAE2565B948230446061BE5DF5C44D B1F2528EC67672DBAF0C74E145BBA55C

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 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

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**03/11/2024 07:27:36 PM Z ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	64639854	AUTHORIZED BY	Matthew Williams
CUSTOMER #	25096	FILING DATE	06/05/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Ben Merritt

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 5111	**E20243AJ28026553**	**JiYoung Anderson**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1501	UTILITY ISSUE FEE	1200.00	1	1200.00
			TOTAL AMOUNT:	**$1,200.00**

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

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New International Application Filed with the USPTO as a Receiving Office

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PART B – FEE(S) TRANSMITTAL

Complete and send this form, together with the 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, VA 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 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)

25096
Perkins Coie LLP
P.O. Box 1247
PATENT - SEA
Seattle, WA, 98111-1247
US

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.

JiYoung Anderson	(Typed or printed name)
/JiYoung Anderson/	(Signature)
2024-03-11	(Date)

APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
18/329,450	Jun 5, 2023	Ben Merritt	111552.8018.US08	1035

TITLE OF INVENTION: SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
UTILITY	LARGE	1200	0	0	1200	2024-06-03

EXAMINER	ART UNIT	CLASS-SUBCLASS
RASSAVONG, ERIC	3781	606-127000

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/AIA/47 or 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. Perkins Coie LLP
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)
Inari Medical, Inc.	Irvine, CA

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 Patent Center or 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. 50-0665

5. Change of Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29. 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.

☐ Applicant asserting small entity status. See 37 CFR 1.27. NOTE: If the application was previously under micro entity status, checking this box will be taken as a notification of loss of entitlement to micro entity status.

☐ Applicant changing to regular undiscounted fee status. NOTE: Checking this box will be taken as 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 /Matthew S. Williams/ Date 2024-03-11

Typed or printed name Matthew S. Williams Registration No. 77,516

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.

Doc Code: R48.REQ
Document Description: Request under Rule 48 correcting inventorship

PTO/AIA/40 (04-18)
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 displays a valid OMB control number.

REQUEST FOR CORRECTION IN A PATENT APPLICATION RELATING TO INVENTORSHIP OR AN INVENTOR NAME, OR ORDER OF NAMES, OTHER THAN IN A REISSUE APPLICATION (37 CFR 1.48)

Application Number	18/329,450 - Conf. No. 1035
Filing Date	2023-06-05
First Named Inventor	Ben Merritt
Art Unit	3781
Examiner Name	Eric Rassavong
Practitioner Docket Number	111552.8018.US08

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

Applicant hereby **requests that the inventorship be corrected or changed, or that the name of the inventor or a joint inventor, or the order of the names of joint inventors, be changed,** in the above-identified application. **Note:** 37 CFR 1.48 applies to any request to correct inventorship filed on or after September 16, 2012, regardless of the application filing date. **Do not submit this form after payment of the issue fee or if the application has been patented.** See 37 CFR 1.324 for correction of inventorship in a patent.

Please check the applicable box(es) below.

For a nonprovisional application:

☑ 1. This request is to correct or change the inventorship in a **nonprovisional** application (**under 37 CFR 1.48(a)**) and includes:

☑ An application data sheet (ADS) in accordance with 37 CFR 1.76(c) with the corrected or updated information shown with markings (*e.g.*, underlining for insertions, strikethrough for deletions). See the Manual of Patent Examining Procedure (MPEP) section 601.05(a) for information about filing an ADS in an application filed on/after September 16, 2012. For information about filing a Supplemental ADS in an application filed before September 16, 2012, see MPEP 601.05(b).

☑ The processing fee set forth in 37 CFR 1.17(i). $ 140

☑ An inventor is being added. An inventor's oath or declaration by any actual inventor who has not yet executed an oath or declaration is required (see 37 CFR 1.48(b)). See MPEP 602.01(a) for information about an inventor's oath or declaration for an application filed on/after September 16, 2012 (*e.g.*, form **PTO/AIA/01**). For information about an inventor's oath or declaration for an application filed before September 16, 2012 (*e.g.*, form **PTO/SB/01**), see MPEP 602.01(b).

☑ This request is being filed after the first Office action on the merits has been given or mailed (see 37 CFR 1.48(c) and 1.17(d)). Check one of the following:

☐ This request to correct or change the inventorship is due solely to the cancellation of claims in the application.

OR

☑ The fee set forth in 37 CFR 1.17(d) is due (in addition to the fee set forth in 37 CFR 1.17(i)). $ 640

This collection of information is required by 37 CFR 1.48. 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 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.**

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

PTO/AIA/40 (04-18)
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 displays a valid OMB control number.

REQUEST FOR CORRECTION IN A PATENT APPLICATION RELATING TO INVENTORSHIP OR AN INVENTOR NAME, OR ORDER OF NAMES, OTHER THAN IN A REISSUE APPLICATION (37 CFR 1.48)

☐ 2. This request is to correct or update the name of the inventor or a joint inventor, or the order of names of joint inventors, in a **nonprovisional** application (**under 37 CFR 1.48(f)**) and includes:

☐ An application data sheet in accordance with 37 CFR 1.76(c) identifying the complete inventive entity, including the corrected or updated name of the inventor, or the new order of names shown with markings (*e.g.*, underlining for insertions, strikethrough for deletions). See the MPEP 601.05(a) for information about filing an ADS in an application filed on/after September 16, 2012. For information about filing a Supplemental ADS in an application filed before September 16, 2012, see MPEP 601.05(b).

☐ The processing fee set forth in 37 CFR 1.17(i). $ _____

For a provisional application:

☐ This request is to change or correct the inventorship, or correct or update the name of the inventor or a joint inventor, in a **provisional** application (**under 37 CFR 1.48(d)**) and includes:

☐ **Attached hereto** is a document that is signed by a party set forth in 37 CFR 1.33(b) and identifies each inventor by his or her legal name, in the preferred order. Note: the document may be an application data sheet in accordance with 37 CFR 1.76(c) that identifies the changes with markings (underlining for insertions, strikethrough for deletions).

☐ The processing fee set forth in 37 CFR 1.17(q). $ _____

Fee Payment Information:

☐ 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 is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 50-0665

☑ 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 77,516 ☐ attorney or agent acting under 37 CFR 1.34 Registration number _____

Signature /Matthew S. Williams/

Typed or printed name Matthew S. Williams

Date 2024.03.11

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, 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 1 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.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**03/11/2024 06:15:36 PM Z ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	64638643	AUTHORIZED BY	Matthew Williams
CUSTOMER #	25096	FILING DATE	06/05/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Ben Merritt

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 5111	**E20243AI16317201**	**JiYoung Anderson**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1830	PROCESSING FEE, EXCEPT IN PROVISIONAL APPLICATIONS	140.00	1	140.00
1819	CORRECTION OF INVENTORSHIP AFTER FIRST ACTION ON MERITS	640.00	1	640.00
			TOTAL AMOUNT:	**$780.00**

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

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

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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.

Based on USPTO form PTO/AIA/01

Docket No.: 111552.8018.US08

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

As the below named inventor, I hereby declare that:

This declaration is directed to:

[ ] The attached application, or

[X] United States application or PCT international application number 18/329,450

filed on 2023-06-05.

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 wilful 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: Paul Lubock Date : January 25, 2024

Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. 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

Based on USPTO form PTO/AIA/01

Docket No.: 111552.8018.US08

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

As the below named inventor, I hereby declare that:

This declaration is directed to:

[ ] The attached application, or

[X] United States application or PCT international application number 18/329,450

filed on 2023-06-05.

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 wilful 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: John Coleman Thress Date: 03/08/2024

Signature:

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. 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.

164668897.1

PTO/AIA/14 (11-15)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

CORRECTED APPLICATION DATA SHEET

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	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

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
	Ben		Merritt	

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

City	San Clemente	State/Province	CA	Country of Residence	US

Mailing Address of Inventor:

Address 1	c/o Inari Medical, Inc.		
Address 2	6001 Oak Canyon, Suite #100		
City	Irvine	State/Province	CA
Postal Code	92618	Country i	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Jacqueline		Macias	

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

City	Fullerton	State/Province	CA	Country of Residence	US

Mailing Address of Inventor:

Address 1	c/o Inari Medical, Inc.		
Address 2	6001 Oak Canyon, Suite #100		
City	Irvine	State/Province	CA
Postal Code	92618	Country i	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Brian	Michael	Strauss	

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

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

City	San Clemente	State/Province	CA	Country of Residence	US

Mailing Address of Inventor:

Address 1	c/o Inari Medical, Inc.		
Address 2	6001 Oak Canyon, Suite #100		
City	Irvine	State/Province	CA
Postal Code	92618	Country i	US

Inventor 4 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Thomas		Tu	

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

City	Louisville	State/Province	KY	Country of Residence	US

Mailing Address of Inventor:

Address 1	c/o Inari Medical, Inc.		
Address 2	6001 Oak Canyon, Suite #100		
City	Irvine	State/Province	CA
Postal Code	92618	Country i	US

Inventor 5 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	John	Coleman	Thress	

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

City	Capistrano Beach	State/Province	CA	Country of Residence	US

Mailing Address of Inventor:

Address 1	c/o Inari Medical, Inc.		
Address 2	6001 Oak Canyon, Suite #100		
City	Irvine	State/Province	CA
Postal Code	92618	Country i	US

Inventor 6 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Paul		Lubock	

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

City	Monarch Beach	State/Province	CA	Country of Residence	US

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

Mailing Address of Inventor:			
Address 1	c/o Inari Medical, Inc.		
Address 2	6001 Oak Canyon, Suite #100		
City	Irvine	State/Province	CA
Postal Code	92618	Country i	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).

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

Customer Number	25096		
Email Address	patentprocurement@perkinscoie.com	Add Email	Remove Email

Application Information:

Title of the Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS		
Attorney Docket Number	111552.8018.US08	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	38	**Suggested Figure for Publication (if any)**	2

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.

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

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	25096		

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	18/167757	2023-02-10
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
18/167757	Continuation of	17/976711	2022-10-28
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
17/976711	Continuation of	17/865315	2022-07-14
Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
17/865315	Continuation of	16/536185	2019-08-08	11559382	2023-01-24

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16/536185	Claims benefit of provisional	62/718269	2018-08-13

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

Prior Application Status	Expired	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16/536185	Claims benefit of provisional	62/718248	2018-08-13
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.			

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.

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

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 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

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	Inari Medical, Inc.

Mailing Address Information For Applicant:

Address 1	6001 Oak Canyon, Suite #100		
Address 2			
City	Irvine	**State/Province**	CA
Country	US	Postal Code	92618
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.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
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	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

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. ☐

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.

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	/Matthew S. Williams/			Date (YYYY-MM-DD)	2024-03-11
First Name	Matthew S.	Last Name	Williams	Registration Number	77,516

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

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. 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	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

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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 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.

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**03/11/2024 06:15:36 PM Z ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	64638643	FILING DATE	06/05/2023
CUSTOMER #	25096	FIRST NAMED INVENTOR	Ben Merritt
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 3

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
Corrected ADS-111552-8018US8.pdf	10	Application Data Sheet	160 KB
Warning: This is not a USPTO supplied ADS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
Declaration additional all - 111552.8018.US08.pdf	2	Oath or Declaration filed	1456 KB
2024.3.11 Request for Correction of Inventorship - 111552.8018.US08.pdf	3	Request under Rule 48 correcting inventorship	227 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
Corrected ADS-111552-8018US8.pdf	7405E458C2C553FE9F6A5FE60CE51C8C30C89F9371EF3C815C002B679814B9A2E612DCF586C3B64EAAEBF255D0439879BB2597C79E3F5236F146F3040BCB7DA9
Declaration additional all - 111552.8018.US08.pdf	C0034615D6366EED3A10F88EBCB34EE11BADC8CBD87A5C8F0838630971F57B47107CC3DACFF9050F161959A3F8EA376E0880AFA7787FD485CFB92CD1A7323AAF
2024.3.11 Request for Correction of Inventorship - 111552.8018.US08.pdf	FA60F600A5DDF2C1AD9E6AC80649191579D89451E13C40E1C3297F8BE68625E8F9AF392C2BAB468BFC005E6D86FFC15A19C6266F69D104FB856B7E6491E7535B

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 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

NOTICE OF ALLOWANCE AND FEE(S) DUE

25096 7590 03/01/2024

PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

EXAMINER	
RASSAVONG, ERIC	
ART UNIT	PAPER NUMBER
3781	

DATE MAILED: 03/01/2024

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/329,450	06/05/2023	Ben Merritt	111552.8018.US08	1035

TITLE OF INVENTION: SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	06/03/2024

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
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 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)

25096 7590 03/01/2024
PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

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)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/329,450	06/05/2023	Ben Merritt	111552.8018.US08	1035

TITLE OF INVENTION: SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1200	$0.00	$0.00	$1200	06/03/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
RASSAVONG, ERIC	3781	606-127000

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,
(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)

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
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.

❑ Applicant asserting small entity status. See 37 CFR 1.27
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.

❑ Applicant changing to regular undiscounted fee 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. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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25096 7590 03/01/2024

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SEATTLE, WA 98111-1247

EXAMINER	
RASSAVONG, ERIC	
ART UNIT	**PAPER NUMBER**
3781	

DATE MAILED: 03/01/2024

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.** 18/329,450	**Applicant(s)** Merritt et al.	
	Examiner ERIC RASSAVONG	**Art Unit** 3781	**AIA (FITF) Status** Yes

-- 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 Remarks filed on 01/30/2024.
   ☐ 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 23-60 . 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 _____.

/E.R./ Examiner, Art Unit 3781	/SUSAN S SU/ Primary Examiner, Art Unit 3781

REASONS FOR ALLOWANCE

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Status of Claims

2. **Claims 23-60** are currently pending. **Claims 1-22** were previously cancelled. No new subject matter is added.

Allowable Claims

3, **Claims 23-60** are allowed.

Reasons for Allowance

4. The following is an examiner's statement of reasons for allowance:

Claim 23 and 42 are allowable for reciting, *inter alia*, "a method of treating *a pulmonary embolism* within a vasculature.. " and "applying the vacuum pressure to the lumen of the aspiration catheter such that at least a portion of the pulmonary embolism and blood are aspirated into the clot canister.

Garrison, Barzell, and Heaton teaches an aspiration catheter, as described in Non-Final Rejection filed on 10/30/2023. However, modified Garrison does not teach an aspiration catheter configured to aspirate pulmonary embolism or deep vein thrombosis. The aspiration catheter of modified Garrison is configured for smaller neurovascular anatomy (see Abstract) and not configured for larger clot/embolisms. As explained by Inventor during the interview on 1/25/2024, and further supported by photographic evidence during the interview, a pulmonary embolism or a deep vein thrombosis presents significant different structures and

physiological responses as compared to neurovascular clots, and therefore one skilled in the art would not have looked to use the Garrison device for the current methods.

Prior art like Batiste (US 20180042623 A1) teaches an aspiration catheter (see Abstract) used for deep vein thrombosis or pulmonary embolisms (see Paragraph [0004]). However, it would not be reasonable to combine modified Garrison with the device of Batiste because Garrison specifically teaches the aspiration catheter being used for neurovascular procedures. Therefore the device of Garrison would be not be combinable with the device of G arrison to teach a method of treating pulmonary embolisms or deep vein thrombosis. There is no prior art that reads on the combination of limitations of claim 23 or 42. **Claims 24-41** are allowable for depending on claim 23. **Claims 43-60** are allowable for depending on claim 42.

5. 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

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC RASSAVONG whose telephone number is (408)918-7549. The examiner can normally be reached Monday - Friday 9:00am-5:30pm PT.

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, Nicholas J. Weiss can be reached on (571)270-1775. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E.R./ (02/09/2024)
Examiner, Art Unit 3781

/SUSAN S SU/
Primary Examiner, Art Unit 3781
12 February 2024

Notice of References Cited	Application/Control No. 18/329,450	Applicant(s)/Patent Under Reexamination Merritt et al.	
	Examiner ERIC RASSAVONG	Art Unit 3781	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-20180042623-A1	2018-02-15	Batiste; Stanley	A61M25/0075	1/1
*	B	US-6059745-A	2000-05-09	Gelbfish; Gary A.	A61M1/81	604/9
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	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 YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/329,450	Merritt et al.
	Examiner	**Art Unit**
	ERIC RASSAVONG	3781

✓	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	10/23/2023	02/09/2024							
	1	✓	-							
	2	✓	-							
	3	✓	-							
	4	✓	-							
	5	✓	-							
	6	✓	-							
	7	O	-							
	8	O	-							
	9	O	-							
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	11	✓	-							
	12	✓	-							
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/329,450	Merritt et al.
	Examiner	**Art Unit**
	ERIC RASSAVONG	3781

CLAIM		DATE								
Final	Original	10/23/2023	02/09/2024							
	43		=							
	44		=							
	45		=							
	46		=							
	47		=							
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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/329,450	Merritt et al.
	Examiner	**Art Unit**
	ERIC RASSAVONG	3781

CPC							
Symbol						**Type**	**Version**
A61F	/	2	/	01		F	2013-01-01
A61B	/	17	/	12109		I	2013-01-01
A61M	/	1	/	84		I	2021-05-01
A61M	/	1	/	815		I	2021-05-01
A61B	/	2017	/	22034		A	2013-01-01
A61B	/	17	/	221		A	2013-01-01
A61B	/	2017	/	22079		A	2013-01-01
A61B	/	2217	/	005		A	2013-01-01
A61M	/	25	/	10		A	2013-01-01
A61M	/	1	/	79		A	2021-05-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

/ERIC RASSAVONG/ Examiner, Art Unit 3781	09 February 2024	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	38	
/SUSAN S SU/ Primary Examiner, Art Unit 3781	12 February 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20240209

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/329,450	Merritt et al.
	Examiner	**Art Unit**
	ERIC RASSAVONG	3781

INTERNATIONAL CLASSIFICATION				
CLAIMED				
A61F2/01	/	2	/	01
A61B17/12	/	17	/	12
A61M1/00	/	1	/	00
A61B17/22	/	17	/	22
A61B17/221	/	17	/	221
A61M25/10	/	25	/	10

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

/ERIC RASSAVONG/ Examiner, Art Unit 3781	09 February 2024	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	38	
/SUSAN S SU/ Primary Examiner, Art Unit 3781	12 February 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/329,450	Merritt et al.
	Examiner	**Art Unit**
	ERIC RASSAVONG	3781

☑ 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	-	10	-	19	6	28	15	37	24	46	33	55		
-	2	-	11	-	20	7	29	16	38	25	47	34	56		
-	3	-	12	-	21	8	30	17	39	26	48	35	57		
-	4	-	13	-	22	9	31	18	40	27	49	36	58		
-	5	-	14	1	23	10	32	19	41	28	50	37	59		
-	6	-	15	2	24	11	33	20	42	29	51	38	60		
-	7	-	16	3	25	12	34	21	43	30	52				
-	8	-	17	4	26	13	35	22	44	31	53				
-	9	-	18	5	27	14	36	23	45	32	54				

/ERIC RASSAVONG/ Examiner, Art Unit 3781	09 February 2024	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	38	
/SUSAN S SU/ Primary Examiner, Art Unit 3781	12 February 2024	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20240209

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/329,450	Merritt et al.
	Examiner	Art Unit
	ERIC RASSAVONG	3781

CPC - Searched*		
Symbol	**Date**	**Examiner**
A61F2/01	10/19/2023	/E.R./
A61B17/12109, 17/221, 2017/22034, 2017/22079, 2217/005, 2017/2212	10/19/2023	/E.R./
A61M1/815, 1/84, 1/79, 25/10, 1/0281, 2205/7545, 2210/12	10/19/2023	/E.R./
A61F2/01	02/09/2024	/E.R./
A61B17/12109, 17/221, 2017/22034, 2017/22079, 2217/005, 2017/2212	02/09/2024	/E.R./
A61M1/815, 1/84, 1/79, 25/10, 1/0281, 2205/7545, 2210/12	02/09/2024	/E.R./

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**
Inventor Name Search in PALM	10/19/2023	/E.R./
CPC and text searching completed	10/23/2023	/E.R./
Updated Search	02/09/2024	/E.R./

/E.R./ Examiner, Art Unit 3781	

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/329,450	Merritt et al.
	Examiner	Art Unit
	ERIC RASSAVONG	3781

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	Keyword Search in USPAT	02/09/2024	/E.R./

/E.R./ Examiner, Art Unit 3781	

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. 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	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	3781
	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	20110152889	06-23-2011	Ashland	
	2.	20230310137	10-05-2023	Merritt et al.	
	3.	20230310751	10-05-2023	Merritt et al.	
	4.	20030023263	01-30-2003	Krolik et al.	
	5.	20030135151	07-17-2003	Deng	
	6.	20200022711	01-23-2020	Look et al.	
	7.	6017335	01-25-2000	Burnham	
	8.	20040039351	02-26-2004	Barrett	
	9.	20140180055	06-26-2014	Glynn et al.	
	10.	20230329734	10-19-2023	Marchand et al.	
	11.	5242461	09-07-1993	Kortenbach et al.	
	12.	11806033	11-07-2023	Marchand et al.	
	13.	3438607	04-15-1969	Williams et al.	
	14.	4401107	08-30-1983	Harber et al.	
	15.	4634421	01-06-1987	Hegemann	
	16.	5484418	01-16-1996	Quiachon et al.	
	17.	20080087853	04-17-2008	Kees	
	18.	10648268	05-12-2020	Jaffrey et al.	
	19.	20230320834	10-12-2023	Merritt et al.	
	20.	9884387	02-06-2018	Plha	
	21.	20230338131	10-26-2023	Merritt et al.	
	22.	20230338130	10-26-2023	Merritt et al.	
	23.	2010114017	05-06-2010	Lenker et al.	
	24.	6589264	07-08-2003	Barbut et al.	
	25.	20230355259	11-09-2023	Marchand et al.	
	26.	20230355256	11-09-2023	Dinh	
	27.	20230355938	11-09-2023	Merritt et al.	
	28.	20230363883	11-16-2023	Merritt et al.	
	29.	20230363776	11-16-2023	Quick	
	30.	20170113005	04-27-2017	LINDER et al.	
	31.	20110309037	12-22-2011	LEE	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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	Application Number	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	3781
	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	32.	20080294096	11-27-2008	Uber, III et al.	
	33.	20130270161	10-17-2013	KUMAR et al.	
	34.	20210316127	10-14-2021	Buck et al.	
	35.	20170172591	06-22-2017	Ulm, III	
	36.	11832837	12-05-2023	Hauser	
	37.	11832838	12-05-2023	Hauser	
	38.	11833023	12-05-2023	Hauser	
	39.	20230390045	12-07-2023	Merritt et al.	
	40.	20230389932	12-07-2023	Ozenne et al.	
	41.	11839393	12-12-2023	Hauser	
	42.	11844921	12-19-2023	Merritt et al.	
	43.	11849963	12-26-2023	Quick	
	44.	20130190701	07-25-2013	Kirn	
	45.	20210128182	05-06-2021	Teigen et al.	
	46.	20170143880	05-25-2017	LUXON et al.	
	47.	3785380	01-15-1974	Brumfield	
	48.	6908455	06-21-2005	Hajianpour	
	49.	7837630	11-23-2010	Nieoson et al.	
	50.	20090312786	12-17-2009	Trask et al.	
	51.	20120095448	04-19-2012	KAJII	
	52.	20160220795	08-04-2016	KORKUCH et al.	
	53.	20130123705	05-16-2013	Holm et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1.	WO2023192925	10-05-2023	Inari Medical, Inc.		
	2.	WO2019173475	09-12-2019	Innovative Cardiovascular Solutions, LLC		
	3.	WO2023215779	11-09-2023	Inari Medical, Inc.		
	4.					

164506319.1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	3781
	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	5.					

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[5]
		Extended European Search Report issued for EP Application No. 20877370.5, Date of Mailing: October 17, 2023, 11 pages.	
		International Search Report and Written Opinion for International App. No. PCT/US23/65128; Date of Filing: March 30, 2023, Applicant: Inari Medical, Inc., Date of Mailing: November 14, 2023, 14 pages.	
		International Search Report and Written Opinion for International App. No. PCT/US23/66538; Date of Filing: May 3, 2023, Applicant: Inari Medical, Inc., Date of Mailing: January 4, 2024, 14 pages.	

EXAMINER SIGNATURE

Examiner Signature	/ERIC RASSAVONG/ (02/09/2024)	Date Considered	02/09/2024

*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.

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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	3781
	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

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.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider the listed references. This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information that may be material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, Applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

COPIES OF REFERENCES

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), Applicant has not submitted copies of U.S. patents and U.S. patent applications. Applicant submits herewith copies of foreign patents and non-patent literature in accordance with 37 C.F.R. § 1.98(a)(2).

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	/Matthew S. Williams/	Date (YYYY-MM-DD)	2024-01-30
Name/Print	Matthew S. Williams	Registration Number	77,516

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.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Bibliographic Data

Application No: 18/329,450

Foreign Priority claimed: ○ Yes ◉ No

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

Verified and Acknowledged: /ERIC RASSAVONG/ Examiner's Signature | Initials

Title: SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/05/2023	606	3781	111552.8018.US08
RULE			

APPLICANTS

Inari Medical, Inc., Irvine, CA, UNITED STATES

INVENTORS

Ben Merritt,

Jacqueline Macias,

Brian Michael Strauss,

Thomas Tu,

CONTINUING DATA

This application is a CON of 18167757 02/10/2023

18167757 is a CON of 17976711 10/28/2022

17976711 is a CON of 17865315 07/14/2022 PAT 11642209

17865315 is a CON of 16536185 08/08/2019 PAT 11559382

16536185 has PRO of 62718248 08/13/2018

16536185 has PRO of 62718269 08/13/2018

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

06/26/2023

STATE OR COUNTRY

ADDRESS

PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247
UNITED STATES

FILING FEE RECEIVED

$6,360

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L48	53	("10648268" OR "11806033" OR "11832837" OR "11832838" OR "11833023" OR "11839393" OR "11844921" OR "11849963" OR "20030023263" OR "20030135151" OR "20040039351" OR "20080087853" OR "20080294096" OR "20090312786" OR "20100114017" OR "20110152889" OR "20110309037" OR "20120095448" OR "20130123705" OR "20130190701" OR "20130270161" OR "20140180055" OR "20160220795" OR "20170113005" OR "20170143880" OR "20170172591" OR "20200022711" OR "20210128182" OR "20210316127" OR "20230310137" OR "20230310751" OR "20230320834" OR "20230329734" OR "20230338130" OR "20230338131" OR "20230355256" OR "20230355259" OR "20230355938" OR "20230363776" OR "20230363883" OR "20230389932" OR "20230390045" OR "3438607" OR "3785380" OR "4401107" OR "4634421" OR "5242461" OR "5484418" OR "6017335" OR "6589264" OR "6908455" OR "7837630" OR	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:09 AM

		"9884387").pn.					
L49	4	("11890180" OR "20140163615" OR "5323514" OR "5911728").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:15 AM
L50	25	A61M1/79.cpc. AND (filter NEAR (replace reuse)) AND (canister receptacle)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:16 AM
L51	277	A61M1/79.cpc. AND (filter NEAR remov$4) AND (canister receptacle)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:16 AM
L52	1	A61M1/79.cpc. AND (filter NEAR remov$4) AND (canister receptacle) NEAR (transparent clear)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:16 AM
L53	277	A61M1/79.cpc. AND (filter NEAR remov$4) AND (canister receptacle)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:16 AM
L54	1135	A61M1/79.cpc. AND remov$4 AND (canister receptacle)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:16 AM
L55	26	((US-20230062809-A1 OR US-20230046775-A1 OR US-20190015298-A1 OR US-20180184912-A1 OR US-20180055999-A1 OR US-20180042623-A1 OR US-20170319221-A1 OR US-20160106353-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:16 AM

		A1 OR US-20040019310-A1 OR US-20040122359-A1 OR US-20230321412-A1 OR US-20110196309-A1 OR US-20140257363-A1 OR US-20140155830-A1 OR US-20170056032-A1 OR US-20030116731-A1).did. AND PGPB.dbnm.) OR ((US-10531883-B1 OR US-8535283-B2 OR US-8753322-B2 OR US-7223253-B2 OR US-6767353-B1 OR US-10478535-B2).did. AND USPT.dbnm.) OR ((WO-2018065092-A1).did. AND DWPI.dbnm.) OR ((WO-2016014955-A1 OR EP-2942624-A1 OR WO-2006029270-A1).did. AND FTDB.dbnm.)					
L56	41	((EP-2942624-A1 OR WO-2006124307-A2 OR WO-2016014955-A1 OR WO-2006029270-A1 OR WO-2015179329-A1).did. AND FTDB.dbnm.) OR ((US-10478535-B2 OR US-10226263-B2 OR US-9581942-B1 OR US-9439751-B2 OR US-8777893-B2 OR US-8535283-B2 OR US-6960189-B2 OR US-6767353-B1 OR US-10456555-B2 OR US-8343167-B2 OR US-7815608-B2).did. AND USPT.dbnm.) OR ((US-20190239910-A1 OR US-20180236205-A1 OR US-20180193043-A1 OR US-20180184912-A1 OR US-20180064453-A1 OR US-20180042623-A1 OR US-20170252057-A1 OR	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:16 AM

		US-20170105743-A1 OR US-20170100142-A1 OR US-20170056032-A1 OR US-20160220741-A1 OR US-20140257363-A1 OR US-20140155830-A1 OR US-20130281788-A1 OR US-20130035628-A1 OR US-20120310166-A1 OR US-20110213290-A1 OR US-20110034986-A1 OR US-20050004534-A1 OR US-20010049486-A1 OR US-20050054995-A1 OR US-20110144592-A1 OR US-20030116731-A1 OR US-20030023263-A1 OR US-20030135151-A1).did. AND PGPB.dbnm.)				
L57	7804	A61F2/01.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:38 AM
L58	17755	A61B17/12109.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:38 AM
L59	1325	A61M1/815.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:38 AM
L60	12779	A61M1/84.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT;	OR	ON	ON	2024/02/10 01:38 AM

			IBM_TDB)				
L61	23096	A61B17/221.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:38 AM
L62	5323	A61B2017/22034.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:38 AM
L63	8367	A61B2017/22079.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:39 AM
L64	30437	A61B2217/005.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:39 AM
L65	4836	A61M1/79.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:39 AM
L66	35116	A61M25/10.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:39 AM
L67	11545	A61B2017/2212.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO;	OR	ON	ON	2024/02/10 01:39 AM

			JPO; DERWENT; IBM_TDB)				
L68	4170	A61M1/0281.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:39 AM
L69	6734	A61M2205/7545.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:39 AM
L70	5615	A61M2210/12.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/02/10 01:39 AM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	0	(aspiration suction).clm. AND (catheter tube).clm. AND (valve stopcock).clm. AND chamber.clm. AND (first second).clm. AND clot.clm. AND filter.clm. AND reintroduc$4.clm. AND ("pulomnary embolism deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:21 AM
N2	0	(aspiration suction).clm. AND (catheter tube).clm. AND (valve stopcock).clm. AND chamber.clm. AND (first second).clm. AND clot.clm. AND filter.clm. AND reintroduc$4.clm. AND ("pulomnary embolism" OR "deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:21 AM
N3	0	(aspiration suction).clm. AND (catheter	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:21 AM

		tube).clm. AND (valve stopcock).clm. AND chamber.clm. AND (first second).clm. AND clot.clm. AND filter.clm. AND ("pulomnary embolism" OR "deep vein thrombrosis")					
N4	0	(aspiration suction).clm. AND (catheter tube).clm. AND (valve stopcock).clm. AND chamber.clm. AND (first second).clm. AND clot.clm. AND reintroduc$4.clm. AND ("pulomnary embolism deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:21 AM
N5	0	(aspiration suction).clm. AND (catheter tube).clm. AND (valve stopcock).clm. AND chamber.clm. AND clot.clm. AND filter.clm. AND reintroduc$4.clm. AND ("pulomnary embolism deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:21 AM
N6	0	(aspiration suction).clm. AND (catheter tube).clm. AND (valve stopcock).clm. AND clot.clm. AND filter.clm. AND reintroduc$4.clm. AND ("pulomnary embolism deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:22 AM
N7	0	(aspiration suction).clm. AND (catheter tube).clm. AND (valve stopcock).clm. AND clot.clm. AND filter.clm. AND reintroduc$4.clm. AND ("pulmonary embolism deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:22 AM
N8	5	(aspiration suction).clm. AND (catheter tube).clm. AND (valve stopcock).clm. AND clot.clm. AND filter.clm. AND reintroduc$4.clm. AND ("pulmonary embolism" OR "deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:22 AM
N9	28	(aspiration suction).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10

		AND (catheter tube).clm. AND (valve stopcock).clm. AND clot.clm. AND filter.clm. AND ("pulmonary embolism" OR "deep vein thrombrosis")					01:22 AM
N10	5	(aspiration suction).clm. AND (catheter tube).clm. AND (valve stopcock).clm. AND clot.clm. AND reintroduc$4.clm. AND ("pulmonary embolism" OR "deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:22 AM
N11	5	(aspiration suction).clm. AND (catheter tube).clm. AND (valve stopcock).clm. AND filter.clm. AND reintroduc$4.clm. AND ("pulmonary embolism" OR "deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:22 AM
N12	6	(aspiration suction).clm. AND (catheter tube).clm. AND clot.clm. AND filter.clm. AND reintroduc$4.clm. AND ("pulmonary embolism" OR "deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:23 AM
N13	5	(aspiration suction).clm. AND (valve stopcock).clm. AND clot.clm. AND filter.clm. AND reintroduc$4.clm. AND ("pulmonary embolism" OR "deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:23 AM
N14	8	(catheter tube).clm. AND (valve stopcock).clm. AND clot.clm. AND filter.clm. AND reintroduc$4.clm. AND ("pulmonary embolism" OR "deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:23 AM
N15	58	(aspiration suction).clm. AND (catheter tube).clm. AND (valve stopcock).clm. AND clot.clm. AND ("pulmonary embolism" OR "deep vein	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:23 AM

		thrombrosis")					
N16	144	(aspiration suction).clm. AND (catheter tube).clm. AND (valve stopcock).clm. AND ("pulmonary embolism" OR "deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:23 AM
N17	60	(aspiration suction).clm. AND (valve stopcock).clm. AND clot.clm. AND ("pulmonary embolism" OR "deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:23 AM
N18	91	(catheter tube).clm. AND (valve stopcock).clm. AND clot.clm. AND ("pulmonary embolism" OR "deep vein thrombrosis")	(US-PGPUB; USPAT)	OR	ON	ON	2024/02/10 01:24 AM

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. 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	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	3781
	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	11890180	02-06-2024	Merritt et al.	
	2.	20140163615	06-12-2014	Gadlage et al.	
	3.	5323514	06-28-1994	Masuda et al.	
	4.	5911728	06-15-1999	Sepetka et al.	
	5.				

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1.					
	2.					
	3.					
	4.					
	5.					

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[5]

EXAMINER SIGNATURE

Examiner Signature	/ERIC RASSAVONG/ (02/09/2024)	Date Considered	02/09/2024

*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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

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	Attorney Docket Number	111552-8018.US08

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.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider the listed references. This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information that may be material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, Applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

COPIES OF REFERENCES

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), Applicant has not submitted copies of U.S. patents and U.S. patent applications. Applicant submits herewith copies of foreign patents and non-patent literature in accordance with 37 C.F.R. § 1.98(a)(2).

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	/Matthew S. Williams/	Date (YYYY-MM-DD)	2024-02-06
Name/Print	Matthew S. Williams	Registration Number	77,516

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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Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

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	Art Unit	3781
	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	20200129741	04-30-2020	Kawwas et al.	
	2.				
	3.				
	4.				
	5.				

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1.	WO2012114633	08-30-2012	TERUMO KABUSHIKI KAISHA		
	2.					
	3.					
	4.					
	5.					

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[5]
		English translation of Japanese Office Action received for JP Application No. 2022-574456, Applicant: Inari Medical, Inc, Date of Mailing: January 23, 2024, 12 pages.	

EXAMINER SIGNATURE

Examiner Signature	/ERIC RASSAVONG/ (02/23/2024)	Date Considered	02/23/2024

*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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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.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

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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	/Matthew S. Williams/	Date (YYYY-MM-DD)	2024-02-13
Name/Print	Matthew S. Williams	Registration Number	77,516

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**02/26/2024 01:46:31 PM Z ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	64445554	FILING DATE	06/05/2023
CUSTOMER #	25096	FIRST NAMED INVENTOR	Ben Merritt
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2024-2-26 IDS SB08 - 111552-8018US8.pdf	2	Information Disclosure Statement (IDS) Form (SB08)	122 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
NPL_CN-Office Action 201980067623.1 mailed Jan. 31 2024 -10 pages.pdf	10	Non Patent Literature	371 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
2024-2-26 IDS SB08 - 111552-	28B1BA0DC51D79FE21635A7A0867563A04951720C3A149D33

8018US8.pdf	8F9D3FFED97953F2C3EF220BC22C20B4570D985EDEB8175E305B6195C1082984BE99AC9D3A1DE2B
NPL_CN-Office Action 201980067623.1 mailed Jan. 31 2024 -10 pages.pdf	67A4EFF504AA331CEC2C9D259CD544739D92C7C66DC4824A0FC1237FB36FC905AA26A95EF95F26FED5E827B5C61B45BBD219D6ACB245089061913101DC669601

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 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

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UNITED STATES
PATENT AND TRADEMARK OFFICE

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Alexandria, VA 22313 - 1450
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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**02/26/2024 01:46:31 PM Z ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	64445554	AUTHORIZED BY	Matthew Williams
CUSTOMER #	25096	FILING DATE	06/05/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Ben Merritt

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 5111	**E20242PD47066357**	**JiYoung Anderson**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
			TOTAL AMOUNT:	**$260.00**

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	3781
	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	2018014840	01-18-2018	Panian	
	2.				
	3.				
	4.				
	5.				

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1.					
	2.					
	3.					
	4.					
	5.					

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[5]
		Chinese First Office Action received for CN Application No. 201980067623.1, Applicant: Inari Medical, Inc., Date of Mailing: January 31, 2024, 10 pages.	

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.

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. 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.

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	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

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OR

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☐ See attached certification statement.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider the listed references. This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information that may be material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, Applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

COPIES OF REFERENCES

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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	/Matthew S. Williams/	Date (YYYY-MM-DD)	2024-02-26
Name/Print	Matthew S. Williams	Registration Number	77,516

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.**

PTO/SB/08a (01-10)
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	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	20200129741	04-30-2020	Kawwas et al.	
	2.				
	3.				
	4.				
	5.				

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1.	WO2012114633	08-30-2012	TERUMO KABUSHIKI KAISHA		
	2.					
	3.					
	4.					
	5.					

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[5]
		English translation of Japanese Office Action received for JP Application No. 2022-574456, Applicant: Inari Medical, Inc, Date of Mailing: January 23, 2024, 12 pages.	

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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	Attorney Docket Number	111552-8018.US08

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☐ None

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Signature	/Matthew S. Williams/	Date (YYYY-MM-DD)	2024-02-13
Name/Print	Matthew S. Williams	Registration Number	77,516

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	Attorney Docket Number	111552-8018.US08

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**02/13/2024 11:03:33 PM Z ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	64313533	AUTHORIZED BY	Matthew Williams
CUSTOMER #	25096	FILING DATE	06/05/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Ben Merritt

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 5111	**E20242CN07275601**	**JiYoung Anderson**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
			TOTAL AMOUNT:	**$260.00**

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**02/13/2024 11:03:33 PM Z ET**	**111552.8018.US08**

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CUSTOMER #	25096	FIRST NAMED INVENTOR	Ben Merritt
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 3

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2024-2-13- IDS SB08 - 111552-8018US8.pdf	3	Information Disclosure Statement (IDS) Form (SB08)	124 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
NPL_EN Translation of JP Official Action JP 2022-574456 mailed Jan 23 2023 12 pages.pdf	12	Non Patent Literature	91 KB
FOR_WO2012114633.pdf	30	Foreign Reference	1051 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
2024-2-13- IDS SB08 - 111552-8018US8.pdf	C1DF31388DF066E94EE8F12E95E0B6B1532D8EAA2B0E7B2300DA34C2F01EF009241EE4FD344EC5F1CA9398AE770503C4197749A4A70360544752378D4DAF6B43
NPL_EN Translation of JP Official Action JP 2022-574456 mailed Jan 23 2023 12 pages.pdf	8FE5FDE20C13A1EAB315826C2B2E39B7E0E6CE2AEF62BDE20DFD8B716DA495C3D7BAC423879A9611348E4CB1C4613B7EE01F8D54BE1580CE6E5F9E3C436302C9
FOR_WO2012114633.pdf	686B21251DE173EEDE1A69F56BB0D3888962CBEF494AD6AE574FAFDA438BFCDCABAA90DE7E1EC169DB112EDF154EFF47F1D1D803B115ADD1652AAB0A55BCF2EF

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U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	11890180	02-06-2024	Merritt et al.	
	2.	20140163615	06-12-2014	Gadlage et al.	
	3.	5323514	06-28-1994	Masuda et al.	
	4.	5911728	06-15-1999	Sepetka et al.	
	5.				

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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[5]

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PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	3781
	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

UNITED STATES
PATENT AND TRADEMARK OFFICE

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**02/06/2024 05:10:59 PM Z ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	64231878	FILING DATE	06/05/2023
CUSTOMER #	25096	FIRST NAMED INVENTOR	Ben Merritt
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2024-2-6- IDS SB08 - 111552-8018US8.pdf	3	Information Disclosure Statement (IDS) Form (SB08)	124 KB

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Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
2024-2-6- IDS SB08 - 111552-8018US8.pdf	B5941B1C51CA178C986C776417077C671CEFB90C350C427198D067E79828D3F935C3A7D129D0349854E951A1FC473CC387598CF05DD4D0191F505C06102D390F

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for 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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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**02/06/2024 05:10:59 PM Z ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	64231878	AUTHORIZED BY	Matthew Williams
CUSTOMER #	25096	FILING DATE	06/05/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Ben Merritt

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 5111	**E202426H11287224**	**JiYoung Anderson**

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1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
			TOTAL AMOUNT:	**$260.00**

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New Applications Under 35 U.S.C. 111

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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.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/329,450	06/05/2023	Ben Merritt	111552.8018.US08	1035

25096 7590 01/31/2024

PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

EXAMINER	
RASSAVONG, ERIC	

ART UNIT	PAPER NUMBER
3781	

NOTIFICATION DATE	DELIVERY MODE
01/31/2024	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentprocurement@perkinscoie.com

Applicant-Initiated Interview Summary	**Application No.** 18/329,450	**Applicant(s)** Merritt et al.		
	Examiner ERIC RASSAVONG	**Art Unit** 3781	**AIA (First Inventor to File) Status** Yes	**Page** 1 of 2

All Participants (applicant, applicants representative, PTO personnel)	**Title**	**Type**
ERIC RASSAVONG	Examiner	Video Conference
Susan Su	Primary Examiner	
Matthew S. Williams	Attorney	
Paul T. Parker	Attorney	
Dr. Thomas Tu	Inventor	

Date of Interview: 25 January 2024

Issues Discussed:

Proposed Amendment(s)

Attorney and Examiner agree that incorporating more structural claim language, i.e. diameter of the catheter, would make the claim 1 allowable over the prior art Garrison.

Attorney and Examiner agree that the newly added method claims would be allowable for reciting the specific use in pulmonary embolism applications.

Other

Dr. Tu discussed the differences between catheters used in cerebral occlusions vs. pulmonary embolisms and deep vein thrombosis.

☑ Attachment

/E.R./ Examiner, Art Unit 3781	/SUSAN S SU/ Primary Examiner, Art Unit 3781

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
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

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.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:	MERRITT ET AL.	EXAMINER:	ERIC RASSAVONG
APPLICATION NO.:	18/329,450	ART UNIT:	3781
FILED:	JUNE 5, 2023	CONF. NO:	1035
FOR:	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS		

Proposed Agenda

DO NOT ENTER—FOR DISCUSSION PURPOSES ONLY

Examiner Rassavong,

The present paper is an agenda for a videoconference interview regarding U.S. Patent Application No. 18/329,450 scheduled for January 25, 2024 at 1:30 PM (Eastern).

The proposed list of participants for the interview representing the Applicant includes:

- Matthew S. Williams (Reg. No. 77,516)
    - Email: matthewwilliams@perksincoie.com
- Paul T. Parker (Reg. No. 38,264)
    - Email: PParker@perkinscoie.com
- Dr. Thomas Tu (Inventor)
    - Email: thomas.tu@inarimedical.com

During the interview, the Applicant's representative plans to discuss:

(1) Discussion of proposed amendment to independent claim 1 and new claims:

23. (Proposed New) A method for the treatment of a pulmonary embolism within a vasculature of a patient, the method comprising:

advancing an aspiration catheter at least partially through the of the vasculature of the patient such that the distal end portion of the aspiration catheter is positioned proximate to the pulmonary embolism, wherein a lumen of the aspiration catheter is fluidly coupled along a flow path to a clot canister and an aspiration source proximal of the clot canister;

with a valve positioned along the flow path between the aspiration catheter and the clot canister in a closed position, generating vacuum pressure within the clot canister via the aspiration source; and

moving the valve to an open position to apply the vacuum pressure to the lumen of the aspiration catheter to aspirate at least a portion of the pulmonary embolism and blood into the clot canister, wherein the clot canister includes a filter configured to filter the blood from the portion of the pulmonary embolism.

24. (Proposed New) The method of claim 23 wherein the catheter has a size of 16 French or greater.

25. (Proposed New) A method for the treatment of a deep vein thrombosis within a vasculature of a patient, the method comprising:

advancing an aspiration catheter at least partially through the of the vasculature of the patient such that the distal end portion of the aspiration catheter is positioned proximate to a deep vein thrombosis, wherein a lumen of the aspiration catheter is fluidly coupled along a flow path to a clot canister and an aspiration source proximal of the clot canister;

with a valve positioned along the flow path between the aspiration catheter and the clot canister in a closed position, generating vacuum pressure within the clot canister via the aspiration source; and

moving the valve to an open position to apply the vacuum pressure to the lumen of the aspiration catheter to aspirate at least a portion of the deep vein thrombosis and blood into the clot canister, wherein the clot canister includes a filter configured to filter the blood from the portion of the pulmonary embolism.

1. (Proposed Amendment) A clot treatment system for treating clot material comprising a pulmonary embolism in the vasculature of a patient, comprising:

an aspiration catheter defining a lumen and having a distal end portion, wherein the aspiration catheter is flexible and shaped to be intravascularly ~~positioned~~ advanced through the vasculature of the patient such that the distal end portion of the aspiration catheter is positioned proximate to ~~the~~a pulmonary embolism~~within a blood vessel of a patient~~;

a hemostasis valve fluidly coupled to the aspiration catheter, wherein the hemostasis valve is actuatable by a user to selectively provide fluid access to the lumen;

a clot canister selectively fluidly coupled to the lumen of the aspiration catheter;

a filter positioned within the clot canister and configured to filter blood from ~~clot material~~the pulmonary embolism;

an aspiration source fluidly coupled to the clot canister;

a flow path extending from the lumen of the aspiration catheter, through the clot canister, and to the aspiration source; and

a user-actuatable valve between the aspiration catheter and the clot canister along the flow path, wherein the valve is movable by user actuation between (a) a closed position in which fluid is prevented from flowing along the flow path from the aspiration catheter to the clot canister and (b) an open position in which fluid is allowed to flow from the aspiration catheter to the clot canister,

wherein the aspiration source is configured to generate vacuum pressure within the clot canister when the valve is in the closed position, and

wherein, upon user actuation to move the valve to the open position with the vacuum pressure having been generated in the clot canister, the clot canister is positioned to apply the vacuum pressure to the lumen of the aspiration catheter to aspirate the blood and ~~the clot material~~at least a portion of the pulmonary embolism into the clot canister.

(2) Discussion of the Section 103 rejection of claim 1 over the combination of U.S. Patent Application Publication No. 2018/0064453 to Garrison et al. ("Garrison"), U.S. Patent Application Publication No. 2005/0054995 to Barzell et al. ("Barzell"), and U.S. Patent No. 8,535,283 to Heaton et al. ("Heaton").

(3) Discussion of additional prior art of record.

(a) U.S. Patent Application Publication No. 2017/0274180 ("Garrison"). *See*, e.g., Figure 34 and paragraphs [0132]–[0134] and [0162]–[0172].

(b) U.S. Patent Application Publication No. 2013/0035628 ("Garrison"). *See*, e.g., Figure 16 and paragraph [0085].

PTO/SB/08a (01-10)
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	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	3781
	Examiner Name	Eric Rassavong
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	20110152889	06-23-2011	Ashland	
	2.	20230310137	10-05-2023	Merritt et al.	
	3.	20230310751	10-05-2023	Merritt et al.	
	4.	20030023263	01-30-2003	Krolik et al.	
	5.	20030135151	07-17-2003	Deng	
	6.	20200022711	01-23-2020	Look et al.	
	7.	6017335	01-25-2000	Burnham	
	8.	20040039351	02-26-2004	Barrett	
	9.	20140180055	06-26-2014	Glynn et al.	
	10.	20230329734	10-19-2023	Marchand et al.	
	11.	5242461	09-07-1993	Kortenbach et al.	
	12.	11806033	11-07-2023	Marchand et al.	
	13.	3438607	04-15-1969	Williams et al.	
	14.	4401107	08-30-1983	Harber et al.	
	15.	4634421	01-06-1987	Hegemann	
	16.	5484418	01-16-1996	Quiachon et al.	
	17.	20080087853	04-17-2008	Kees	
	18.	10648268	05-12-2020	Jaffrey et al.	
	19.	20230320834	10-12-2023	Merritt et al.	
	20.	9884387	02-06-2018	Plha	
	21.	20230338131	10-26-2023	Merritt et al.	
	22.	20230338130	10-26-2023	Merritt et al.	
	23.	2010114017	05-06-2010	Lenker et al.	
	24.	6589264	07-08-2003	Barbut et al.	
	25.	20230355259	11-09-2023	Marchand et al.	
	26.	20230355256	11-09-2023	Dinh	
	27.	20230355938	11-09-2023	Merritt et al.	
	28.	20230363883	11-16-2023	Merritt et al.	
	29.	20230363776	11-16-2023	Quick	
	30.	20170113005	04-27-2017	LINDER et al.	
	31.	20110309037	12-22-2011	LEE	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	32.	20080294096	11-27-2008	Uber, III et al.	
	33.	20130270161	10-17-2013	KUMAR et al.	
	34.	20210316127	10-14-2021	Buck et al.	
	35.	20170172591	06-22-2017	Ulm, III	
	36.	11832837	12-05-2023	Hauser	
	37.	11832838	12-05-2023	Hauser	
	38.	11833023	12-05-2023	Hauser	
	39.	20230390045	12-07-2023	Merritt et al.	
	40.	20230389932	12-07-2023	Ozenne et al.	
	41.	11839393	12-12-2023	Hauser	
	42.	11844921	12-19-2023	Merritt et al.	
	43.	11849963	12-26-2023	Quick	
	44.	20130190701	07-25-2013	Kirn	
	45.	20210128182	05-06-2021	Teigen et al.	
	46.	20170143880	05-25-2017	LUXON et al.	
	47.	3785380	01-15-1974	Brumfield	
	48.	6908455	06-21-2005	Hajianpour	
	49.	7837630	11-23-2010	Nieoson et al.	
	50.	20090312786	12-17-2009	Trask et al.	
	51.	20120095448	04-19-2012	KAJII	
	52.	20160220795	08-04-2016	KORKUCH et al.	
	53.	20130123705	05-16-2013	Holm et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1.	WO2023192925	10-05-2023	Inari Medical, Inc.		
	2.	WO2019173475	09-12-2019	Innovative Cardiovascular Solutions, LLC		
	3.	WO2023215779	11-09-2023	Inari Medical, Inc.		
	4.					

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	5.					

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[5]
		Extended European Search Report issued for EP Application No. 20877370.5, Date of Mailing: October 17, 2023, 11 pages.	
		International Search Report and Written Opinion for International App. No. PCT/US23/65128; Date of Filing: March 30, 2023, Applicant: Inari Medical, Inc., Date of Mailing: November 14, 2023, 14 pages.	
		International Search Report and Written Opinion for International App. No. PCT/US23/66538; Date of Filing: May 3, 2023, Applicant: Inari Medical, Inc., Date of Mailing: January 4, 2024, 14 pages.	

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.

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

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	Attorney Docket Number	111552-8018.US08

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.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider the listed references. This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information that may be material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, Applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

COPIES OF REFERENCES

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), Applicant has not submitted copies of U.S. patents and U.S. patent applications. Applicant submits herewith copies of foreign patents and non-patent literature in accordance with 37 C.F.R. § 1.98(a)(2).

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	/Matthew S. Williams/	Date (YYYY-MM-DD)	2024-01-30
Name/Print	Matthew S. Williams	Registration Number	77,516

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.**

AMENDMENTS TO THE CLAIMS

Please delete claims 1–22 and add new claims 23–60. Following is a complete listing of the claims pending in the application, as amended:

1–22. (Canceled)

23. (New) A method of treating a pulmonary embolism within a vasculature of a patient, the method comprising:

advancing an aspiration catheter at least partially through the vasculature of the patient such that a distal end portion of the aspiration catheter is positioned proximate to the pulmonary embolism, wherein a lumen of the aspiration catheter is fluidly coupled along a fluid path to a clot canister and an aspiration source proximal to the clot canister;

generating vacuum pressure within the clot canister via the aspiration source while a valve positioned along the fluid path between the aspiration catheter and the clot canister is in a first position that inhibits fluid flow along the fluid path from the lumen of the aspiration catheter to the clot canister; and

moving the valve from the first position to a second position thereby applying the vacuum pressure to the lumen of the aspiration catheter such that at least a portion of the pulmonary embolism and blood are aspirated into the clot canister, wherein in the second position the valve permits fluid flow along the fluid path from the lumen of the aspiration catheter to the clot canister, and wherein the clot canister includes a filter configured to filter the blood from the portion of the pulmonary embolism.

24. (New) The method of claim 23 wherein advancing the aspiration catheter comprises inserting a catheter having a size of 16 French or greater through the vasculature.

25. (New) The method of claim 23 wherein advancing the aspiration catheter comprises inserting a catheter having a size of 20 French or greater through the vasculature.

26. (New) The method of claim 23 wherein advancing the aspiration catheter includes advancing the aspiration catheter such that a distal end portion of the aspiration catheter is positioned proximate to the pulmonary embolism within a pulmonary artery of the patient.

27. (New) The method of claim 23 wherein the method further comprises:

receiving the filtered blood through a fluid outlet of the clot canister; and

reintroducing the filtered blood into the vasculature of the patient.

28. (New) The method of claim 23 wherein the method further comprises removing the filter from within the clot canister.

29. (New) The method of claim 23 wherein the method further comprises removing the portion of the pulmonary embolism from within the clot canister.

30. (New) The method of claim 29 wherein the method further comprises:

after removing the portion of the pulmonary embolism from within the clot canister, positioning the filter within the clot canister;

repeating generating vacuum pressure within the clot canister via the aspiration source while the valve is in the first position; and

repeating moving the valve from the first position to the second position thereby applying the vacuum pressure to the lumen of the aspiration catheter to aspirate at least another portion of the pulmonary embolism and additional blood into the clot canister.

31. (New) The method of claim 23 wherein the valve comprises a lever, and wherein moving the valve from the first position to the second position includes rotating the lever.

32. (New) The method of claim 23 wherein the method further comprises selectively providing fluid access to the lumen of the aspiration catheter via a hemostasis valve fluidly coupled to the aspiration catheter.

33. (New) The method of claim 32 wherein selectively providing fluid access to the lumen of the aspiration catheter includes decreasing a tension on a filament of the hemostasis valve thereby providing fluid access to the lumen of the aspiration catheter and increasing the tension on the filament to inhibit fluid access to the lumen of the aspiration catheter.

34. (New) The method of claim 33 wherein decreasing the tension on the filament includes depressing a button coupled to the hemostasis valve.

35. (New) The method of claim 32 wherein the hemostasis valve is fluidly coupled to a proximal end portion of the aspiration catheter, and wherein the clot canister is fluidly coupled to the lumen of the aspiration catheter via a tube branching from the aspiration catheter distal to the proximal end portion of the aspiration catheter.

36. (New) The method of claim 23 wherein the method further comprises:

positioning a clot treatment device within the lumen of the aspiration catheter; and

engaging a portion of the pulmonary embolism with the clot treatment device thereby disrupting the pulmonary embolism.

37. (New) The method of claim 23 wherein the aspiration source is an electric pump.

38. (New) The method of claim 23 wherein the clot canister has a first volume, and wherein the aspiration source has a second volume greater than the first volume.

39. (New) The method of claim 23 wherein the filter has a generally tubular shape.

40. (New) The method of claim 23 wherein advancing the aspiration catheter comprises inserting through the vasculature an aspiration catheter having a size of 16 French or greater and an inner diameter, and wherein the fluid path from the aspiration catheter through the valve to the clot canister has a diameter that is the same as or greater than the inner diameter.

41. (New) The method of claim 23 wherein the aspiration source has a volume of 60 cubic centimeters or greater.

42. (New) A method of treating a deep vein thrombosis within a vasculature of a patient, the method comprising:

advancing an aspiration catheter at least partially through the vasculature of the patient such that a distal end portion of the aspiration catheter is positioned proximate to the deep vein thrombosis, wherein a lumen of the aspiration catheter is fluidly coupled along a fluid path to a clot canister and an aspiration source proximal to the clot canister;

generating vacuum pressure within the clot canister via the aspiration source while a valve positioned along the fluid path between the aspiration catheter and the clot canister is in a first position that inhibits fluid flow along the fluid path from the lumen of the aspiration catheter to the clot canister; and

moving the valve from the first position to a second position thereby applying the vacuum pressure to the lumen of the aspiration catheter such that at least a portion of the deep vein thrombosis and blood are aspirated into the clot canister, wherein in the second position the valve permits fluid flow along the fluid path from the lumen of

the aspiration catheter to the clot canister, and wherein the clot canister includes a filter configured to filter the blood from the portion of the deep vein thrombosis.

43. (New) The method of claim 42 wherein advancing the aspiration catheter comprises inserting a catheter having a size of 16 French or greater through the vasculature.

44. (New) The method of claim 42 wherein advancing the aspiration catheter comprises inserting a catheter having a size of 20 French or greater through the vasculature.

45. (New) The method of claim 42 wherein advancing the aspiration catheter includes advancing the aspiration catheter such that a distal end portion of the aspiration catheter is positioned proximate to the deep vein thrombosis within a peripheral vasculature of the patient.

46. (New) The method of claim 42 wherein the method further comprises:
receiving the filtered blood through a fluid outlet of the clot canister; and
reintroducing the filtered blood into the vasculature of the patient.

47. (New) The method of claim 42 wherein the method further comprises removing the filter from within the clot canister.

48. (New) The method of claim 42 wherein the method further comprises removing the portion of the deep vein thrombosis from within the clot canister.

49. (New) The method of claim 48 wherein the method further comprises:
after removing the portion of the deep vein thrombosis from within the clot canister, positioning the filter within the clot canister;
repeating generating vacuum pressure within the clot canister via the aspiration source while the valve is in the first position; and

repeating moving the valve from the first position to the second position thereby applying the vacuum pressure to the lumen of the aspiration catheter to aspirate at least another portion of the deep vein thrombosis and additional blood into the clot canister.

50. (New) The method of claim 42 wherein the valve comprises a lever, and wherein moving the valve from the first position to the second position includes rotating the lever.

51. (New) The method of claim 42 wherein the method further comprises selectively providing fluid access to the lumen of the aspiration catheter via a hemostasis valve fluidly coupled to the aspiration catheter.

52. (New) The method of claim 42 wherein selectively providing fluid access to the lumen of the aspiration catheter includes decreasing a tension on a filament of the hemostasis valve thereby providing fluid access to the lumen of the aspiration catheter and increasing the tension on the filament to inhibit fluid access to the lumen of the aspiration catheter.

53. (New) The method of claim 52 wherein decreasing the tension on the filament includes depressing a button coupled to the hemostasis valve.

54. (New) The method of claim 52 wherein the hemostasis valve is fluidly coupled to a proximal end portion of the aspiration catheter, and wherein the clot canister is fluidly coupled to the lumen of the aspiration catheter via a tube branching from the aspiration catheter distal to the proximal end portion of the aspiration catheter.

55. (New) The method of claim 42 wherein the method further comprises:

positioning a clot treatment device within the lumen of the aspiration catheter; and

engaging a portion of the deep vein thrombosis with the clot treatment device thereby disrupting the deep vein thrombosis.

56. (New) The method of claim 42 wherein the aspiration source is an electric pump.

57. (New) The method of claim 42 wherein the clot canister has a first volume, and wherein the aspiration source has a second volume greater than the first volume.

58. (New) The method of claim 42 wherein the filter has a generally tubular shape.

59. (New) The method of claim 42 wherein advancing the aspiration catheter comprises inserting through the vasculature an aspiration catheter having a size of 16 French or greater and an inner diameter, and wherein the fluid path from the aspiration catheter through the valve to the clot canister has a diameter that is the same as or greater than the inner diameter.

60. (New) The method of claim 42 wherein the aspiration source has a volume of 60 cubic centimeters or greater.

REMARKS

Claims 1–22 were pending when the present Office Action was mailed on October 30, 2023. In this response, claims 1–22 have been canceled to expedite prosecution of this application, and without commenting on or conceding the merits of the rejections of these claims and without prejudice to or disclaimer of pursuing the subject matter of these claims in a continuation or other related application. New claims 23–60 have been added. Accordingly, claims 23–60 are currently pending.

In the Office Action dated October 30, 2023, claims 1–6, 11–14, 16–18, and 20–22 were rejected. More specifically, the status of the application considering this Office Action is as follows:

(A) Claims 1–6, 11–14, 16–18, and 20–22 were rejected under 35 U.S.C. § 103 over a combination of U.S. Patent Application Publication No. 2018/0064453 to Garrison et al. ("Garrison I"), U.S. Patent Application Publication No. 2005/0054995 to Barzell et al. ("Barzell"), and U.S. Patent No. 8,535,283 to Heaton et al. ("Heaton"); and

(B) Claims 7–10, 15, and 19 were indicated to be allowable if rewritten in independent form.

As a preliminary matter, the undersigned attorney, his colleague Paul Parker, and inventor Dr. Thomas Tu wish to thank the Examiner and his supervisor, Examiner Su, for engaging in a productive videoconference interview on January 25, 2024 to discuss proposed new independent claims 23 and 42 in view of the applied references Garrison I, Barzell, and Heaton. Dr. Thomas Tu explained that it would not have been obvious to one of ordinary skill in the art to have applied the teachings of Garrison, Barzell, and/or Heaton to treat pulmonary embolism (as recited in new independent claim 23) or deep vein thrombosis (as recited in new independent claim 42). At that time, the Examiner and Examiner Su provisionally agreed that new independent claims 23 and 42 patentably distinguish over the applied references and the other art of record.

Additionally, during the January 25th videoconference interview, the parties discussed proposed new independent claims 23 and 42 in view of U.S. Patent Application Publication No. 2017/0274180 ("Garrison II") and U.S. Patent Application Publication No. 2013/0035628 ("Garrison III"). For example, FIG. 15 and Paragraph [0085] of Garrison III were specifically discussed with respect to claims 23 and 42. At that time, the Examiner and his supervisor provisionally agreed that new independent claims 23 and 42 also patentably distinguish over Garrison II and Garrison III.

The remarks set forth herein summarize and expand on the January 25th videoconference interview and reflect the agreements reached between the Examiner, Examiner Su, and the undersigned attorney. Accordingly, the Applicant requests that this paper constitute the Applicant's Interview Summary. If the Examiner notices any deficiencies in this regard, the Examiner is encouraged to contact the undersigned attorney so that any such deficiencies can be promptly addressed.

A. Response to the Section 103 Rejection of Claims 1–6, 11–14, 16–18, and 20–22 (Garrison I, Barzell, and Heaton)

Claims 1–6, 11–14, 16–18, and 20–22 were rejected under 35 U.S.C. § 103 over the combination of Garrison I, Barzell, and Heaton. Without commenting on or conceding the merits of the rejection of these claims, claims 1–6, 11–14, 16–18, and 20–22 have been canceled in this response and, accordingly, the rejection of these claims is now moot.

B. Indication of Allowable Subject Matter

Claims 7–10, 15, and 19 were indicated to be allowable. Claims 7–10, 15, and 19 have been canceled in this response in the interest of expediting prosecution. The Applicant thanks the Examiner for indicating that claims 7–10, 15, and 19 are allowable. Although the undersigned attorney agrees with the Examiner's conclusion that claims 7–10, 15, and 19 are allowable, the undersigned attorney notes that these claims may be allowable for reasons other than those identified by the Examiner and does not concede that the Examiner's characterization of the terms of this claim and the applied references are correct.

C. New Claims 23–60

New claims 23–60 have been added in this response. New claims 23 and 42 are independent, new claims 24–41 depend from independent claim 23, and new claims 43–60 depend from independent claim 42. As discussed and agreed upon during the January 25th videoconference interview, new independent claims 23 and 42 are patentable, either alone or in combination, over Garrison I, Barzell, Heaton, Garrison II, and Garrison III.

Conclusion

In view of the foregoing, the pending claims comply with 35 U.S.C. § 112 and are patentable over the applied art. The Applicant accordingly requests reconsideration of the application and respectfully submits that the application is in condition for allowance. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the Examiner is encouraged to contact the undersigned at (206) 359-3343.

Although the present communication may include alterations to the application or claims, or characterizations of claim scope or referenced art, the Applicant is not conceding that previously pending claims are not patentable over the applied references; instead, any alteration or characterizations are being made to expedite prosecution of this application.

The Applicant also reserves the right to later pursue any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter that might be found 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 underpayment or credit any overpayment to Deposit Account No. 50-0665, under Order No. 111552.8018.US08 from which the undersigned is authorized to draw.

Dated: ___January 30, 2024___

Respectfully submitted,

By: __/Matthew S. Williams/____
Matthew S. Williams
Registration No.: 77,516

PERKINS COIE LLP
P.O. Box 1247
Seattle, Washington 98111-1247
Telephone: 206.359.3343
Facsimile: 206.359.7198

Attorney for Applicant

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**01/30/2024 08:29:32 PM Z ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	64147922	AUTHORIZED BY	Matthew Williams
CUSTOMER #	25096	FILING DATE	06/05/2023
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Ben Merritt

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 5111	**E20241TK30126200**	**JiYoung Anderson**

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
1202	EACH CLAIM IN EXCESS OF 20	100.00	16	1600.00
			TOTAL AMOUNT:	**$1,860.00**

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 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

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
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CUSTOMER #	25096	FIRST NAMED INVENTOR	Ben Merritt
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 10

DOCUMENT		PAGES	DESCRIPTION	SIZE (KB)
2024-1-30 Response to NFOA 2023-10-30 - 111552.8018.US08.pdf		12	-	115 KB
2024-1-30 Response to NFOA 2023-10-30 - 111552.8018.US08-A....pdf	(1-1)	1	Amendment/Request for Reconsideration-After Non-Final Rejection	89 KB
2024-1-30 Response to NFOA 2023-10-30 - 111552.8018.US08-IACS.pdf	(2-8)	7	Amendment Copy Claims/Response to Suggested Claims	101 KB
2024-1-30 Response to NFOA 2023-10-30 - 111552.8018.US08-REM.pdf	(9-12)	4	Applicant Arguments/Remarks Made in an Amendment	96 KB

2024-1-30 IDS SB08 - 111552-8018US8.pdf	4	Information Disclosure Statement (IDS) Form (SB08)	139 KB

Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.

NPL_EESR-EP20877370.5-Oct 17 2023 11 pages.pdf	11	Non Patent Literature	1028 KB
FOR_WO2023215779.pdf	33	Foreign Reference	1420 KB
NPL_ISR-PCTUS23_66538 Jan 4 2024 - 14 pages.pdf	14	Non Patent Literature	1697 KB
FOR_WO2023192925.pdf	54	Foreign Reference	2231 KB
NPL_ISR-PCTUS23_65128 Nov 14 2023 - 14 pages.pdf	14	Non Patent Literature	2404 KB
FOR_WO2019173475.pdf	114	Foreign Reference	5744 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
2024-1-30 Response to NFOA 2023-10-30 - 111552.8018.US08.pdf	D6D0D098A90AA60100AC0E5FBEFEE6284EA6AC93766F8372E92B4B89D7FC02BCA0B781C54145C65911B6B4F022A8D74F3151C59F22AA6A1F07F79C876932EE5A
2024-1-30 Response to NFOA 2023-10-30 - 111552.8018.US08-A....pdf	B17AADBD726010FBD01E7C629CF7FFC2E48E2BB3D487015C30CA86ACE7A0B6479CED827BEE73431169C9399F9B87A95FA914D1F5475E90564299A39E8E9391C4
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2024-1-30 Response to NFOA 2023-10-30 - 111552.8018.US08-REM.pdf	CEEDE46A66E987C2520F9C7EDDDC6FE74C89E05ED618BE0BDB4CDF14CEF698D9AF2455492A4F422D08A457AA10B02F35B0064EF00E5E82F9A138643D9D302199
2024-1-30 IDS SB08 - 111552-8018US8.pdf	0412CB259A37C53A3177DAB6C850E1232FB6769AA6ED16ECFE7F86B76A8BFF82118ED113146A8A81A1E4C6078B31EE2ABEF2B353593C5AD25C75FFC390980C5B
NPL_EESR-EP20877370.5-Oct 17 2023 11 pages.pdf	965199476EC91E44333C0B2C98A43D4DB73CBBE22CD58A51C5F767C071A88473B07F82C411A5BAB6F24DB4311E74FDAC803F906F3C960C97292C98BC16A40CF0
FOR_WO2023215779.pdf	822189693D23DE0172A440D88C414B1830B6A2EA08247722E04B87B1176552CCF2625D119E1A1B60EB97B33DE23A2BA3A56E554FDC3DA071CC5608A9C2902D4F

NPL_ISR-PCTUS23_66538 Jan 4 2024 - 14 pages.pdf	413F5954C40B9EAE1F11B8341F4D3C84EC7CC651BC247C016C6A36ADF29A2609FFB59D69495EB01A386C6B24513BC57266FEA4116D96CD832228588508B55111
FOR_WO2023192925.pdf	505C8B0B5181623D59604F65A91F55E7362EC91ECCFAED65CDDADF834C815E200E02C38FF719F0C512F22B547F9B3C14DD623B59C16DAB25BFB5A8A2FC85055F
NPL_ISR-PCTUS23_65128 Nov 14 2023 - 14 pages.pdf	0D8172E4E2C5CA2C3EB1552C85530BE7ED95C8BEBB81598DEE99414192B1D5BD56A716931753D0B4C943E7A07F8030B5B3707F1FEA77C81A2CC385DDA4C3B6DF
FOR_WO2019173475.pdf	46135CA36322848AC7713731C3C3A89B30E3CD582A0A4656E000533596F331158ECD136D065C986D6C15459727E80D1E8901469442DD51ADE518ACC9FD2FBBD5

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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 COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: BENJAMIN D. CASHDOLLAR
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

JAN 11 2024

PERKINS COIE LLP

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

	Date of mailing (day/month/year): JAN 04 2024
Applicant's or agent's file reference: 111552-8042WO00	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No.: PCT/US 23/66538	International filing date (day/month/year): 03 May 2023 (03.05.2023)

Applicant: INARI MEDICAL, INC.

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

How? Directly to the International Bureau preferably through ePCT, or on paper to:
The International Bureau of WIPO, 34, chemin des Colombettes, 1211 Geneva 20, Switzerland

For more detailed instructions, see the *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.
   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made

4. **Reminders**

The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for **entry into the national phase** before those designated Offices. In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

Within **22 months from the priority date, the applicant may request that a supplementary international search be carried out** by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Kari Rodriquez Telephone No. PCT Helpdesk: 571-272-4300

Form PCT/ISA/220 (revised January 2020)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference		FOR FURTHER ACTION
111552-8042WO00		see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US 23/66538	03 May 2023 (03.05.2023)	04 May 2022 (04.05.2022)
Applicant INARI MEDICAL, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☒ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the drawings to be published with the abstract is Figure No. 2A

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 23/66538

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

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

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
-*- see extra sheet -*-

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-3

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 23/66538

A. CLASSIFICATION OF SUBJECT MATTER

IPC - INV. A61M 29/00 (2023.01)
ADD. A61M 25/00 (2023.01)

CPC - INV. A61M 29/00, A61M 25/0662
ADD. A61M 2025/0687, A61M 2025/0681, A61B 2017/347

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/0312786 A1 (Trask et al.) 17 December 2009 (17.12.2009), entire document, especially Fig 1, para [0009], para [0028]-[0034], para [0036]	1-5
X	US 2016/0220741 A1 (Route 92 Medical, Inc.) 4 August 2016 (04.08.2016), entire document, especially Fig 1, Fig 12A, para [0017]-[0018], para [0044], para [0091]-[0095]	1, 6-8
A	US 2012/0095448 A1 (Kajii) 19 April 2012 (19.04.2012), entire document	1-8
A	US 2016/0220795 A1 (Teleflex Medical Incorporated) 4 August 2016 (04.08.2016), entire document	1-8
A	US 2013/0123705 A1 (W. L. Gore & Associates, Inc.) 16 May 2013 (16.05.2013), entire document	1-8

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
07 September 2023 (07.09.2023)	JAN 04 2024
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Kari Rodriquez Telephone No. PCT Helpdesk: 571-272-4300

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 23/66538

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I: Claims 1-8 directed to a dilator comprising a coupling component, a tip, and body regions between the coupling component and tip having different flexibilities.

Group II: Claims 9-19 and 25-33 directed to a vascular access system comprising a valve, a catheter and a dilator.

Group III: Claims 20-24 directed to a method of treating clot material using a vascular access system.

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

SPECIAL TECHNICAL FEATURES

The invention of Group I includes the special technical features of a dilator comprising a tip; a coupling component; a first body region between the tip and the coupling component with a first flexibility profile; a second body region between the first body region and the tip with a second flexibility profile greater than the first flexibility profile, not required by the claims of Groups II or III.

The invention of Group II includes the special technical features of a catheter defining a lumen and coupled to the valve; wherein the dilator is configured to be positioned within the lumen through the valve, not required by the claims of Group I or III.

The invention of Group III includes the special technical features of positioning a dilator within a vascular access system such that a valve of the vascular access system releasably engages a notch of the dilator to inhibit further movement of the dilator relative to the vascular access system; activating a button of the valve to release the notch from the valve to allow further movement of the dilator relative to the vascular access system; and moving the dilator relative to the vascular access system and/or the vascular access system relative to the dilator, not required by the claims of Group I or II.

COMMON TECHNICAL FEATURES

Groups I-III share the common technical features of a dilator for use in a vascular access system. However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 2013/0123705 A1 to W.L. Gore & Associates, Inc. (hereinafter 'Gore').

Gore discloses a dilator for use in a vascular access system (introducer assembly for a vascular treatment site including a dilator, para [0020]).

Groups II-III further share the common technical features of a vascular access system comprising a valve, wherein the valve is configured to releasably engage a notch of the dilator to inhibit movement of the dilator relative to the vascular access system when the dilator is inserted through the valve and into the vascular access system. However, this shared technical feature does not represent a contribution over prior art as being anticipated by

Gore discloses a vascular access system (see introducer sheath 10, Fig 2; introducer sheath 10, para [0014]) comprising a valve (see valve 400, Fig 2; valve 400, para [0014]), wherein the valve is configured to releasably engage a notch of the dilator (see a locking knob 500 on the valve 400 to releasably engage a notch surface 104 of dilator 100, Fig 2-3; dilator tool 100, para [0014]; 100 includes hub 102 with annular bearing surface 104, para [0015]; lock knob 500 includes a radially extending rib 520 to engage 104 to axially constrain 500 and 102 relative to each other, para [0016]; locking mechanism 300 such as knob 500 to allow selective locking of the tool 100 to the valve 400, para [0014]-[0016]) to inhibit movement of the dilator relative to the vascular access system when the dilator is inserted through the valve and into the vascular access system (the mechanism is actuable between locked and unlocked positions to releasably axially lock 100 to the valve 400 of sheath 100, para [0016]).

Groups I-II further share the common technical features of a dilator for use in a vascular access system having a first body region with a first flexibility profile, a second body region with a second different flexibility profile, wherein the first body region and the second body region have a same diameter. However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 2009/0312766 A1 to Trask et al. (hereinafter 'Trask').

Trask discloses a dilator for use in a vascular access system (see dilator 30 for use in a vascular access sheath assembly 10, Fig 1; sheath assembly 10 which includes dilator 30 to access a blood vessel, para [0028]-[0029]) having a first body region with a first flexibility profile (see region 32a, Fig 1; stiffness section 32a hence inherently having a first flexibility, para [0034]), a second body region with a second different flexibility profile (see second region 32b having a second different flexibility, Fig 1; multiple stiffness sections 32a-b which become less rigid, para [0034]), wherein the first body region and the second body region have a same diameter (see how 32a and 32b have a same diameter, Fig 1).

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical feature that would otherwise unify the groups.

Therefore, Groups I-III lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: BENJAMIN D. CASHDOLLAR
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

JAN 11 2024

PERKINS COIE LLP

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	JAN 04 2024

Applicant's or agent's file reference	FOR FURTHER ACTION
111552-8042WO00	See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 23/66538	03 May 2023 (03.05.2023)	04 May 2022 (04.05.2022)

International Patent Classification (IPC) or both national classification and IPC
IPC - INV. A61M 29/00 (2023.01)
ADD. A61M 25/00 (2023.01)
CPC - INV. A61M 29/00, A61M 25/0662
ADD. A61M 2025/0687, A61M 2025/0681, A61B 2017/347

Applicant INARI MEDICAL, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn. ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	07 September 2023 (07.09.2023)	Kari Rodriguez PCT Help Desk Telephone No. 571-272-4300

Form PCT/ISA/237 (cover sheet) (revised July 2022)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 23/66536

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(b)).

3. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of a sequence listing:

a. ☐ forming part of the international application as filed.

b. ☐ furnished subsequent to the international filing date for the purposes of international search (Rule 13*ter*.1(a)).

☐ accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.

4. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.

5. Additional comments:

Form PCT/ISA/237 (Box No. I) (revised July 2022)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 23/66538

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:

   ☐ paid additional fees.

   ☐ paid additional fees under protest and, where applicable, the protest fee.

   ☐ paid additional fees under protest but the applicable protest fee was not paid.

   ☒ not paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☐ complied with.

   ☒ not complied with for the following reasons:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I: Claims 1-8 directed to a dilator comprising a coupling component, a tip, and body regions between the coupling component and tip having different flexibilities.

Group II: Claims 9-19 and 25-33 directed to a vascular access system comprising a valve, a catheter and a dilator.

Group III: Claims 20-24 directed to a method of treating clot material using a vascular access system.

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

SPECIAL TECHNICAL FEATURES

The invention of Group I includes the special technical features of a dilator comprising a tip; a coupling component; a first body region between the tip and the coupling component with a first flexibility profile; a second body region between the first body region and the tip with a second flexibility profile greater than the first flexibility profile, not required by the claims of Groups II or III.

The invention of Group II includes the special technical features of a catheter defining a lumen and coupled to the valve; wherein the dilator is configured to be positioned within the lumen through the valve, not required by the claims of Group I or III.

The invention of Group III includes the special technical features of positioning a dilator within a vascular access system such that a valve of the vascular access system releasably engages a notch of the dilator to inhibit further movement of the dilator relative to the vascular access system; activating a button of the valve to release the notch from the valve to allow further movement of the dilator relative to the vascular access system; and moving the dilator relative to the vascular access system and/or the vascular access system relative to the dilator, not required by the claims of Group I or II.

COMMON TECHNICAL FEATURES

Groups I-III share the common technical features of a dilator for use in a vascular access system. However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 2013/0123709 A1 to W.L. Gore & Associates, Inc. (hereinafter "Gore").

Gore discloses a dilator for use in a vascular access system (introducer assembly for a vascular treatment site including a dilator, para [0020]).

-*- Continued in Supplemental Box -*-

4. Consequently, this opinion has been established in respect of the following parts of the international application:

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-8

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 23/66538

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	None	YES
	Claims	1-8	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-8	NO
Industrial applicability (IA)	Claims	1-8	YES
	Claims	None	NO

2. Citations and explanations:
Claims 1-5 lack novelty under PCT Article 33(2) as being anticipated by US 2009/0312786 A1 to Trask et al. (hereinafter 'Trask').

As to claim 1, Trask discloses a dilator (see 30, Fig 1; dilator 30, para [0028]), comprising:
a tip (see tip 36, Fig 1);
a coupling component (see hub 31, Fig 1; hub 31 to interact with a sheath 40, para [0032]);
a first body region between the tip and the coupling component (see region 32a between 31 and 36, Fig 1), wherein the first body region has a first flexibility profile (stiffness section 32a hence inherently having a first flexibility, para [0034]); and
a second body region between the first body region and the tip (see region 32b between 32a and 36, Fig 1), wherein the second body region has a second flexibility profile greater than the first flexibility profile (multiple stiffness sections 32a-b become less rigid toward the distal end 33 hence the more distal section 32b is more flexible than 32a, para [0034]),
wherein the first body region and the second body region have a same diameter (see how 32a and 32b have a same diameter, Fig 1).

As to claim 2, Trask discloses the dilator of claim 1 wherein the first body region has a first stiffness (stiffness section 32a hence inherently having a first stiffness, para [0034]), wherein the second body region has a second stiffness (stiffness section 32b hence inherently having a second stiffness, para [0034]), and wherein the first stiffness is greater than the second stiffness (multiple stiffness sections 32a-b become less rigid toward the distal end 33 hence the more proximal section 32a is stiffer than 32b, para [0034]).

As to claim 3, Trask discloses the dilator of claim 1 wherein the first body region has a first durometer (the proximal end hence 32a has a durometer of 50-80 shore D, para [0034]), wherein the second body region has a second durometer (the distal end hence 32b has a durometer of 30-70 shore D, para [0034]), and wherein the second durometer is less than the first durometer (see how the distal end has a lower durometer than the proximal end, para [0034]).

As to claim 4, Trask discloses the dilator of claim 1 wherein the first body region comprises a first material (the first section 32a has a first material blend, para [0036]), and wherein the second body region comprises a second material different than the first material (the second section 32b has a second different material blend, para [0036]).

As to claim 5, Trask discloses the dilator of claim 1, further comprising a third body region between the tip and the coupling component (the dilator may have at least two stiffness sections between the proximal and distal ends hence including a third stiffness section, para [0038]), wherein the third body region has a third flexibility profile different than the first flexibility profile or the second flexibility profile (multiple stiffness sections that become less rigid toward the distal end hence the third region has a different flexibility than the other regions, para [0038]).

Claims 1 and 6-8 lack novelty under PCT Article 33(2) as being anticipated by US 2016/0220741 A1 to Route 92 Medical, Inc. (hereinafter 'Route').

As to claim 1, Route discloses a dilator (see 340, Fig 1; dilator 340, para [0044], para [0017]), comprising:
a tip (see tip 346, Fig 1, distal tip 346, para [0092]);
a coupling component (see 348, Fig 1; proximal luer adapter 348, para [0092]);
a first body region between the tip and the coupling component (see a first red region between 346 and 348, see Supplemental Fig 1), wherein the first body region has a first flexibility profile (340 has stiffer materials toward the more proximal sections hence the proximal red region has a first flexibility profile, para [0093]); and
a second body region between the first body region and the tip (see a second blue region between the red region and 346, see Supplemental Fig 1), wherein the second body region has a second flexibility profile greater than the first flexibility profile (340 has more flexible materials toward the distal end hence the distal blue region has a greater flexibility profile than the proximal red region, para [0093]),
wherein the first body region and the second body region have a same diameter (see how the red region and the blue region have the same diameter, see Supplemental Fig 1; tubular dilator 340, para [0091]).

-*-Continued in Supplemental Box-*-

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 23/66538

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
-*-Box IV - Lack of unity of invention -*-

Groups II-III further share the common technical features of a vascular access system comprising a valve, wherein the valve is configured to releasably engage a notch of the dilator to inhibit movement of the dilator relative to the vascular access system when the dilator is inserted through the valve and into the vascular access system. However, this shared technical feature does not represent a contribution over prior art as being anticipated by

Gore discloses a vascular access system (see introducer sheath 10, Fig 2; introducer sheath 10, para [0014]) comprising a valve (see valve 400, Fig 2; valve 400, para [0014]), wherein the valve is configured to releasably engage a notch of the dilator (see a locking knob 500 on the valve 400 to releasably engage a notch surface 104 of dilator 100, Fig 2-3; dilator tool 100, para [0014]; 100 includes hub 102 with annular bearing surface 104, para [0015]; lock knob 500 includes a radially extending rib 520 to engage 104 to axially constrain 500 and 102 relative to each other, para [0016]; locking mechanism 300 such as knob 500 to allow selective locking of the tool 100 to the valve 400, para [0014]-[0015]) to inhibit movement of the dilator relative to the vascular access system when the dilator is inserted through the valve and into the vascular access system (the mechanism is actuable between locked and unlocked positions to releasably axially lock 100 to the valve 400 of sheath 100, para [0015]).

Groups I-II further share the common technical features of a dilator for use in a vascular access system having a first body region with a first flexibility profile, a second body region with a second different flexibility profile, wherein the first body region and the second body region have a same diameter. However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 2009/0312786 A1 to Trask et al. (hereinafter 'Trask').

Trask discloses a dilator for use in a vascular access system (see dilator 30 for use in a vascular access sheath assembly 10, Fig 1; sheath assembly 10 which includes dilator 30 to access a blood vessel, para [0028]-[0029]) having a first body region with a first flexibility profile (see region 32a, Fig 1; stiffness section 32a hence inherently having a first flexibility, para [0034]), a second body region with a second different flexibility profile (see second region 32b having a second different flexibility, Fig 1; multiple stiffness sections 32a-b which become less rigid, para [0034]), wherein the first body region and the second body region have a same diameter (see how 32a and 32b have a same diameter, Fig 1).

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical feature that would otherwise unify the groups.

Therefore, Groups I-III lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

-*-Box V.2 - Citations and Explanations-*-

As to claim 6, Route discloses the dilator of claim 1, further comprising a notch positioned between the tip and the coupling component (the distal dilator portion can include detents on an outer surface configured to lock with corresponding features on an inner surface of a lumen, para [0016]; see additional views of a dilator 1340 including distal region 1360 between the tip 1346 and proximal coupling component, Fig 12A; dilator 1340 as described elsewhere, para [0094]; the entire dilator 1340 can be tubular and portion 1360 can include detents on an outer surface to lock with correspondingly shaped features of a catheter, para [0095], para [0016]).

As to claim 7, Route discloses the dilator of claim 6 wherein the notch is positioned between the first body region and the second body region (see how region 1360 including at least one of the notches is between the proximal body region and distal body region, Fig 12A, para [0017]).

As to claim 8, Route discloses the dilator of claim 6 wherein the notch is a first notch, the dilator further comprising a second notch positioned on a proximal or a distal side of the first notch (multiple detents to provide multiple points of locking connection hence further comprising a second notch either proximal or distal to the first notch, para [0017], para [0095]).

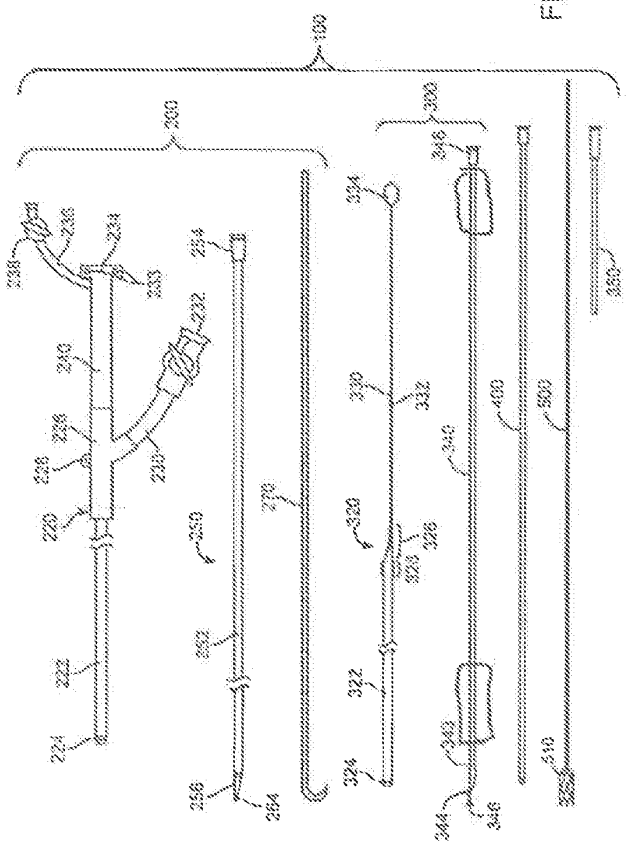
Claims 1-8 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used by industry.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Supplemental Fig 1

FIG. 1



SEARCH HISTORY

Application Number	PCT/US 23/66538
Search Conducted By	JBT
Search Approved By	SCL

CPC/IPC Classifications Searched	CPC - INV. A61M 29/00, A61M 25/0662; ADD. A61M 2025/0687, A61M 2025/0681, A61B 2017/347 IPC(8) - INV. A61M 29/00; ADD. A61M 25/00 (2023.01)
Date Conducted	07 September 2023 (07.09.2023)

Documentation Searched	CPC - INV. A61M 29/00, A61M 25/0662; ADD. A61M 2025/0687, A61M 2025/0681, A61B 2017/347 IPC(8) - INV. A61M 29/00; ADD. A61M 25/00 (2023.01)
Search Terms Used	Vary*, different, gradient, increas*, decreas*, stiffness, flexib*, durometer, dilator, shaft, tube, notch, notches, indent*, groove%, hardness, vascular, sheath, catheter
Date Conducted	07 September 2023 (07.09.2023)

Electronic Database Searched	PatBase
Files Searched	Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO Bibliographic: (Europe) AT BA BE BG CH CS CY CZ DD DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW
Date Conducted	07 September 2023 (07.09.2023)

Search Logic:

#	Search query	Results
1	PN=(US2009312786 AA)	1
2	CTB 1 or CTF 1	67
3	2 and FT=((vary* or different or gradient or increas* or decreas*) NEAR (stiffness or flexib* or durometer))	25
4	3 and FT=((dilator or shaft or tube) NEAR (notch or notches or indent* or groove%))	5
5	3 and FT=(dilator% WP ((vary* or different or gradient or increas* or decreas*) NEAR	

(stiffness or flexib* or durometer))) 8
6 PN=(US2016220741 AA) 1
7 PN=(US2016220741 AA) 1
8 CTB 7 or CTF 7 891
9 8 and FT=(dilator% WP ((vary* or different or gradient or increas* or decreas*) NEAR (stiffness or flexib* or durometer))) 19
10 9 and FT=((dilator or shaft or tube) NEAR (notch or notches or indent* or groove%)) 4
11 CPC=A61M 2025/0687 196
12 11 and FT=(dilator% WP ((vary* or different or gradient or increas* or decreas*) NEAR (stiffness or flexib* or durometer))) 16
13 12 and FT=stiffness 12
14 12 and FT=(durometer or hardness) 9
15 12 and FT=((dilator or shaft or tube) NEAR (notch or notches or indent* or groove%)) 2
16 IC=A61M 29/00 12,954
17 CPC=(A61M 29/00 or A61M 25/0662 or A61M 2025/0681 or A61B 2017/347) 4,673
18 16 or 17 15,782
19 18 and FT=(dilator% WP ((vary* or different or gradient or increas* or decreas*) NEAR (stiffness or flexib* or durometer))) 155
20 19 and FT=stiffness 105
21 19 and FT=(durometer or hardness) 62
22 19 and FT=((dilator or shaft or tube) NEAR (notch or notches or indent* or groove%)) 31
23 22 not (15 or 4) 27
24 A61M 25/00 120
25 24 and FT=(dilator% WP ((vary* or different or gradient or increas* or decreas*) NEAR (stiffness or flexib* or durometer))) 1
26 IC=A61M 25/00 42,855
27 26 and FT=(dilator% WP ((vary* or different or gradient or increas* or decreas*) NEAR (stiffness or flexib* or durometer))) 128
28 27 and FT=((dilator or shaft or tube) NEAR (notch or notches or indent* or groove%)) 23
29 28 and FT=((vascular or sheath or catheter) NEAR dilator%) 20
30 FT=((vascular or sheath or catheter) NEAR dilator%) 4,044
31 30 and FT=(dilator% WP ((vary* or different or gradient or increas* or decreas*) NEAR (stiffness or flexib* or durometer))) 176
32 31 and FT=((dilator or shaft or tube) NEAR (notch or notches or indent* or groove%)) 28

Electronic Database Searched	Google
Files Searched	Google Web
Date Conducted	07 September 2023 (07.09.2023)
Search Logic:	
variable stiffness vascular access dilator About 126,000 results inari medical vascular access dilator	

About 34,100 results

vascular dilator flexible distal portion
About 1,600,000 results

Electronic Database Searched	Google
Files Searched	Patents (US Patents/Published Applications, EPO publications, International, China, Germany, Canada)
Date Conducted	07 September 2023 (07.09.2023)
Search Logic:	

dilator with varying flexibility
About 8,770 results

vascular catheter and dilator
About 7,410 results

dilator to lock to valve
About 4,020 results

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: BENJAMIN D. CASHDOLLAR
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

NOV 20 2023

PERKINS COIE LLP

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Applicant's or agent's file reference: 111552-8037WO00	Date of mailing (day/month/year): NOV 14 2023
International application No.: PCT/US 23/65128	FOR FURTHER ACTION See paragraphs 1 and 4 below
Applicant: INARI MEDICAL, INC.	International filing date (day/month/year): 30 March 2023 (30.03.2023)

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   How? Directly to the International Bureau preferably through ePCT, or on paper to:
   The International Bureau of WIPO, 34, chemin des Colombettes, 1211 Geneva 20, Switzerland

   For more detailed instructions, see the *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.
   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may **submit comments on an informal basis on the written opinion of the International Searching Authority** to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

   Shortly after the expiration of **18 months from the priority date, the international application will be published** by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within 19 months from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later); otherwise, the applicant must, within 20 months from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices. In respect of other designated Offices, the time limit of 30 months (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

   Within 22 months from the priority date, the applicant may request that a supplementary international search be carried out by a different International Searching Authority that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/US: Mail Stop PCT, Attn: ISA/US, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450	Authorized officer: Kari Rodriquez
Facsimile No. 571-273-8300	Telephone No. PCT Helpdesk: 571-272-4300

Form PCT/ISA/220 (revised January 2020)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION
111562-8037WO00	see Form PCT/ISA/220 as well as, where applicable, item 5 below.

International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US 23/65128	30 March 2023 (30.03.2023)	31 March 2022 (31.03.2022)

Applicant
INARI MEDICAL, INC.

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 1 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☒ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 2A

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 23/85128

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

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

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
-*- see extra sheet -*-

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-17, 27-32

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 23/65128

A. CLASSIFICATION OF SUBJECT MATTER

IPC - INV. A61M 5/178, A61M 5/315, A61B 5/153, A61B 17/22 (2023.01)
ADD. A61M 1/00 (2023.01)

CPC - INV. A61M 5/3145, A61B 5/150236, A61B 5/150244, A61M 1/67, A61M 1/81
ADD. A61B 5/153, A61B 2017/22079, A61M 5/178

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2017/0113005 A1 (Human Med AG) 27 April 2017 (27.04.2017), entire document, especially Fig 1, para [0044]-[0045]	1-4, 6-7, 10-12
X	US 2011/0309037 A1 (Lee) 22 December 2011 (22.12.2011), entire document, especially Fig 5, Fig 7-10, para [0015]-[0018], para [0041], para [0044]-[0045], para [0065]-[0066], para [0071]	1, 6, 8-9, 13-17
X	US 2008/0294096 A1 (Uber, III et al.) 27 November 2008 (27.11.2008), entire document, especially Fig 3, Fig 18C, para [0227]-[0229], para [0223], para [0233], para [0351], para [0468]-[0471]	1, 5, 27-32
A	US 2020/0046368 A1 (Inari Medical, Inc) 13 February 2020 (13.02.2020), entire document	1-17, 27-32
A	US 2013/0270161 A1 (Kumar et al.) 17 October 2013 (17.10.2013), entire document	1-17, 27-32

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 August 2023	NOV 14 2023
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Kari Rodriquez Telephone No. PCT Helpdesk: 571-272-4300

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/US 23/65128

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I: Claims 1-17, 27-32 directed to a filtering syringe comprising a plunger with a lumen, a filter at a first end of the plunger, and a valve at a second end of the plunger.

Group II: Claims 18-23 directed to a system for aspirating clots from a blood vessel comprising a catheter and a filtering syringe.

Group III: Claims 24-26 directed to a method for removing clots from a blood vessel using a filtering syringe, a catheter, and a fluid control device.

Group IV: Claims 33-37 directed to a filtering syringe comprising a first plunger body including a filter and valve connected to a second plunger body defining an interior chamber.

The inventions listed as Groups I-IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

SPECIAL TECHNICAL FEATURES

The invention of Group I includes the special technical features of a plunger assembly having a first end portion and a second end portion opposite the first end portion, wherein the plunger assembly includes a filter proximate to the first end portion, a port/valve proximate to the second end portion, and a lumen therebetween and fluidly coupling the filter and the port/valve; wherein at least the first end portion of the plunger assembly is insertable within the chamber and slidable relative to the barrel, not required by the claims of Groups II-IV.

The invention of Group II includes the special technical features a filtering syringe including a tip configured to be coupled to the catheter, not required by the claims of Group I or III-IV.

The invention of Group III includes the special technical features of positioning a distal portion of a catheter proximate to the clot material within the blood vessel; coupling a filtering and pressure-generating syringe to the catheter via a fluid control device, wherein (i) opening of the fluid control device fluidly connects the filtering and pressure-generating syringe to the catheter, and (ii) closing the fluid control device fluidly disconnects the filtering and pressure-generating syringe from the catheter; activating the syringe to generate a vacuum while the fluid control device is closed; opening the fluid control device to apply the vacuum to the catheter to thereby aspirate at least a portion of the clot material into the catheter; and filtering blood from the portion of the clot material via a filter of the syringe, not required by the claims of Group I-II or IV.

The invention of Group IV includes the special technical features of the plunger assembly including a first body portion and a second body portion, wherein the first body portion includes a filter and a valve, and wherein the second body portion defines an interior chamber and is detachably couplable to the first body portion via the valve; wherein at least part of the first body portion and the second body portion are insertable within the chamber and slidable relative to the barrel, not required by the claims of Group I-III.

COMMON TECHNICAL FEATURES

The inventions of Groups I-IV share the technical features of a system for use in filtering clot material from blood, comprising: a syringe including at least one filter. Specifically, Groups I-IV are related as an apparatus (Groups I-II and IV) and methods for using the apparatus (Group III). The apparatus is known in prior art as shown in US 2008/0294096 A1 to Uber, III et al. (hereinafter "Uber").

Uber discloses system for use in filtering clot material from blood (see system comprising syringe 50 coupled with a patient's blood via catheter 315', Fig 3; see embodiment of 50 as syringe 2250 including filter 2556, Fig 18C; 50 is a syringe such as in Fig 18A-I, para [0229]; 315 is an intravascular catheter, para [0233]; syringe with filter 2556 with pore size to allow liquid hence configured to filter clot material from blood, para [0466], para [0471]), comprising: a syringe (see syringe 2250, Fig 18C; syringe 2250, para [0468]) including at least one filter (see filter 2556, Fig 18C, filter 2556, para [0468]).

Groups II-III further share the common technical features of the system for use in filtering clot material from blood further comprising a catheter configured to be intravascularly positioned at a treatment site within a blood vessel. However, this shared technical feature does not represent a contribution over prior art as being anticipated by Human.

Uber discloses wherein the system for use in filtering clot material from blood further comprising a catheter (see 315', Fig 3) configured to be intravascularly positioned at a treatment site within a blood vessel (315 is an intravascular catheter, para [0233]).

Groups I and IV further share the common technical features of the syringe comprising a barrel defining a chamber; a plunger assembly comprising a filter and a valve, wherein at least a portion of the plunger assembly is insertable within the chamber and slidable relative to the barrel. However, this shared technical feature does not represent a contribution over prior art as being anticipated by Human.

Uber discloses the syringe comprising a barrel defining a chamber (see barrel 2250 defining a chamber for plunger 2552, Fig 18C, syringe barrel, para [0468]); a plunger assembly (see plunger 2552, Fig 18C; plunger 2552, para [0468]) comprising a filter (see how 2552 comprises filter 2556, Fig 18C, filter 2556 replaces the rubber cover on the forward end of a conventional plunger, para [0468]) and a valve (see valve 2564 of plunger 2552, Fig 18C; exit outlet valve 2564 of plunger chamber 25564, para [0469]); wherein at least a portion of the plunger assembly is insertable within the chamber and slidable relative to the barrel (see how the left end of 2552 is insertable within and slidable relative to 2550, Fig 18C; plunger 2552 may be drawn back and pushed forward in syringe 2550, para [0468]).

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical feature that would otherwise unify the groups.

Therefore, Groups I-IV lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: BENJAMIN D. CASHDOLLAR
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

NOV 20 2023

PERKINS COIE LLP

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	NOV 14 2023
Applicant's or agent's file reference 111552-8037WO00	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 23/65128	30 March 2023 (30.03.2023)	31 March 2022 (31.03.2022)

International Patent Classification (IPC) or both national classification and IPC
IPC - INV. A61M 5/178, A61M 5/315, A61B 5/153, A61B 17/22 (2023.01)
ADD. A61M 1/00 (2023.01)
CPC - INV. A61M 5/3145, A61B 5/150236, A61B 5/150244, A61M 1/67, A61M 1/81
ADD. A61B 5/153, A61B 2017/22079, A61M 5/178

Applicant INARI MEDICAL, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	23 August 2023	Kari Rodriquez PCT Help Desk Telephone No. 571-272-4300

Form PCT/ISA/237 (cover sheet) (revised July 2022)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 23/65128

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(b)).

3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:

   a. ☐ forming part of the international application as filed.

   b. ☐ furnished subsequent to the international filing date for the purposes of international search (Rule 13ter.1(a)),

      ☐ accompanied by a statement to the effect that the sequence listing does not go beyond the disclosure in the international application as filed.

4. ☐ With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established to the extent that a meaningful opinion could be formed without a WIPO Standard ST.26 compliant sequence listing.

5. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 23/65128

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has, within the applicable time limit:

   ☐ paid additional fees.

   ☐ paid additional fees under protest and, where applicable, the protest fee.

   ☐ paid additional fees under protest but the applicable protest fee was not paid.

   ☒ not paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☐ complied with.

   ☒ not complied with for the following reasons:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I: Claims 1-17, 27-32 directed to a filtering syringe comprising a plunger with a lumen, a filter at a first end of the plunger, and a valve at a second end of the plunger.

Group II: Claims 18-23 directed to a system for aspirating clots from a blood vessel comprising a catheter and a filtering syringe.

Group III: Claims 24-26 directed to a method for removing clots from a blood vessel using a filtering syringe, a catheter, and a fluid control device.

Group IV: Claims 33-37 directed to a filtering syringe comprising a first plunger body including a filter and valve connected to a second plunger body defining an interior chamber.

The inventions listed as Groups I-IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

SPECIAL TECHNICAL FEATURES

The invention of Group I includes the special technical features of a plunger assembly having a first end portion and a second end portion opposite the first end portion, wherein the plunger assembly includes a filter proximate to the first end portion, a port/valve proximate to the second end portion, and a lumen therebetween and fluidly coupling the filter and the port/valve; wherein at least the first end portion of the plunger assembly is insertable within the chamber and slidable relative to the barrel, not required by the claims of Groups II-IV.

The invention of Group II includes the special technical features a filtering syringe including a tip configured to be coupled to the catheter, not required by the claims of Group I or III-IV.

The invention of Group III includes the special technical features of positioning a distal portion of a catheter proximate to the clot material within the blood vessel; coupling a filtering and pressure-generating syringe to the catheter via a fluid control device, wherein (i) opening of the fluid control device fluidly connects the filtering and pressure-generating syringe to the catheter, and (ii) closing the fluid control device fluidly disconnects the filtering and pressure-generating syringe from the catheter; activating the syringe to generate a vacuum while the fluid control device is closed; opening the fluid control device to apply the vacuum to the catheter to thereby aspirate at least a portion of the clot material into the catheter; and filtering blood from the portion of the clot material via a filter of the syringe, not required by the claims of Group I-II or IV.

The invention of Group IV includes the special technical features of the plunger assembly including a first body portion and a second body portion, wherein the first body portion includes a filter and a valve, and wherein the second body portion defines an interior chamber and is detachably couplable to the first body portion via the valve; wherein at least part of the first body portion and the second body portion are insertable within the chamber and slidable relative to the barrel, not required by the claims of Group I-III.

-*- Continued in Supplemental Box -*-

4. Consequently, this opinion has been established in respect of the following parts of the international application:

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-17, 27-32

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 23/65128

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	5, 11, 17	YES
	Claims	1-4, 6-10, 12-16, 27-32	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-17 and 27-32	NO
Industrial applicability (IA)	Claims	1-17 and 27-32	YES
	Claims	None	NO

2. Citations and explanations:
Claims 1-4, 6-7, 10 and 12 lack novelty under PCT Article 33(2) as being anticipated by US 2017/0113005 A1 to Human Med AG (hereinafter 'Human').

As to claim 1, Human discloses a filtering syringe for treatment of clot material from within a blood vessel of a patient (see syringe 10 coupled to cannula 50 hence configured to filter clot material from within a blood vessel, Fig 1; cannula 50 may be mounted depending on application, para [0045]), the filtering syringe comprising
a barrel defining a chamber (see hollow barrel 12 defining a chamber, Fig 1; 12 is a hollow cylinder, para [0044]) configured to receive at least a portion of the clot material and blood from the patient (see how the chamber of 12 is configured to receive at least a portion of clot and blood material from a patient through cannula 50, Fig 1; fluid may be sucked into the chamber 12, para [0045]); and
a plunger assembly (see plunger 14 and piston 24, Fig 1; piston 24 connected to plunger 14, para [0044]) having a first end portion (see first end portion 22, Fig 1; sealing lips 22 of 14, para [0044]) and a second end portion opposite the first end portion (see opposite end portion 26, Fig 1), wherein the plunger assembly includes a filter proximate to the first end portion (see filter 30 proximate 22, Fig 1; plunger 14 includes filter 30, para [0044]), a port proximate to the second end portion (see port 32 proximate end 26, Fig 1; closeable media connection 32, para [0044]), and a lumen therebetween and fluidly coupling the filter and the port (see lumen 28 coupling 30 and 32, Fig 1; fluidic connection 28 extending through the plunger, para [0044]),
wherein at least the first end portion of the plunger assembly is insertable within the chamber and slidable relative to the barrel (see how at least end 22 is insertable within the chamber of 12 and slidable, Fig 1; plunger 14 may be guided on inner surface 16 of chamber 12, para [0044]); and
wherein the filter is configured to allow at least part of the blood received within the chamber to separate from the portion of the clot material (the filter 30 has a transmission limit of 200 um hence is configured to allow at least a part of liquid blood to separate from larger clot material, para [0044]) and enter the lumen of the plunger assembly (see how 30 is fluidly connected to 28 hence is configured to allow a liquid part of blood to enter lumen 28, Fig 1; fluid can be sucked through plunger filter 30, para [0045]).

As to claim 2, Human discloses the filtering syringe of claim 1, further comprising a tip (see a left tip of 12, Fig 1) configured to fluidly couple the filtering syringe to a clot treatment system (see how the tip is configured to fluidly couple 12 to a cannula 50 which may be configured to aspirate blood and clots from a patient, Fig 1; negative pressure may be supplied at 32 to suck fluid in, para [0045]; means 34 for guiding fluid into the chamber of 12 includes cannula 50, para [0045]).

As to claim 3, Human discloses the filtering syringe of claim 1 wherein the filter has a circular, annular, cylindrical, and/or pleated shape (see how 30 has a circular shape similar to the shape of 12 and 14, Fig 1; 12 is a hollow cylinder, para [0044]).

As to claim 4, Human discloses the filtering syringe of claim 1 wherein the filter has a porosity between about 40 microns and about 200 microns (the transmission limit of 30 is about 200 um, para [0044]).

As to claim 6, Human discloses the filtering syringe of claim 1 wherein the filter is a first filter having a first porosity (see how 30 is a first filter, Fig 1; filter 30 having transmission limit of 200 um, para [0044]), the filtering syringe further comprising a second filter having a second porosity (see how 12 further has a second filter 52, Fig 1; prefilter 52 with transmission limit of 1.5 mm, para [0045]).

As to claim 7, Human discloses the filtering syringe of claim 6 wherein the first porosity is different than the first porosity (30 has a transmission limit of 200 um, para [0044]; 52 has a transmission limit of 1.5 mm, para [0045]).

As to claim 10, Human discloses the filtering syringe of claim 6 wherein the second filter is spaced apart from the first filter (see how 52 is spaced apart from 30, Fig 1).

As to claim 12, Human discloses the filtering syringe of claim 1 wherein the first end portion of the plunger assembly is a distal end portion of the plunger assembly (see distal end 22, Fig 1) and the second end portion is a proximal end portion of the plunger assembly (see proximal end 26, Fig 1), wherein the filter is positioned proximally from the distal end portion (see how 30 is to the right of sealing lips 22, Fig 1).

-*-Continued in Supplemental Box-*-

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 23/65128

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
-*-Box IV - Lack of unity of invention -*-

COMMON TECHNICAL FEATURES

The inventions of Groups I-IV share the technical features of a system for use in filtering clot material from blood, comprising: a syringe including at least one filter. Specifically, Groups I-IV are related as an apparatus (Groups I-II and IV) and methods for using the apparatus (Group III). The apparatus is known in prior art as shown in US 2008/0294096 A1 to Uber, III et al. (hereinafter 'Uber').

Uber discloses system for use in filtering clot material from blood (see system comprising syringe 50 coupled with a patient's blood via catheter 315', Fig 3; see embodiment of 50 as syringe 2550 including filter 2556, Fig 18C; 50 is a syringe such as in Fig 18A-I, para [0228]; 315 is an intravascular catheter, para [0233]; syringe with filter 2556 with pore size to allow liquid hence configured to filter clot material from blood, para [0468], para [0471]), comprising: a syringe (see syringe 2550, Fig 18C; syringe 2550, para [0468]) including at least one filter (see filter 2556, Fig 18C, filter 2556, para [0468]).

Groups II-III further share the common technical features of the system for use in filtering clot material from blood further comprising a catheter configured to be intravascularly positioned at a treatment site within a blood vessel. However, this shared technical feature does not represent a contribution over prior art as being anticipated by Human.

Uber discloses wherein the system for use in filtering clot material from blood further comprising a catheter (see 315', Fig 3) configured to be intravascularly positioned at a treatment site within a blood vessel (315 is an intravascular catheter, para [0233])

Groups I and IV further share the common technical features of the syringe comprising a barrel defining a chamber; a plunger assembly comprising a filter and a valve; wherein at least a portion of the plunger assembly is insertable within the chamber and slidable relative to the barrel. However, the shared technical feature does not represent a contribution over prior art as being anticipated by Human.

Uber discloses the syringe comprising a barrel defining a chamber (see barrel 2550 defining a chamber for plunger 2552, Fig 18C, syringe barrel, para [0468]); a plunger assembly (see plunger 2552, Fig 18C; plunger 2552, para [0468]) comprising a filter (see how 2552 comprises filter 2556, Fig 18C; filter 2556 replaces the rubber cover on the forward end of a conventional plunger, para [0468]) and a valve (see valve 2564 of plunger 2552, Fig 18C; exit outlet valve 2564 of plunger chamber 25564, para [0468]); wherein at least a portion of the plunger assembly is insertable within the chamber and slidable relative to the barrel (see how the left end of 2552 is insertable within and slidable relative to 2550, Fig 18C; plunger 2552 may be drawn back and pushed forward in syringe 2550, para [0468]).

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical feature that would otherwise unify the groups.

Therefore, Groups I-IV lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

-*-Box V.2 - Citations and Explanations-*-

Claims 1, 6, 8-9 and 13-16 lack novelty under PCT Article 33(2) as being anticipated by US 2011/0309037 A1 to Lee.

As to claim 1, Lee discloses a filtering syringe for treatment of clot material from within a blood vessel of a patient (syringe having filtering device, para [0018]; filtering device pore diameter 10 to 100 um hence configured to filter clot material from blood, para [0018]), the filtering syringe comprising:
a barrel defining a chamber (see b defining a chamber, Fig 9) configured to receive at least a portion of the clot material and blood from the patient (see how b is connected to a cannula 100 hence is configured to receive a portion of clot material and blood when cannula 100 is inserted in a patient, Fig 9, b has cannula 100 attached and inserted into the patient, para [0041]); and
a plunger assembly (see plunger assembly, Fig 7; syringe piston shown in Fig 7, para [0065]) having a first end portion (see end portion 13, Fig 7, Fig 10) and a second end portion opposite the first end portion (see end 404, Fig 8), wherein the plunger assembly includes a filter proximate to the first end portion (see filter 50 proximate end 13, Fig 8, filter 50 of the syringe piston, para [0071]), a port proximate to the second end portion (see port at 400, Fig 8), and a lumen therebetween and fluidly coupling the filter and the port (see lumen 300 between 50 and the port at 400, Fig 8; central hole 300 penetrating the front end and rear end of the piston body, para [0066]);
wherein at least the first end portion of the plunger assembly is insertable within the chamber and slidable relative to the barrel (see how at least end 13 is insertable and slidable relative to b, Fig 9-10); and
wherein the filter is configured to allow at least part of the blood received within the chamber to separate from the portion of the clot material (filtering device has pore diameter of 10 um to 100 um hence is configured to separate clot material from blood, para [0018]) and enter the lumen of the plunger assembly (see how 50 is positioned to allow blood from the chamber of b to enter the lumen of the plunger, Fig 10).

As to claim 6, Lee discloses the filtering syringe of claim 1 wherein the filter is a first filter having a first porosity (a first layer of 50 may comprise holes of about 100 um, para [0045]), the filtering syringe further comprising a second filter having a second porosity (a second layer of 50 hence a second filter may comprises holes of about 100 um, para [0045]).

As to claim 8, Lee discloses the filtering syringe of claim 6 wherein the first porosity is the same as the second porosity (multiple layers of filter each having holes of about 100 um, para [0045]).

As to claim 9, Lee discloses the filtering syringe of claim 6 wherein the second filter is positioned proximate the first end portion of the plunger assembly (see how 50 hence including the second filter layer is proximate 13, Fig 7).

-*-Continued in next Supplemental Box-*-

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
-*-Supplemental Box - Box V.2 - Citations and Explanations-*-

As to claim 13, Lee discloses the filtering syringe of claim 1 wherein the chamber includes an inner surface (see an inner surface of b, Fig 10), and wherein first end portion of the plunger assembly is radially spaced apart from chamber (see how 13 is radially spaced from the inner surface of b, Fig 10) such that the barrel assembly and the plunger assembly at least partially define (i) a first chamber portion positioned on a first side of the first end portion of the plunger assembly (see a first chamber portion of b to the left of 13, Fig 10), (ii) a second chamber portion positioned on a second side of the first end portion of the plunger assembly, the second side opposite the first side (see a second chamber portion of b to the right of 13, Fig 10), and (iii) a gap fluidly coupling the first chamber portion and the second chamber portion (see how the left and right chamber portions relative to 13 are coupled by a gap between 13 and the inner surface of b, Fig 10).

As to claim 14, Lee discloses the filtering syringe of claim 13 wherein the filter is positioned in the second chamber portion (see how 50 is positioned in the chamber portion to the right of 13, Fig 10), wherein the first chamber portion is configured to receive at least the portion of the clot material from the patient (see how the left chamber portion is configured to receive at least a portion of blood and clot material from the patient via cannula 100, Fig 5), wherein the gap is configured to at least partially prevent the portion of the clot material from entering the second chamber portion (see how the gap between 13 and the inner surface of b is configured to prevent clot material larger than the gap size from entering the right chamber portion, Fig 10), and wherein the filter is configured to allow blood within the second chamber portion to enter the lumen (see how 50 is positioned to allow blood within the right chamber portion to enter the lumen of the plunger, Fig 10).

As to claim 15, Lee discloses the filtering syringe of claim 1 wherein the first end portion of the plunger assembly is configured to at least partially prevent contact between the filter and the portion of the clot material (see how 13 is to the left of 50 hence is configured to prevent contact between 50 and clot material, Fig 10).

As to claim 16, Lee discloses the filtering syringe of claim 1 wherein the plunger assembly defines a filter chamber configured to receive the filter (see how 50 is received in a chamber of the plunger, Fig 8), and wherein the first end portion of the plunger assembly includes one or more holes in fluid communication with the filter chamber (see holes in the tip portion 13 in fluid communication with the chamber with filter 50, Fig 7, Fig 10).

Claims 1 and 27-32 lack novelty under PCT Article 33(2) as being anticipated by US 2008/0294096 A1 to Uber, III et al. (hereinafter 'Uber').

As to claim 1, Uber discloses a filtering syringe for treatment of clot material from within a blood vessel of a patient (see syringe 50 configured to remove target material such as clots from a patient's vascular system via catheter 315', Fig 3; see embodiment of 50 as syringe 2550 including filter 2556, Fig 18C; 50 is a syringe such as in Fig 18A-I, para [0229]; 315 is an intravascular catheter, para [0233]; syringe with filter 2556, para [0471]), the filtering syringe comprising:
a barrel defining a chamber (see 2550 defining an inner chamber, Fig 18C; syringe 2550 with plunger within syringe barrel, para [0468]) configured to receive at least a portion of the clot material and blood from the patient (see how the chamber of 2550 is configured to receive a target material such as clots to the left of plunger 2552 due to filter 2556, Fig 18C; filter 2556 has pores sized so liquid may pass while other target material cannot, para [0468]); and
a plunger assembly (see plunger 2552, Fig 18C; plunger 2552, para [0468]) having a first end portion (see left end of 2552, Fig 18C) and a second end portion opposite the first end portion (see right end 2562, Fig 18C), wherein the plunger assembly includes a filter proximate to the first end portion (see filter 2556 proximate the left end of 2552, Fig 18C; filter 2556 on the forward end of the plunger, para [0468]), a port proximate to the second end portion (see port with valve 2564 proximate end 2562, Fig 18C; outlet valve 2564, para [0468]), and a lumen therebetween and fluidly coupling the filter and the port (see lumen 2554 between 2556 and 2564, Fig 18C; plunger chamber 2554, para [0468]),
wherein at least the first end portion of the plunger assembly is insertable within the chamber and slidable relative to the barrel (see how at least the left end of 2552 is insertable within and slidable relative to 2550, Fig 18C; plunger 2552 may be drawn back and pushed forward, para [0468]), and
wherein the filter is configured to allow at least part of the blood received within the chamber to separate from the portion of the clot material and enter the lumen of the plunger assembly (holes of filter 2556 are sized such that liquid may pass through while larger material may not, para [0468]).

-*-Continued in next Supplemental Box-*-

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 23/65128

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
-*-Supplemental Box - Box V.2 - Citations and Explanations-*-

As to claim 27, Uber discloses a filtering syringe for removing target material from within a human patient (see syringe 50 configured to remove target material from a patient's vascular system via catheter 315', Fig 3; see embodiment of 50 as syringe 2550 including filter 2556, Fig 18C; 50 is a syringe such as in Fig 18A-I, para [0229]; 315 is an intravascular catheter, para [0233]; syringe with filter 2556, para [0471]), the filtering syringe comprising:
a barrel defining a chamber (see 2550 defining an inner chamber, Fig 18C; syringe 2550 with plunger within syringe barrel, para [0468]) configured to receive at least a portion of the target material and fluid from the human patient (see how the chamber of 2550 is configured to receive a target material to the left of plunger 2552 due to filter 2556, Fig 18C; filter 2556 has pores sized so liquid may pass while other target material cannot, para [0468]); and
a plunger assembly (see plunger 2552, Fig 18C; plunger 2552, para [0468]) having a first end portion (see left end of 2552, Fig 18C) and a second end portion opposite the first end portion (see right end 2562, Fig 18C), wherein the plunger assembly includes a filter proximate to the first end portion (see filter 2556 proximate the left end of 2552, Fig 18C; filter 2556 on the forward end of the plunger, para [0468]), a valve proximate to the second end portion (see valve 2564 proximate end 2562, Fig 18C; outlet valve 2564, para [0468]), and a lumen therebetween and fluidly coupling the filter and the valve (see lumen 2554 between 2556 and 2564, Fig 18C; plunger chamber 2554, para [0468]);
wherein at least the first end portion of the plunger assembly is insertable within the chamber and slidable relative to the barrel (see how at least the left end of 2552 is insertable within and slidable relative to 2550, Fig 18C; plunger 2552 may be drawn back and pushed forward, para [0469]); and
wherein the filter is configured to allow at least part of the fluid received within the chamber to pass through the filter and enter the lumen of the plunger assembly (holes of filter 2556 are sized such that liquid may pass through, para [0468]).

As to claim 28, Uber discloses the filtering syringe of claim 27 wherein the fluid includes blood (315 is an intravascular catheter hence fluid entering the syringe from the catheter includes blood, para [0233], para [0468]).

As to claim 29, Uber discloses the filtering syringe of claim 27 wherein the target material includes clot material (315 is an intravascular catheter hence target material entering the syringe from the catheter that may not pass through the filter may include clots, para [0233], para [0468]).

As to claim 30, Uber discloses a filtering syringe for treating a human patient (see syringe 50 configured to treat a patient via catheter 315', Fig 3; see embodiment of 50 as syringe 2550 including filter 2556, Fig 18C; 50 is a syringe such as in Fig 18A-I, para [0229]; 315 is an intravascular catheter, para [0233]; syringe with filter 2556, para [0471]), comprising:
a barrel defining a chamber (see 2550 defining an inner chamber, Fig 18C; syringe 2550 with plunger within syringe barrel, para [0468]) configured to receive first material (see how liquid material received within 2550 may pass through filter 2556, Fig 18C; filter 2556 has pores sized so liquid may pass while other larger sized material cannot, para [0468]) and second material from within the human patient (see how the chamber of 2550 is configured to receive a larger sized material to the left of plunger 2552 due to filter 2556, Fig 18C; filter 2556 has pores sized so liquid may pass while other larger sized material cannot, para [0468]); and
a plunger assembly (see plunger 2552, Fig 18C; plunger 2552, para [0468]) having a first end portion (see left end of 2552, Fig 18C) having a first end portion (see left end of 2552, Fig 18C) and a second end portion opposite the first end portion (see right end 2562, Fig 18C), wherein the plunger assembly includes a filter proximate to the first end portion (see filter 2556 proximate the left end of 2552, Fig 18C; filter 2556 on the forward end of the plunger, para [0468]), a valve proximate to the second end portion (see valve 2564 proximate end 2562, Fig 18C; outlet valve 2564, para [0468]), and a lumen therebetween and fluidly coupling the filter and the valve (see lumen 2554 between 2556 and 2564, Fig 18C; plunger chamber 2554, para [0468]);
wherein at least the first end portion of the plunger assembly is insertable within the chamber and slidable relative to the barrel (see how at least the left end of 2552 is insertable within and slidable relative to 2550, Fig 18C; plunger 2552 may be drawn back and pushed forward, para [0469]); and
wherein the filter is configured to (i) allow at least part of the first material received within the chamber to pass through the filter and enter the lumen of the plunger assembly (filter 2556 has pores sized so liquid may pass while other larger sized material cannot, para [0468]), and (ii) prevent at least part of the second material received within the chamber from passing through the filter (filter 2556 has pores sized so liquid may pass while other larger sized material cannot, para [0468]).

As to claim 31, Uber discloses the filtering syringe of claim 30 wherein the first material includes blood (315 is an intravascular catheter hence liquid material entering the syringe from the catheter includes blood, para [0233], para [0468]).

As to claim 32, Uber discloses the filtering syringe of claim 30 wherein the second material includes clot material (315 is an intravascular catheter hence larger sized material entering the syringe from the catheter that may not pass through the filter may include clots, para [0233], para [0468]).

-*-Continued in next Supplemental Box-*-

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 23/65128

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:
-*-Supplemental Box - Box V.2 - Citations and Explanations-*-

Claim 5 lacks an inventive step under PCT Article 33(3) as being obvious over Uber.

As to claim 5, Uber discloses the filtering syringe of claim 1 but does not explicitly teach wherein the filter includes at least one of a polyester, a polyamide, and/or a hemocompatible material.
Uber teaches wherein the syringe may be used with an intravascular catheter (para [0223], para [0233]) such that the syringe receives material from a patient (material such as cells may be harvested directly into the syringe 50 from the patient, para [0227]), and wherein blood-contacting catheters may comprise hemocompatible material (coatings on blood-contacting catheters provide hemocompatibility, para [0351]), however Uber does not specify the material of the filter.
However, it would have been obvious to a person having ordinary skill in the art to modify the material of the filter such that it comprises a hemocompatible material in order to use the filtering syringe for applications involving blood from a patient.

Claim 11 lacks an inventive step under PCT Article 33(3) as being obvious over Human.

As to claim 11, Human discloses the filtering syringe of claim 1 but does not explicitly teach wherein the port includes a luer-activated valve.
Human teaches wherein the port includes a closeable media connection such as a shut-off valve (closeable media connection 32 can be a shut-off valve, para [0044]) for connection to a negative pressure source (32 is connected to negative pressure, para [0044] [0045]). Luer-activated valves are commonly known in the art in order to provide a valve which is only opened when connected to a luer connector and which is closed when not connected. Accordingly, it would have been obvious to a person having ordinary skill in the art to modify the port valve such that it comprises a luer-activated valve in order to provide a valve which is only opened when connected to a suitable luer connector of a negative pressure source.

Claim 17 lacks an inventive step under PCT Article 33(3) as being obvious over Lee.

As to claim 17, Lee discloses the filtering syringe of claim 16 but does not teach wherein the filter is an annular filter defining a central space, and wherein individual ones of the one or more holes are positioned to direct at least a portion of the clot material and/or the blood received from the patient into the central space.
Lee teaches wherein the filter is circular (see circular filter 60, Fig 7; circular filter 60, para [0044]) comprising holes sized to filter larger sized material while passing fluid material (60 has holes of the size for filtering adipose cells and passing free oil, para [0044]) and wherein the fluid material is passed to the plunger assembly lumen aligned with the center of the filter (see how material is passed through 60 to the central lumen of the plunger, Fig 10; see central lumen 380, Fig 8). Further, optimizing size, shape, and angle(s) is within the ordinary skill of one in the art. Accordingly, it would have been obvious to a person having ordinary skill in the art to have optimized the shape of the filter such that it comprises an annular filter defining a central space, wherein individual ones of the one or more holes are positioned to direct at least a portion of the fluid blood received from the patient into a central space of the filter sized to only pass the fluid material to the plunger assembly lumen.

Claims 1-17 and 27-32 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used by industry.

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 18/329,450	Filing Date 06/05/2023	☐ 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 $100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*		x $480 =	
☐ 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	01/30/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 38	Minus	** 38	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 4	= 0		x $480 =	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.	Team Leader
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/JASMINE C GLENN/
*** 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.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/329,450	06/05/2023	Ben Merritt	111552.8018.US08	1035

25096 7590 10/30/2023

PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

EXAMINER	
RASSAVONG, ERIC	

ART UNIT	PAPER NUMBER
3781	

NOTIFICATION DATE	DELIVERY MODE
10/30/2023	ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentprocurement@perkinscoie.com

Office Action Summary	Application No. 18/329,450	Applicant(s) Merritt et al.	
	Examiner ERIC RASSAVONG	Art Unit 3781	AIA (FITF) Status Yes

-- 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 06/05/2023.

☐ 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) 1-22 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) 1-6,11-14,16-18 and 20-22 is/are rejected.

8) ☑ Claim(s) 7-10,15 and 19 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 06/05/2023 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: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claim Rejections - 35 USC § 103

2. 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 (i.e., changing from AIA to pre-AIA) 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.

3. 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, 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.

4. The factual inquiries 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.

5. This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly owned as of the effective filing date of the claimed invention(s) absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

6. **Claims 1-6, 11-14, 16-18, and 20-22** are rejected under 35 U.S.C. 103 as being unpatentable over Garrison et al. (US 20180064453 A1), hereinafter referred to as "Garrison", in view of Barzell et al. (US 20050054995 A1), hereinafter referred to as "Barzell" and in further view of Heaton et al. (US 8535283 B2), hereinafter referred to as "Heaton".

Regarding **Claim 1**, Garrison teaches a clot treatment system (100), comprising:

an aspiration catheter (320) defining a lumen (lumen extending through catheter (320), see Figure 9), wherein the aspiration catheter is flexible and shaped to be intravascularly positioned within a blood vessel of a patient (the spined aspiration catheter (320) can include a relatively flexible, distal luminal portion (322) coupled to a stiff and kink-resistant proximal spine (330));

a hemostasis valve (234) fluidly coupled to the aspiration catheter (coupled to sheath aspiration catheter (320) via sheath (220), see Figure 1), wherein the hemostasis valve is actuatable by a user to selectively provide fluid access to the lumen (hemostasis valve (234) can be an adjustable-opening valve such as a Tuohy-Borst valve or rotating hemostasis valve (RHV), see Paragraph [0061]);

a clot canister selectively fluidly coupled to the lumen of the aspiration catheter (aspiration source (600) may be connected to a delivery location, such as a receptacle, see Figure 11 and [0111]);

an aspiration source fluidly coupled to the clot canister (aspiration source (600) may be connected to a delivery location, such as a receptacle, see Figure 11); and

a user-actuatable valve (valve (232)) between the aspiration catheter and the clot canister along the flow path (positioned on aspiration line (230) between the aspiration catheter (222) and aspiration source (600), see Figure 5 and 11), wherein the valve (232) is movable by user actuation (see Figure 1) between (a) a closed position in which fluid is prevented from flowing along the flow path from the aspiration catheter to the clot canister (the aspiration line valve (232) enables the line (230) to be opened or closed, see Paragraph [0060]) and (b) an open position in which fluid is allowed to flow from the aspiration catheter to the clot canister (the aspiration line valve (232) enables the line (230) to be opened or closed, see Paragraph [0060]),

wherein the aspiration source is configured to generate vacuum pressure within the clot canister when the valve is in the closed position (aspiration source (600) may be a syringe that generates vacuum pressure while the valve (232) is selectively closed, see Paragraph [0060]), and

wherein, upon user actuation to move the valve to the open position with the vacuum pressure having been generated in the clot canister (negative pressure generated in the aspiration source or syringe (600)), the clot canister is positioned to apply the vacuum pressure to the lumen of the aspiration catheter to aspirate the blood and the clot material into the clot

canister (aspiration source (600), i.e. syringe, provides negative pressure within the sheath body (222) to aspirate clot and blood into aspiration source (600) when the valve is selectively open, see Paragraph [0060]).

However, Garrison does not explicitly teach wherein the a filter positioned within the clot canister and configured to filter blood from clot material.

Barzell teaches a clot canister (22) comprising: a filter (filter (28), see Figures 1-5) positioned within the clot canister (positioned in container, see Figure 1) and configured to filter blood from clot material (filter (28) is provided with a plurality of pores allowing the passage of fluid and particulate material of a given size, the pores in filter (28) have a size to restrict throughflow of a particulate material of a predetermined size, see Paragraph [0039]).

Garrison and Barzell are analogous art because all both deal with an aspiration source configured to collect bodily fluids.

It would have been obvious to a person having ordinary skill in the art before the effective filling date of the invention to modify the filter of Garrison and further include wherein the filter is placed within the clot canister configured to filter the blood from the portion of the clot material, as taught by Barzell. Barzell teaches the filter allows for remove substantially all of the loose tissue and particulate material from the body cavity (see last line of paragraph [0033]).

Garrison and Barzell teach all of the limitations as discussed above. However, Garrison and Barzell do not explicitly teach wherein a flow path extending from the lumen of the aspiration catheter, through the clot canister, and to the aspiration source.

Heaton teaches an aspiration system with accelerated response (reduce pressure system (100)), comprising: an aspiration pump (pump (102)) with a clot canister (fixed volume (115)) and an aspiration source (a variable volume (110), see Figure 1) proximal of the clot canister (variable volume (110) is proximal of the fixed volume (115), see Figure 1); and a flow path extending from the lumen of the aspiration catheter (flow path extending through lumen (135)), through the clot canister (fixed volume (115), see Figure 1), and to the aspiration source (variable volume (110), see Figure 1).

Garrison, Heaton, and Barzell are analogous art because all deal with an aspiration source configured to collect bodily fluids.

It would have been obvious to a person having ordinary skill in the art before the effective filling date of the invention to modify the aspiration pump of Garrison and replace it with the aspiration pump with the aspiration source proximal of the clot container wherein the flow path extends through the clot canister to the aspiration source, as taught Heaton. Heaton teaches the compressible pumps capable of being re-charged (i.e. the flexible bellows can be re-depressed) even when liquids are present in the fixed volume chamber of consistently and the pumps are capable of repeating the targeted pressure each time the compressible pump is recharged. These pressure delivery capabilities exist regardless of the orientation or location of the fixed volume chamber (see Col. 17 lines 24-40).

Regarding **Claim 2**, Modified Garrison teaches all of the limitations as taught in claim 1 and Heaton further teaches wherein the clot canister has a first volume (fixed volume (115), see Figure 1), and wherein the aspiration source has a second volume different than the first volume (variable volume (110), see Figure 1).

Regarding **Claim 3**, Modified Garrison teaches all of the limitations as taught in claim 1 and Heaton further teaches wherein the clot canister has a first volume (fixed volume (115), see Figure 1), and wherein the aspiration source has a second volume greater than the first volume (variable volume (110) is compressible into a plurality of positioned, each which may define a different volume, see Col. 5 lines 4-7) (the variable volume can have a volume larger than the fixed volume).

Regarding **Claim 4**, Modified Garrison teaches all of the limitations as taught in claim 1 and Heaton further teaches wherein the clot canister (115) is proximal to the aspiration catheter along the flow path (proximal to tube (135), see Figure 1).

Regarding **Claim 5**, Modified Garrison teaches all of the limitations as taught in claim 1 and Heaton further teaches wherein the aspiration source (110) is proximal to the clot canister along the flow path (proximal to fixed volume (115), see Figure 1).

Regarding **Claim 6**, Modified Garrison teaches all of the limitations as taught in claim 1 and Heaton further teaches wherein the clot canister (115) is proximal to the aspiration catheter along the flow path (proximal to tube (135), see Figure 1), and wherein the aspiration source (110) is proximal to the clot canister along the flow path (proximal to fixed volume (115), see Figure 1).

Regarding **Claim 11**, Modified Garrison teaches all of the limitations as taught in claim 1 and Garrison further teaches wherein the user-actuatable valve includes a lever graspable by a user (valve (232) may be a stopcock valve, see Paragraph [0060]).

Regarding **Claim 12**, Modified Garrison teaches all of the limitations as taught in claim 1 and Heaton further teaches wherein the filter is removable from the clot canister (filter housing

(220) can be snapped onto fixed volume (215) and variable volume (210), see Figure 2) and wherein the clot canister is transparent (fixed volume chamber (115) may be made of any material capable of providing fixed volume chamber (115) with a substantially fixed volume, see Col. 5 lines 48-50) (including glass or a transparent material).

Regarding **Claim 13**, Modified Garrison teaches all of the limitations as taught in claim 1 and Garrison further teaches wherein the aspiration source is an electric pump (aspiration source (600) may be an electromechanical pump, see Paragraph [0111]).

Regarding **Claim 14**, Modified Garrison teaches all of the limitations as taught in claim 1 and Garrison further teaches a clot treatment device (retrievable stent device (500), see Figure 1) configured to be advanced through the hemostasis valve (valve (324) allows introduction of devices through sheath (220), see Paragraph [0061]) and the lumen of the aspiration catheter (220) to physically engage and disrupt at least a portion of the clot material (see Paragraph [0108]).

Regarding **Claim 16**, Modified Garrison teaches all of the limitations as taught in claim 1 and Barzell further teaches wherein the filter has a generally tubular shape (filter (28) is tubular, see Figure 1).

Regarding **Claim 17**, Modified Garrison teaches all of the limitations as taught in claim 1 and Garrison further teaches wherein the hemostasis valve (234) is fluidly coupled to a proximal end portion of the aspiration catheter (see Figure 1), and wherein the clot canister is fluidly coupled to lumen of the aspiration catheter via a tube branching from the aspiration catheter (clot canister is fluidly coupled to catheter (320) via aspiration line (230), see Figure 1 and 11) distal to the proximal end portion of the aspiration catheter (clot canister is can be located

distally from the catheter (320), see Figure 1 and 2A) (catheter (320) ends with proximal spine (330), see Figure 2A).

Regarding **Claim 18**, Garrison teaches a clot treatment system (100), comprising:

an aspiration catheter (320) defining a lumen (lumen extending through catheter (320), see Figure 9), wherein the aspiration catheter is flexible and shaped to be intravascularly positioned within a blood vessel of a patient (the spined aspiration catheter (320) can include a relatively flexible, distal luminal portion (322) coupled to a stiff and kink-resistant proximal spine 330);

a hemostasis valve (234) fluidly coupled to the aspiration catheter (coupled to sheath aspiration catheter (320) via sheath (220), see Figure 1), wherein the hemostasis valve is actuatable by a user to selectively provide fluid access to the lumen (hemostasis valve (234) can be an adjustable-opening valve such as a Tuohy-Borst valve or rotating hemostasis valve (RHV), see Paragraph [0061]);

a clot canister selectively fluidly coupled to the lumen of the aspiration catheter and having a first volume (aspiration source (600) may be connected to a delivery location having a first volume, such as a receptacle, see Figure 11);

an aspiration source fluidly coupled to the clot canister (aspiration source (600) may be connected to a delivery location, such as a receptacle, see Figure 11); and

a user-actuatable valve (valve (232)) between the aspiration catheter and the clot canister along the flow path (positioned on aspiration line (230) between the aspiration catheter (222) and aspiration source (600), see Figure 5 and 11), wherein the valve (232) is movable by user actuation (see Figure 1) between (a) a closed position in which fluid is

prevented from flowing along the flow path from the aspiration catheter to the clot canister (the aspiration line valve (232) enables the line (230) to be opened or closed, see Paragraph [0060]) and (b) an open position in which fluid is allowed to flow from the aspiration catheter to the clot canister (the aspiration line valve (232) enables the line (230) to be opened or closed, see Paragraph [0060]),

wherein the aspiration source is configured to generate vacuum pressure within the clot canister when the valve is in the closed position (aspiration source (600) may be a syringe that generates vacuum pressure while the valve (232) is selectively closed, see Paragraph [0060]), and

wherein, upon user actuation to move the valve to the open position with the vacuum pressure having been generated in the clot canister (negative pressure generated in the aspiration source or syringe (600)), the clot canister is positioned to apply the vacuum pressure to the lumen of the aspiration catheter to aspirate the blood and the clot material into the clot canister (aspiration source (600), i.e. syringe, provides negative pressure within the sheath body (222) to aspirate clot and blood into aspiration source (600) when the valve is selectively open, see Paragraph [0060]).

However, Garrison does not explicitly teach wherein the a filter positioned within the clot canister and configured to filter blood from clot material.

Barzell teaches a clot canister (22) comprising: a filter (filter (28), see Figures 1-5) positioned within the clot canister (positioned in container, see Figure 1) and configured to filter blood from clot material (filter (28) is provided with a plurality of pores allowing the

passage of fluid and particulate material of a given size, the pores in filter (28) have a size to restrict throughflow of a particulate material of a predetermined size, see Paragraph [0039]).

Garrison and Barzell are analogous art because all both deal with an aspiration source configured to collect bodily fluids.

It would have been obvious to a person having ordinary skill in the art before the effective filling date of the invention to modify the filter of Garrison and further include wherein the filter is placed within the clot canister configured to filter the blood from the portion of the clot material, as taught by Barzell. Barzell teaches the filter allows for remove substantially all of the loose tissue and particulate material from the body cavity (see last line of paragraph [0033]).

Garrison and Barzell teach all of the limitations as discussed above. However, Garrison and Barzell do not explicitly teach an aspiration source having a second volume greater the first volume of the clot canister and wherein a flow path extending from the lumen of the aspiration catheter, through the clot canister, and to the aspiration source.

Heaton teaches an aspiration system with accelerated response (reduce pressure system (100)), comprising: an aspiration pump (pump (102)) with a clot canister (fixed volume (115)) and an aspiration source (a variable volume (110), see Figure 1) proximal of the clot canister (variable volume (110) is proximal of the fixed volume (115), see Figure 1) having a second volume greater than the first volume (variable volume (110) is compressible into a plurality of positioned, each which may define a different volume, see Col. 5 lines 4-7) (the variable volume can have a volume larger than the fixed volume); and a flow path extending from the lumen of the aspiration catheter (flow path extending through lumen (135)), through

the clot canister (fixed volume (115), see Figure 1), and to the aspiration source (variable volume (110), see Figure 1).

Garrison, Heaton, and Barzell are analogous art because all deal with an aspiration source configured to collect bodily fluids.

It would have been obvious to a person having ordinary skill in the art before the effective filling date of the invention to modify the aspiration pump of Garrison and replace it with the aspiration pump with the aspiration source proximal of the clot container wherein the flow path extends through the clot canister to the aspiration source, as taught Heaton. Heaton teaches the compressible pumps capable of being re-charged (i.e. the flexible bellows can be re-depressed) even when liquids are present in the fixed volume chamber of consistently and the pumps are capable of repeating the targeted pressure each time the compressible pump is recharged. These pressure delivery capabilities exist regardless of the orientation or location of the fixed volume chamber (see Col. 17 lines 24-40).

Regarding **Claim 20**, Garrison teaches a clot treatment system (100), comprising:

an aspiration catheter (320) defining a lumen (lumen extending through catheter (320), see Figure 9), wherein the aspiration catheter is flexible and shaped to be intravascularly positioned within a blood vessel of a patient (the spined aspiration catheter (320) can include a relatively flexible, distal luminal portion (322) coupled to a stiff and kink-resistant proximal spine 330);

a hemostasis valve (234) fluidly coupled to the aspiration catheter (coupled to sheath aspiration catheter (320) via sheath (220), see Figure 1), wherein the hemostasis valve is actuatable by a user to selectively provide fluid access to the lumen (hemostasis valve (234) can

be an adjustable-opening valve such as a Tuohy-Borst valve or rotating hemostasis valve (RHV), see Paragraph [0061]);

a clot canister selectively fluidly coupled to the lumen of the aspiration catheter and having a first volume (aspiration source (600) may be connected to a delivery location having a first volume, such as a receptacle, see Figure 11);

an aspiration source fluidly coupled to the clot canister (aspiration source (600) may be connected to a delivery location, such as a receptacle, see Figure 11); and

a user-actuatable valve (valve (232)) between the aspiration catheter and the clot canister along the flow path (positioned on aspiration line (230) between the aspiration catheter (222) and aspiration source (600), see Figure 5 and 11), wherein the valve (232) is movable by user actuation (see Figure 1) between (a) a closed position in which fluid is prevented from flowing along the flow path from the aspiration catheter to the clot canister (the aspiration line valve (232) enables the line (230) to be opened or closed, see Paragraph [0060]) and (b) an open position in which fluid is allowed to flow from the aspiration catheter to the clot canister (the aspiration line valve (232) enables the line (230) to be opened or closed, see Paragraph [0060]),

wherein upon user actuation to move the valve to the open position (user actuation of the stopcock valve (232)), the clot canister is positioned to apply the vacuum pressure to the lumen of the aspiration catheter to aspirate the blood and the clot material into the clot canister (aspiration source (600), i.e. syringe, provides negative pressure within the sheath body (222) to aspirate clot and blood into aspiration source (600) when the valve is selectively open, see Paragraph [0060]).

However, Garrison does not explicitly teach wherein the a filter positioned within the clot canister and configured to filter blood from clot material.

Barzell teaches a clot canister (22) comprising: a filter (filter (28), see Figures 1-5) positioned within the clot canister (positioned in container, see Figure 1) and configured to filter blood from clot material (filter (28) is provided with a plurality of pores allowing the passage of fluid and particulate material of a given size, the pores in filter (28) have a size to restrict throughflow of a particulate material of a predetermined size, see Paragraph [0039]).

Garrison and Barzell are analogous art because all both deal with an aspiration source configured to collect bodily fluids.

It would have been obvious to a person having ordinary skill in the art before the effective filling date of the invention to modify the filter of Garrison and further include wherein the filter is placed within the clot canister configured to filter the blood from the portion of the clot material, as taught by Barzell. Barzell teaches the filter allows for remove substantially all of the loose tissue and particulate material from the body cavity (see last line of paragraph [0033]).

Garrison and Barzell teach all of the limitations as discussed above. However, Garrison and Barzell do not explicitly teach an aspiration source having a second volume greater the first volume of the clot canister, wherein the aspiration source is configured to generate vacuum pressure in the clot canister and wherein a flow path extending from the lumen of the aspiration catheter, through the clot canister, and to the aspiration source.

Heaton teaches an aspiration system with accelerated response (reduce pressure system (100)), comprising: an aspiration pump (pump (102)) with a clot canister (fixed volume

(115)) and an aspiration source (a variable volume (110), see Figure 1) proximal of the clot canister (variable volume (110) is proximal of the fixed volume (115), see Figure 1) having a second volume greater than the first volume (variable volume (110) is compressible into a plurality of positioned, each which may define a different volume, see Col. 5 lines 4-7) (the variable volume can have a volume larger than the fixed volume), wherein the aspiration source is configured to generate vacuum pressure in the clot canister (as variable volume chamber (110) expands from the compressed position to the uncompressed position, gas is transferred from fixed volume chamber (115) to variable volume chamber (110), see Col. 8 lines 64-67); and a flow path extending from the lumen of the aspiration catheter (flow path extending through lumen (135)), through the clot canister (fixed volume (115), see Figure 1), and to the aspiration source (variable volume (110), see Figure 1).

Garrison, Heaton, and Barzell are analogous art because all deal with an aspiration source configured to collect bodily fluids.

It would have been obvious to a person having ordinary skill in the art before the effective filling date of the invention to modify the aspiration pump of Garrison and replace it with the aspiration pump with the aspiration source proximal of the clot container wherein the flow path extends through the clot canister to the aspiration source, as taught Heaton. Heaton teaches the compressible pumps capable of being re-charged (i.e. the flexible bellows can be re-depressed) even when liquids are present in the fixed volume chamber of consistently and the pumps are capable of repeating the targeted pressure each time the compressible pump is recharged. These pressure delivery capabilities exist regardless of the orientation or location of the fixed volume chamber (see Col. 17 lines 24-40).

Regarding **Claim 21**, Garrison teaches a clot treatment system (100), comprising:

an aspiration catheter (320) defining a lumen (lumen extending through catheter (320), see Figure 9), wherein the aspiration catheter is flexible and shaped to be intravascularly positioned within a blood vessel of a patient (the spined aspiration catheter (320) can include a relatively flexible, distal luminal portion (322) coupled to a stiff and kink-resistant proximal spine 330);

a hemostasis valve (234) fluidly coupled to the aspiration catheter (coupled to sheath aspiration catheter (320) via sheath (220), see Figure 1), wherein the hemostasis valve is actuatable by a user to selectively provide fluid access to the lumen (hemostasis valve (234) can be an adjustable-opening valve such as a Tuohy-Borst valve or rotating hemostasis valve (RHV), see Paragraph [0061]);

a clot canister selectively fluidly coupled to the lumen of the aspiration catheter (aspiration source (600) may be connected to a delivery location, such as a receptacle, see Figure 11);

an aspiration source fluidly coupled to the clot canister (aspiration source (600) may be connected to a delivery location, such as a receptacle, see Figure 11); and

a user-actuatable valve (valve (232)) between the aspiration catheter and the clot canister along the flow path (positioned on aspiration line (230) between the aspiration catheter (222) and aspiration source (600), see Figure 5 and 11), wherein the valve (232) is movable by user actuation (see Figure 1) between (a) a first position in which fluid flow along the flow path from the aspiration catheter to the clot canister has a first rate (the aspiration line valve (232) enables the line (230) to be opened or closed, see Paragraph [0060]) (the first

positioned can be when the valve is closed having a zero flow rate) and (b) a second position in which the fluid flow along the flow path from the aspiration catheter to the clot canister has a second rate (the aspiration line valve (232) enables the line (230) to be opened or closed, see Paragraph [0060]) (the second positioning being open with the flow rate at maximum), wherein the aspiration source is configured to generate vacuum pressure within the clot canister when the valve is in the first position (aspiration source (600) may be a syringe that generates vacuum pressure while the valve (232) is selectively closed, see Paragraph [0060]), and

wherein, upon user actuation to move the valve to the second position with the vacuum pressure having been generated in the clot canister (negative pressure generated in the aspiration source or syringe (600)), the clot canister is positioned to apply the vacuum pressure to the lumen of the aspiration catheter to aspirate the blood and the clot material into the clot canister (aspiration source (600), i.e. syringe, provides negative pressure within the sheath body (222) to aspirate clot and blood into aspiration source (600) when the valve is selectively open, see Paragraph [0060]).

However, Garrison does not explicitly teach wherein the a filter positioned within the clot canister and configured to filter blood from clot material.

Barzell teaches a clot canister (22) comprising: a filter (filter (28), see Figures 1-5) positioned within the clot canister (positioned in container, see Figure 1) and configured to filter blood from clot material (filter (28) is provided with a plurality of pores allowing the passage of fluid and particulate material of a given size, the pores in filter (28) have a size to restrict throughflow of a particulate material of a predetermined size, see Paragraph [0039]).

Garrison and Barzell are analogous art because all both deal with an aspiration source configured to collect bodily fluids.

It would have been obvious to a person having ordinary skill in the art before the effective filling date of the invention to modify the filter of Garrison and further include wherein the filter is placed within the clot canister configured to filter the blood from the portion of the clot material, as taught by Barzell. Barzell teaches the filter allows for remove substantially all of the loose tissue and particulate material from the body cavity (see last line of paragraph [0033]).

Garrison and Barzell teach all of the limitations as discussed above. However, Garrison and Barzell do not explicitly teach wherein a flow path extending from the lumen of the aspiration catheter, through the clot canister, and to the aspiration source.

Heaton teaches an aspiration system with accelerated response (reduce pressure system (100)), comprising: an aspiration pump (pump (102)) with a clot canister (fixed volume (115)) and an aspiration source (a variable volume (110), see Figure 1) proximal of the clot canister (variable volume (110) is proximal of the fixed volume (115), see Figure 1); and a flow path extending from the lumen of the aspiration catheter (flow path extending through lumen (135)), through the clot canister (fixed volume (115), see Figure 1), and to the aspiration source (variable volume (110), see Figure 1).

Garrison, Heaton, and Barzell are analogous art because all deal with an aspiration source configured to collect bodily fluids.

It would have been obvious to a person having ordinary skill in the art before the effective filling date of the invention to modify the aspiration pump of Garrison and replace it

with the aspiration pump with the aspiration source proximal of the clot container wherein the flow path extends through the clot canister to the aspiration source, as taught Heaton. Heaton teaches the compressible pumps capable of being re-charged (i.e. the flexible bellows can be re-depressed) even when liquids are present in the fixed volume chamber of consistently and the pumps are capable of repeating the targeted pressure each time the compressible pump is recharged. These pressure delivery capabilities exist regardless of the orientation or location of the fixed volume chamber (see Col. 17 lines 24-40).

Regarding **Claim 22**, Modified Garrison teaches all of the limitations as taught in claim 21 and Garrison further teaches wherein the second rate is greater than the first rate (maximum flow rate when the valve is open is greater than zero flow rate when the valve is closed), and wherein the first rate is zero such that the fluid is prevented from flowing the along the flow path from the aspiration catheter to the clot canister when the valve is in the first position (the aspiration line valve (232) enables the line (230) to be opened or closed, see Paragraph [0060]) (the first position can be the valve being closed allowing a zero flow rate through the valve).

Allowable Subject Matter

7. **Claims 7-10, 15, and 19** are 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.

8. The following is a statement of reasons for the indication of allowable subject matter:

Claim 7 and 19 is allowable for reciting, *inter alia,* "wherein the filter includes a mouth positioned around the fluid outlet, and wherein the fluid outlet is configured to direct the filtered blood through the fluid outlet".

Garrison, Heaton, and Barzell teaches all of the limitations as discussed above in claim 1 and Heaton further teaches wherein the clot canister is coupled to the aspiration source (variable volume (110), see Figure 1). However, Heaton does not explicitly disclose a fluid outlet in the clot canisters wherein a mouth a the filter is positioned. Even if there was prior art that discloses a clot canister with filter with a mouth positioned at a fluid outlet. It would be too complex to further modify the clot canister of Heaton and the filter of Barzell to functionally operate as claimed. Therefore, the combination of limitations of claim 7 would be considered allowable.

Claim 8 is allowable for reciting, *inter alia,* "a reintroduction catheter, wherein the reintroduction catheter is flexible and shaped to be intravascularly positioned within a second blood vessel of a patient, and wherein the reintroduction catheter is configured to direct the filtered blood into the second blood vessel".

Garrison, Heaton, and Barzell teaches all of the limitations as discussed above in claim 1 and Garrison further teaches wherein the blood vessel if a first blood vessel (a cerebral vessel, see Paragraph [0010]). However, Garrison, Heaton and Barzell fail to teach a reintroduction catheter. Even if there was prior art that discloses a reintroduction catheter. It would be too complex to further modify the aspiration catheter of Garrison, Heaton, and Barzell to include a reintroduction catheter within the already modified device. Therefore, the combination of

limitations of claim 8 would be considered allowable. **Claims 9-10** would be allowable for depending on claim 8.

Claim 15 is allowable for reciting, *inter alia,* "wherein the hemostasis valve comprises: a tubular member defining a lumen configured to slidably receive the clot treatment device; and a filament extending at least partially around the tubular member, wherein the filament is moveable between (a) a first position wherein the filament circumferentially constricts the lumen to create a seal around the clot treatment device and (b) a second position wherein the filament is moved to at least partially open the lumen".

Garrison, Heaton, and Barzell teaches all of the limitations as discussed above in claim 1 and Garrison further teaches a hemostasis valve (234). However, Garrison, Heaton, and Barzell fail to teach the hemostasis valve having a filament to open/constrict the lumen. Even if there was prior art that discloses a hemostasis valve with a filament. It would be too complex to further modify the aspiration catheter of Garrison, Heaton, and Barzell to include the hemostasis valve within the already modified device. Therefore, the combination of limitations of claim 15 would be considered allowable.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC RASSAVONG whose telephone number is (408)918-7549. The examiner can normally be reached Monday - Friday 9:00am-5:30pm PT.

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, Nicholas J. Weiss can be reached on (571)270-1775. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/E.R./ (10/23/2023)
Examiner, Art Unit 3781

/SUSAN S SU/
Primary Examiner, Art Unit 3781
24 October 2023

Notice of References Cited	Application/Control No. 18/329,450	Applicant(s)/Patent Under Reexamination Merritt et al.	
	Examiner ERIC RASSAVONG	Art Unit 3781	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-2784717-A	03-1957	THOMPSON ELBERT O	A61C17/06	604/245
	B					
	C					
	D					
	E					
	F					
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	I					
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FOREIGN PATENT DOCUMENTS

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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/329,450	Merritt et al.
	Examiner	Art Unit
	ERIC RASSAVONG	3781

CPC - Searched*		
Symbol	**Date**	**Examiner**
A61F2/01	10/19/2023	/E.R./
A61B17/12109, 17/221, 2017/22034, 2017/22079, 2217/005, 2017/2212	10/19/2023	/E.R./
A61M1/815, 1/84, 1/79, 25/10, 1/0281, 2205/7545, 2210/12	10/19/2023	/E.R./

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**
Inventor Name Search in PALM	10/19/2023	/E.R./
CPC and text searching completed	10/23/2023	/E.R./

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

/E.R./ Examiner, Art Unit 3781	

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	18/329,450	Merritt et al.
	Examiner	**Art Unit**
	ERIC RASSAVONG	3781

✓	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	10/23/2023								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	O								
	8	O								
	9	O								
	10	O								
	11	✓								
	12	✓								
	13	✓								
	14	✓								
	15	O								
	16	✓								
	17	✓								
	18	✓								
	19	O								
	20	✓								
	21	✓								
	22	✓								

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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	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	~~Not Yet Assigned~~ 3781
	Examiner Name	~~Not Yet Assigned~~ Eric Rassavong
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	20230218310	07-13-2023	Scheinblum et al.	
	2.	20230218383	07-13-2023	Merritt et al.	
	3.	20230218313	07-13-2023	Rosenbluth et al.	
	4.	20230200970	06-29-2023	Merritt et al.	
	5.				

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1.	WO2023137341	07-20-2023	Inari Medical, Inc.		
	2.	WO2015179329	11-26-2015	WALK VASCULAR, LLC		
	3.					

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[5]
		English translation of Japanese Office Action mailed June 7, 2023 for Japanese Application No. 2021-507564, 7 pages.	

EXAMINER SIGNATURE

Examiner Signature/ERIC RASSAVONG/ (10/19/2023)	Date Considered	10/19/2023

*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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	Attorney Docket Number	111552-8018.US08

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.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider the listed references. This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information that may be material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, Applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

COPIES OF REFERENCES

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), Applicant has not submitted copies of U.S. patents and U.S. patent applications. Applicant submits herewith copies of foreign patents and non-patent literature in accordance with 37 C.F.R. § 1.98(a)(2).

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	/Matthew S. Williams/	Date (YYYY-MM-DD)	2023-7-24
Name/Print	Matthew S. Williams	Registration Number	77,516

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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U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	2846179	08-05-1958	Monckton	
	2.	2955592	10-11-1960	Maclean	
	3.	3088363	05-07-1963	W. Sparks	
	4.	3197173	07-27-1965	Taubenheim	
	5.	3435826	04-01-1969	T. J. Fogarty	
	6.	3515137	06-02-1970	Santomieri	
	7.	3892161	07-01-1975	Sokol	
	8.	3923065	12-02-1975	Nozick et al.	
	9.	4030503	06-21-1977	Clark,III	
	10.	4034642	07-12-1977	Iannucci et al.	
	11.	4222380	09-16-1980	Terayama	
	12.	4243040	01-06-1981	Beecher	
	13.	4287808	09-08-1981	Leonard et al.	
	14.	4324262	04-13-1982	Hall	
	15.	4393872	07-19-1983	Reznik et al.	
	16.	4469100	09-04-1984	Hardwick	
	17.	4523738	06-18-1985	Raftis et al.	
	18.	4551862	11-12-1985	Haber	
	19.	4604094	08-05-1986	Shook	
	20.	4646736	03-03-1987	Auth et al.	
	21.	4650466	03-17-1987	Luther	
	22.	4863440	09-05-1989	Chin et al.	
	23.	4883458	11-28-1989	Shiber	
	24.	4890611	01-02-1990	Monfort et al.	
	25.	4946440	08-07-1990	Hall	
	26.	4960259	10-02-1990	Sunnanvader et al.	
	27.	4978341	12-18-1990	Niederhauser	
	28.	5059178	10-22-1991	Ya	
	29.	5100423	03-31-1992	Fearnot	

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	30.	5127626	07-07-1992	Hilal et al.	
	31.	5129910	07-14-1992	Phan et al.	
	32.	5192286	03-09-1993	Phan et al.	
	33.	5192290	03-09-1993	Hilal	
	34.	5329923	07-19-1994	Lundquist	
	35.	5360417	11-01-1994	Gravener et al.	
	36.	5364345	11-15-1994	Lowery et al.	
	37.	5389100	02-14-1995	Bacich et al.	
	38.	5419774	05-30-1995	Willard et al.	
	39.	5443443	08-22-1995	Shiber	
	40.	5476450	12-19-1995	Ruggio	
	41.	5490859	02-13-1996	Mische et al.	
	42.	5591137	01-07-1997	Stevens	
	43.	5662703	09-02-1997	Yurek et al.	
	44.	5746758	05-05-1998	Nordgren et al.	
	45.	5749858	05-12-1998	Cramer	
	46.	5782817	07-21-1998	Franzel et al.	
	47.	5827229	10-27-1998	Auth et al.	
	48.	5873866	02-23-1999	Kondo et al.	
	49.	5873882	02-23-1999	Straub et al.	
	50.	5876414	03-02-1999	Straub	
	51.	5911710	06-15-1999	Barry et al.	
	52.	5941869	08-24-1999	Patterson et al.	
	53.	5971938	10-26-1999	Hart et al.	
	54.	5972019	10-26-1999	Engelson et al.	
	55.	5974938	11-02-1999	Lloyd	
	56.	5989233	11-23-1999	Yoon	
	57.	5993483	11-30-1999	Gianotti	
	58.	6066158	05-23-2000	Engelson et al.	

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	59.	6068645	05-30-2000	Tu	
	60.	6152946	11-28-2000	Broome et al.	
	61.	6156055	12-05-2000	Ravenscroft	
	62.	6168579	01-02-2001	Tsugita	
	63.	6221006	04-24-2001	Dubrulet al.	
	64.	6228060	05-08-2001	Howell	
	65.	6238412	05-29-2001	Dubrulet al.	
	66.	6245078	06-12-2001	Ouchi	
	67.	6254571	07-03-2001	Hart	
	68.	6258115	07-10-2001	Dubrul	
	69.	6306163	10-23-2001	Fitz	
	70.	6350271	02-26-2002	Kurz et al.	
	71.	6364895	04-02-2002	Greenhalgh	
	72.	6368339	04-09-2002	Amplatz	
	73.	6383205	05-07-2002	Samson et al.	
	74.	6413235	07-02-2002	Parodi	
	75.	6423032	07-23-2002	Parodi	
	76.	6458103	10-01-2002	Albert et al.	
	77.	6511492	01-28-2003	Rosenbluth et al.	
	78.	6514273	02-04-2003	Voss et al.	
	79.	6530935	03-11-2003	Wensel et al.	
	80.	6544278	04-08-2003	Vrba et al.	
	81.	6544279	04-08-2003	Hopkins et al.	
	82.	6551342	04-22-2003	Shen et al.	
	83.	6589263	07-08-2003	Hopkins et al.	
	84.	6596011	07-22-2003	Johnson et al.	
	85.	6602271	08-05-2003	Adams et al.	
	86.	6605074	08-12-2003	Zadno-azizi et al.	
	87.	6605102	08-12-2003	Mazzocchi et al.	

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	88.	6620179	09-16-2003	Brook et al.	
	89.	6623460	09-23-2003	Heck	
	90.	6635068	10-21-2003	Dubrul et al.	
	91.	6645222	11-11-2003	Parodi et al.	
	92.	6660013	12-09-2003	Rabiner et al.	
	93.	6663650	12-13-2003	Sepetka et al.	
	94.	6692504	02-17-2004	Kurz et al.	
	95.	6699260	03-02-2004	Dubrulet al.	
	96.	6755847	06-29-2004	Eskuri	
	97.	6767353	07-27-2004	Shiber	
	98.	6800080	10-05-2004	Bates	
	99.	6824553	11-30-2004	Gene et al.	
	100.	6830561	12-14-2004	Jansen et al.	
	101.	6846029	01-25-2005	Ragner et al.	
	102.	6939361	09-06-2005	Kleshinski	
	103.	6942682	09-13-2005	Vrba et al.	
	104.	6960222	11-01-2005	Vo et al.	
	105.	7004954	02-28-2006	Voss et al.	
	106.	7036707	05-02-2006	Aota et al.	
	107.	7041084	05-09-2006	Fotjik	
	108.	7052500	05-30-2006	Bashiriet al.	
	109.	7056328	06-06-2006	Arnott	
	110.	7069835	07-04-2006	Nishri et al.	
	111.	7094249	08-22-2006	Thomas et al.	
	112.	7179273	02-20-2007	Palmer et al.	
	113.	7232432	06-19-2007	Fulton III et al.	
	114.	7244243	07-17-2007	Lary	
	115.	7285126	10-23-2007	Sepetka et al.	
	116.	7306618	12-11-2007	Demond et al.	

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	117.	7320698	01-22-2008	Eskuri	
	118.	7323002	01-29-2008	Johnson et al.	
	119.	7331980	02-19-2008	Dubrul et al.	
	120.	7534234	05-19-2009	Fotjik	
	121.	7578830	08-25-2009	Kusleika et al.	
	122.	7621870	11-24-2009	Berrada et al.	
	123.	7674247	03-09-2010	Fotjik	
	124.	7691121	04-06-2010	Rosenbluth et al.	
	125.	7695458	04-13-2010	Belley et al.	
	126.	7763010	07-27-2010	Evans et al.	
	127.	7766934	08-03-2010	Pal et al.	
	128.	7775501	08-17-2010	Kees	
	129.	7780696	08-24-2010	Daniel et al.	
	130.	7905877	03-15-2011	Oscar et al.	
	131.	7905896	03-15-2011	Straub	
	132.	7938809	05-10-2011	Lampropoulos et al.	
	133.	7938820	05-10-2011	Webster et al.	
	134.	7967790	06-28-2011	Whiting et al.	
	135.	7976511	07-12-2011	Fotjik	
	136.	7993302	08-09-2011	Hebert et al.	
	137.	7993363	08-09-2011	Demond et al.	
	138.	8043313	10-25-2011	Krolik et al.	
	139.	8052640	11-08-2011	Fiorella et al.	
	140.	8057496	11-15-2011	Fischer Jr.	
	141.	8066757	11-29-2011	Ferrera et al.	
	142.	8070769	12-06-2011	Broome	
	143.	8070791	12-06-2011	Ferrera et al.	
	144.	8075510	12-13-2011	Aklog et al.	
	145.	8088140	01-03-2012	Ferrera et al.	

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	146.	8092486	01-10-2012	Berrada et al.	
	147.	8100935	01-24-2012	Rosenbluth et al.	
	148.	8109962	02-07-2012	Pal	
	149.	8118829	02-21-2011	Carrison et al.	
	150.	8197493	06-12-2012	Ferrera et al.	
	151.	8246641	08-21-2012	Osborne et al.	
	152.	8261648	09-11-2012	Marchand et al.	
	153.	8267897	09-18-2012	Wells	
	154.	8298257	10-30-2012	Sepetka et al.	
	155.	8317748	11-27-2012	Fiorella et al.	
	156.	8337450	12-25-2012	Fotjik	
	157.	8357178	01-22-2013	Grandfield et al.	
	158.	8361104	01-29-2013	Jones et al.	
	159.	8409215	04-02-2013	Sepetka et al.	
	160.	8486105	07-16-2013	Demond et al.	
	161.	8491539	07-23-2013	Fotjik	
	162.	8512352	08-20-2013	Martin	
	163.	8535334	09-17-2013	Martin	
	164.	8545526	10-01-2013	Martin et al.	
	165.	8568432	10-29-2013	Straub	
	166.	8574262	11-05-2013	Ferrera et al.	
	167.	8579915	11-12-2013	French et al.	
	168.	8585713	11-19-2013	Ferrera et al.	
	169.	8657867	02-25-2014	Dorn et al.	
	170.	8696622	04-15-2014	Fiorella et al.	
	171.	8715314	05-06-2014	Janardhan et al.	
	172.	8721714	05-13-2014	Kelley	
	173.	8771289	07-08-2014	Mohiuddin et al.	
	174.	8777893	07-15-2014	Malewicz	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	175.	8784441	07-22-2014	Rosenbluth et al.	
	176.	8784442	07-22-2014	Jones et al.	
	177.	8795305	08-05-2014	Martin et al.	
	178.	8795345	08-05-2014	Grandfield et al.	
	179.	8801748	08-12-2014	Martin	
	180.	8814927	08-26-2014	Shin et al.	
	181.	8820207	09-02-2014	Marchand et al.	
	182.	8826791	09-09-2014	Thompson et al.	
	183.	8828044	09-09-2014	Aggerholm et al.	
	184.	8833224	09-16-2014	Thompson et al.	
	185.	8845621	09-30-2014	Fotjik	
	186.	8852226	10-07-2014	Gilson et al.	
	187.	8939991	01-27-2015	Krolik et al.	
	188.	8945143	02-03-2015	Ferrera et al.	
	189.	8945172	02-03-2015	Ferrera et al.	
	190.	8956384	02-17-2015	Berrada et al.	
	191.	8992504	03-31-2015	Castella et al.	
	192.	9005172	04-14-2015	Chung	
	193.	9028401	05-12-2015	Bacich et al.	
	194.	9101382	08-11-2015	Krolik et al.	
	195.	9125683	09-08-2015	Farhangnia et al.	
	196.	9126016	09-08-2015	Fulton	
	197.	9149609	10-06-2015	Ansel et al.	
	198.	9155552	10-13-2015	Ulm III	
	199.	9161766	10-20-2015	Slee et al.	
	200.	9173668	11-03-2015	Ulm III	
	201.	9186487	11-17-2015	Dubrul et al.	
	202.	9204887	12-08-2015	Cully et al.	
	203.	9259237	02-16-2016	Quick et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	204.	9283066	03-15-2016	Hopkins et al.	
	205.	9351747	05-31-2016	Kugler et al.	
	206.	9358037	01-07-2016	Farhangnia et al.	
	207.	9439664	09-13-2016	Sos	
	208.	9439751	09-13-2016	White et al.	
	209.	9456834	10-04-2016	Folk	
	210.	9463035	10-11-2016	Greenhalgh et al.	
	211.	9463036	10-11-2016	Brady et al.	
	212.	9526864	12-27-2016	Quick	
	213.	9526865	12-27-2016	Quick	
	214.	9566424	02-14-2017	Pessin	
	215.	9579116	02-28-2017	Nguyen et al.	
	216.	9616213	04-11-2017	Furnish et al.	
	217.	9636206	05-02-2017	Nguyen et al.	
	218.	9643035	05-09-2017	Mastenbroek	
	219.	9700332	07-11-2017	Marchand et al.	
	220.	9717514	08-01-2017	Martin et al.	
	221.	9717519	08-01-2017	Rosenbluth et al.	
	222.	9744024	08-29-2017	Nguyen et al.	
	223.	9757137	09-12-2017	Krolik et al.	
	224.	9844386	12-19-2017	Nguyen et al.	
	225.	9844387	12-19-2017	Marchand et al.	
	226.	9848975	12-26-2017	Hauser	
	227.	9849014	12-26-2017	Kusleika	
	228.	9962178	05-08-2018	Greenhalgh et al.	
	229.	9999493	06-19-2018	Nguyen et al.	
	230.	10004531	06-26-2018	Rosenbluth et al.	
	231.	10010335	07-03-2018	Greenhalgh et al.	
	232.	10016266	07-10-2018	Hauser	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
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PTO/SB/08a (01-10)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	233.	10028759	07-24-2018	Wallace et al.	
	234.	10045790	08-14-2018	Cox et al.	
	235.	10098651	10-16-2018	Marchand et al.	
	236.	10130385	11-20-2018	Farhangnia et al.	
	237.	10226263	03-12-2019	Look et al.	
	238.	10238406	03-26-2019	Cox et al.	
	239.	10271864	04-30-2019	Greenhalgh et al.	
	240.	10327883	06-25-2019	Yachia	
	241.	10335186	07-02-2019	Rosenbluth et al.	
	242.	10342571	07-09-2019	Marchand et al.	
	243.	10349960	07-16-2019	Quick	
	244.	10383644	08-20-2019	Molaei et al.	
	245.	10524811	01-07-2020	Marchand et al.	
	246.	10588655	03-17-2020	Rosenbluth et al.	
	247.	10912577	02-09-2021	Marchand et al.	
	248.	11058445	07-13-2021	Cox et al.	
	249.	11058451	07-13-2021	Marchand et al.	
	250.	RE43902	01-01-2013	Hopkins et al.	
	251.	6569181	05-27-2003	Burns	
	252.	20020173819	11-21-2002	Leeflang et al.	
	253.	5383887	01-24-1995	Nadal	
	254.	6902540	06-07-2005	Dorros et al.	
	255.	5135484	08-04-1992	Wright	
	256.	6432122	08-13-2002	Gilson et al.	
	257.	6620182	09-16-2003	Khosravi et al.	
	258.	5947985	09-07-1999	Imram	
	259.	6126635	10-03-2000	Simpson et al.	
	260.	6165196	12-26-2000	Stack et al.	
	261.	5846251	12-08-1998	Hart	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

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PTO/SB/08a (01-10)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	262.	6264663	07-24-2001	Cano	
	263.	20020169474	11-14-2002	Kusleika	
	264.	4643184	02-17-1987	Mobin-Uddin	
	265.	4776337	10-11-1988	Palmaz	
	266.	4790812	12-13-1988	Hawkins Jr. et al.	
	267.	4870953	10-03-1989	DonMichael et al.	
	268.	4886062	12-12-1989	Wiktor	
	269.	4898575	02-06-1990	Fischell et al.	
	270.	5456667	10-10-1995	Ham et al.	
	271.	5496365	03-05-1996	Sgro	
	272.	5527326	06-18-1996	Hermann et al.	
	273.	5549626	08-27-1996	Miller et al.	
	274.	5769816	06-23-1998	Barbut et al.	
	275.	5800457	09-01-1998	Gelbfish	
	276.	5860938	01-19-1999	Lafontaine et al.	
	277.	5895406	04-20-1999	Gray et al.	
	278.	5911733	06-15-1999	Parodi	
	279.	5911754	06-15-1999	Kanesaka et al.	
	280.	5954737	09-21-1999	Lee	
	281.	6030397	02-29-2000	Moneti et al.	
	282.	6142987	11-07-2000	Tsugita	
	283.	6146396	11-14-2000	Konya et al.	
	284.	6146403	11-14-2000	St. Germain	
	285.	6179859	01-30-2001	Bates et al.	
	286.	6245089	06-12-2001	Daniel et al.	
	287.	6322572	11-27-2001	Lee	
	288.	6361545	03-26-2002	Macoviak et al.	
	289.	6402771	06-11-2002	Palmer et al.	
	290.	6475236	11-05-2002	Roubin et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	291.	6485502	11-26-2002	Don Michael	
	292.	6508782	01-21-2003	Evans et al.	
	293.	6530923	03-11-2003	Dubrul et al.	
	294.	6544276	04-08-2003	Azizi	
	295.	6575995	06-10-2003	Huter et al.	
	296.	6610077	08-26-2003	Hancock et al.	
	297.	6620148	09-16-2003	Tsugita	
	298.	6660014	12-09-2003	Demarais et al.	
	299.	6702830	03-09-2004	Demarais et al.	
	300.	6824545	11-30-2004	Sepetka et al.	
	301.	6824550	11-30-2004	Noriega et al.	
	302.	6945977	09-20-2005	Demarais et al.	
	303.	7063707	06-20-2006	Bose et al.	
	304.	7300458	11-27-2007	Henkes et al.	
	305.	8608754	12-17-2013	Wensel et al.	
	306.	6159230	12-12-2000	Samuels	
	307.	6790204	09-14-2004	Zadno-azizi et al.	
	308.	20020049452	04-25-2002	Kurz et al.	
	309.	20020188276	12-12-2002	Evans et al.	
	310.	20050085846	04-21-2005	Carrison et al.	
	311.	20070093744	04-26-2007	Elmaleh	
	312.	20020161392	10-31-2002	Dubrul	
	313.	20210330344	10-28-2021	Rosenbluth et al.	
	314.	20210378694	12-09-2021	Thress et al.	
	315.	11154314	10-26-2021	Quick	
	316.	11147571	10-19-2021	Cox et al.	
	317.	20210290925	09-23-2021	Merritt et al.	
	318.	20220000507	01-06-2022	Hauser	
	319.	20220000506	01-06-2022	Hauser	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

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	320.	20220000505	01-06-2022	Hauser	
	321.	20130126559	05-23-2013	Cowan et al.	
	322.	20040122359	06-24-2004	Wenz et al.	
	323.	20040267272	12-30-2004	Henniges et al.	
	324.	10709471	07-14-2020	Rosenbluth et al.	
	325.	20220039815	02-10-2022	Thress et al.	
	326.	20220022898	01-27-2022	Cox et al.	
	327.	20220015798	01-20-2022	Marchand et al.	
	328.	5376101	12-27-1994	Green et al.	
	329.	5192274	03-09-1993	Bierman	
	330.	20130116708	05-09-2013	Ziniti et al.	
	331.	20040260344	12-23-2004	Lyons et al.	
	332.	20060074401	04-06-2006	Ross	
	333.	20160151605	06-02-2016	Welch et al.	
	334.	20130197454	08-01-2013	SHIBATA et al.	
	335.	20100016837	01-21-2010	Howat	
	336.	20040138525	07-15-2004	Saadat et al.	
	337.	20090192495	07-30-2009	Ostrovsky et al.	
	338.	11000682	05-11-2021	Merritt et al.	
	339.	10695159	06-30-2020	Hauser	
	340.	10799331	10-13-2020	Hauser	
	341.	20020022859	02-21-2002	Hogendijk	
	342.	20020151918	10-17-2002	Lafontaine et al.	
	343.	11000682	05-11-2021	Merritt et al.	
	344.	5154724	10-13-1992	Andrews	
	345.	20030216774	11-20-2003	Larson	
	346.	20010004699	06-21-2001	Gittings et al.	
	347.	20010041909	11-15-2001	Tsugita et al.	
	348.	20010051810	12-13-2001	Dubrul et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	349.	20020022858	02-21-2002	Demond et al.	
	350.	20020026211	02-28-2002	Khosravi et al.	
	351.	20020032455	03-14-2002	Boock et al.	
	352.	20020095161	07-18-2002	Dhindsa	
	353.	20020095171	07-18-2002	Belef	
	354.	20020111648	08-15-2002	Kusleika et al.	
	355.	20020120277	08-29-2002	Hauschild et al.	
	356.	20020147458	10-10-2002	Hiblar et al.	
	357.	20020156457	10-24-2002	Fisher	
	358.	20030083693	05-01-2003	Daniel et al.	
	359.	20030100919	05-29-2003	Hopkins et al.	
	360.	20030114875	06-19-2003	Sjostrom	
	361.	20030116731	06-26-2003	Hartley	
	362.	20030125663	07-03-2003	Coleman et al.	
	363.	20030135230	07-17-2003	Massey et al.	
	364.	20030135258	07-17-2003	Andreas et al.	
	365.	20030153873	08-14-2003	Luther et al.	
	366.	20030153973	08-14-2003	Soun et al.	
	367.	20030168068	09-11-2003	Poole et al.	
	368.	20030176884	09-18-2003	Berrada et al.	
	369.	20030191516	10-09-2003	Weldon et al.	
	370.	20030208224	11-06-2003	Broome	
	371.	20040039412	02-26-2004	Isshiki et al.	
	372.	20040068288	04-08-2004	Palmer et al.	
	373.	20040073243	04-15-2004	Sepetka et al.	
	374.	20040098033	05-20-2004	Leeflang et al.	
	375.	20040133232	07-08-2004	Rosenbluth et al.	
	376.	20040138692	07-15-2004	Phung et al.	
	377.	20040167567	08-26-2004	Cano et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	378.	20040199201	10-07-2004	Kellett et al.	
	379.	20040199202	10-07-2004	Dubrul et al.	
	380.	20050033172	02-10-2005	Dubrul et al.	
	381.	20050038468	02-17-2005	Panetta et al.	
	382.	20050055047	03-10-2005	Greenhalgh	
	383.	20050085826	04-21-2005	Nair et al.	
	384.	20050085849	04-21-2005	Sepetka et al.	
	385.	20050119668	06-02-2005	Teague et al.	
	386.	20050177132	08-11-2005	Lentz et al.	
	387.	20050187570	08-25-2005	Nguyen et al.	
	388.	20050283165	12-22-2005	Gadberry	
	389.	20050283166	12-22-2005	Greenhalgh et al.	
	390.	20050283186	12-22-2005	Berrada et al.	
	391.	20060020286	01-26-2006	Niermann	
	392.	20060042786	03-02-2006	West	
	393.	20060047286	03-02-2006	West	
	394.	20060089533	04-27-2006	Ziegler et al.	
	395.	20060100662	05-11-2006	Daniel et al.	
	396.	20060155305	07-13-2006	Freudenthal et al.	
	397.	20060173525	08-03-2006	Behl et al.	
	398.	20060195137	08-31-2006	Sepetka et al.	
	399.	20060200221	09-07-2006	Malewicz	
	400.	20060224177	10-05-2006	Finitsis	
	401.	20060229645	10-12-2006	Bonnette et al.	
	402.	20060247500	11-02-2006	Voegele et al.	
	403.	20060253145	11-09-2006	Lucas	
	404.	20060276874	12-07-2006	Wilson et al.	
	405.	20060282111	12-14-2006	Morsi	
	406.	20060293696	12-28-2006	Fahey et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	407.	20070038225	02-15-2007	Osborne	
	408.	20070112374	05-17-2007	Paul, JR. et al.	
	409.	20070118165	05-24-2007	DeMello et al.	
	410.	20070149996	06-28-2007	Coughlin	
	411.	20070161963	07-12-2007	Smalling	
	412.	20070179513	08-02-2007	Deutsch	
	413.	20070191866	08-16-2007	Palmer et al.	
	414.	20070198028	08-23-2007	Miloslavskiet al.	
	415.	20070208361	09-06-2007	Okushi et al.	
	416.	20070208367	09-06-2007	Fiorella et al.	
	417.	20070213753	09-13-2007	Waller	
	418.	20070213765	09-13-2007	Adams et al.	
	419.	20070255252	11-01-2007	Mehta	
	420.	20070288054	12-13-2007	Tanaka et al.	
	421.	20080015541	01-17-2008	Rosenbluth et al.	
	422.	20080088055	04-17-2008	Ross	
	423.	20080157017	07-03-2008	Macatangay et al.	
	424.	20080167678	07-10-2008	Morsi	
	425.	20080183136	07-31-2008	Lenker et al.	
	426.	20080228209	09-18-2008	DeMello et al.	
	427.	20080234722	09-25-2008	Bonnette et al.	
	428.	20080262528	10-23-2008	Martin	
	429.	20080269798	10-30-2008	Ramzipoor et al.	
	430.	20080300466	12-04-2008	Gresham	
	431.	20090018566	01-15-2009	Escudero et al.	
	432.	20090054918	02-26-2009	Henson	
	433.	20090062841	03-05-2009	Amplatz et al.	
	434.	20090069828	03-12-2009	Martin et al.	
	435.	20090076417	03-19-2009	Jones	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. 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)		
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	436.	20090160112	06-25-2009	Ostrovsky	
	437.	20090163846	06-25-2009	Aklog et al.	
	438.	20090182362	07-16-2009	Thompson et al.	
	439.	20090281525	11-12-2009	Harding et al.	
	440.	20090292307	11-26-2009	Razack	
	441.	20090299393	12-03-2009	Martin et al.	
	442.	20100030256	02-04-2010	Dubrul et al.	
	443.	20100042136	02-18-2010	Berrada et al.	
	444.	20100087844	04-08-2010	Fischer Jr.	
	445.	20100087850	04-08-2010	Razack	
	446.	20100114113	05-06-2010	Dubrulet al.	
	447.	20100121312	05-13-2010	Gielenz et al.	
	448.	20100137846	06-03-2010	Desaietal	
	449.	20100190156	07-29-2010	Van Wordragen et al.	
	450.	20100204712	08-12-2010	Mallaby	
	451.	20100249815	09-30-2010	Jantzen et al.	
	452.	20100268264	10-21-2010	Bonnette et al.	
	453.	20100318178	12-16-2010	Rapaport et al.	
	454.	20110034987	02-10-2011	Kennedy	
	455.	20110054405	03-03-2011	Whiting et al.	
	456.	20110060212	03-10-2011	Slee et al.	
	457.	20110118817	05-19-2011	Gunderson et al.,	
	458.	20110125181	05-26-2011	Brady et al.	
	459.	20110144592	06-16-2011	Wong et al.	
	460.	20110152823	06-23-2011	Mohiuddin et al.	
	461.	20110152993	06-23-2011	Marchand et al.	
	462.	20110160742	06-30-2011	Ferrera et al.	
	463.	20110160763	06-30-2011	Ferrera et al.	
	464.	20110190806	08-04-2011	Wittens	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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	Attorney Docket Number	111552.8018.US08

U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	465.	20110196414	08-11-2011	Porter et al.	
	466.	20110213290	09-01-2011	Chin et al.	
	467.	20110213403	09-01-2011	Aboytes	
	468.	20110224707	09-15-2011	Miloslavskiet al.	
	469.	20110245807	10-06-2011	Sakata et al.	
	470.	20110251629	10-13-2011	Galdonik et al.	
	471.	20110264133	10-27-2011	Hanlon et al.	
	472.	20110265681	11-03-2011	Allen et al.	
	473.	20110288529	11-24-2011	Fulton	
	474.	20110288572	11-24-2011	Martin	
	475.	20110319917	12-29-2011	Ferrera et al.	
	476.	20120059309	03-08-2012	di Palma et al.	
	477.	20120059356	03-08-2012	di Palma et al.	
	478.	20120083824	04-05-2012	Berrada et al.	
	479.	20120083868	04-05-2012	Shrivastava	
	480.	20120089216	04-12-2012	Rapaport et al.	
	481.	20120101480	04-26-2012	Ingle et al.	
	482.	20120101510	04-26-2012	Lenker et al.	
	483.	20120138832	06-07-2012	Townsend	
	484.	20120143239	06-07-2012	Aklog et al.	
	485.	20120165919	06-28-2012	Cox et al.	
	486.	20120179181	07-12-2012	Straub et al.	
	487.	20120197277	08-02-2012	Stinis	
	488.	20120232655	09-13-2012	Lorrison et al.	
	489.	20120271105	10-25-2012	Nakamura et al.	
	490.	20120271231	10-25-2012	Agrawal	
	491.	20120277788	11-01-2012	Cattaneo	
	492.	20120310166	12-06-2012	Huff	
	493.	20130030460	01-31-2014	Marks et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	494.	20130046332	02-21-2013	Jones et al.	
	495.	20130066348	03-14-2013	Fiorella et al.	
	496.	20130092012	04-18-2013	Marchand et al.	
	497.	20130096571	04-18-2013	Massicotte et al.	
	498.	20130102996	04-25-2013	Strauss	
	499.	20130116721	05-09-2013	Takagi et al.	
	500.	20130144326	06-06-2013	Brady et al.	
	501.	20130165871	06-27-2013	Fiorella et al.	
	502.	20130184703	07-18-2013	Shireman et al.	
	503.	20130197567	08-01-2013	Brady et al.	
	504.	20130226196	08-29-2013	Smith	
	505.	20130289608	10-31-2013	Tanaka et al.	
	506.	20130317589	11-28-2013	Martin et al.	
	507.	20130345739	12-26-2013	Brady et al.	
	508.	20140005712	01-02-2014	Martin	
	509.	20140005713	01-02-2014	Bowman	
	510.	20140005715	01-02-2014	Castella et al.	
	511.	20140005717	01-02-2014	Martin et al.	
	512.	20140025048	01-23-2014	Ward	
	513.	20140031856	01-30-2014	Martin	
	514.	20140046133	02-13-2014	Nakamura et al.	
	515.	20140046243	02-13-2014	Ray et al.	
	516.	20140121672	05-01-2014	Folk	
	517.	20140155830	06-05-2014	Bonnette et al.	
	518.	20140155908	07-22-2014	Rosenbluth et al.	
	519.	20140155980	06-05-2014	Turjman	
	520.	20140180397	06-26-2014	Gerberding et al.	
	521.	20140188143	04-03-2018	Martin et al.	
	522.	20140236219	08-21-2014	Dubrul et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	523.	20140243882	08-28-2014	Ma	
	524.	20140257253	09-11-2014	Jemison	
	525.	20140276403	09-18-2014	Follmer et al.	
	526.	20140318354	10-30-2014	Thompson et al.	
	527.	20140324091	10-30-2014	Rosenbluth et al.	
	528.	20140330286	11-06-2014	Wallace et al.	
	529.	20140336691	11-13-2014	Jones et al.	
	530.	20140343593	11-20-2014	Chin et al.	
	531.	20140364896	12-11-2014	Consigny	
	532.	20140371779	12-18-2014	Vale et al.	
	533.	20150005781	01-01-2015	Lund-Clausen et al.	
	534.	20150005792	01-01-2015	Ahn	
	535.	20150018859	01-15-2015	Quick et al.	
	536.	20150018860	01-15-2015	Quick	
	537.	20150018929	01-15-2015	Martin et al.	
	538.	20150025555	01-22-2015	SOS	
	539.	20150032144	01-29-2015	Holloway	
	540.	20150059908	03-05-2015	Mollen	
	541.	20150088190	03-26-2015	Jensen	
	542.	20150127035	05-07-2015	Trapp et al.	
	543.	20150133990	05-14-2015	Davidson	
	544.	20150150672	06-04-2015	Ma	
	545.	20150164523	06-18-2015	Brady et al.	
	546.	20150164666	06-18-2015	Johnson et al.	
	547.	20150190155	07-09-2015	Ulm III	
	548.	20150190156	07-09-2015	Ulm III	
	549.	20150196380	07-16-2015	Berrada et al.	
	550.	20150196744	07-16-2015	Aboytes	
	551.	20150209058	07-30-2015	Ferrera et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	552.	20150209165	07-30-2015	Grandfield et al.	
	553.	20150238207	08-27-2015	Cox et al.	
	554.	20150250578	09-10-2015	Cook et al.	
	555.	20150265299	09-24-2015	Cooper et al.	
	556.	20150305756	10-29-2015	Rosenbluth	
	557.	20150305859	10-29-2015	Eller	
	558.	20150352325	12-10-2015	Quick	
	559.	20150360001	12-17-2015	Quick	
	560.	20150374391	12-31-2015	Quick	
	561.	20160008014	08-09-2016	Rosenbluth	
	562.	20160022293	01-28-2016	Dubrul et al.	
	563.	20160058540	03-03-2016	Don Michael	
	564.	20160074627	03-17-2016	Cottone	
	565.	20160106448	04-21-2016	Brady et al.	
	566.	20160106449	04-21-2016	Brady et al.	
	567.	20160113663	04-28-2016	Brady et al.	
	568.	20160113664	04-28-2016	Brady et al.	
	569.	20160113665	04-28-2016	Brady et al.	
	570.	20160113666	04-28-2016	Quick	
	571.	20160143721	05-26-2016	Rosenbluth	
	572.	20160206344	07-21-2016	Bruzzi et al.	
	573.	20160228134	08-11-2016	Martin et al.	
	574.	20160262790	09-15-2016	Rosenbluth et al.	
	575.	20160287276	10-06-2016	Cox et al.	
	576.	20160367285	12-22-2016	Sos	
	577.	20170014560	01-19-2017	Minskoff et al.	
	578.	20170037548	02-09-2017	Lee	
	579.	20170042571	02-16-2017	Levi	
	580.	20170058623	03-02-2017	Jaffrey et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
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PTO/SB/08a (01-10)
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	581.	20170079672	03-23-2017	Quick	
	582.	20170086864	03-30-2017	Greenhalgh et al.	
	583.	20170100142	04-13-2017	Look et al.	
	584.	20170105743	04-20-2017	Vale et al.	
	585.	20170105745	04-20-2017	Rosenbluth et al.	
	586.	20170112513	07-11-2017	Marchand et al.	
	587.	20170112514	04-27-2017	Marchand et al.	
	588.	20170189041	07-06-2017	Cox et al.	
	589.	20170233908	08-17-2017	Kroczynski et al.	
	590.	20170265878	09-21-2017	Marchand et al.	
	591.	20170303939	10-26-2017	Greenhalgh et al.	
	592.	20170303942	10-26-2017	Greenhalgh et al.	
	593.	20170303947	10-26-2017	Greenhalgh et al.	
	594.	20170303948	10-26-2017	Wallace et al.	
	595.	20170325839	11-16-2017	Rosenbluth et al.	
	596.	20170348014	12-07-2017	Wallace et al.	
	597.	20180042624	02-15-2018	Greenhalgh et al.	
	598.	20180042626	02-15-2018	Greenhalgh et al.	
	599.	20180064453	03-08-2018	Garrison et al.	
	600.	20180064454	03-08-2018	Losordo et al.	
	601.	20180070968	03-15-2018	Wallace et al.	
	602.	20180092652	04-05-2018	Marchand et al.	
	603.	20180105963	04-19-2018	Quick	
	604.	20180125512	05-10-2018	Nguyen et al.	
	605.	20180193043	07-12-2018	Marchand et al.	
	606.	20180236205	08-23-2018	Krautkremer et al.	
	607.	20180256178	09-13-2018	Cox et al.	
	608.	20180296240	10-18-2018	Rosenbluth et al.	
	609.	20180344339	12-06-2018	Cox et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

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PTO/SB/08a (01-10)
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	610.	20180361116	12-20-2018	Quick et al.	
	611.	20190000492	01-03-2019	Casey et al.	
	612.	20190046219	02-14-2019	Marchand et al.	
	613.	20190070401	03-07-2019	Merritt et al.	
	614.	20190117244	04-25-2019	Wallace et al.	
	615.	20190133622	05-06-2019	Wallace et al.	
	616.	20190133623	05-09-2019	Wallace et al.	
	617.	20190133624	05-09-2019	Wallace et al.	
	618.	20190133625	05-09-2019	Wallace et al.	
	619.	20190133626	05-09-2019	Wallace et al.	
	620.	20190133627	05-09-2019	Wallace et al.	
	621.	20190150959	05-23-2019	Cox et al.	
	622.	20190231373	08-01-2019	Quick	
	623.	20190321071	10-24-2019	Marchand et al.	
	624.	20190336148	11-07-2019	Greenhalgh et al.	
	625.	20200046368	02-13-2020	Merritt et al.	
	626.	20210113224	04-22-2021	Dinh	
	627.	20210186541	06-24-2021	Thress	
	628.	20220125451	04-28-2022	Hauser	
	629.	20220160382	05-26-2022	Hauser	
	630.	20140303658	10-09-2014	Bonnette et al.	
	631.	20050085769	04-21-2005	MacMahon et al.	
	632.	20220160383	05-26-2022	Hauser	
	633.	20220160381	05-26-2022	Hauser	
	634.	20170049942	02-23-2017	Conlan et al.	
	635.	20220240959	08-04-2022	Quick	
	636.	20220211992	07-07-2022	Merritt et al.	
	637.	6564828	05-20-2003	Ishida	
	638.	5197485	03-30-1993	Grooters	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
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PTO/SB/08a (01-10)
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	639.	20130035628	02-07-2013	Garrison et al.	
	640.	8057497	11-15-2011	Raju et al.	
	641.	20150173782	06-25-2015	Garrison et al.	
	642.	20130281788	10-24-2013	Garrison	
	643.	20170196576	07-13-2017	Long et al.	
	644.	20070010787	01-11-2007	Hackett et al.	
	645.	20170319221	11-09-2017	CHU	
	646.	20110196309	08-11-2011	Wells	
	647.	20140296868	10-02-2014	Garrison et al.	
	648.	20010049486	12-06-2001	Evans et al.	
	649.	20100217276	08-26-2010	Garrison et al.	
	650.	20140257363	09-11-2014	Lippert	
	651.	20170056032	03-02-2017	Look et al.	
	652.	20160220741	08-04-2016	Garrison et al.	
	653.	20180104404	04-19-2018	Ngo-Chu	
	654.	6719717	04-13-2004	Johnson et al.	
	655.	10478535	11-19-2019	Ogle	
	656.	6960189	11-01-2005	Bates et al.	
	657.	7004931	02-28-2006	Hogendijk	
	658.	7223253	05-29-2007	Hogendijk	
	659.	20220211400	07-07-2022	Cox et al.	
	660.	11433218	09-06-2022	Quick et al.	
	661.	20040127936	07-01-2004	Salahieh et al.	
	662.	20210022843	01-28-2021	Hauser	
	663.	5158564	10-27-1992	Schnepp-Pesch et al.	
	664.	20220347455	11-03-2022	Merritt et al.	
	665.	20220346800	11-03-2022	Merritt et al.	
	666.	20220346813	11-03-2022	Quick	
	667.	20220346814	11-03-2022	Quick	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
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PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Art Unit	Not Yet Assigned
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	Attorney Docket Number	111552.8018.US08

U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	668.	3675657	07-11-1972	Gauthier	
	669.	9216277	12-22-2015	Myers	
	670.	9980813	05-29-2018	Eller	
	671.	6451036	09-17-2002	Heitzmann et al.	
	672.	20080234715	09-25-2008	Pesce et al.	
	673.	20110034986	02-10-2011	Chou et al.	
	674.	20190336142	11-07-2019	Torrie et al.	
	675.	20190239910	08-08-2019	Brady et al.	
	676.	20060217664	09-28-2006	Hattler et al.	
	677.	20170252057	09-07-2017	Bonnette et al.	
	678.	20170340867	11-30-2017	Accisano, II	
	679.	11457936	10-04-2022	Buck et al.	
	680.	11259821	03-01-2022	Buck et al.	
	681.	11439799	09-13-2022	Buck et al.	
	682.	20210315598	10-14-2021	Buck et al.	
	683.	11529158	12-20-2022	Hauser	
	684.	20220362512	11-17-2022	Quick et al.	
	685.	20220142638	05-12-2022	Enright et al.	
	686.	20220151647	05-19-2022	Dolendo et al.	
	687.	20220152355	05-19-2022	Dolendo et al.	
	688.	5653684	08-05-1997	Laptewicz et al.	
	689.	5908435	06-01-1999	Samuels	
	690.	4611594	09-16-1986	Grayhack et al.	
	691.	9827084	11-28-2017	Bonnette et al.	
	692.	20210137667	05-13-2021	Sonnette et al.	
	693.	20180256177	09-13-2018	Cooper et al.	
	694.	11013523	05-25-2021	Arad Hadar	
	695.	20200113412	04-16-2020	Jensen	
	696.	11406801	08-09-2022	Fojtik et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	697.	11554005	01-17-2023	Merritt et al.	
	698.	11559382	01-24-2023	Merritt et al.	
	699.	6818006	11-16-2004	Douk et al.	
	700.	9078682	07-14-2015	Lenker et al.	
	701.	20140052161	02-20-2014	Cully et al.	
	702.	20180042623	02-15-2018	Batiste	
	703.	20180184912	07-05-2018	Al-Ali	
	704.	20160262774	09-15-2016	HONDA	
	705.	20120172918	07-05-2012	Fifer et al.	
	706.	20050054995	03-10-2005	Barzell et al.	
	707.	20030116731	06-26-2003	Hartley	
	708.	5421824	06-06-1995	Clement et al.	
	709.	20210236148	08-05-2021	Marchand et al.	
	710.	5158533	10-27-1992	Strauss et al.	
	711.	20230046775	02-16-2023	Quick	
	712.	20140188127	07-03-2014	Dubrul et al.	
	713.	20140074144	03-13-2014	Shrivastava et al.	
	714.	8535283	09-17-2013	Heaton et al.	
	715.	8753322	06-17-2014	Hu et al.	
	716.	8808259	08-19-2014	Walton et al.	
	717.	20230062809	03-02-2023	Merritt et al.	
	718.	20230070120	03-09-2023	Cox et al.	
	719.	20010031981	10-18-2001	Evans et al.	
	720.	20040102807	05-27-2004	Kusleika et al.	
	721.	6059814	05-09-2000	Ladd	
	722.	11648028	05-16-2023	Rosenbluth et al.	
	723.	5030201	07-09-1991	Palestrant	
	724.	11642209	05-09-2023	Merritt et al.	
	725.	6540722	04-01-2003	Boyle et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	726.	7678131	03-16-2010	Muller	
	727.	9301769	04-05-2016	Brady et al.	
	728.	20210393278	12-23-2021	O'MALLEY et al.	
	729.	20210038385	02-11-2021	Popp et al.	
	730.	20050203605	09-15-2005	Dolan	
	731.	6152144	11-28-2000	Lesh et al.	
	732.	9011551	04-21-2015	Oral et al.	
	733.	8647367	02-11-2014	Kassab et al.	
	734.	11166703	11-09-2021	Kassab et al.	
	735.	8834519	09-16-2014	van der Burg et al.	
	736.	7713282	05-11-2010	Frazier et al.	
	737.	8080032	12-20-2011	van der Burg et al.	
	738.	7722641	05-25-2010	van der Burg et al.	
	739.	8523897	09-03-2013	van der Burg et al.	
	740.	8535343	09-17-2013	van der Burg et al.	
	741.	7152605	12-26-2006	Khairkhahan et al.	
	742.	9168043	10-27-2015	van der Burg et al.	
	743.	7128073	10-31-2006	van der Burg et al.	
	744.	10772636	09-15-2020	Kassab et al.	
	745.	8480708	07-09-2013	Kassab et al.	
	746.	9717488	08-01-2017	Kassab et al.	
	747.	8784469	07-22-2014	Kassab	
	748.	9566073	02-14-2017	Kassab et al.	
	749.	20160192912	07-07-2016	Kassab et al.	
	750.	20160030708	02-04-2016	Casiello et al.	
	751.	20160135829	05-19-2016	Holoehwost et ah	
	752.	20060264905	11-23-2006	Eskridge et al.	
	753.	5244619	09-14-1993	Burnham	
	754.	20170021130	01-26-2017	Dye	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

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PTO/SB/08a (01-10)
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	755.	20160106353	04-21-2016	Schuetz et al.	
	756.	10960114	03-30-2021	Goisis	
	757.	10531883	01-14-2020	Deville et al.	
	758.	9581942	02-28-2017	Shippert	
	759.	5234403	08-10-1993	Yoda et al.	
	760.	20100106081	04-29-2010	Brandeis	
	761.	20100094201	04-15-2010	Mallaby	
	762.	20050004534	01-06-2005	Lockwood et al.	
	763.	20190365395	12-05-2019	Tran et al.	
	764.	20160038267	02-11-2016	ALLEN et al.	
	765.	20140222070	08-07-2014	BELSON et al.	
	766.	20130204297	08-08-2013	Melsheimer et al.	
	767.	11697012	07-11-2023	Merritt et al.	
	768.	11697011	07-11-2023	Merritt et al.	
	769.				

FOREIGN PATENT DOCUMENTS						
Examiner Initial*	Cite No.	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1. **	JP2004097807	04-02-2004	Takaakiet al.		
	2. **	JP2005230132	09-02-2005	Tomihisa		
	3. **	JP2005323702	11-24-2005	Tomihisa		
	4. **	JP2006094876	04-13-2006	Tomihisa		
	5. **	JPH6190049	07-12-1994	Deyuaa Edowaado lindo		
	6. **	WO1997017889	05-22-1997	Applied Medical Resources Corporation		
	7. **	WO2000053120	09-14-2000	Microvena Corporation		
	8. **	WO2005046736	05-29-2005	Bonnette		

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

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PTO/SB/08a (01-10)
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	9. **	WO2006110186	10-19-2006	Bonnette		
	10. **	WO2007092820	08-16-2007	Lazarus Effect Inc.		
	11. **	WO2009155571	12-23-2009	Coherex Medical Inc.		
	12. **	WO2010010545	01-28-2010	Neuravi Limited		
	13. **	WO2010023671	03-04-2010	Rapid Medical Ltd.		
	14. **	WO2010049121	05-06-2010	Acandis GMBH & Co		
	15. **	WO2010102307	09-10-2010	Lazarus Effect Inc.		
	16. **	WO2011054531	05-12-2011	Cattaneo		
	17. **	WO2012065748	05-24-2012	Monstadt et al.		
	18. **	WO2012009675	01-19-2012	Martin		
	19. **	WO2014047650	03-27-2014	Inceptus Medical LLC		
	20. **	WO2014081892	05-30-2014	Rosenbluth et al.		
	21. **	WO2015061365	04-30-2015	Inceptus Medical LLC		
	22. **	WO2015006782	01-13-2015	Inceptus Medical LLC		
	23. **	JP2011526820 (corresponds to WO2010/003135)	01-07-2010	Hot-Spur Technologies, Inc.		
	24. **	JP2001522631 (corresponds to WO99/23958)	05-20-1999	Prolifix Medical, Inc.		
	25. **	WO2010002549	01-07-2010	Hot-Spur Technologies, Inc.		
	26. **	EP1867290	02-27-2013	Cordis Corporation		
	27. **	JP 2005-095242	06-15-2005	Ishimaru		
	28. **	WO9838920	09-11-1998	Daniel et al.		
	29. **	WO03015840	02-27-2003	Advanced Bio Prosthetic Surfaces Ltd.		
	30. **	WO2004093696	11-04-2004	Kellett et al.		
	31. **	WO1999044542	09-10-1999	SCHIMED Life Systems, Inc.		
	32. **	WO2012011097	01-26-2012	The Medical Research, Infrastructure and Health Services Fund of the Tel Aviv Medical Center		
	33. **	WO2018080590	05-03-2018	Inari Medical, Inc.		

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

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PTO/SB/08a (01-10)
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	34. **	WO2017070702	04-27-2017	Inari Medical, Inc.		
	35. **	WO2017024258	02-09-2017	KP MEDCURE, INC.		
	36. **	DE102017004383	07-12-2018	Verlage		
	37. **	WO2019075444	04-18-2019	Inceptus Medical, LLC		
	38. **	WO2015191646	12-17-2015	Inceptus Medical, LLC		
	39. **	WO2019050765	03-14-2019	Inari Medical, Inc.		
	40. **	WO2017106877	06-22-2017	Inari Medical, Inc.		
	41. **	WO2012120490	09-13-2012	Neuravi Llimited		
	42. **	CN103932756	07-23-2014	Wu et al.		
	43. **	WO2011032712	03-24-2011	MAGIERKA ALEXANDRINA		
	44. **	WO2015121424	08-20-2015	Technip France		
	45. **	WO2004018916	03-04-2004	Asahi Organic Chemicals Industry Co., LTD.		
	46. **	WO2020036809	02-20-2020	Inari Medical, Inc.		
	47. **	WO2021127202	06-24-2021	Inari Medical, Inc.		
	48. **	CN108348319	07-31-2018	GW Medical LLC		
	49. **	CN111281482	06-16-2020	Stryker Corporation		
	50. **	CN103764049	04-30-2014	Marks et al.		
	51. **	CN104068910	10-01-2014	Shanghai Microport Medical Group Co Ltd		
	52. **	CN102186427	09-14-2011	Hotspur Technologies Inc.		
	53. **	WO2015189354	12-17-2015	Neuravi Ltd.		
	54. **	WO0202162	01-10-2002	Concentric Medical Inc.		
	55. **	EP1254634	11-06-2002	Radi Medical Systems		
	56. **	WO2019222117	11-21-2019	Stryker Corporation		
	57. **	GB2498349	07-17-2013	Cook Medical Technologies		
	58. **	WO0032118	06-08-2000	Atropos Limited		
	59. **	WO2017058280	04-06-2017	GW Medical LLC		
	60. **	WO2012049652	04-19-2012	Endogrowht		
	61. **	WO2017189535	11-02-2017	Stryker Corporation		

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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	62. **	WO2017189550	11-02-2017	Stryker Corporation		
	63. **	WO2017189591	11-02-2017	Stryker Corporation		
	64. **	WO2017189615	11-02-2017	Stryker Corporation		
	65. **	WO2017210487	12-07-2017	Stryker Corporation		
	66. **	GB1588072	04-15-1981	Beecher		
	67. **	AU2015210338	08-27-2015	Shifamed Holdings LLC		
	68. **	WO2018049317	03-15-2018	Stryker Corporation		
	69. **	WO2019010318	01-10-2019	Stryker Corporation		
	70. **	WO2019094456	05-16-2019	Stryker Corporation		
	71. **	WO2012162437	11-29-2012	Lazarus Effect Inc.		
	72. **	WO2009086482	07-09-2009	Lazarus Effect Inc.		
	73. **	WO9839053	09-11-1998	Scimed Life Systems Inc.		
	74. **	WO9833443	08-06-1998	Angioguard		
	75. **	WO9851237	11-19-1998	Gertler		
	76. **	WO2009082513	07-02-2009	Vortex Medical		
	77. **	WO2018148174	08-16-2018	KP MEDCURE, INC.		
	78. **	WO2021248042	12-09-2021	Inari Medical, Inc.		
	79. **	WO2021076954	04-22-2021	Inari Medical, Inc.		
	80. **	WO2011073176	06-23-2011	Novartis AG		
	81. **	WO2021067134	04-08-2021	BECTON, DICKINSON AND COMPANY		
	82. **	WO2022032173	02-10-2022	Inari Medical, Inc.		
	83. **	CN110652645	01-07-2020	Shanghai Warbey Medical Technology Co Ltd		
	84. **	WO2019246240	12-26-2019	INTU ITIVE SURGICAL OPERATIONS, INC.		
	85. **	JPH07323090A	12-12-1995	Heisei		
	86. **	WO2022103848	05-19-2022	Inari Medical, Inc.		
	87. **	WO2022109021	05-27-2022	Inari Medical, Inc.		
	88. **	WO2022109034	05-27-2022	Inari Medical, Inc.		

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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Examiner Initial*	Cite No.	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	89.	WO2006124307	11-23-2006	KERBEROS PROXIMAL SOLUTIONS, INC.		
	90.	WO2016014955	01-28-2016	OSTEOMEDIX, INC.		
	91.	EP2942624	11-11-2015	Kim, Hong		
	92.	WO2006029270	03-16-2006	SMITH & NEPHEW, INC.		

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[5]
	1. **	GIBBS, et al., "Temporary Stent as a bail-out device during percutaneous transluminal coronary angioplasty: preliminary clinical experience," British Heart Journal, 1994, 71:372-377, October 12, 1993, 6 pgs.	
	2. **	GUPTA, S. et al., "Acute Pulmonary Embolism Advances in Treatment", JAPI, Association of Physicians India, March 2008, Vol. 56, 185-191.	
	3. **	International Search Report and Written Opinion for International App. No. PCT/US13/61470, mailed January 17, 2014, 7 pages.	
	4. **	International Search Report and Written Opinion for International App. No. PCT/US2014/046567, mailed 11/3/2014, 13 pages	
	5. **	International Search Report and Written Opinion for International App. No. PCT/US2014/061645, mailed 1/23/2015, 15 pages.	
	6. **	International Search Report for International App. No. PCT/US13/71101, mailed March 31, 2014, 4 pages.	
	7. **	KONSTANTINIDES, S. et al., "Pulmonary embolism hotline 2012 - Recent and expected trials", Thrombosis and Haemostasis, January 9, 2013:33; 43-50.	
	8. **	KONSTANTINIDES, S. et al., "Pulmonary embolism: risk assessment and management", European Society of Cardiology; European Heart Journal, September 7, 2012:33, 3014-3022.	
	9. **	KUCHER, N. et al., "Percutaneous Catheter Thrombectomy Device for Acute Pulmonary Embolism: In Vitro and in Vivo Testing", Circulation, September, 2005:112:e28-e32.	
	10. **	KUCHER, N., "Catheter Interventions in Massive Pulmonary Embolism", Cardiology Rounds, March, 2006 Volume 10, Issue 3, 6 pages.	
	11. **	KUCHER, N. et al., "Management of Massive Pulmonary Embolism", Radiology, September 2005:236:3 852-858.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

	12. **	KUCHER, N. et al., "Randomized, Controlled Trial of Ultrasound-Assisted Catheter-Directed Thrombolysis for Acute Intermediate-Risk Pulmonary Embolism." Circulation, 2014, 129, pages 9 pages.	
	13. **	KUO, W. et al., "Catheter-directed Therapy for the Treatment of Massive Pulmonary Embolism: Systematic Review and Meta-analysis of Modern Techniques", Journal of Vascular and Interventional Radiology, November 2009:20:1431-1440.	
	14. **	KUO, W. et al., "Catheter-Directed Embolectomy, Fragmentation, and Thrombolysis for the Treatment of Massive Pulmonary Embolism After Failure of Systemic Thrombolysis", American College of CHEST Physicians 2008: 134:250-254.	
	15. **	KUO, W. MD, "Endovascular Therapy for Acute Pulmonary Embolism", Continuing Medical Education Society of Interventional Radiology ("CME"); Journal of Vascular and Interventional Radiology, February 2012: 23:167-179.	
	16. **	LEE, L. et al, "Massive pulmonary embolism: review of management strategies with a focus on catheter-based techniques", Expert Rev. Cardiovasc. Ther. 8(6), 863-873 (2010)	
	17. **	LIU, S. et al, "Massive Pulmonary Embolism: Treatment with the Rotarex Thrombectomy System", Cardiovascular Interventional Radiology; 2011: 34:106-113.	
	18. **	MULLER-HULSBECK, S. et al. "Mechanical Thrombectomy of Major and Massive Pulmonary Embolism with Use of the Amplatz Thrombectomy Device", Investigative Radiology, June 2001:36:6:317-322.	
	19. **	REEKERS, J. et al., "Mechanical Thrombectomy for Early Treatment of Massive Pulmonary Embolism", CardioVascular and Interventional Radiology, 2003: 26:246-250.	
	20. **	SCHMITZ-RODE et al., "New Mesh Basket for Percutaneous Removal of Wall-Adherent Thrombi in Dialysis Shunts," Cardiovasc Intervent Radiol 16:7-10 1993 4 pgs.	
	21. **	SCHMITZ-RODE et al., "Temporary Pulmonary Stent Placement as Emergency Treatment of Pulmonary Embolism," Journal of the American College of Cardiology, Vol. 48, No.4, 2006 (5 pgs.)	
	22. **	SCHMITZ-RODE, T. et al., "Massive Pulmonary Embolism: Percutaneous Emergency Treatment by Pigtail Rotation Catheter", JACC Journal of the American College of Cardiology, August 2000:36:2:375-380.	
	23. **	SPIOTTA, A et al., "Evolution of thrombectomy approaches and devices for acute stroke: a technical review." J NeuroIntervent Surg 2015, 7, pages 7 pages.	
	24. **	SVILAAS, T. et al., "Thrombus Aspiration During Primary Percutaneous Coronary Intervention." The New England Journal of Medicine, 2008, Vol. 358, No. 6, 11 pages.	
	25. **	TAPSON, V., "Acute Pulmonary Embolism", The New England Journal of Medicine, March 6, 2008:358:2037-52.	
	26. **	The Penumbra Pivotal Stroke Trial Investigators, "The Penumbra Pivotal Stroke Trial: Safety and Effectiveness of a New Generation of Mechanical Devices for Clot Removal in Intracranial Large Vessel Occlusive Disease." Stroke, 2009, 40: page 9 pages.	
	27. **	TRUONG et al., "Mechanical Thrombectomy of Iliocaval Thrombosis Using a Protective Expandable Sheath," Cardiovasc Intervent Radiol27-254-258, 2004, 5 pgs.	
	28. **	TURK et al., "ADAPT FAST study: a direct aspiration first pass technique for acute stroke thrombectomy." J NeuroIntervent Surg, Vol. 6, 2014, 6 pages.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

	29. **	UFLACKER, R., "Interventional Therapy for Pulmonary Embolism", Journal of Vascular and Interventional Radiology, February 2001: 12:147-164.	
	30. **	VERMA, R., MD et al. "Evaluation of a Newly Developed Percutaneous Thrombectomy Basket Device in Sheep With Central Pulmonary Embolisms", *Investigative Radiology*, October 2006, 41, 729-734.	
	31. **	International Search Report and Written Opinion for International App. No. PCT/US2015/034987 filed June 9, 2015, Applicant: Inceptus Medical, LLC, Date of Mailing: September 17, 2015, 12 pages.	
	32. **	International Search Report and Written Opinion for International App. No. PCT/US2016/067628 filed December 19, 2016, Applicant: Inari Medical, Inc., Date of Mailing: April 10, 2017, 11 pages.	
	33. **	GOLDHABER, S. et al. "Percutaneous Mechanical Thrombectomy for Acute Pulmonary Embolism - A Double-Edged Sword," American College of CHEST Physicians, August 2007, 132:2, 363-372.	
	34. **	GOLDHABER, S., "Advanced treatment strategies for acute pulmonary embolism, including thrombolysis and embolectomy," Journal of Thrombosis and Haemostasis, 2009: 7 (Suppl. 1): 322-327.	
	35. **	International Search Report and Written Opinion for International App. No. PCT/US2017/029696, Date of Filing: April 26, 2017, Applicant: Inari Medical, Inc., Date of Mailing: September 15, 2017, 19 pages.	
	36. **	International Search Report and Written Opinion for International App. No. PCT/US2016/058536, Date of Filing: October 24, 2016, Applicant: Inari Medical, Inc., Date of Mailing: March 13, 2017, 14 pages.	
	37. **	International Search Report and Written Opinion for International App. No. PCT/US2018/048786, Date of Filing: August 30, 2018, Applicant: Inari Medical, Inc., Date of Mailing: December 13, 2018, 12 pages.	
	38. **	International Search Report and Written Opinion for International App. No. PCT/US2018/055780, Date of Filing: October 13, 2018, Applicant: Inceptus Medical LLC., Date of Mailing: January 22, 2019, 8 pages.	
	39. **	International Search Report and Written Opinion for International App. No. PCT/US2019/045794, Date of Filing: August 8, 2019, Applicant: Inari Medical, Inc., Date of Mailing: November 1, 2019, 17 pages.	
	40. **	International Search Report and Written Opinion for International App. No. PCT/US2020/056067, Date of Filing: October 16, 2020; Applicant: Inari Medical, Inc., Date of Mailing: January 22, 2021, 8 pages.	
	41. **	International Search Report and Written Opinion for International App. No. PCT/US2020/055645, Date of Filing: December 17, 2020; Applicant: Inari Medical, Inc., Date of Mailing: April 14, 2021, 12 pages.	
	42. **	VORWERK, D. MD, et al., "Use of a Temporary Caval Filter to Assist Percutaneous Iliocaval Thrombectomy: Experimental Results." SCVIR, 1995, 4 pages.	
	43. **	WIKIPEDIA; Embolectomy; retrieved from the internet: https://en.wikipedia.org/wiki/Embolectomy; 4 pgs.; retrieved/printed: 3/24/2016	
	44. **	O'SULLIVAN; Thrombolysis versus thrombectomy in acute deep vein thrombosis; Interventional Cardiology; 3(5); pp. 589-596; October 2011	
	45. **	CAPTURE VASCULAR SYSTEMS; (company website); retrieved from the internet: http://www.capturevascular.com; 3 pgs.; retrieved/printed: 3/24/2016	
	46. **	EDWARDS LIFESCIENCES; Fogarty® Occlusion Catheters (product brochure); retrieved from the internet: http://web.archive.org/web/20150228193218/http://www.edwards.com/products/vascular/atraumaticocclusion/pages/occlusioncatheter.aspx; ©2011; 2 pgs.; retrieved/printed: 3/24/2011	

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	Attorney Docket Number	111552.8018.US08

	47. **	BOSTON SCIENTIFIC; Fetch(TM) 2 Aspiration Catheter (product information);retrieved from the internet: http://www.bostonscientific.com/en-US/products/thrombectomy-systems/fetch2-aspiration-catheter.html; 2 pgs.; retrieved/printed: 3/24/2016	
	48. **	PENUMBRA, INC.; Indigo® System (product information); retrieved from the internet: http://www.penumbrainc.com/peripherallpercutaneous-thromboembolectomy/ indigo-system; 7 pgs.; retrieved/printed: 3/24/2016	
	49. **	YOUTUBE; Merci Retrieval System X Series Animation; uploaded March 16,2009 (product information); posted on May 7, 2009 by SSMDePAUL, time 1:09, retrieved from the internet: https://www.youtube.com/watch?v=MGX7deuFkhc; 3 pgs.; retrieved/printed: 3/24/2016	
	50. **	COVIDIEN; Solitaire(TM) AS Neurovascular Remodeling Device (product information); retrieved from the internet: http://www.ev3.net/neuro/intl/remodeling-devices/solitaire-ab. htm; ©2015; 2 pgs.; retrieved/printed: 3/24/2016	
	51. **	International Search Report and Written Opinion for International App. No. PCT/US21/35965, Date of Filing: June 4, 2021, Applicant: Inari Medical, Inc., Date of Mailing: September 28, 2021, 12 pages.	
	52. **	International Search Report and Written Opinion for International App. No. PCT/US21/45072 Date of Filing: August 6, 2021, Applicant: Inari Medical, Inc., Date of Mailing: January 20, 2022, 10 pages.	
	53. **	International Search Report and Written Opinion for International App. No. PCT/US21/58793; Date of Filing: November 10, 2021, Applicant: Inari Medical, Inc., Date of Mailing: March 16, 2022, 13 pages.	
	54. **	International Search Report and Written Opinion for International App. No. PCT/US21/59718; Date of Filing: November 17, 2021, Applicant: Inari Medical, Inc., Date of Mailing: March 22, 2022, 13 pages.	
	55. **	International Search Report and Written Opinion for International App. No. PCT/US21/59735; Date of Filing: November 17, 2021, Applicant: Inari Medical, Inc., Date of Mailing: March 22, 2022, 11 pages.	
	56.	International Search Report and Written Opinion for International App. No. PCT/US23/60502; Date of Filing: January 11, 2023, Applicant: Inari Medical, Inc., Date of Mailing: May 25, 2023, 9 pages.	
	57.	International Search Report and Written Opinion for International App. No. PCT/US23/61256; Date of Filing: January 25, 2023, Applicant: Inari Medical, Inc., Date of Mailing: June 7, 2023, 8 pages.	
	58.	Gross et al., "Dump the pump: manual aspiration thrombectomy (MAT) with a syringe is technically effective, expeditious, and cost-efficient," J NeuroIntervent Surg, 2018, 4 pages.	

EXAMINER SIGNATURE			
Examiner Signature	/ERIC RASSAVONG/ (10/19/2023)	Date Considered	10/19/2023

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CERTIFICATION STATEMENT
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	Attorney Docket Number	111552.8018.US08

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OR

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☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

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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	/Matthew S. Williams/	Date (YYYY-MM-DD)	2023-07-13
Name/Print	Matthew S. Williams	Registration Number	77,516

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		"5954737" OR "5971938" OR "5972019" OR "5974938" OR "5989233" OR "5993483" OR "6030397" OR "6059814" OR "6066158" OR "6068645" OR "6126635" OR "6142987" OR "6146396" OR "6146403" OR "6152144" OR "6152946" OR "6156055" OR "6159230" OR "6165196" OR "6168579" OR "6179859" OR "6221006" OR "6228060" OR "6238412" OR "6245078" OR "6245089" OR "6254571" OR "6258115" OR "6264663" OR "6306163" OR "6322572" OR "6350271" OR "6361545" OR "6364895" OR "6368339" OR "6383205" OR "6402771" OR "6413235" OR "6423032" OR "6432122" OR "6451036" OR "6458103" OR "6475236" OR "6485502" OR "6508782" OR "6511492" OR "6514273" OR "6530923" OR "6530935" OR "6540722" OR "6544276" OR "6544278" OR "6544279" OR "6551342" OR "6564828" OR "6569181" OR "6575995" OR "6589263" OR					

		"6596011" OR "6602271" OR "6605074" OR "6605102" OR "6610077" OR "6620148" OR "6620179" OR "6620182" OR "6623460" OR "6635068" OR "6645222" OR "6660013" OR "6660014" OR "6663650" OR "6692504" OR "6699260" OR "6702830" OR "6719717" OR "6755847" OR "6767353" OR "6790204" OR "6800080" OR "6818006" OR "6824545" OR "6824550" OR "6824553" OR "6830561" OR "6846029" OR "6902540" OR "6939361" OR "6942682" OR "6945977" OR "6960189" OR "6960222" OR "7004931" OR "7004954" OR "7036707" OR "7041084" OR "7052500" OR "7056328" OR "7063707" OR "7069835" OR "7094249" OR "7128073" OR "7152605" OR "7179273" OR "7223253" OR "7232432" OR "7244243" OR "7285126" OR "7300458" OR "7306618" OR "7320698" OR "7323002" OR "7331980" OR "7534234" OR "7578830" OR "7621870" OR					

		"7674247" OR "7678131" OR "7691121" OR "7695458" OR "7713282" OR "7722641" OR "7763010" OR "7766934" OR "7775501" OR "7780696" OR "7905877" OR "7905896" OR "7938809" OR "7938820" OR "7967790" OR "7976511" OR "7993302" OR "7993363" OR "8043313" OR "8052640" OR "8057496" OR "8057497" OR "8066757" OR "8070769" OR "8070791" OR "8075510" OR "8080032" OR "8088140" OR "8092486" OR "8100935" OR "8109962" OR "8118829" OR "8197493" OR "8246641" OR "8261648" OR "8267897" OR "8298257" OR "8317748" OR "8337450" OR "8357178" OR "8361104" OR "8409215" OR "8480708" OR "8486105" OR "8491539" OR "8512352" OR "8523897" OR "8535283" OR "8535334" OR "8535343" OR "8545526" OR "8568432" OR "8574262" OR "8579915" OR "8585713" OR "8608754" OR "8647367" OR "8657867" OR					

		"8696622" OR "8715314" OR "8721714" OR "8753322" OR "8771289" OR "8777893" OR "8784441" OR "8784442" OR "8784469" OR "8795305" OR "8795345" OR "8801748" OR "8808259" OR "8814927" OR "8820207" OR "8826791" OR "8828044" OR "8833224" OR "8834519" OR "8845621" OR "8852205" OR "8852226" OR "8939991" OR "8945143" OR "8945172" OR "8956384" OR "8992504" OR "9005172" OR "9011551" OR "9028401" OR "9078682" OR "9101382" OR "9125683" OR "9126016" OR "9149609" OR "9155552" OR "9161766" OR "9168043" OR "9173668" OR "9186487" OR "9204887" OR "9216277" OR "9259237" OR "9283066" OR "9301769" OR "9351747" OR "9358037" OR "9439664" OR "9439751" OR "9456834" OR "9463035" OR "9463036" OR "9526864" OR "9526865" OR "9566073" OR "9566424" OR "9579116" OR "9581942" OR					

		"9616213").pn.					
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L5	250	("10004531" OR "10010335" OR "10016266" OR "10028759" OR "10045790" OR "10098651" OR "10130385" OR "10226263" OR "10238406" OR "10271864" OR "10327883" OR "10335186" OR "10342571" OR "10349960" OR "10383644" OR "10478535" OR "10524811" OR "10531883" OR "10588655" OR "10695159" OR "10709471" OR "10772636" OR "10799331" OR "10912577" OR "10960114" OR "11000682" OR "11013523" OR "11058445" OR "11058451" OR "11147571" OR "11154314" OR "11166703" OR "11259821" OR "11406801" OR "11433218" OR "11439799" OR "11457936" OR "11529158" OR "11554005" OR	(US-PGPUB; USPAT)	OR	ON	ON	2023/10/18 09:19 PM

		"11559382" OR "11642209" OR "11648028" OR "11697011" OR "11697012" OR "20010004699" OR "20010031981" OR "20010041909" OR "20010049486" OR "20010051810" OR "20020022858" OR "20020022859" OR "20020026211" OR "20020032455" OR "20020049452" OR "20020095161" OR "20020095171" OR "20020111648" OR "20020120277" OR "20020147458" OR "20020151918" OR "20020156457" OR "20020161392" OR "20020169474" OR "20020173819" OR "20020188276" OR "20030083693" OR "20030100919" OR "20030114875" OR "20030116731" OR "20030125663" OR "20030135230" OR "20030135258" OR "20030153873" OR "20030153973" OR "20030168068" OR "20030176884" OR "20030191516" OR "20030208224" OR "20030216774" OR "20040039412" OR "20040068288" OR "20040073243" OR "20040098033" OR "20040102807" OR "20040122359" OR "20040127936" OR "20040133232" OR "20040138525" OR "20040138692" OR "20040167567" OR "20040199201" OR "20040199202" OR "20040260344" OR "20040267272" OR "20050004534" OR "20050033172" OR "20050038468" OR					

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		"20080300466" OR "20090018566" OR "20090054918" OR "20090062841" OR "20090069828" OR "20090076417" OR "20090160112" OR "20090163846" OR "20090182362" OR "20090192495" OR "20090281525" OR "20090292307" OR "20090299393" OR "20100016837" OR "20100030256" OR "20100042136" OR "20100087844" OR "20100087850" OR "20100094201" OR "20100106081" OR "20100114113" OR "20100121312" OR "20100137846" OR "20100190156" OR "20100204712" OR "20100217276" OR "20100249815" OR "20100268264" OR "20100318178" OR "20110034986" OR "20110034987" OR "20110054405" OR "20110060212" OR "20110118817" OR "20110125181" OR "20110144592" OR "20110152823" OR "20110152993" OR "20110160742" OR "20110160763" OR "20110190806" OR "20110196309" OR "20110196414" OR "20110213290" OR "20110213403" OR "20110224707" OR "20110245807" OR "20110251629" OR "20110264133" OR "20110265681" OR "20110288529" OR "20110288572" OR "20110319917" OR "20120059309" OR "20120059356" OR "20120083824" OR "20120083868" OR "20120089216" OR					

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		"4324262" OR "4393872" OR "4469100" OR "4523738" OR "4551862" OR "4604094" OR "4611594" OR "4643184" OR "4646736" OR "4650466" OR "4776337" OR "4790812" OR "4863440" OR "4870953" OR "4883458" OR "4886062" OR "4890611" OR "4898575" OR "4946440" OR "4960259" OR "4978341" OR "5030201" OR "5059178" OR "5100423" OR "5127626" OR "5129910" OR "5135484" OR "5154724" OR "5158533" OR "5158564" OR "5192274" OR "5192286" OR "5192290" OR "5197485" OR "5234403" OR "5244619" OR "5329923" OR "5360417" OR "5364345" OR "5376101" OR "5383887" OR "5389100" OR "5419774" OR "5421824" OR "5443443" OR "5456667" OR "5476450" OR "5490859" OR "5496365" OR "5527326" OR "5549626" OR "5591137" OR "5653684" OR "5662703" OR "5746758").pn.					
L7	250	("5749858" OR "5769816" OR "5782817" OR	(US-PGPUB; USPAT)	OR	ON	ON	2023/10/18 09:20 PM

		"5800457" OR "5827229" OR "5846251" OR "5860938" OR "5873866" OR "5873882" OR "5876414" OR "5895406" OR "5908435" OR "5911710" OR "5911733" OR "5911754" OR "5941869" OR "5947985" OR "5954737" OR "5971938" OR "5972019" OR "5974938" OR "5989233" OR "5993483" OR "6030397" OR "6059814" OR "6066158" OR "6068645" OR "6126635" OR "6142987" OR "6146396" OR "6146403" OR "6152144" OR "6152946" OR "6156055" OR "6159230" OR "6165196" OR "6168579" OR "6179859" OR "6221006" OR "6228060" OR "6238412" OR "6245078" OR "6245089" OR "6254571" OR "6258115" OR "6264663" OR "6306163" OR "6322572" OR "6350271" OR "6361545" OR "6364895" OR "6368339" OR "6383205" OR "6402771" OR "6413235" OR "6423032" OR "6432122" OR "6451036" OR "6458103" OR "6475236" OR "6485502" OR					

		"6508782" OR "6511492" OR "6514273" OR "6530923" OR "6530935" OR "6540722" OR "6544276" OR "6544278" OR "6544279" OR "6551342" OR "6564828" OR "6569181" OR "6575995" OR "6589263" OR "6596011" OR "6602271" OR "6605074" OR "6605102" OR "6610077" OR "6620148" OR "6620179" OR "6620182" OR "6623460" OR "6635068" OR "6645222" OR "6660013" OR "6660014" OR "6663650" OR "6692504" OR "6699260" OR "6702830" OR "6719717" OR "6755847" OR "6767353" OR "6790204" OR "6800080" OR "6818006" OR "6824545" OR "6824550" OR "6824553" OR "6830561" OR "6846029" OR "6902540" OR "6939361" OR "6942682" OR "6945977" OR "6960189" OR "6960222" OR "7004931" OR "7004954" OR "7036707" OR "7041084" OR "7052500" OR "7056328" OR "7063707" OR "7069835" OR "7094249" OR "7128073" OR					

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		"8491539" OR "8512352" OR "8523897" OR "8535283" OR "8535334" OR "8535343" OR "8545526" OR "8568432" OR "8574262" OR "8579915" OR "8585713" OR "8608754" OR "8647367" OR "8657867" OR "8696622" OR "8715314" OR "8721714" OR "8753322" OR "8771289" OR "8777893" OR "8784441" OR "8784442" OR "8784469" OR "8795305" OR "8795345" OR "8801748" OR "8808259" OR "8814927" OR "8820207" OR "8826791" OR "8828044" OR "8833224" OR "8834519" OR "8845621" OR "8852226" OR "8939991" OR "8945143" OR "8945172" OR "8956384" OR "8992504" OR "9005172" OR "9011551" OR "9028401" OR "9078682" OR "9101382" OR "9125683" OR "9126016" OR "9149609" OR "9155552" OR "9161766" OR "9168043" OR "9173668" OR "9186487" OR "9204887" OR "9216277" OR "9259237" OR "9283066" OR "9301769" OR					

		"9351747" OR "9358037" OR "9439664" OR "9439751" OR "9456834" OR "9463035" OR "9463036" OR "9526864" OR "9526865" OR "9566073" OR "9566424" OR "9579116" OR "9581942" OR "9616213" OR "9636206").pn.					
L8	16	("9643035" OR "9700332" OR "9717488" OR "9717514" OR "9717519" OR "9744024" OR "9757137" OR "9827084" OR "9844386" OR "9844387" OR "9848975" OR "9849014" OR "9962178" OR "9980813" OR "9999493" OR "RE43902").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/10/18 09:20 PM
L9	250	("10004531" OR "10010335" OR "10016266" OR "10028759" OR "10045790" OR "10098651" OR "10130385" OR "10226263" OR "10238406" OR "10271864" OR "10327883" OR "10335186" OR "10342571" OR "10349960" OR "10383644" OR "10478535" OR "10524811" OR "10531883" OR "10588655" OR "10695159" OR "10709471" OR "10772636" OR "10799331" OR "10912577" OR "10960114" OR "11000682" OR	(US-PGPUB; USPAT)	OR	ON	ON	2023/10/18 09:20 PM

		"11013523" OR "11058445" OR "11058451" OR "11147571" OR "11154314" OR "11166703" OR "11259821" OR "11406801" OR "11433218" OR "11439799" OR "11457936" OR "11529158" OR "11554005" OR "11559382" OR "11642209" OR "11648028" OR "11697011" OR "11697012" OR "20010004699" OR "20010031981" OR "20010041909" OR "20010049486" OR "20010051810" OR "20020022858" OR "20020022859" OR "20020026211" OR "20020032455" OR "20020049452" OR "20020095161" OR "20020095171" OR "20020111648" OR "20020120277" OR "20020147458" OR "20020151918" OR "20020156457" OR "20020161392" OR "20020169474" OR "20020173819" OR "20020188276" OR "20030083693" OR "20030100919" OR "20030114875" OR "20030116731" OR "20030125663" OR "20030135230" OR "20030135258" OR "20030153873" OR "20030153973" OR "20030168068" OR "20030176884" OR "20030191516" OR "20030208224" OR "20030216774" OR "20040039412" OR "20040068288" OR "20040073243" OR "20040098033" OR "20040102807" OR					

		"20040122359" OR "20040127936" OR "20040133232" OR "20040138525" OR "20040138692" OR "20040167567" OR "20040199201" OR "20040199202" OR "20040260344" OR "20040267272" OR "20050004534" OR "20050033172" OR "20050038468" OR "20050054995" OR "20050055047" OR "20050085769" OR "20050085826" OR "20050085846" OR "20050085849" OR "20050119668" OR "20050177132" OR "20050187570" OR "20050203605" OR "20050283165" OR "20050283166" OR "20050283186" OR "20060020286" OR "20060042786" OR "20060047286" OR "20060074401" OR "20060089533" OR "20060100662" OR "20060155305" OR "20060173525" OR "20060195137" OR "20060200221" OR "20060217664" OR "20060224177" OR "20060229645" OR "20060247500" OR "20060253145" OR "20060264905" OR "20060276874" OR "20060282111" OR "20060293696" OR "20070010787" OR "20070038225" OR "20070093744" OR "20070112374" OR "20070118165" OR "20070149996" OR "20070161963" OR "20070179513" OR "20070191866" OR "20070198028" OR "20070208361" OR "20070208367" OR "20070213753" OR					

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		"20110224707" OR "20110245807" OR "20110251629" OR "20110264133" OR "20110265681" OR "20110288529" OR "20110288572" OR "20110319917" OR "20120059309" OR "20120059356" OR "20120083824" OR "20120083868" OR "20120089216" OR "20120101480" OR "20120101510" OR "20120138832" OR "20120143239" OR "20120165919" OR "20120172918" OR "20120179181" OR "20120197277" OR "20120232655" OR "20120271105" OR "20120271231" OR "20120277788" OR "20120310166" OR "20130030460" OR "20130035628" OR "20130046332" OR "20130066348" OR "20130092012" OR "20130096571" OR "20130102996" OR "20130116708" OR "20130116721" OR "20130126559" OR "20130144326" OR "20130165871" OR "20130184703" OR "20130197454" OR "20130197567" OR "20130204297" OR "20130226196" OR "20130281788" OR "20130289608" OR "20130317589" OR "20130345739" OR "20140005712" OR "20140005713" OR "20140005715").pn.					
L10	250	("20140005717" OR "20140025048" OR "20140031856" OR "20140046133" OR "20140046243" OR "20140052161" OR "20140074144" OR "20140121672" OR	(US-PGPUB; USPAT)	OR	ON	ON	2023/10/18 09:21 PM

		"20140155830" OR "20140155908" OR "20140155980" OR "20140180397" OR "20140188127" OR "20140188143" OR "20140222070" OR "20140236219" OR "20140243882" OR "20140257253" OR "20140257363" OR "20140276403" OR "20140296868" OR "20140303658" OR "20140318354" OR "20140324091" OR "20140330286" OR "20140336691" OR "20140343593" OR "20140364896" OR "20140371779" OR "20150005781" OR "20150005792" OR "20150018859" OR "20150018860" OR "20150018929" OR "20150025555" OR "20150032144" OR "20150059908" OR "20150088190" OR "20150127035" OR "20150133990" OR "20150150672" OR "20150164523" OR "20150164666" OR "20150173782" OR "20150190155" OR "20150190156" OR "20150196380" OR "20150196744" OR "20150209058" OR "20150209165" OR "20150238207" OR "20150250578" OR "20150265299" OR "20150305756" OR "20150305859" OR "20150352325" OR "20150360001" OR "20150374391" OR "20160008014" OR "20160022293" OR "20160030708" OR "20160038267" OR "20160058540" OR "20160074627" OR "20160106353" OR "20160106448" OR					

		"20160106449" OR "20160113663" OR "20160113664" OR "20160113665" OR "20160113666" OR "20160135829" OR "20160143721" OR "20160151605" OR "20160192912" OR "20160206344" OR "20160220741" OR "20160228134" OR "20160262774" OR "20160262790" OR "20160287276" OR "20160367285" OR "20170014560" OR "20170021130" OR "20170037548" OR "20170042571" OR "20170049942" OR "20170056032" OR "20170058623" OR "20170079672" OR "20170086864" OR "20170100142" OR "20170105743" OR "20170105745" OR "20170112513" OR "20170112514" OR "20170189041" OR "20170196576" OR "20170233908" OR "20170252057" OR "20170265878" OR "20170303939" OR "20170303942" OR "20170303947" OR "20170303948" OR "20170319221" OR "20170325839" OR "20170340867" OR "20170348014" OR "20180042623" OR "20180042624" OR "20180042626" OR "20180064453" OR "20180064454" OR "20180070968" OR "20180092652" OR "20180104404" OR "20180105963" OR "20180125512" OR "20180184912" OR "20180193043" OR "20180236205" OR "20180256177" OR "20180256178" OR					

		"20180296240" OR "20180344339" OR "20180361116" OR "20190000492" OR "20190046219" OR "20190070401" OR "20190117244" OR "20190133622" OR "20190133623" OR "20190133624" OR "20190133625" OR "20190133626" OR "20190133627" OR "20190150959" OR "20190231373" OR "20190239910" OR "20190321071" OR "20190336142" OR "20190336148" OR "20190365395" OR "20200046368" OR "20200113412" OR "20210022843" OR "20210038385" OR "20210113224" OR "20210137667" OR "20210186541" OR "20210236148" OR "20210290925" OR "20210315598" OR "20210330344" OR "20210378694" OR "20210393278" OR "20220000505" OR "20220000506" OR "20220000507" OR "20220015798" OR "20220022898" OR "20220039815" OR "20220125451" OR "20220142638" OR "20220151647" OR "20220152355" OR "20220160381" OR "20220160382" OR "20220160383" OR "20220211400" OR "20220211992" OR "20220240959" OR "20220346800" OR "20220346813" OR "20220346814" OR "20220347455" OR "20220362512" OR "20230046775" OR "20230062809" OR "20230070120" OR "2846179" OR					

		"2955592" OR "3088363" OR "3197173" OR "3435826" OR "3515137" OR "3675657" OR "3892161" OR "3923065" OR "4030503" OR "4034642" OR "4222380" OR "4243040" OR "4287808" OR "4324262" OR "4393872" OR "4469100" OR "4523738" OR "4551862" OR "4604094" OR "4611594" OR "4643184" OR "4646736" OR "4650466" OR "4776337" OR "4790812" OR "4863440" OR "4870953" OR "4883458" OR "4886062" OR "4890611" OR "4898575" OR "4946440" OR "4960259" OR "4978341" OR "5030201" OR "5059178" OR "5100423" OR "5127626" OR "5129910" OR "5135484" OR "5154724" OR "5158533" OR "5158564" OR "5192274" OR "5192286" OR "5192290" OR "5197485" OR "5234403" OR "5244619" OR "5329923" OR "5360417" OR "5364345" OR "5376101" OR "5383887" OR "5389100" OR "5419774" OR "5421824" OR "5443443" OR					

		"5456667" OR "5476450" OR "5490859" OR "5496365" OR "5527326" OR "5549626" OR "5591137" OR "5653684" OR "5662703" OR "5746758").pn.					
L11	250	("5749858" OR "5769816" OR "5782817" OR "5800457" OR "5827229" OR "5846251" OR "5860938" OR "5873866" OR "5873882" OR "5876414" OR "5895406" OR "5908435" OR "5911710" OR "5911733" OR "5911754" OR "5941869" OR "5947985" OR "5954737" OR "5971938" OR "5972019" OR "5974938" OR "5989233" OR "5993483" OR "6030397" OR "6059814" OR "6066158" OR "6068645" OR "6126635" OR "6142987" OR "6146396" OR "6146403" OR "6152144" OR "6152946" OR "6156055" OR "6159230" OR "6165196" OR "6168579" OR "6179859" OR "6221006" OR "6228060" OR "6238412" OR "6245078" OR "6245089" OR "6254571" OR "6258115" OR "6264663" OR "6306163" OR "6322572" OR	(US-PGPUB; USPAT)	OR	ON	ON	2023/10/18 09:21 PM

		"6350271" OR "6361545" OR "6364895" OR "6368339" OR "6383205" OR "6402771" OR "6413235" OR "6423032" OR "6432122" OR "6451036" OR "6458103" OR "6475236" OR "6485502" OR "6508782" OR "6511492" OR "6514273" OR "6530923" OR "6530935" OR "6540722" OR "6544276" OR "6544278" OR "6544279" OR "6551342" OR "6564828" OR "6569181" OR "6575995" OR "6589263" OR "6596011" OR "6602271" OR "6605074" OR "6605102" OR "6610077" OR "6620148" OR "6620179" OR "6620182" OR "6623460" OR "6635068" OR "6645222" OR "6660013" OR "6660014" OR "6663650" OR "6692504" OR "6699260" OR "6702830" OR "6719717" OR "6755847" OR "6767353" OR "6790204" OR "6800080" OR "6818006" OR "6824545" OR "6824550" OR "6824553" OR "6830561" OR "6846029" OR "6902540" OR "6939361" OR "6942682" OR					

		"6945977" OR "6960189" OR "6960222" OR "7004931" OR "7004954" OR "7036707" OR "7041084" OR "7052500" OR "7056328" OR "7063707" OR "7069835" OR "7094249" OR "7128073" OR "7152605" OR "7179273" OR "7223253" OR "7232432" OR "7244243" OR "7285126" OR "7300458" OR "7306618" OR "7320698" OR "7323002" OR "7331980" OR "7534234" OR "7578830" OR "7621870" OR "7674247" OR "7678131" OR "7691121" OR "7695458" OR "7713282" OR "7722641" OR "7763010" OR "7766934" OR "7775501" OR "7780696" OR "7905877" OR "7905896" OR "7938809" OR "7938820" OR "7967790" OR "7976511" OR "7993302" OR "7993363" OR "8043313" OR "8052640" OR "8057496" OR "8057497" OR "8066757" OR "8070769" OR "8070791" OR "8075510" OR "8080032" OR "8088140" OR "8092486" OR "8100935" OR "8109962" OR					

		"8118829" OR "8197493" OR "8246641" OR "8261648" OR "8267897" OR "8298257" OR "8317748" OR "8337450" OR "8357178" OR "8361104" OR "8409215" OR "8480708" OR "8486105" OR "8491539" OR "8512352" OR "8523897" OR "8535283" OR "8535334" OR "8535343" OR "8545526" OR "8568432" OR "8574262" OR "8579915" OR "8585713" OR "8608754" OR "8647367" OR "8657867" OR "8696622" OR "8715314" OR "8721714" OR "8753322" OR "8771289" OR "8777893" OR "8784441" OR "8784442" OR "8784469" OR "8795305" OR "8795345" OR "8801748" OR "8808259" OR "8814927" OR "8820207" OR "8826791" OR "8828044" OR "8833224" OR "8834519" OR "8845621" OR "8852226" OR "8939991" OR "8945143" OR "8945172" OR "8956384" OR "8992504" OR "9005172" OR "9011551" OR "9028401" OR "9078682" OR "9101382" OR					

		"9125683" OR "9126016" OR "9149609" OR "9155552" OR "9161766" OR "9168043" OR "9173668" OR "9186487" OR "9204887" OR "9216277" OR "9259237" OR "9283066" OR "9301769" OR "9351747" OR "9358037" OR "9439664" OR "9439751" OR "9456834" OR "9463035" OR "9463036" OR "9526864" OR "9526865" OR "9566073" OR "9566424" OR "9579116" OR "9581942" OR "9616213" OR "9636206").pn.					
L12	16	("9643035" OR "9700332" OR "9717488" OR "9717514" OR "9717519" OR "9744024" OR "9757137" OR "9827084" OR "9844386" OR "9844387" OR "9848975" OR "9849014" OR "9962178" OR "9980813" OR "9999493" OR "RE43902").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/10/18 09:21 PM
L13	4	("20230200970" OR "20230218310" OR "20230218313" OR "20230218383").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2023/10/19 03:27 PM
L14	0	"2105179329".pn.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 03:28 PM
L15	6	"2015179329".pn.	(US-PGPUB; USPAT;	OR	ON	ON	2023/10/19

			USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				03:29 PM
L16	2	"20150179329".pn.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 03:29 PM
L17	2	"20150327875".pn.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 03:30 PM
L18	63	("10058339" OR "10183159" OR "10384034" OR "10456555" OR "10485952" OR "10926060" OR "10953195" OR "1101890" OR "11065019" OR "11185664" OR "11224450" OR "11224721" OR "11305094" OR "11383064" OR "11395903" OR "11576691" OR "11596768" OR "11744691" OR "20040019310" OR "20070233043" OR "20080312681" OR "20110071503" OR "20120109109" OR "20130150793" OR "20170143359" OR "20170143938" OR "20170281204" OR "20180055999" OR "20180250498" OR "20190015298" OR "20190366036" OR "20200046940" OR "20200121334" OR "20210138194" OR	(US-PGPUB; USPAT)	OR	ON	ON	2023/10/19 04:10 PM

		"20210205577" OR "20210404464" OR "20220033888" OR "20220370761" OR "20230059721" OR "20230122587" OR "20230233311" OR "20230240705" OR "20230240706" OR "20230241302" OR "20230248380" OR "20230270991" OR "3416531" OR "3860006" OR "4981478" OR "5391152" OR "5639276" OR "5971958" OR "7122034" OR "7481805" OR "7815608" OR "8021351" OR "8070694" OR "8343167" OR "8568465" OR "9241669" OR "9265512" OR "9532792" OR "9662129").pn.					
L19	7796	A61F2/01.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 04:26 PM
L20	17500	A61B17/12109.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 04:26 PM
L21	1278	A61M1/815.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 04:41 PM
L22	12279	A61M1/84.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR,	OR	ON	ON	2023/10/19 04:41 PM

			GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L23	22668	A61B17/221.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 04:41 PM
L24	5166	A61B2017/22034.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 04:41 PM
L25	8025	A61B2017/22079.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 04:42 PM
L26	29684	A61B2217/005.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 04:42 PM
L27	4673	A61M1/79.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 04:42 PM
L28	34650	A61M25/10.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 04:42 PM
L29	11318	A61B2017/2212.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR,	OR	ON	ON	2023/10/19 04:42 PM

			GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
L30	4099	A61M1/0281.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 04:42 PM
L31	6512	A61M2205/7545.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 04:42 PM
L32	5437	A61M2210/12.cpc.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 04:42 PM
L33	26	((US-20050054995-A1 OR US-20180064453-A1 OR US-20160262774-A1 OR US-20190000492-A1 OR US-20140276288-A1 OR US-20170143938-A1 OR US-20170143359-A1 OR US-20080312681-A1 OR US-20170281204-A1 OR US-20180184912-A1 OR US-20120172918-A1 OR US-20140371779-A1 OR US-20180064454-A1 OR US-20120310166-A1 OR US-20030116731-A1).did. AND PGPB.dbnm.) OR ((WO-2016182977-A1 OR WO-2006124307-A2 OR JP-2001321364-A).did. AND FTDB.dbnm.) OR ((US-5421824-A OR US-8808259-B2 OR US-8753322-B2 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/19 07:44 PM

		10531883-B1 OR US-9345499-B2 OR US-4880408-A OR US-8535283-B2 OR US-9028401-B1).did. AND USPT.dbnm.)					
L34	17	((US-20160220741-A1 OR US-20110144592-A1 OR US-20030116731-A1 OR US-20140046133-A1 OR US-20140025048-A1 OR US-20130116708-A1 OR US-20120271105-A1).did. AND PGPB.dbnm.) OR ((US-9526864-B2 OR US-11000682-B2 OR US-10349960-B2 OR US-10271864-B2 OR US-10130385-B2 OR US-10016266-B2 OR US-9566424-B2 OR US-8777893-B2 OR US-7775501-B2).did. AND USPT.dbnm.) OR ((US-0777501-A).did. AND USOC.dbnm.)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/20 07:14 PM
L35	41	((EP-2942624-A1 OR WO-2006124307-A2 OR WO-2016014955-A1 OR WO-2006029270-A1 OR WO-2015179329-A1).did. AND FTDB.dbnm.) OR ((US-10478535-B2 OR US-10226263-B2 OR US-9581942-B1 OR US-9439751-B2 OR US-8777893-B2 OR US-8535283-B2 OR US-6960189-B2 OR US-6767353-B1 OR US-10456555-B2 OR US-8343167-B2 OR US-7815608-B2).did. AND USPT.dbnm.) OR ((US-20190239910-A1 OR US-20180236205-A1 OR US-20180193043-A1 OR US-20180184912-A1 OR US-20180064453-A1 OR US-20180042623-A1 OR US-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/20 07:22 PM

		20170252057-A1 OR US-20170105743-A1 OR US-20170100142-A1 OR US-20170056032-A1 OR US-20160220741-A1 OR US-20140257363-A1 OR US-20140155830-A1 OR US-20130281788-A1 OR US-20130035628-A1 OR US-20120310166-A1 OR US-20110213290-A1 OR US-20110034986-A1 OR US-20050004534-A1 OR US-20010049486-A1 OR US-20050054995-A1 OR US-20110144592-A1 OR US-20030116731-A1 OR US-20030023263-A1 OR US-20030135151-A1).did. AND PGPB.dbnm.)					
L36	26	((US-20230062809-A1 OR US-20230046775-A1 OR US-20190015298-A1 OR US-20180184912-A1 OR US-20180055999-A1 OR US-20180042623-A1 OR US-20170319221-A1 OR US-20160106353-A1 OR US-20040019310-A1 OR US-20040122359-A1 OR US-20230321412-A1 OR US-20110196309-A1 OR US-20140257363-A1 OR US-20140155830-A1 OR US-20170056032-A1 OR US-20030116731-A1).did. AND PGPB.dbnm.) OR ((US-10531883-B1 OR US-8535283-B2 OR US-8753322-B2 OR US-7223253-B2 OR US-6767353-B1 OR US-10478535-B2).did. AND USPT.dbnm.) OR ((WO-2018065092-A1).did. AND	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/20 07:24 PM

		DWPI.dbnm.) OR ((WO-2016014955-A1 OR EP-2942624-A1 OR WO-2006029270-A1).did. AND FTDB.dbnm.)					
L37	4	"20050054995".pn.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/21 09:53 PM
L39	1096	A61M1/79.cpc. AND remov$4 AND (canister receptacle)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/23 02:45 PM
L40	266	A61M1/79.cpc. AND (filter NEAR remov$4) AND (canister receptacle)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/23 02:45 PM
L41	1	A61M1/79.cpc. AND (filter NEAR remov$4) AND (canister receptacle) NEAR (transparent clear)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/23 02:46 PM
L42	266	A61M1/79.cpc. AND (filter NEAR remov$4) AND (canister receptacle)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/23 02:46 PM
L43	25	A61M1/79.cpc. AND (filter NEAR (replace reuse)) AND (canister receptacle)	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2023/10/23 02:48 PM

There are no Interference searches to show.

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	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	~~Not Yet Assigned~~ 3781
	Examiner Name	~~Not Yet Assigned~~ Eric Rassavong
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	20230233311	07-27-2023	Merritt et al.	
	2.	20070233043	10-04-2007	Dayton et al.	
	3.	8343167	01-01-2023	Henson	
	4.	8568465	10-29-2013	Freudenthal et al.	
	5.	20230241302	08-03-2023	Merritt et al.	
	6.	20230240705	08-03-2023	Rosenbluth et al.	
	7.	20230240706	08-03-2023	Rosenbluth et al.	
	8.	10183159	01-22-2019	Nobles et al.	
	9.	20190366036	12-05-2019	Jalgaonkar et al.	
	10.	20110071503	03-24-2011	TAKAGI et al.	
	11.	20120109109	05-03-2012	KAJII	
	12.	20180250498	09-06-2018	Stern et al.	
	13.	11744691	09-05-2023	Merritt et al.	
	14.	20230248380	08-10-2023	Long et al.	
	15.	5391152	02-21-1995	Patterson et al.	
	16.	20210404464	12-30-2021	Patoskie	
	17.	5971958	10-26-1999	Zhang	
	18.	3860006	01-14-1975	Patel	
	19.	20130150793	06-13-2013	Beissel et al.	
	20.	20230270991	08-31-2023	Merritt et al.	
	21.	20190015298	01-17-2019	Beatty et al.	
	22.	20180055999	03-01-2018	Bare et al.	
	23.	20040019310	01-29-2004	Hogendijk	
	24.	20080312681	12-18-2008	Ansel et al.	
	25.	20170143359	05-25-2017	Nguyen et al.	
	26.	20170143938	05-25-2017	Ogle et al.	
	27.	20170281204	10-05-2017	Garrison et al.	
	28.	8021351	09-20-2011	Boldenow et al.	
	29.	1101890	06-30-1914	TUNSTEAD	
	30.	10953195	03-23-2021	Jalgaonkar et al.	
	31.	20210205577	07-08-2021	Jalgaonkar et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.R./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

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	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	32.	3416531	12-17-1968	EDWARDS	
	33.	4981478	01-01-1991	Evard et al.	
	34.	7815608	10-19-2010	Schafersman et al.	
	35.	9662129	05-30-2017	Galdonik et al.	
	36.	8070694	12-06-2011	Galdonik et al.	
	37.	10058339	08-28-2018	Galdonik et al.	
	38.	9532792	01-03-2017	Galdonik et al.	
	39.	20200121334	04-23-2020	Galdonik et al.	
	40.	11596768	03-07-2023	Stern et al.	
	41.	10926060	02-23-2021	Stern et al.	
	42.	11224450	01-18-2022	Chou et al.	
	43.	11065019	07-20-2021	Chou et al.	
	44.	11576691	02-14-2023	Chou et al.	
	45.	2022033888	02-03-2022	Schnall-Levin et al.	
	46.	20220370761	11-24-2022	Chou et al.	
	47.	20230059721	02-23-2023	Chou et al.	
	48.	20230122587	04-20-2023	Chou et al.	
	49.	11305094	04-19-2022	Carrison et al.	
	50.	10485952	11-26-2019	Carrison et al.	
	51.	10456555	10-29-2019	Carrison et al.	
	52.	11383064	07-12-2022	Carrison et al.	
	53.	11185664	11-30-2021	Carrison et al.	
	54.	11224721	01-18-2022	Carrison et al.	
	55.	11395903	07-26-2022	Carrison et al.	
	56.	20200046940	02-13-2020	Carrison et al.	
	57.	20210138194	05-13-2021	Carrison et al.	
	58.	7122034	10-17-2006	Belhe et al.	
	59.	5639276	06-17-1997	Weinstock et al.	
	60.	7481805	01-27-2009	Magnusson	
	61.	9241669	01-26-2016	Pugh et al.	
	62.	10384034	08-20-2019	Carrison et al.	

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Doc description: Information Disclosure Statement (IDS) Filed

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	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	63.	9265512	02-23-2016	Carrison et al.	
	64.				
	65.				

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1.	WO2023147353	08-03-2023	Inari Medical, Inc.		
	2.	CN106178227	12-07-2016	Shanghai Microport Medical Group Co., Ltd.		
	3.	WO2023154612	08-17-2023	Inari Medical, Inc.		
	4.	WO2018065092	04-12-2018	PRINZESSIN VON ISENBURG, Sarah		
	5.	EP3013404	04-15-2020	NorMedix Inc.		
	6.	EP3583972	12-25-2019	Covidien LP		
	7.	EP3589348	01-08-2020	Covidien LP		
	8.	EP4137070	02-22-2023	ROUTE 92 MEDICAL INC.		
	9.	EP3620204	03-11-2020	ROUTE 92 MEDICAL INC.		
	10.					

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[5]
		International Search Report and Written Opinion for International App. No. PCT/US23/60927; Date of Filing: January 19, 2023, Applicant: Inari Medical, Inc., Date of Mailing: July 20, 2023, 12 pages.	

163880866.1

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	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8018.US08

EXAMINER SIGNATURE			
Examiner Signature	/ERIC RASSAVONG/ (10/19/2023)	Date Considered	10/19/2023

*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.

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.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider the listed references. This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information that may be material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, Applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

COPIES OF REFERENCES

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), Applicant has not submitted copies of U.S. patents and U.S. patent applications. Applicant submits herewith copies of foreign patents and non-patent literature in accordance with 37 C.F.R. § 1.98(a)(2).

SIGNATURE

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Doc description: Information Disclosure Statement (IDS) Filed

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	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8018.US08

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	/Matthew S. Williams/	Date (YYYY-MM-DD)	2023-09-21
Name/Print	Matthew S. Williams	Registration Number	77,516

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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Bibliographic Data

Application No: 18/329,450

Foreign Priority claimed: ○ Yes ◉ No

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

Verified and Acknowledged: /ERIC RASSAVONG/ Examiner's Signature | Initials

Title: SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/05/2023	606	3781	111552.8018.US08
RULE			

APPLICANTS

Inari Medical, Inc., Irvine, CA, UNITED STATES

INVENTORS

Ben Merritt,

Jacqueline Macias, Fullerton, CA, UNITED STATES

Brian Michael Strauss, San Clemente, CA, UNITED STATES

Thomas Tu, Louisville, KY, UNITED STATES

CONTINUING DATA

This application is a CON of 18167757 02/10/2023

18167757 is a CON of 17976711 10/28/2022

17976711 is a CON of 17865315 07/14/2022 PAT 11642209

17865315 is a CON of 16536185 08/08/2019 PAT 11559382

16536185 has PRO of 62718248 08/13/2018

16536185 has PRO of 62718269 08/13/2018

FOREIGN APPLICATIONS

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PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
18/329,450	06/05/2023	Ben Merritt	111552.8018.US08

CONFIRMATION NO. 1035

25096
PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

PUBLICATION NOTICE



Date Mailed: 10/05/2023

Title:SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Publication No.US-2023-0310138-A1
Publication Date:10/05/2023

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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.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	20230233311	07-27-2023	Merritt et al.	
	2.	20070233043	10-04-2007	Dayton et al.	
	3.	8343167	01-01-2023	Henson	
	4.	8568465	10-29-2013	Freudenthal et al.	
	5.	20230241302	08-03-2023	Merritt et al.	
	6.	20230240705	08-03-2023	Rosenbluth et al.	
	7.	20230240706	08-03-2023	Rosenbluth et al.	
	8.	10183159	01-22-2019	Nobles et al.	
	9.	20190366036	12-05-2019	Jalgaonkar et al.	
	10.	20110071503	03-24-2011	TAKAGI et al.	
	11.	20120109109	05-03-2012	KAJII	
	12.	20180250498	09-06-2018	Stern et al.	
	13.	11744691	09-05-2023	Merritt et al.	
	14.	20230248380	08-10-2023	Long et al.	
	15.	5391152	02-21-1995	Patterson et al.	
	16.	20210404464	12-30-2021	Patoskie	
	17.	5971958	10-26-1999	Zhang	
	18.	3860006	01-14-1975	Patel	
	19.	20130150793	06-13-2013	Beissel et al.	
	20.	20230270991	08-31-2023	Merritt et al.	
	21.	20190015298	01-17-2019	Beatty et al.	
	22.	20180055999	03-01-2018	Bare et al.	
	23.	20040019310	01-29-2004	Hogendijk	
	24.	20080312681	12-18-2008	Ansel et al.	
	25.	20170143359	05-25-2017	Nguyen et al.	
	26.	20170143938	05-25-2017	Ogle et al.	
	27.	20170281204	10-05-2017	Garrison et al.	
	28.	8021351	09-20-2011	Boldenow et al.	
	29.	1101890	06-30-1914	TUNSTEAD	
	30.	10953195	03-23-2021	Jalgaonkar et al.	
	31.	20210205577	07-08-2021	Jalgaonkar et al.	

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U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	32.	3416531	12-17-1968	EDWARDS	
	33.	4981478	01-01-1991	Evard et al.	
	34.	7815608	10-19-2010	Schafersman et al.	
	35.	9662129	05-30-2017	Galdonik et al.	
	36.	8070694	12-06-2011	Galdonik et al.	
	37.	10058339	08-28-2018	Galdonik et al.	
	38.	9532792	01-03-2017	Galdonik et al.	
	39.	20200121334	04-23-2020	Galdonik et al.	
	40.	11596768	03-07-2023	Stern et al.	
	41.	10926060	02-23-2021	Stern et al.	
	42.	11224450	01-18-2022	Chou et al.	
	43.	11065019	07-20-2021	Chou et al.	
	44.	11576691	02-14-2023	Chou et al.	
	45.	2022033888	02-03-2022	Schnall-Levin et al.	
	46.	20220370761	11-24-2022	Chou et al.	
	47.	20230059721	02-23-2023	Chou et al.	
	48.	20230122587	04-20-2023	Chou et al.	
	49.	11305094	04-19-2022	Carrison et al.	
	50.	10485952	11-26-2019	Carrison et al.	
	51.	10456555	10-29-2019	Carrison et al.	
	52.	11383064	07-12-2022	Carrison et al.	
	53.	11185664	11-30-2021	Carrison et al.	
	54.	11224721	01-18-2022	Carrison et al.	
	55.	11395903	07-26-2022	Carrison et al.	
	56.	20200046940	02-13-2020	Carrison et al.	
	57.	20210138194	05-13-2021	Carrison et al.	
	58.	7122034	10-17-2006	Belhe et al.	
	59.	5639276	06-17-1997	Weinstock et al.	
	60.	7481805	01-27-2009	Magnusson	
	61.	9241669	01-26-2016	Pugh et al.	
	62.	10384034	08-20-2019	Carrison et al.	

PTO/SB/08a (01-10)
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	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	63.	9265512	02-23-2016	Carrison et al.	
	64.				
	65.				

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1.	WO2023147353	08-03-2023	Inari Medical, Inc.		
	2.	CN106178227	12-07-2016	Shanghai Microport Medical Group Co., Ltd.		
	3.	WO2023154612	08-17-2023	Inari Medical, Inc.		
	4.	WO2018065092	04-12-2018	PRINZESSIN VON ISENBURG, Sarah		
	5.	EP3013404	04-15-2020	NorMedix Inc.		
	6.	EP3583972	12-25-2019	Covidien LP		
	7.	EP3589348	01-08-2020	Covidien LP		
	8.	EP4137070	02-22-2023	ROUTE 92 MEDICAL INC.		
	9.	EP3620204	03-11-2020	ROUTE 92 MEDICAL INC.		
	10.					

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[5]
		International Search Report and Written Opinion for International App. No. PCT/US23/60927; Date of Filing: January 19, 2023, Applicant: Inari Medical, Inc., Date of Mailing: July 20, 2023, 12 pages.	

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	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8018.US08

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.

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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.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider the listed references. This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information that may be material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, Applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

COPIES OF REFERENCES

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), Applicant has not submitted copies of U.S. patents and U.S. patent applications. Applicant submits herewith copies of foreign patents and non-patent literature in accordance with 37 C.F.R. § 1.98(a)(2).

SIGNATURE

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	Attorney Docket Number	111552-8018.US08

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	/Matthew S. Williams/	Date (YYYY-MM-DD)	2023-09-21
Name/Print	Matthew S. Williams	Registration Number	77,516

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APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**09/21/2023 02:33:26 PM ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	62841828	FILING DATE	06/05/2023
CUSTOMER #	25096	FIRST NAMED INVENTOR	Ben Merritt
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 11

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2023-9-21 - IDS SB08 - 111552-8018US8.pdf	5	Information Disclosure Statement (IDS) Form (SB08)	147 KB
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FOR_WO2023147353.pdf	52	Foreign Reference	2162 KB
FOR_CN106178227.pdf	14	Foreign Reference	6121 KB
FOR-WO2018065092.pdf	50	Foreign Reference	2030 KB
FOR-EP3013404.pdf	15	Foreign Reference	591 KB

FOR_WO2023154612.pdf	42	Foreign Reference	8876 KB
FOR-EP3583972.pdf	21	Foreign Reference	1735 KB
FOR-EP3589348 - Counterpart WO2018160810.pdf	44	Foreign Reference	2164 KB
FOR-EP4137070.pdf	51	Foreign Reference	3226 KB
FOR-EP3620204.pdf	50	Foreign Reference	3291 KB
NPL_ISR_WO_PCTUS20236 0927_JUL_20_2023_12page s.pdf	12	Non Patent Literature	6286 KB

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FOR-WO2018065092.pdf	8CD5C10DCA882A13C195ED6238D679A0D5AEC67FB86BA6D7 5814A5943F1911EE33A68A315B57F447D2CA9698FA33332063 CE1BB690E501F57728B93546A20BAD
FOR-EP3013404.pdf	3D90324030CFADDE2E69B16548429204EED8FD4CB29E457F0 532D25D701134341C5E14FD142B0E42FBE19C633688FAC8C5

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FOR_WO2023154612.pdf	3C9F5C1AFA5DAF87353AD9ADE84FDB7C4BAED63CC5B03A1BFA09D4C569B26851BF1F54043C003B047406BA9C85A53244E46A60E8CA62C7AEE7F89CB62BFA557E
FOR-EP3583972.pdf	1BCADA91406B3C917BB9CA44C5E41E850921CC779D2790C820A8D3F5730A239DFE5AB4A8A8412B60BFAC80E3ED5A3C2A9F47BF7ADE74D0BD6052AB153471DDAD
FOR-EP3589348 - Counterpart WO2018160810.pdf	5494011818D2C61C69D8661EAE176A54A8D2D22DE923F718FEAE2C688C0893E19C7F61304AD3589D55C2AA6C52E01FD2385F346D5A7523F37569A5AA54BBEDE2
FOR-EP4137070.pdf	05C4C9A6AF9A250D312393DAF39AABE109571DE37245F17B65A86187121D449DC3060876A4DDD7C5E2023068B0EDE11F9EA19C9777D641BBE064B96725B094AA
FOR-EP3620204.pdf	3BFC88107F2D2CC39249A1082F73A511741CFF801B44AAC797CAC8ED804966306DDC2052ED2BA49AEF1280DFC3B31D0DE301B802ECD3EC774353D8A04CE3EE09
NPL_ISR_WO_PCTUS2023609 27_JUL_20_2023_12pages.pdf	C3544C8CC4356AE50734DAA84C2B65A4258997E9E0E90E459CCDABC6A995E67A4123E7F292B4D4D91AA981B64CDE4549814DAB408B3E39575FF8CDA130EC4870

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2023-7-24 IDS SB08 - 111552-8018US8.PDF	2	Information Disclosure Statement (IDS) Form (SB08)	122 KB
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NPL_JP_Office Action 2021-507564_mailed June 7, 2023, 7 pages.PDF	7	Non Patent Literature	94 KB
FOR_WO2015179329.PDF	56	Foreign Reference	2433 KB
FOR_WO2023137341.PDF	75	Foreign Reference	3594 KB

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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
26 November 2015 (26.11.2015)

WIPO | PCT

(10) International Publication Number
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14/715,451 18 May 2015 (18.05.2015) US

(71) Applicant: **WALK VASCULAR, LLC** [US/US]; 17171 Daimler Street, Irvine, California 92614 (US).

(72) Inventors: **LOOK, David M.**; 2018 Port Provence Pl., Newport Beach, California 92660 (US). **MALLABY, Mark**; 11497 Grassy Trail Drive, San Diego, California 92127 (US).

(74) Agent: **WALKER, Blair D.**; Blair Walker IP Services, LLC, 24742 San Doval Lane, Mission Viejo, California 92691 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report (Art. 21(3))*

(54) **Title**: SYSTEMS AND METHODS FOR REMOVAL OF BLOOD AND THROMBOTIC MATERIAL

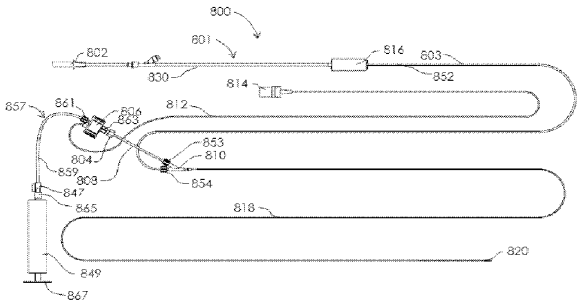


FIG. 21

(57) **Abstract**: A system for aspirating thrombus includes a catheter having a supply lumen having a distal end and an aspiration lumen configured to couple to a vacuum source and having an interior wall surface and an open distal end, an orifice at or near the distal end of the supply lumen, in fluid communication with the interior of the aspiration lumen, the orifice located proximally of the open distal end of the aspiration lumen, wherein the orifice is configured to create a spray pattern that impinges on the interior wall surface of the aspiration lumen when a distal end of the aspiration catheter is immersed within an aqueous environment, and a disposable tubing set having a first conduit configured to couple the supply lumen of the aspiration catheter to a fluid source, and a pump component associated with the first conduit and configured to detachably couple to a drive unit.

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SYSTEMS AND METHODS FOR REMOVAL OF BLOOD AND THROMBOTIC MATERIAL

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present disclosure pertains generally to medical devices and methods of their use. More particularly, the present invention pertains to aspiration and thrombectomy devices and methods of use thereof.

Description of the Related Art

[0002] Several devices and systems already exist to aid in the removal of thrombotic material. These include simple aspiration tube type devices using vacuum syringes to extract thrombus into the syringe, simple flush-and-aspirate devices, more complex devices with rotating components the pull in, macerate and transport thrombotic material away from the distal tip using a mechanical auger, systems that use very high pressure to macerate the thrombus and create a venturi effect to flush the macerated material away.

[0003] All of the devices described above have limitations as a result of individual design characteristics. For example, simple aspiration catheters offer ease of use and rapid deployment but may become blocked or otherwise inoperable when faced with older, more organized thrombotic material. Such devices must be removed and cleared outside the body and then re-inserted into the vasculature, which lengthens the time needed for the procedure and increases the opportunity to kink the catheter shaft. Such kinks may reduce performance by decreasing the cross-sectional area of the catheter or may render the device inoperable.

[0004] Mechanical rotary devices use an auger to grab and carry the thrombus away from the target area. Some create transport force via vacuum bottles while others create differential pressure at the distal tip of the device with the auger acting as a low pressure pump. These devices typically work slowly and offer the physician no feedback as to when the device should be advanced further into the lesion.

[0005] Flushing type devices include manual flush type devices in which the physician manipulates a hand-driven pump to provide flowing saline at the tip of the device to break up and aspirate the thrombus material, which may introduce performance variations based on the ability of the physician to consistently pump the device over the duration of the procedure. Flushing devices also include high pressure flushing devices that macerate the thrombus and then, using a vortex created by the high pressure fluid, transport the emulsified thrombotic material to a collection bag. These devices are effective at removing all levels of thrombotic material, but the pressure created by the device is so great that its action against certain vessel walls may interrupt the heart muscle stimulation mechanism and create a bradycardia event in certain patients, sometimes requiring that a pacing lead be placed in the patient prior to use. Further, interacting with the thrombotic material outside of the catheter may allow loose material to escape the capture mechanism.

SUMMARY OF THE INVENTION

[0006] In one embodiment of the present invention, a system for aspirating thrombus includes an aspiration catheter having a supply lumen and an aspiration lumen, the supply lumen having a wall and a closed distal end, the aspiration lumen configured to couple to a vacuum source and having an interior wall surface, and an open distal end, an orifice in the wall of the supply lumen, in fluid communication with the interior of the aspiration lumen, the orifice located proximally of the open distal end of the aspiration lumen and adjacent the closed distal end of the supply lumen, wherein the orifice is configured to create a spray pattern when pressurized fluid is pumped through the supply lumen such that the spray pattern impinges on the interior wall surface of the aspiration lumen when a distal end of the aspiration catheter is immersed within an aqueous environment, and a disposable tubing set having a first conduit configured to couple to the supply lumen of the aspiration catheter to a fluid source, and a pump component associated with the first conduit and configured to detachably couple to a drive unit, such that motion from the drive unit is transferred to the pump component such that resultant motion of the pump component causes fluid from the fluid source to be injected through the supply lumen of the aspiration catheter, and through the orifice into the aspiration lumen.

[0007] In another embodiment of the present invention, a system for aspirating thrombus includes an aspiration catheter having a supply lumen and an aspiration lumen, the supply lumen having a distal end, the aspiration lumen configured to couple to a vacuum source and having an interior wall surface, and an open distal end, an orifice at or near the distal end of the supply lumen, in fluid communication with the interior of the aspiration lumen, the orifice located proximally of the open distal end of the aspiration lumen, wherein the orifice is configured to create a spray pattern when pressurized fluid is pumped through the supply lumen such that the spray pattern impinges on the interior wall surface of the aspiration lumen when a distal end of the aspiration catheter is immersed within an aqueous environment, and a disposable tubing set having a first conduit configured to couple the supply lumen of the aspiration catheter to a fluid source, and a pump component associated with the first conduit and configured to detachably couple to a drive unit, such that motion from the drive unit is transferred to the pump component such that resultant motion of the pump component causes fluid from the fluid source to be injected through the supply lumen of the aspiration catheter, and through the orifice into the aspiration lumen.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 is a diagrammatic view of a system for aspirating thrombus according to an embodiment of the present invention.

[0009] FIG. 2 is a diagrammatic view showing more detail of the proximal portion of the system for aspirating thrombus of FIG. 1.

[0010] FIG. 3 is a diagrammatic view of the distal end portion of the system for aspirating thrombus of FIG. 1.

[0011] FIG. 4 is a plan view of disposable components of a system for aspirating thrombus according to an embodiment of the present invention.

[0012] FIG. 5 is a detailed view of detail 5 of FIG. 4.

[0013] FIG. 6 is a detailed view of detail 6 of FIG. 4.

[0014] FIG. 7 is a detailed view of detail 7 of FIG. 4.

[0015] FIG. 8 is a detailed view of detail 8 of FIG. 4.

[0016] FIG. 9 is a plan view of a distal end of an aspiration catheter of the system for aspirating thrombus of FIG. 4.

[0017] FIG. 10 is a sectional view of FIG. 9 taken through line 10-10, as viewed within a blood vessel.

[0018] FIG. 11 is a detailed view of detail 11 of FIG. 10.

[0019] FIG. 12 is elevation perspective view of a pump base according to an embodiment of the present invention.

[0020] FIG. 13 illustrates a piston of the system for aspirating thrombus being coupled to a saddle of a piston pump.

[0021] FIG. 14 is a cross-sectional view of the distal tip of the aspiration catheter of FIG. 9.

[0022] FIG 15 is a view a cassette for coupling to a pump base.

[0023] FIG. 16 is a sectional view of the cassette of FIG. 15.

[0024] FIG. 17 is a partially exploded view of the pump base of FIG. 12.

[0025] FIG. 18 is a graph of a pressure vs. time relationship of a piston pump.

[0026] FIG. 19 is an elevation view of a piston and a cassette of a piston pump according to an embodiment of the present invention.

[0027] FIG. 20 is a graph of a pressure vs. time relationship of a piston pump.

[0028] FIG. 21 is a plan view of disposable components of a system for aspirating thrombus according to an embodiment of the present invention.

[0029] FIG. 22 is a detailed view of a catheter of the system for aspirating thrombus of FIG. 21.

[0030] FIG. 23 is a detailed view of a tubing set of the system for aspirating thrombus of FIG. 21.

[0031] FIG. 24 is an exploded view of a saline pump drive unit according to an embodiment of the present invention.

[0032] FIG. 25 is an exploded view of a disposable piston pump head of the saline pump unit of FIG. 24.

[0033] FIG. 26 is a sectional view of an aspiration catheter of a system for aspirating thrombus within a blood vessel according to an embodiment of the present invention.

[0034] FIG. 27 is a sectional view of a catheter within a blood vessel delivering a drug to a target site.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

[0035] For the following defined terms, these definitions shall be applied, unless a different definition is given in the claims or elsewhere in this specification.

[0036] All numeric values are herein assumed to be modified by the term "about," whether or not explicitly indicated. The term "about" generally refers to a range of numbers that one of skill in the art would consider equivalent to the recited value (i.e., having the same function or result). In many instances, the terms "about" may include numbers that are rounded to the nearest significant figure.

[0037] The recitation of numerical ranges by endpoints includes all numbers within that range (e.g. 1 to 5 includes 1, 1.5, 2, 2.75, 3, 3.80, 4, and 5).

[0038] As used in this specification and the appended claims, the singular forms "a", "an", and "the" include plural referents unless the content clearly dictates otherwise. As used in this specification and the appended claims, the term "or" is generally employed in its sense including "and/or" unless the content clearly dictates otherwise.

[0039] The following detailed description should be read with reference to the drawings in which similar elements in different drawings are numbered the same. The drawings, which are not necessarily to scale, depict illustrative embodiments and are not intended to limit the scope of the invention.

[0040] FIG. 1 is a diagrammatic figure depicting an assisted aspiration system 10. The aspiration system 10 includes a remote hand piece 12 that contains a fluid pump 26 and an operator control interface 6. In one contemplated embodiment, the system 10 is a single use disposable unit. The aspiration system 10 may also include extension tubing 14, which contains a fluid irrigation lumen 2(or high pressure injection lumen) and an aspiration lumen 4, and which allows independent manipulation of a catheter 16 without requiring repositioning of the hand piece 12 during a procedure performed with the aspiration system 10. Extension tubing 14 may also act as a pressure accumulator. High pressure fluid flow from the pump 26, which may comprise a displacement pump, pulses with each stroke of the pump 26, creating a sinusoidal pressure map with distinct variations between the peaks and valleys of each sine wave. Extension tubing 14 may be matched to the pump 26 to expand and contract in unison with each pump pulse to reduce the variation in pressure caused by the pump pulses to produce a smooth or smoother fluid flow at tip of catheter 16. Any tubing having suitable compliance characteristics may be used. The extension tubing 14 may be permanently attached to the pump 26 or it may be attached to the pump 26 by a connector 44. The connector 44 is preferably configured to ensure that the extension tubing 14 cannot be attached to the pump 26 incorrectly.

[0041] An interface connector 18 joins the extension tubing 14 and the catheter 16 together. In one contemplated embodiment, the interface connector 18 may contain a filter assembly 8 between high pressure fluid injection lumen 2 of the extension tubing 14 and a high pressure injection lumen 36 of the catheter 16 (FIG. 3). The catheter 16 and the extension tubing 14 may be permanently joined by the interface connector 18. Alternatively, the interface connector 18 may contain a standardized connection so that a selected catheter 16 may be attached to the extension tubing 14.

[0042] Attached to the hand piece 12 are a fluid source 20 and a vacuum source 22. A standard hospital saline bag may be used as fluid source 20; such bags are readily available to the physician and provide the necessary volume to perform the procedure. Vacuum bottles may provide the vacuum source 22, or the vacuum source 22 may be provided by a syringe, a vacuum pump or other suitable vacuum sources.

[0043] In one contemplated embodiment, the catheter 16 has a variable stiffness ranging from stiffer at the proximal end to more flexible at the distal end. The variation in the stiffness of the catheter 16 may be achieved with a single tube with no radial bonds between two adjacent tubing pieces. For example, the shaft of the catheter 16 may be made from a single length of metal tube that has a spiral cut down the length of the tube to provide shaft flexibility. Variable stiffness may be created by varying the pitch of the spiral cut through different lengths of the metal tube. For example, the pitch of the spiral cut may be greater (where the turns of the spiral cut are closer together) at the distal end of the device to provide greater flexibility. Conversely, the pitch of the spiral cut at the proximal end may be lower (where the turns of the spiral cut are further apart) to provide increased stiffness. In some embodiments, a single jacket may cover the length of the metal tube to provide for a vacuum tight catheter shaft. Other features of catheter 16 are described with reference to FIG. 3, below.

[0044] FIG. 2 is a diagrammatic view showing more detail of the hand piece 12 and the proximal portion of assisted catheter aspiration system 10. The hand piece 12 includes a control box 24 where the power and control systems are disposed. The pump 26 may in some embodiments be a motor driven displacement pump that has a constant output. The pump displacement relationship to the catheter volume, along with the location of the orifice 42 (exit) of the catheter high pressure lumen 36 within the

aspiration lumen 38 (FIG. 3), ensures that no energy is transferred to the patient from the saline pump as substantially all pressurized fluid is evacuated by the aspiration lumen. A prime button 28 is mechanically connected to a prime valve 30. When preparing the device for use, it is advantageous to evacuate all air from the pressurized fluid system to reduce the possibility of air embolization. By depressing the prime button 28, the user connects the fluid source 20 to the vacuum source 22 via the pump 26. This forcefully pulls fluid (for example 0.9 % NaCl solution, or "saline", or "normal saline", or heparinized saline) through the entire pump system, removing all air and positively priming the system for safe operation. A pressure/vacuum valve 32 is used to turn the vacuum on and off synchronously with the fluid pressure system. One contemplated valve 32 is a ported one way valve. Such a valve is advantageous with respect to manual or electronic valve systems because it acts as a tamper proof safety feature by mechanically and automatically combining the operations of the two primary systems. By having pressure/vacuum valve 32, the possibility of turning the vacuum on without also activating the fluid system is eliminated.

[0045] The operator control interface 6 is powered by a power system 48 (such as a battery or an electrical line), and may comprise an electronic control board 50, which may be operated by a user by use of one or more switches 52 and one or more indicator lamps 54. The control board 50 also monitors and controls several device safety functions, which include over pressure detection, air bubble detection, and vacuum charge. A pressure sensor 64 monitors pressure (i.e. injection pressure), and senses the presence of air bubbles. Alternatively, or in conjunction, an optical device 66 may be used to sense air bubbles. In one contemplated embodiment, the pump pressure is proportional to the electric current needed to produce that pressure. Consequently, if the electric current required by pump 26 exceeds a preset limit, the control board 50 will disable the pump 26 by cutting power to it. Air bubble detection may also be monitored by monitoring the electrical current required to drive the pump 26 at any particular moment. In order for a displacement pump 26 to reach high fluid pressures, there should be little or no air (which is highly compressible) present in the pump 26 or connecting system (including the catheter 16 and the extension tubing 14). The fluid volume is small enough that any air in the system will result in no pressure being generated at the pump head. The control board monitors the pump current for any abrupt downward change that may indicate that air has entered the system. If the rate of drop is faster than a preset limit,

the control board 50 will disable the pump 26 by cutting power to it until the problem is corrected. Likewise, a block in the high pressure lumen 36 (FIG. 3), which may be due to the entry of organized or fibrous thrombus, or a solid embolus, may be detected by monitoring the electrical current running the pump 26. In normal use, the current fluxuations of the pump 26 are relatively high. For example, the pump 26 may be configured so that there is a variation of 200 milliAmps or greater in the current during normal operation, so that when current fluxuations drop below 200 milliAmps, air is identified, and the system shuts down. Alternatively, current fluxuations in the range of, for example, 50 milliAmps to 75 milliAmps may be used to identify that air is in the system. Additionally, an increase in the current or current fluxuations may indicate the presence of clot or thrombus within the high pressure lumen 36. For example, a current of greater than 600 milliAmps may indicate that thrombus it partially or completely blocking the high pressure lumen 36, or even the aspiration lumen 38 (FIG. 3).

[0046] A vacuum line 56, connected to the vacuum source 22, may be connected to a pressure sensor 58. If the vacuum of the vacuum source 22 is low (i.e. the absolute value pressure has decreased) or if a leak is detected in the vacuum line 56, the control board 50 disables the pump 26 until the problem is corrected. The pressure sensor 58 may also be part of a safety circuit 60 that will not allow the pump 26 to run if a vacuum is not present. Thereby, a comprehensive safety system 62, including the safety circuit 60, the pressure sensor 64 and/or the optical device 66, and the pressure sensor 58, requires both pump pressure and vacuum pressure for the system to run. If a problem exists (for example, if there is either a unacceptably low pump pressure or an absence of significant vacuum), the control board 50 will not allow the user to operate the aspiration system 10 until all problems are corrected. This will keep air from being injected into a patient, and will assure that the aspiration system 10 is not operated at incorrect parameters. Alternatively, in lieu of a direct connection (e.g., electrical, optical), the pressure sensor 58 can be configured to send a wireless signal to the control board 50, or any other component (e.g., antenna) coupled to or in communication with the control board 50, to remotely control operation of the pump 26. The removte control may be possible, whetehr the pump is within the sterile filed or outside the sterile field.

[0047] FIG. 3 is a diagrammatic view of the distal end portion 68 of the assisted catheter aspiration system 10, showing more details of the catheter 16. The

catheter 16 in some embodiments is a single-operator exchange catheter and includes a short guidewire lumen 34 attached to the distal end of the device. The guidewire lumen 34 can be between about 1 and about 30 cm in length, or between about 5 and about 25 cm in length, or between about 5 and about 20 cm in length, or approximately 13.5 cm in length. In other embodiments, a full-length guidewire lumen (extending the length of the catheter 16) may be used. For example, a catheter 16 sized to be used on peripheral blood vessels, including peripheral arteries, may incorporate a full-length guidewire lumen. In some embodiments, the aspiration itself may also serve as a guidewire lumen. An aspiration lumen 38 includes a distal opening 40 which allows a vacuum (for example, from vacuum source 22) to draw thrombotic material into the aspiration lumen 38. A high pressure lumen 36 includes a distal orifice 42 that is set proximally of distal opening 40 by a set amount. For example, distal orifice 42 can be set proximally of distal opening 40 by about 0.508 mm (0.020 inches), or by 0.508 mm ± 0.076 mm (0.020 inches ± 0.003inches) or by another desired amount. The orifice 42 is configured to spray across the aspiration lumen to macerate and/or dilute the thrombotic material for transport to vacuum source 22, for example, by lowering the effective viscosity of the thrombotic material. The axial placement of the fluid orifice 42 is such that the spray pattern interaction with the opposing lumen wall preferably produces a spray mist and not a swirl pattern that could force embolic material out from the distal opening 40. The spray pattern may be present at least when a distal end of the catheter 16 is within an aqueous environment, such as a body lumen, including a blood vessel. The aqueous environment may be at body temperature, for example between about 35.0°C and about 40.0°C, or between about 36.0°C and about 38.0°C. The system may be configured so that the irrigation fluid leaves the pump at a pressure of between about 3.447 megapascal (500 pounds per square inch) and about 10.342 megapascal (1500 pounds per square inch). In some embodiments, after a pressure head loss along the high pressure lumen 36, the irrigation fluid leaves orifice 42 at between about 4.137 megapascal (600 pounds per square inch) and about 8.274 megapascal (1200 pounds per square inch), or between about 4.816 megapascal (650 pounds per square inch) and about 5.861 megapascal (850 pounds per square inch).

[0048] FIG. 4 illustrates a system for aspirating thrombus 100 according to an embodiment of the present invention. The system for aspirating thrombus 100 depicted in FIG. 4 represents disposable components 101, comprising a tubing set 103 and an

aspiration catheter 118, which are configured to attach to a vacuum source 22, a fluid source 20 (FIGS. 1 and 2), a pressure monitor (not shown), and a pump base 200 (FIG. 12). The system for aspirating thrombus 100 is also configured to be used with a guidewire. Beginning with the components of the tubing set 103, a spike 102 (shown in more detail in FIG. 5) is configured to couple to a fluid source 20 such as a saline bag. The saline bag may have a volume of saline equal to about 1000 ml or about 500 ml. The saline may be heparinized, or may contain one or more therapeutic agents. The saline may be at room temperature, or may be warmed or cooled. A connector 104 (shown in more detail in FIG. 7), for example a luer connector, is configured to couple to a vacuum source 22. The vacuum source 22 may be a vacuum bottle having a volume of between 20 ml and 500 ml. The vacuum source 22 may instead be a 60 ml syringe whose plunger is pulled back after coupling to the connector 104. This may be a lockable plunger, which is locked in order to maintain the evacuated plunger position. In some cases, the vacuum source 22 may be a 20 ml syringe or a 30 ml syringe. An exemplary syringe with a lockable plunger is the VacLok® syringe sold by Merit Medical Systems, Inc. of South Jordan, UT, USA. The vacuum source 22 may also be a vacuum pump, with or without a collection container. A pressure transducer106 capable of measuring vacuum (including positive pressure sensors that are configured to measure positive pressure, but are capable of measuring negative pressure) is coupled to a vacuum line 108 via a y-connector 110. Signals from the pressure transducer 106 travel along a cable 112 (FIG. 7), which also supplies voltage to the pressure transducer 106. A connector 114 (also shown in FIG. 6) couples the cable 112 to a pressure monitor or to the pump base 200. A cassette 116 is a disposable component attachable to the pump base 200 (FIG. 12) for allowing pressurized injection of a liquid injectate (such as saline). The cassette 116 is described in more detail in relation to FIG. 6. The aspiration catheter 118 having a distal end 120 is shown in more detail in FIG. 8.

[0049] Turning to FIG. 5, the spike 102 communicates with extension tubing 122. Liquid injectate is pumped downstream at the piston pump, which pulls more liquid injectate (for example from a saline bag) through a check valve 126 and through a supply tube 130. An injection port 128 may be used for injecting other materials into the system, or for removing air or priming the system. The spike 102 may be packaged with a removable protective spike cover 124.

[0050] The cassette 116, as seen in FIG. 6, pulls liquid injectate from the supply tube 130, and pressurizes (in conjunction with the pump base 200) an injection tube 152. More detail of the cassette 116 will be described along with the description of the entire piston pump. FIG. 7 shows more detail of the pressure transducer 106 for measuring the vacuum. The pressure transducer 106 connects to the y-connector 110 with a luer fitting 154. The injection tube 152 and the vacuum line 108 communicate to lumens of a catheter shaft 142. For example, the injection tube 152 may be fluidly connected to a distal supply tube 168 (FIGS. 9-11), for example a polyimide or stainless steel or nitinol tube having high strength thin walls. This distal supply tube 168 may reside within the catheter shaft 142, with the annulus between forming an aspiration lumen 160 (FIGS. 9-11). A strain relief 156 protects the catheter shaft 142 from kinking and other damage. In any cases in which luer fittings 154 are used (at any of the connections), a custom luer with an added o-ring may be used in order to allow the connection to withstand elevated pressures. In some embodiments, a bespoke connector may be utilized, to increase high pressure endurance. In some embodiments, pressures as high as 6.89 megapascal (1,200 pounds per square inch) or greater may be achieved without leakage or without causing decoupling of the catheter.

[0051] Turning to FIG. 8, the aspiration catheter 118 is illustrated as a single-operator exchange catheter and includes a guidewire tube 132 attached to the distal end 120 on one side of the aspiration catheter 118. The guidewire tube 132 can be between about 1 and about 30 cm in length, or between about 5 and about 25 cm in length, or between about 5 and about 20 cm in length, or approximately 13.5 cm in length. The guidewire tube 132 has a distal end 136 and a proximal end 138, and a single guidewire lumen 134 passing between the two ends 136, 138. The guidewire lumen 134 may be configured to be compatible with a 0.014" guidewire, a 0.018" guidewire, or a number of other guidewire diameters. A lumen inner diameter may be about 0.406 mm (0.016 inches) for compatibility with a 0.014" guidewire. The guidewire tube 132 may be constructed of a number of materials, including nylon, polyethylene, PEBAX®, polyester, PET, or may be constructed from composite or coextruded materials. For example an inner layer may comprise high density polyethylene or FEP, PTFE, ETFE, or other materials for high lubricity, and an outer layer may include PEBAX, nylon or other materials, for combination mechanical strength and flexibility. A tie layer may be used between the inner and outer layers, for example linear low density polyethylene. The

catheter 118 may include a composite catheter shaft 142 having an inner support structure 144 covered with a polymer jacket 146. The inner support structure 144 may be a tubular braid or one or more helical coils, for example, made with stainless steel flat or round wires. The inner support structure 144 may also be spiral cut hypodermic tubing, for example made from 304 stainless steel or nickel-titanium. The spiral cut hypodermic tubing may have a pitch measuring about 4 to 6 millimeters, or about 5 millimeters at the proximal end for increased stiffness, transitioning to a pitch of about 0.75 to 1 mm or about 0.87 mm, at the distal end 150 of the inner support structure 144. In between the these two different pitch sections, may be intermediate pitch sections, for example, a section having a pitch of between about 2 mm and about 5 mm, and another section having a pitch of about 1 mm to about 2.5 mm. The inner support structure 144 may end at a transition zone 148, so that the polymer jacket 146 alone extends to the distal end 136 of the aspiration catheter 118. A catheter tip portion 140 is described in more detail in relation to FIGS. 9-11.

[0052] FIGS. 9-11 show an open distal end 158 of an aspiration lumen 160 for aspirating thrombus. A skive 162 may be formed in the polymer jacket 146, to aid entry of thrombus 164 that is aspirated into the aspiration lumen 160 (in the direction of arrow 180) by the combination of the vacuum created by the vacuum source 22. The skive 162 also minimizes the chances of the open distal end 158 being sucked against a blood vessel wall 166. A distal supply tube 168 has a closed distal end 170, for example, it may occluded during manufacture using adhesive, epoxy, hot melt adhesive or an interference member. Alternatively, the distal supply tube 168 may be closed off by melting a portion of it. The distal supply tube 168 has a lumen 176 extending its length and an orifice 172 formed through its wall 174 at a location adjacent and proximal to the closed distal end 170. The orifice 172 may have a diameter between about 0.0508 mm (0.002 inches) and about 0.1016 mm (0.004 inches), or about 0.0787 mm (0.0031 inches). The inner diameter of the distal supply tube 168 may be between about 0.3048 mm (0.012 inches) and about 0.4826 mm (0.019 inches), or between about 0.3556 mm (0.014 inches and about 0.4318 mm (0.017 inches) or about 0.3937 mm (0.0155 inches). The lumen 176 of the distal supply tube 168 is a continuation of an overall flow path emanating from the fluid source 20 including the extension tubing 122, the supply tube 130, the interior of the cassette 116, and the injection tube 152. In some embodiments, the lumen 176 of the distal supply tube 168 may taper, for example, from an inner diameter of about 0.3937

mm (0.0155 inches) at a proximal portion to an inner diameter of about 0.2974 mm (0.011 inches) at a distal portion. In some embodiments, the equivalent of a taper may be achieved by bonding different diameter tubing to each other, resulting in a stepped-down tubing inner diameter. In some embodiments, different diameter tapered tubing may be bonded to each other, for a combination of tapering and step-down of diameter. As described in conjunction with the piston pump, a pump output pressure wave of about 4.137 megapascal (600 pounds per square inch) to about 5.516 megapascal (800 pounds per square inch) causes a liquid injectate to flow through the flow path, including a the distal supply tube 168 (arrows 182), and causes a fluid jet 178 to exit the orifice 172 at a high velocity. The fluid jet 178, in absence of flow through the aspiration lumen 160 (for example if there is no vacuum), would impinge upon an inner wall 181 of the aspiration lumen 160 directly adjacent the orifice 172. Depending on the amount of vacuum present, the fluid jet, may curve as shown. The fluid jet 178 serves to macerate thrombus 164 that enters the aspiration lumen 160, and dilutes it. The flow rate of the liquid injectate (e.g. saline) and the amount of vacuum are controlled so that about 50% to about 70% of the volume of the mixture of the saline and blood flowing through the proximal aspiration lumen 160 is blood. Or about 60% of the volume is blood. This maceration and dilution assures that there is continuous flow through the aspiration lumen 160 so that it will not clog. The fluid jet 178 is configured to be contained within the aspiration lumen 160, and to not exit into a blood vessel or other body lumen.

[0053] The axial center of the orifice 172 is about 0.3302 mm (0.013 inches) to about 0.4826 mm (0.019 inches) proximal to the most proximal portion of the open distal end 158, as illustrated by distance D in FIG. 11. FIG. 14 is a cross-section of the catheter tip portion 140 at the axial center of the orifice 172. The orifice 172 it is oriented approximately along a vertical midline 184 of the aspiration lumen 160, or within a range of ± a, there where angle a is about 20°. The angle a, may be varied in different embodiments between about 1° and about 45°, or between about 20° and about 35°. The guidewire tube 132 may be secured to the polymer jacket 146 with attachment materials 186, such as adhesive, epoxy, hot melt or other materials. The guidewire tube 132 may be secured along its entire length, or at discrete locations along its length, in order to maximize flexibility. The distal supply tube 168 may be secured within the aspiration lumen 160 with attachment materials 188, such as adhesive, epoxy, hot melt or other materials. The polymer jacket 146 may comprise a number of different materials,

including PEBAX, nylon, or polyurethane. In some embodiments, the polymer jacket may be partially melt bonded to the distal supply tube 162 and/or the guidewire tube 132, in order to minimize the wall thickness of the assembly.

[0054] FIG. 12 illustrates a pump base 200 for coupling the cassette 116 of the system for aspiration of thrombus 100. A housing 202 is attached to an IV pole clamp 204, and contains the control circuitry and the motor for operating a piston pump system 300 (FIG. 13) which comprises the combined pump base 200 and the cassette 116. By action of a motor and cam within the pump base 200, a saddle 206 is cyclically actuated (up and down) within a window 208 to move a piston 210 within the cassette 116 (FIG. 13). Pegs 212 of the cassette 116 insert into cavities 216 in the pump base 200. Biased snaps 214 lock into one or more grooves 218 in the pump base 200. Either the cavities 216 or the grooves 218, may have one or more switches which sense the presence of the cassette 116. For example, the cassette for one particular model may have a first number (or combination) of pegs 212 or biased snaps 214, which another particular model may have a different number (or combination) of pegs 212 or biased snaps 214, which is recognized by the system. A smooth surface 224 of an elastomeric frame 222 engages edges 220 of the cassette 116, for enhanced protection. An upper space 226 is configured to engage, or closely match the supply tube 130 and a lower space 228 is configured to engage, or closely match the injection tube 152. The saddle 206 has a semi-cylindrical cavity 236 which snaps over a cylindrical engagement surface 238 on the piston 210. The saddle also has an upper edge 240 and a lower edge 242 for axially engaging a first abutment 244 and a second abutment 246, respectively, of the piston 210. A user interface 230 on the pump base 200 has one or more buttons 232 and one or more indicators 234, which allow the user to operate and assess the operation of the system 100. For example, the buttons may include a start button to begin pumping, a stop button to stop pumping, a prime button to prime the system with a fluid injectate and purge out air, or a temporary pause button. Other data entry keys are also possible. The cassette 116 may include one or more interface components 248. For example, a resistor, whose value the pump base 200 is able to measure via contacts 247, 249 when the cassette 116 is attached to the pump base. This allows the pump base to determine the appropriate parameter for operating a specific model of the system 100. For example, a first resistor having a first resistance may be used with a first model and a second resistor having a second resistance may be used with another model. Alternatively, the interface component 248 may

incorporate an RFID chip, such as a read RFID chip or a read/write RFID chip. This may allow specific data (pump operating pressures, RPM of motor output, etc.) to be recorded within the pump base or to connected hardware and identified for each patient.

[0055] FIG. 15 and 16 illustrate the cassette 116 with most of its internal components visible. FIG. 16 is a sectional view of the cassette 116. The cassette 116 comprises an internal supply cylinder 252 and an internal injection cylinder 254, which are cylindrical cavities extending within the cassette 116. The piston 210 includes a supply side shaft 256 and an injection side shaft 258, the supply side shaft 256 including an o-ring 266 for sealably interfacing with the supply cylinder 252 and the injection side shaft 258 including an o-ring 268 for sealably interfacing with the injection cylinder 254. Each of the o-rings 266, 268 are within a cylindrical groove 290, 292 around each respective shaft portion 256, 258. An internal ball valve 272 (FIG. 16) stops injectate (saline) from flowing through an internal channel 274 in the supply side shaft 256 of the piston 210 when the piston 210 moves in a first direction 276, but the internal ball valve 272 allows injectate to flow through the internal channel 274 and through an internal channel 282 in the injection side shaft 258 when the piston 210 moves in a second direction 278. The ball valve 272 is axially held between a spherical annular recess 284 in the interior of the supply side shaft 256 and a recess having thru channels 286 in the injection side shaft 258. The supply side shaft 256 and the injection side shaft 258 may be held together with a threaded connection 288. When the piston 210 moves in the first direction 276, the injection side shaft 258 of the piston 210 and o-ring 268 force injectate through the injection tube 152. A protective tube 280 is shown over the injection tube 152. In FIG. 15, the injection side shaft 258 is shown at the bottom of an injection pulse. Injectate is filtered through an in-line filter 262, which may be a 40 to 50 micron filter, having an approximate thickness of 0.762 mm (0.030 inches). The in-line filter 262 is configured to keep particulate out of the injectate. Even though injectate is circulated through the aspiration catheter 118, and not into the blood vessel, the filtering provided by the in-line filter 262 is an extra safety step. However, this step helps assure that particulate does not block the small orifice 172 (FIG. 11). When the piston 210 moves in the second direction 278, the supply side shaft 256 of the piston 210 and the o-ring 266 sealably move together within the supply cylinder 252, but the ball valve 272 allows the injectate to pass through the internal channels 274, 282 of the piston 210 and fill the injection cylinder 254. The injectate is able to enter from the supply tube 130 through a

check valve assembly 270 comprising an o-ring 264 and a check valve 250. The check valve 250 allows injectate to enter the interior of the cassette 116 from the supply tube 130, but not to move from the cassette 116 to the supply tube 130. The check valve 250 may be configured so that air, due at least in part to its low viscosity, will not be able to cause the check valve 250 to move (open), thus not allowing air to progress through the system. In some embodiments, the piston 210 may be a single piece (monolithic) design with a bore into which a check-valve is press-fit or bonded. A check valve compatible with this assembly may be supplied by the Lee Company of Westbrook, CT, USA.

[0056] The volume of injectate injected per cycle may range from about 0.02 ml to about 41 ml, or from about 0.04 ml to about 2.0 ml, or about 0.06 ml to about 0.08 ml, or about 0.07 ml. The usable volume (volume that can be injected) of the injection cylinder 254 may be configured to be less than the usable volume (volume that can be filled from) of the supply cylinder 252, in order to assure sufficient filling of the injection cylinder 254. For example, the usable volume of the injection cylinder 254 may be about 0.05 ml to about 0.12 ml, and the usable volume of the supply cylinder 252 may be about 0.07 ml to about 0.16 ml. A usable volume ratio R_U of between about 1.15 and about 2.00, or between about 1.25 and about 1.85, or about 1.40 is contemplated, where:

$R_U = V_{SCU}/V_{ICU}$, wherein:
V_{SCU} = Usable volume of the supply cylinder 252, and
V_{ICU} = Usable volume of the injection cylinder 254.

[0057] A mean flow rate of between about 5 ml/minute and about 100 ml/minute. In some embodiments for use in coronary applications, 20 ml/minute may be desired. In some embodiments for use in peripheral applications, 50 ml/minute may be desired.

[0058] FIG. 18 illustrates a graph 600 of a pressure (P) vs. time (T) curve 602 of a piston pump. Peaks 604 and valley 606 of the curve 602 can be dependent upon the design of the piston and cylinders of the piston pump, particularly of the usable volume ratio R_U. Turning to FIG. 19, a piston 608 is illustrated having a first diameter D_1 and a second diameter D_2 measured at the compressed o-rings 601, 603 (when placed within cylinders 605 and 607 of a cassette 609). The diameters of the cylinders 605, 607 are thus

also defined as diameters D_1 and D_2. When the diameters D_1, D_2, and the lengths of the cylinders 605, 607 are adjusted such that the the usable volume ratio R_U is optimized as previously described, a curve 610 as illustrated in FIG. 20 may be produced. The curve 610 has less-defined peaks 614 and valleys 616, and thus produces less variation of flow amplitude, and a more balanced injection.

[0059] The partially exploded pump base 200 in FIG. 17 illustrates the internal mechanisms for linear (up and down) actuation of the saddle 206, which is attached to a saddle stage 310. A motor 302 is controlled by a circuit board 304 and operated by the user interface 230 (FIG. 12), whose indicators 234 are lit by LEDs 306. The motor 302 turns a cam 316, in which includes a path 330. The saddle stage 310 has a pin 318 extending from its back side. The pin 318 may be press fit, bonded or screwed in place within the saddle stage 310. The saddle stage 310 is secured with screws to two slides 312, 314 through holes 326, 328, such that rotary motion of the cam 316 causes the pin 318 to track along the path 330 of the cam 316, thus causing the saddle stage 310 attached to the slides 312, 314 to slide upward and downward in cyclic motion. The shape of the cam determines the amount of acceleration and deceleration in the motion. Upper posts 322 and lower posts 324 serve as guides and/or stops of the saddle stage 310. The connector 114 of the pressure transducer 106 for measuring vacuum may be plugged into socket 308 (also shown in FIG. 12), and pressure related signals may be processed by the circuit board 304. The entire pump base 200 is reusable.

[0060] The inner contour diameter of the cam 316 may be sized and/or shaped to control the stroke length of the piston 210 and the amount of pulsatility (i.e., the difference between the high and low pressure). In some cases, decreasing the stroke length decreases the amount of pulsatiliy. In applications within the heart, such as coronary artery applications, lowering the amount of pulsatility can reduce the incidence of bradycardia. To compensate for a lower stroke length, and to maintain a sufficient total flow rate, the speed of the rotation of the cam (i.e. rotations per minute), can be increased, for example by increasing motor output speed, either by gearing or by increased applied voltage.

[0061] Another embodiment of a system for aspirating thrombus 800 is illustrated in FIG.21. The system for aspirating thrombus 800 includes, three major

components: the pump base 200 of FIG. 12, an aspiration catheter 818, and a tubing set 803. The aspiration catheter 818 and the tubing set 803 represent disposable components 801, and the pump base 200 is a reusable component. It is not necessary to sterilize the pump base 200 as it is kept in a non-sterile field or area during use. The aspiration catheter 818 and the tubing set 803 may each be supplied sterile, after sterilization by ethylene oxide gas, electron beam, gamma, or other sterilization methods. The aspiration catheter 818 may be packaged and supplied separately from the tubing set 803, or the aspiration catheter 818 and the tubing set 803 may be package together and supplied together. Alternatively, the aspiration catheter 818 and tubing set may be packaged separately, but supplied together (i.e., bundled). As shown in FIGS. 21 and 22. The aspiration catheter 818 and tubing set 803 share many of the same features as the aspiration catheter 118 and tubing set 103 of FIG. 4, but are configured to allow easier separation from each other, and additional procedural adaptability. The aspiration catheter 818 has a distal end 820 comprising a guidewire tube 832 having a distal tip 836, and a proximal end 819 comprising a y-connector 810. The catheter shaft 842 of the aspiration catheter 818 is connected to the y-connector 810 via a protective strain relief 856. In other embodiments, the catheter shaft 842 may be attached to the y-connector 810 with a luer fitting. The y-connector 810 may comprise a first female luer 851 which communicates with a catheter supply lumen (as in the catheter 118 of FIGS. 4, 8-11), and a second female luer 855 which communicates with a catheter aspiration lumen (as in catheter 118 of FIGS. 4, 8-11).

[0062] Turning to FIG. 23, the tubing set 803 is shown in more detail. A spike 802 for coupling to a fluid source 20 (FIG. 1) allows fluid to enter through extension tubing 822 and a check valve 826, and into supply tube 830. An optional injection port 828 allows injection of materials or removal of air, as described in relation to previous embodiments. A cassette 816 is used in conjunction with the pump base 200, and is similar in structure and function to the cassette 116 in FIGS. 15-16. Fluid is pumped into injection tube 852 from cassette 816. A male luer 854 is configured to attach to the female luer 851 of the y-connector 810.

[0063] Returning to FIG. 21, accessories 857 are illustrated that are intended for applying a vacuum source 22, including a syringe 849 having a plunger 867, to the catheter 818. The syringe 849 is attached to syringe extension tubing 859 via the luer 865

of the syringe 849. A stopcock 847 may be used to hold maintain the vacuum, or the plunger 867 may be a locking variety of plunger. A luer 861 of the syringe extension tubing 859 is connected to an pressure transducer 806, the pressure transducer 806 having a male luer 863 for connection to a connector (e.g., female luer) 804 of vacuum line 808. A male luer 853 at the end of the vacuum line 808 may be detachably secured to the female luer 855 of the y-connector 810 of the aspiration catheter 818. Signals from the pressure transducer 806 are carried through cable 812 to a connector 814. The connector 814 is plugged into the socket 308 (FIG. 12) of the pump base 200. Pressure related signals may be processed by the circuit board 304 of the pump base 200. The pressure transducer 806 may be power from the pump base 200, via cable 812. The accessories 857 may also be supplied sterile to the user.

[0064] In use, the pump base 200 resides outside the sterile field. Because operation of the pump base 200 may be controlled by the presence or absence of a pressure, a user who is working in the sterile field may turn the pump on or off without touching the non-sterile pump base 200. For example, the pump may be started by placing a vacuum on the system (e.g., pulling the plunger 867 of the syringe 849). The pump may in turn be stopped by removing the vacuum on the system (unlocking the plunger 867 of the syringe 849 and allowing to to release, or opening the stopcock 847). The syringe 849 or the combination syringe 849 and stopcock 847 may act as a sterile on/off button of the pump vase 200. Alternatively, the aspiration catheter 818 may be initially used without the pump base 200, with only aspiration being applied to the aspiration lumen. If in certain cases, if the aspiration lumen becomes clogged, the distal end 820 of the aspiration catheter 818 may be backed off of the thrombus, and the pump base 200 and tubing set 803 may be coupled to the aspiration catheter 818, to then operate with forced saline injection, for increased aspiration, and clear the aspiration lumen. This will also help stop any thrombus that is blocking the aspiration lumen from being inadvertently delivered into the blood vessel of the patient.

[0065] FIGS. 24 and 25 illustrate a saline pump drive unit 400 having a completely disposable pump head 500. The saline pump drive unit 400 is configured to be usable with the catheters 16, 118 described herein, or other embodiments of aspiration systems comprising fluid injection. In FIG. 24, a bottom case 402 and a top case 404 having a label 406 are secured together with screws 408. Contained within the bottom

case 402 and top case 404 are a battery pack 410 and an electronic control module 412. A battery cover 416 holds the battery pack 410 in place. In some embodiments, the battery pack 410 may supply a voltage of 18 Volts DC, but systems utilizing other voltages are possible. A user interface 414 enables operation of the saline pump drive unit. A vacuum bottle sleeve 418 may be used when a vacuum bottle is incorporated as the vacuum source 22. A spike 420 is connectable to a fluid source 20, and fluid injectate passes from the fluid source 20 through extension tubing 422 to a disposable piston pump head 500. Saline may be primed through the system by an automatic priming ("self-priming") system described herein in relation to prior embodiments, or may be primed by gravity from a saline bag that is located (for example on an IV pole) above the rest of the system. A valve on the lowest portion of the system may be opened in order to prime the entire system.

[0066] As illustrated in FIG. 25, the disposable piston pump head 500 is configured to couple to a motor shaft 504 of a motor 502, that is powered by the battery pack 410 of the saline pump drive unit 400. A motor plate 506 and a main body 508 of the disposable piston pump head 500 are secured to each other with screws 510, and hold the internal components of the disposable piston pump head 500. First and second follower plates 512, 514 are held together with screws 516 and bosses 518 extending from the first follower plate 512. The first and second follower plates 512, 514 rotatably hold a cam 520. The cam may be assymetric (as illustrated) or alternatively may be symmetric. The asymmetry may be incorporated in order to control the amount of noise in the pump, the contours serving to customize the shape of the pressure wave, and of the function of the pump. First and second bushings 522, 524 are rotatably held on first and second pins 526, 528. The pins 526, 528 insert into cylindrical cavities 530, 532 in each of the follower plates 512, 514.

[0067] In use, a user attaches the disposable piston pump head 500 to the motor 502 of the saline pump drive unit 400 by bringing the motor plate 506 close to the motor shaft 504 so that a d-shaped hole 534 in the cam 520 can be pressed over the d-shaped motor shaft 504. Alternatively, the d-shapes may be other non-circular shapes, including, but not limited to elliptical, oval, or rectangular. In operation the motor 502 turns the motor shaft 504, which in turn turns the cam 520. The cam 520 turns, forcing the bushings 522, 524 to push the first and second follower plates 512, 514 back and forth in

a first direction 536 and a second direction 538. A saddle 544 is carried on the second follower plate 514, and a piston 210 may be coupled to the saddle 544 in the same manner as described herein with other embodiments. A supply cylinder 552 and an injection cylinder 554 in the main body 508 are analogous to the supply cylinder 252 and injection cylinder 254 of the cassette 116 of the system 100. The piston 210 of the cassette 116 may be used in the disposable piston pump head 500. The labelled components related to the piston 210 in FIG. 25 are similar to those described in relation to the piston 210 in FIGS. 15 and 16. The outer diameter of the cam 520 may be sized and/or shaped to control the stroke length of the piston 210 and the amount of pulsatility (i.e., the difference between the high and low pressure). In some cases, decreasing the stroke length decreases the amount of pulsatiliy. In applications within the heart, such as coronary artery applications, lowering the amount of pulsatility can reduce the incidence of bradycardia. To compensate for a lower stroke length, and to maintain a sufficient total flow rate, the speed of the rotation of the cam (i.e. rotations per minute), can be increased, for example by increasing motor output speed, either by gearing or by increased applied voltage. A vacuum spike 546 is used for coupling to the vacuum source 22, for example a vacuum bottle held within the vacuum bottle sleeve 418. A vacuum switch valve 540, which is activated against the bias of a spring 542, may be used to allow pump activation. For example, the electronic control module 412 may be configured to initiate the operation of the motor 502 automatically when the vacuum switch valve 540 sends a signal corresponding to movement of the vacuum switch valve 540,which occurs when a significant vacuum is achieved. This control may be instead of or in addition to control from a vacuum pressure transducer, such as pressure transducer 106. The turning on of the vacuum may thus be used to simultaneously turn on the motor 502, so that a single input begins the operation of the saline pump drive unit 400. Additionally, a vacuum source 22 may be controlled by the electronic control module 412 (for example, by opening or closing a solenoid), when a minimum injectate pressure is measured by an additional pressure transducer. For example, when a pressure of about 0.62 megapascal (90 pounds per square inch) or greater is measured, the vacuum may be activated or communicated to the system. An advantage of the saline pump drive unit 400 is that the user is required only to assemble a single component onto the shaft 504 of the motor 502.

[0068] As previously described, the systems according to any of the embodiments of the present invention may be configured such that active flow of saline

(or other) injectate is not possible without concurrent vacuum being applied for aspiration. Also, the systems may be configured such aspiration is not possible without saline (or other) injectate flow. The systems according to any of the embodiments of the present invention may be configured such that current driving the pump (for example the current driving the motor 302, 502) is monitored, or by any alternative monitoring method, such that when a change in condition occurs, for example, air in the injection system, or clogs in any of the catheter lumens or extension tubes, or leaks within the system, the system shuts down, in order to avoid events such as injection of air into the blood vessels, or catheter or system failure.

[0069] FIG. 26 illustrates an aspiration catheter 700 inserted within a blood vessel 165. The aspiration catheter 700 includes a guidewire lumen 702 secured to the distal end 704 of the aspiration catheter 700 which allows the aspiration catheter 700 to be tracked over a guidewire 706. A supply lumen 708 is secured within an aspiration lumen 710. The supply lumen 708 extends through a tapering tube 712. In some embodiments, the tapering tube 712 may be constructed of polyimide. In some embodiments, the tapering tube 712 may have a luminal inner diameter that tapers from its proximal end to its distal end. For example, in some embodiments, the luminal inner diameter may taper from about 0.3937 mm (0.0155 inches) to about 0.2794 mm (0.011 inches). The supply lumen 708 extends generally parallel to the aspiration lumen 710, however a distal end 714 of the tapering tube 712 curves towards an interior wall surface 716 of the aspiration lumen 710, thus allowing an open end 718 of the supply lumen 708 to act as an orifice for applying a spray pattern 720. The open end 718 of the supply lumen 708 may further promote a jet or spray effect by having an internal diameter that is less than about 0.203 mm (0.008 inches). In some embodiments, the open end 718 of the supply lumen 708 may have an internal diameter that is between about 0.076 mm (0.003 inches) and about 0.102 mm (0.004 inches). The center of the open end 718 orifice may in some embodiments be about 0.3302 mm (0.013 inches) to about 0.4826 mm (0.019 inches) proximal to the most proximal portion 724 of the open distal end 722 of the aspiration lumen 710, as illustrated by distance D in FIG. 26. The most distal portion 726 of the open distal end 722 of the aspiration lumen 710 is slightly distal of the most proximal portion 724 in the embodiment illustrated, and thus has an angled skive, but the skive angle A_s is not severe. A skive angle A_s of between about 75° and about 89°, or between about 80° and about 85° may be used, in order to allow a large portion of

thrombus being pulled into the open distal end 722 of the aspiration lumen 710 to be struck by high velocity exiting jet (e.g. saline) flow, as illustrated with the spray pattern 720.

[0070] FIG. 27 illustrates the catheter 700 of FIG. 26 being utilized to deliver a drug 730 to a target site 732 within a blood vessel 165. The target site 732 may include an atherosclerotic lesion 728 and/or a thrombus 734. Whereas the aspiration of thrombus, as in FIG. 26, involves actively applying a vacuum (e.g., from a vacuum source) on the aspiration lumen 710, the drug delivery illustrated in FIG. 27, though utilizing the same catheter 700, allows the metering of a fine, precision volume flow rate of drug 730 to be delivered into the vessel. This is achieved by having significantly less vacuum applied to the aspiration lumen 710, or no vacuum applied to the aspiration lumen. The precision metering in small, controlled volumes, provides efficient use of typically expensive drugs, with minimal wasted drug. In some embodiments, the drug 730 may be delivered at body temperature. In other embodiments, the drug 730 may be warmed, and delivered at an elevated temperature, for example, to increase the activity and effectiveness of a drug. This may be done, for example, to get a more effective dose, with a smaller volume of drug. In other embodiments, the drug 730 may be cooled and delivered at a reduced temperature (i.e., in relation to the body temperature). The drug 730 may be cooled to control the activity level, or to delay the activity of the drug (e.g., so that it is active downstream, at a location that is not reachable by the catheter 700). In some cases, the drug 730 may be cooled in order to apply a conjunctive therapeutic cooling effect on the tissue being treated. In some cases, the therapeutic cooling effect may be achieved from cooled saline or other aqueous non-drug media alone.

[0071] Some of the drugs 730 which may be delivered include thrombolytic agents (clot busting drugs), such as streptokinase, tissue plasminogen activator (t-PA), recombinant or genetically-engineered tissue plasminogen activator, tenecteplase (TNK), urokinase, staphylokinase, and reteplase. Alternatively, stem cells or "cocktails" containing stem cells may be delivered. In some cases, glycoprotein inhibitos (GPI's) may be injected through the supply lumen 708 of the aspiration catheter 700. Saline or other aqueous solutions may be delivered alone for selective dilution of blood at the target site 732. In some applications, a solution may be used which is capable of exhibiting a phase change, for example, when its pressure or temperature is changed. In these

applications, a liquid may be injected that becomes a gas when exiting from a small orifice, for example at the open end 718 of the supply lumen 708. Alternatively, a gas may be injected that becomes a liquid when being force through a small orifice, such as the open end 718 of the supply lumen 708. In any of the applications in which drugs 730 or other materials are injected intravascularly through the catheter 700, the injection of the drugs 730 or other materials may occur before, during, after, or instead of an aspiration procedure. Returning to the aspiration catheter 818 of FIGS 21-22, if, during an aspiration procedure, it is desired to deliver drugs down the supply lumen and into the vessel, the tubing set 803 may be removed from the aspiration catheter 818 by disconnecting the male luer 854 of the tubing set 803 from the female luer 851 of the aspiration catheter 818, and the drug may be injected directly into the supply lumen at the female luer 851, for example, by a syringe or metering system, including a syringe/syringe pump combination. By also removing the vacuum source from the female luer 855 of the aspiration catheter 818, when aspiration lumen now serves as an overflow, so that the fluid being delivered into the patient (e.g., intravascularly) is maintained at a controlled rate. The volume of the supply lumen is relatively very small, so only a small volume of drug is needed to fill the supply lumen, and thus reach the distal top of the aspiration catheter 818. This, at the end of the procedure, very little drug is wasted, or needs to be disposed, allowing for a very cost-effective procedure.

[0072] In the embodiments described herein, a sterile fluid path is provided extending all the way from the fluid source 20 to the distal opening 40/open distal end 158 of the catheter 16, 118. In both the embodiments of the system 100 of FIGS. 4-17, the system 800 of FIGs. 21-23, and the embodiments of FIGS. 24-25, a disposable catheter and disposable pump set are configured to be supplied sterile, and coupled to a non-sterile (reusable) pump base 200 or pump motor 502. These combinations allow for reusability of the more expensive components, and for reusability (and maximized sterility) of the less expensive components, thus maximizing cost containment and patient safety at the same time.

[0073] In some cases, parts or all of the devices described herein may be doped with, made of, coated with, or otherwise include a radiopaque material. Radiopaque materials are understood to be materials capable of producing a relatively bright image on a fluoroscopy screen or another imaging technique during a medical procedure. Some

examples of radiopaque materials can include, but are not limited to, gold, platinum, palladium, tantalum, tungsten alloy, polymer material loaded with a radiopaque filler, and the like. One or more hydrophilic or hydrophobic lubricious coatings may be used in order to improve trackability of the aspiration catheter 118 through the blood vessels.

[0074] In some instances, a degree of MRI compatibility may be imparted into parts of the devices described herein. For example, to enhance compatibility with Magnetic Resonance Imaging (MRI) machines, it may be desirable to make various portions of the devices described herein from materials that do not substantially distort MRI images or cause substantial artifacts (gaps in the images). Some ferromagnetic materials, for example, may not be suitable as they may create artifacts in an MRI image. In some cases, the devices described herein may include materials that the MRI machine can image. Some materials that exhibit these characteristics include, for example, tungsten, cobalt-chromium-molybdenum alloys (e.g., UNS: R30003 such as ELGILOY®, PHYNOX®, and the like), nickel-cobalt-chromium-molybdenum alloys (e.g., UNS: R30035 such as MP35-N® and the like), nitinol, and the like, and others.

[0075] In some instances, some of the devices described herein may include a coating such as a lubricious coating or a hydrophilic coating. Hydrophobic coatings such as fluoropolymers provide a dry lubricity. Lubricious coatings improve steerability and improve lesion crossing capability. Suitable lubricious polymers are well known in the art and may include silicone and the like, hydrophilic polymers such as high-density polyethylene (HDPE), polytetrafluoroethylene (PTFE), polyarylene oxides, polyvinylpyrrolidones, polyvinylalcohols, hydroxy alkyl cellulosics, algins, saccharides, caprolactones, and the like, and mixtures and combinations thereof. Hydrophilic polymers may be blended among themselves or with formulated amounts of water insoluble compounds (including some polymers) to yield coatings with suitable lubricity, bonding, and solubility.

[0076] In one embodiment of the present invention, a system for aspirating thrombus includes an aspiration catheter having a high pressure supply lumen and an aspiration lumen, the supply lumen having a proximal end configured to attach to a piston pump and a closed distal end, the aspiration lumen having a proximal end configured to attach to a vacuum source and an open distal end; a first orifice in a side wall of the

supply lumen which communicates directly with the interior of the aspiration lumen, the first orifice located proximal to the open distal end of the aspiration lumen and adjacent the closed distal end of the supply lumen; the piston pump configured to generate a cyclic pressure cycle when attached to the supply lumen, wherein the first orifice creates a spray pattern at least in conjunction with a peak of the piston pump pressure cycle such that the spray pattern impinges on an interior wall of the aspiration lumen when a distal end of the aspiration catheter is immersed within an environment having a temperature of between about 36°C and 38°C, such that the spray is at an angle of between about 20° in each direction of the vertical midline of the aspiration lumen.

[0077] In another embodiment of the present invention, a system for aspirating thrombus includes an aspiration catheter having a high pressure supply lumen and an aspiration lumen, the supply lumen having a proximal end configured to attach to a piston pump and a closed distal end, the aspiration lumen having a proximal end configured to attach to a vacuum source and an open distal end; a first orifice in a side wall of the supply lumen which communicates directly with the interior of the aspiration lumen, the first orifice located proximal to the open distal end of the aspiration lumen and adjacent the closed distal end of the supply lumen; the piston pump configured to generate a cyclic pressure cycle when attached to the supply lumen, wherein the first orifice creates a spray pattern at least in conjunction with a peak of the piston pump pressure cycle such that the spray pattern impinges on an interior wall of the aspiration lumen when a distal end of the aspiration catheter is immersed within an environment having a temperature of between about 36°C and 38°C; a disposable cassette having a supply cylinder, an injection cylinder and a piston, the disposable cassette configured to releasably couple to at least a motor of the piston pump, the piston configured to actuate into the supply cylinder while actuating out of the injection cylinder, causing the injection cylinder to increase its volume of a liquid injectate, the piston further configured to actuate into the injection cylinder while actuating out of the supply cylinder, causing the injection cylinder to decrease its volume by injecting the liquid injectate, and causing the liquid injectate to travel through the supply lumen of the aspiration catheter.

[0078] In another embodiment of the present invention, a system for aspirating thrombus includes an aspiration catheter having a high pressure supply lumen and an aspiration lumen, the supply lumen having a proximal end configured to attach to a piston

pump and a closed distal end, the aspiration lumen having a proximal end configured to attach to a vacuum source and an open distal end; a first orifice in a side wall of the supply lumen which communicates directly with the interior of the aspiration lumen, the first orifice located proximal to the open distal end of the aspiration lumen and adjacent the closed distal end of the supply lumen; the piston pump configured to generate a cyclic pressure cycle when attached to the supply lumen, wherein the first orifice creates a spray pattern at least in conjunction with a peak of the piston pump pressure cycle such that the spray pattern impinges on an interior wall of the aspiration lumen when a distal end of the aspiration catheter is immersed within an environment having a temperature of between about 36°C and 38°C; wherein the piston pump includes a supply cylinder, an injection cylinder and a piston, the piston configured to actuate into the supply cylinder while actuating out of the injection cylinder, causing the injection cylinder to increase its volume of a liquid injectate, the piston further configured to actuate into the injection cylinder while actuating out of the supply cylinder, causing the injection cylinder to decrease its volume by injecting the liquid injectate, and causing the liquid injectate to travel through the supply lumen of the aspiration catheter; wherein the piston is configured to engage with a saddle associated with the piston pump, the saddle configured for cyclic linear motion, wherein motion of the saddle in a first direction actuates the piston out of the supply cylinder and motion of the saddle in a second direction actuates the piston into the supply cylinder.

[0079] In another embodiment of the present invention, a system for aspirating thrombus includes an aspiration catheter having a high pressure supply lumen and an aspiration lumen, the supply lumen having a proximal end configured to attach to a piston pump and a closed distal end, the aspiration lumen having a proximal end configured to attach to a vacuum source and an open distal end; a first orifice in a side wall of the supply lumen which communicates directly with the interior of the aspiration lumen, the first orifice located proximal to the open distal end of the aspiration lumen and adjacent the closed distal end of the supply lumen; the piston pump configured to generate a cyclic pressure cycle when attached to the supply lumen, wherein the first orifice creates a spray pattern at least in conjunction with a peak of the piston pump pressure cycle such that the spray pattern includes a jet; wherein the piston pump includes a supply cylinder, an injection cylinder and a piston, the piston configured to actuate into the supply cylinder while actuating out of the injection cylinder, causing the injection cylinder to increase its

volume of a liquid injectate, the piston further configured to actuate into the injection cylinder while actuating out of the supply cylinder, causing the injection cylinder to decrease its volume by injecting the liquid injectate, and causing the liquid injectate to travel through the supply lumen of the aspiration catheter; wherein a usable volume ratio R_U between the supply cylinder and the invention cylinder is between about 1.15 and about 2.00. Additionally, the usable volume ratio R_U may be between about 1.25 and about 1.85. Additionally, the usable volume ratio R_U may be about 1.40.

[0080] In another embodiment of the present invention a method for delivery of a drug includes providing a catheter including a supply lumen and an aspiration lumen, the supply lumen having a distal end, the aspiration lumen configured to couple to a vacuum source and having an interior wall surface, and an open distal end, an orifice at or near the distal end of the supply lumen, in fluid communication with the interior of the aspiration lumen, the orifice located proximally of the open distal end of the aspiration lumen, wherein the orifice is configured to create a spray pattern when pressurized fluid is pumped through the supply lumen such that the spray pattern impinges on the interior wall surface of the aspiration lumen when a distal end of the aspiration catheter is immersed within an aqueous environment, providing a disposable tubing set having a first conduit configured to couple the supply lumen of the catheter to a fluid source, and a pump component associated with the first conduit and configured to detachably couple to a drive unit, such that motion from the drive unit is transferred to the pump component such that resultant motion of the pump component causes fluid from the fluid source to be injected through the supply lumen of the catheter, and through the orifice into the aspiration lumen, coupling the supply lumen of the catheter to a fluid source, wherein the fluid source contains at least a first drug for intravascular delivery, inserting the catheter within a blood vessel of a patient and advancing the catheter to a target site, coupling the pump component to a drive unit, and operating the drive unit to cause the pump component to inject at least some of the first drug in the region of the target site.

[0081] It should be understood that this disclosure is, in many respects, only illustrative. Changes may be made in details, particularly in matters of shape, size, and arrangement of steps without exceeding the scope of the invention. The scope of the invention is, of course, defined in the language in which the appended claims are expressed.

[0082] While embodiments of the present invention have been shown and described, various modifications may be made without departing from the scope of the present invention. The invention, therefore, should not be limited, except to the following claims, and their equivalents. Embodiments of the present invention are contemplated to have utility in a variety of blood vessels, including but not limited to coronary arteries, carotid arteries, intracranial/cerebral arteries, inferior and superior vena cavae and other veins (for example, in cases of deep venous thrombosis), peripheral arteries, shunts, grafts, vascular defects, and chambers of the heart. This includes, but is not limited to, any vessel having a diameter of bout two mm or greater. An aspiration catheter 118 outer diameter of about seven French or less is contemplated for many of the applications, though in certain applications, it may be larger. In some embodiments, an aspiration catheter 118 diameter of about six French or less is contemplated. Embodiments of the present invention may even be used in non-vascular applications, for example body lumens or cavities having material accumulations that need to be macerated and/or removed.

[0083] It is contemplated that various combinations or subcombinations of the specific features and aspects of the embodiments disclosed above may be made and still fall within one or more of the inventions. Further, the disclosure herein of any particular feature, aspect, method, property, characteristic, quality, attribute, element, or the like in connection with an embodiment can be used in all other embodiments set forth herein. Accordingly, it should be understood that various features and aspects of the disclosed embodiments can be combined with or substituted for one another in order to form varying modes of the disclosed inventions. Thus, it is intended that the scope of the present inventions herein disclosed should not be limited by the particular disclosed embodiments described above. Moreover, while the invention is susceptible to various modifications, and alternative forms, specific examples thereof have been shown in the drawings and are herein described in detail. It should be understood, however, that the invention is not to be limited to the particular forms or methods disclosed, but to the contrary, the invention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the various embodiments described and the appended claims. Any methods disclosed herein need not be performed in the order recited. The methods disclosed herein include certain actions taken by a practitioner; however, they

can also include any third-party instruction of those actions, either expressly or by implication.

WHAT IS CLAIMED IS:

1. A system for aspirating thrombus comprising:

an aspiration catheter having a supply lumen and an aspiration lumen, the supply lumen having a wall and a closed distal end, the aspiration lumen configured to couple to a vacuum source and having an interior wall surface, and an open distal end;

an orifice in the wall of the supply lumen, in fluid communication with the interior of the aspiration lumen, the orifice located proximally of the open distal end of the aspiration lumen and adjacent the closed distal end of the supply lumen, wherein the orifice is configured to create a spray pattern when pressurized fluid is pumped through the supply lumen such that the spray pattern impinges on the interior wall surface of the aspiration lumen when a distal end of the aspiration catheter is immersed within an aqueous environment; and

a tubing set having a first conduit configured to couple to the supply lumen of the aspiration catheter to a fluid source, and a pump component associated with the first conduit and configured to detachably couple to a drive unit, such that motion from the drive unit is transferred to the pump component such that resultant motion of the pump component causes fluid from the fluid source to be injected through the supply lumen of the aspiration catheter, and through the orifice into the aspiration lumen.

2. The system of claim 1, wherein the aqueous environment has a temperature of between about 36°C and 38°C.

3. The system of claim 1, wherein the pump component comprises a piston.

4. The system of claim 3, wherein the piston is slidably contained within a supply cylinder and an injection cylinder, the piston configured to actuate into the supply cylinder while actuating out of the injection cylinder, thus causing the injection cylinder to increase its volume of fluid supplied from the fluid source, and wherein the piston is further configured to actuate into the injection cylinder while actuating out of the supply cylinder, thus causing the injection cylinder to decrease its volume by injecting fluid supplied from the fluid source into the supply lumen of the aspiration catheter.

5. The system of claim 4, wherein the piston includes an inner bore having a one-way valve.

6. The system of claim 1, wherein the spray pattern is defined by an angle of between about 1° to about 45° in each direction of the vertical midline of the aspiration lumen.

7. The system of claim 6, wherein the spray pattern is defined by an angle of between about 20° to about 35° in each direction of the vertical midline of the aspiration lumen.

8. The system of claim 1, wherein a usable volume ratio R_U between the supply cylinder and the injection cylinder is between about 1.15 and about 2.00.

9. The system of claim 8, wherein the usable volume ratio R_U between the supply cylinder and the injection cylinder is between about 1.25 and about 1.85.

10. The system of claim 1, wherein the open distal end of the aspiration lumen has a most distal portion and a most proximal portion, and wherein an axial center of the orifice is about 0.3302 mm to about 0.4826 mm proximal to the most proximal portion of the open distal end of the aspiration lumen.

11. The system of claim 1, further comprising a vacuum-activated interface configured to cause the drive unit to start to operate or to remain in an operating condition when a vacuum pressure at the vacuum-activated interface is less than a threshold value, and configured to cause the drive unit to stop or to remain in a non-operating condition when the vacuum pressure at the vacuum-activated interface is greater than the threshold value.

12. The system of claim 11, wherein the vacuum-activated interface comprises a vacuum switch valve.

13. The system of claim 11, wherein the vacuum-activated interface comprises a pressure transducer.

14. The system of claim 1, wherein the open distal end of the aspiration lumen is angled in relation to the longitudinal axis of the aspiration lumen.

15. A system for aspirating thrombus comprising:

an aspiration catheter having a supply lumen and an aspiration lumen, the supply lumen having a distal end, the aspiration lumen configured to couple to a vacuum source and having an interior wall surface, and an open distal end;

an orifice at or near the distal end of the supply lumen, in fluid communication with the interior of the aspiration lumen, the orifice located proximally of the open distal end of the aspiration lumen, wherein the orifice is configured to create a spray pattern when pressurized fluid is pumped through the supply lumen such that the spray pattern impinges on the interior wall surface of the aspiration lumen when a distal end of the aspiration catheter is immersed within an aqueous environment; and

a tubing set having a first conduit configured to couple the supply lumen of the aspiration catheter to a fluid source, and a pump component associated with the first conduit and configured to detachably couple to a drive unit, such that motion from the drive unit is transferred to the pump component such that resultant motion of the pump component causes fluid from the fluid source to be injected through the supply lumen of the aspiration catheter, and through the orifice into the aspiration lumen.

16. The system of claim 15, wherein the supply lumen of the aspiration catheter extends generally parallel to the aspiration lumen, and wherein the distal end of the supply lumen curves towards the interior wall surface of the aspiration lumen.

17. The system of claim 16, wherein the distal end of the supply lumen has an internal diameter that is less than about 0.203 mm.

18. The system of claim 17, wherein the distal end of the supply lumen has an internal diameter that is between about 0.076 mm and about 0.102 mm.

19. The system of claim 16, wherein the open distal end of the aspiration lumen has a most distal portion and a most proximal portion, and wherein an axial center of the orifice is about 0.3302 mm to about 0.4826 mm proximal to the most proximal portion of the open distal end of the aspiration lumen.

20. The system of claim 16, wherein the aqueous environment has a temperature of between about 36°C and 38°C.

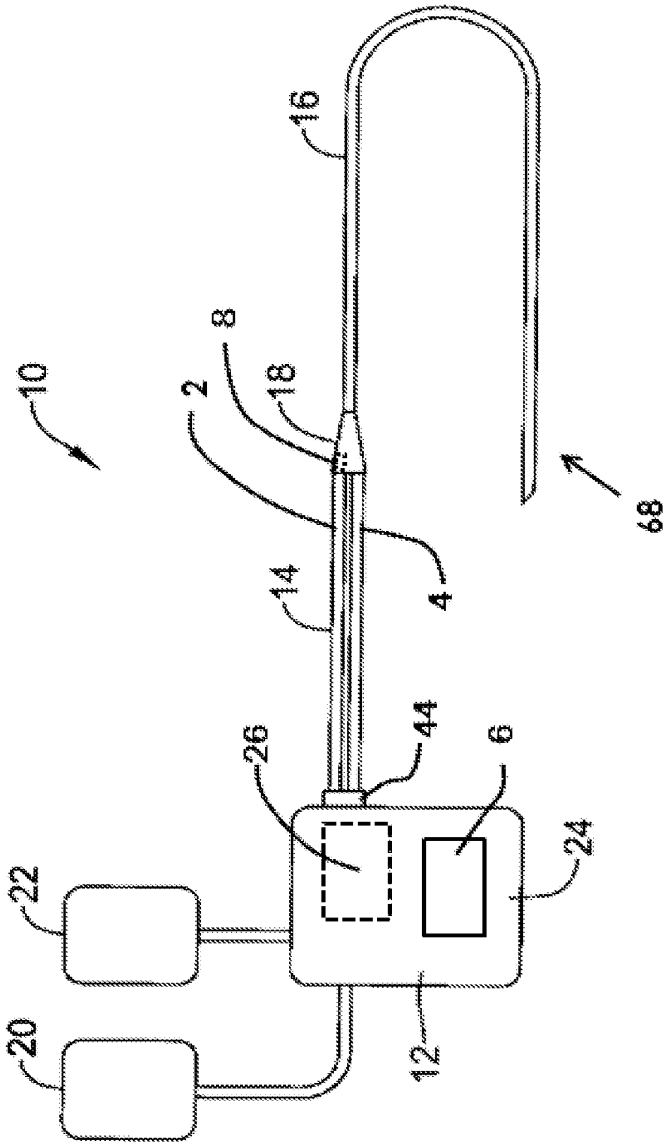


FIG. 1

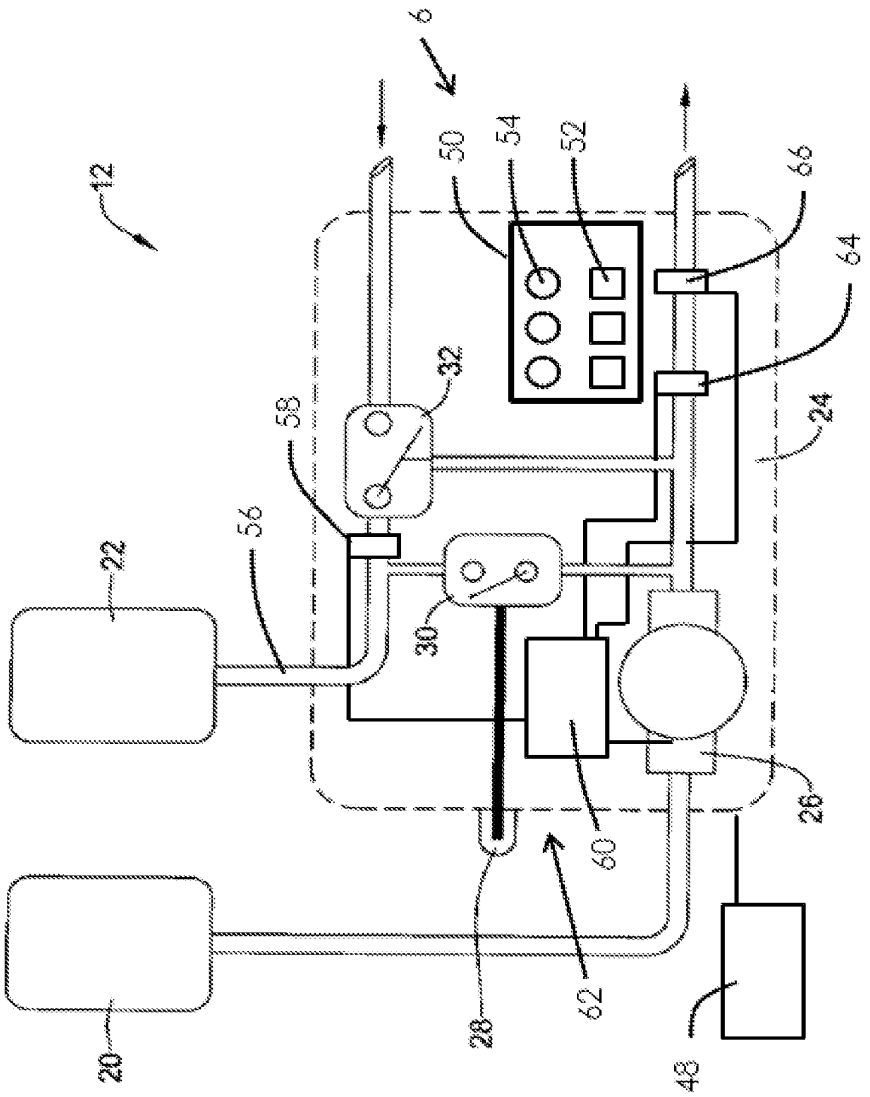


FIG. 2

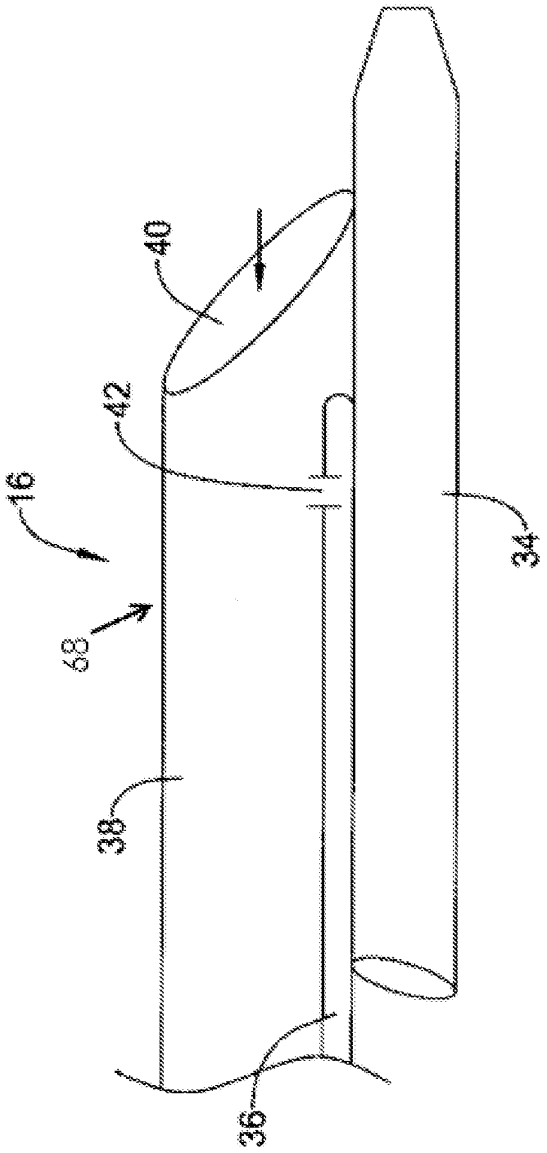


FIG. 3

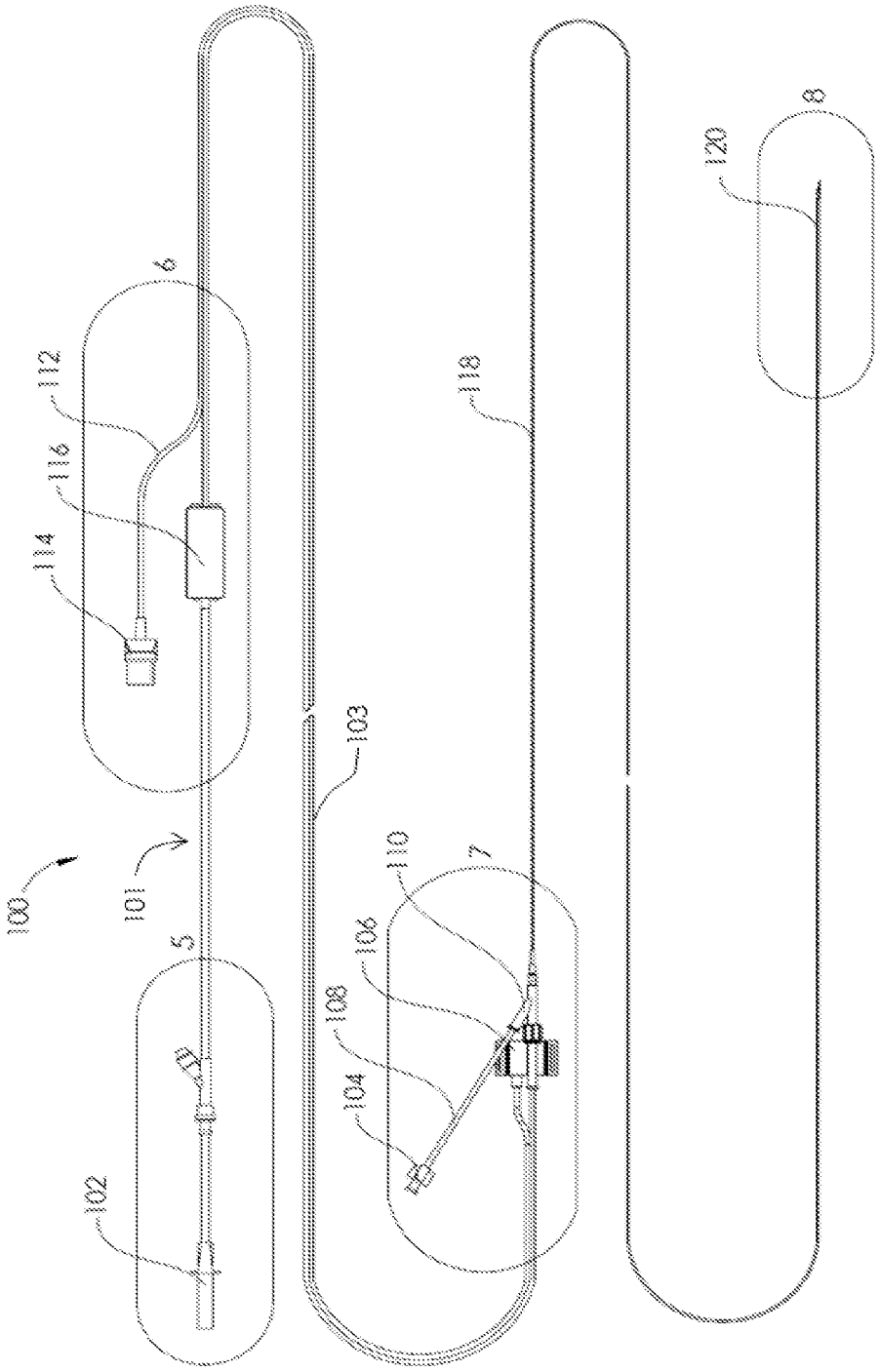


FIG. 4

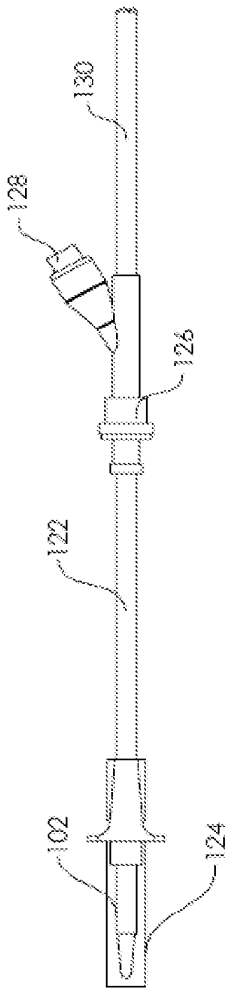

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FIG. 5

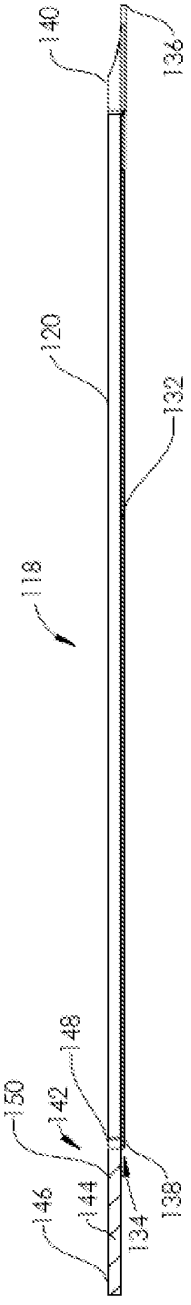

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FIG. 8

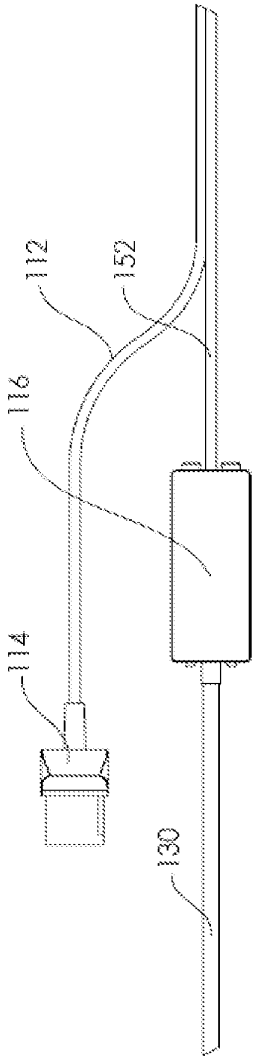


FIG. 6

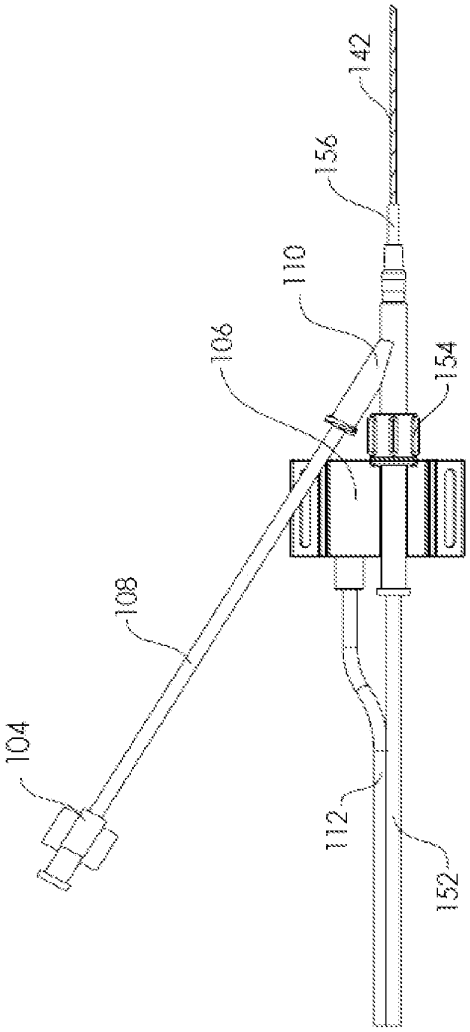


FIG. 7

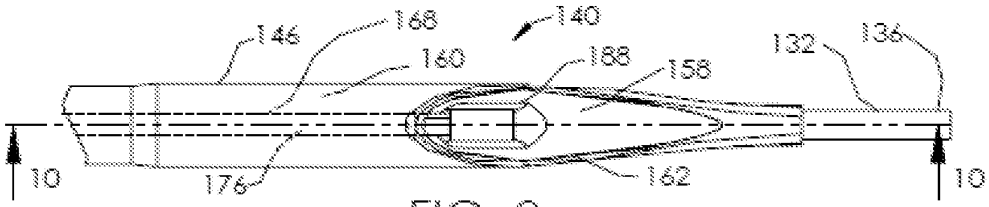


FIG. 9

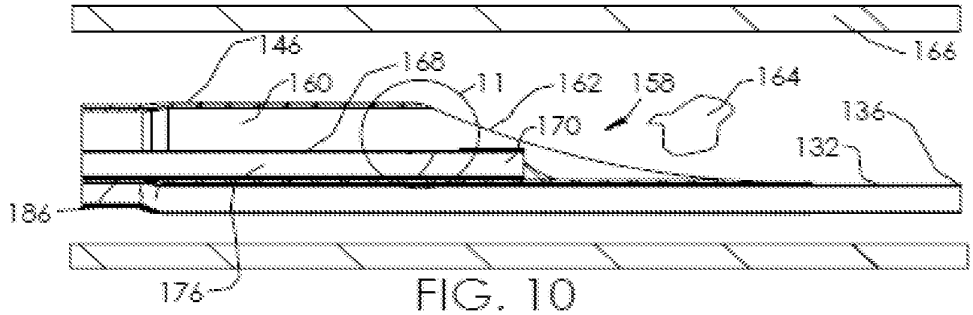


FIG. 10

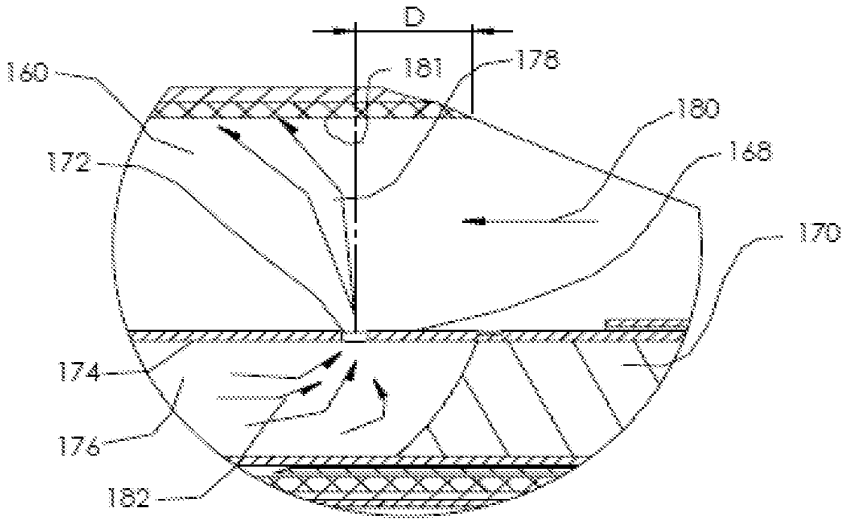


FIG. 11

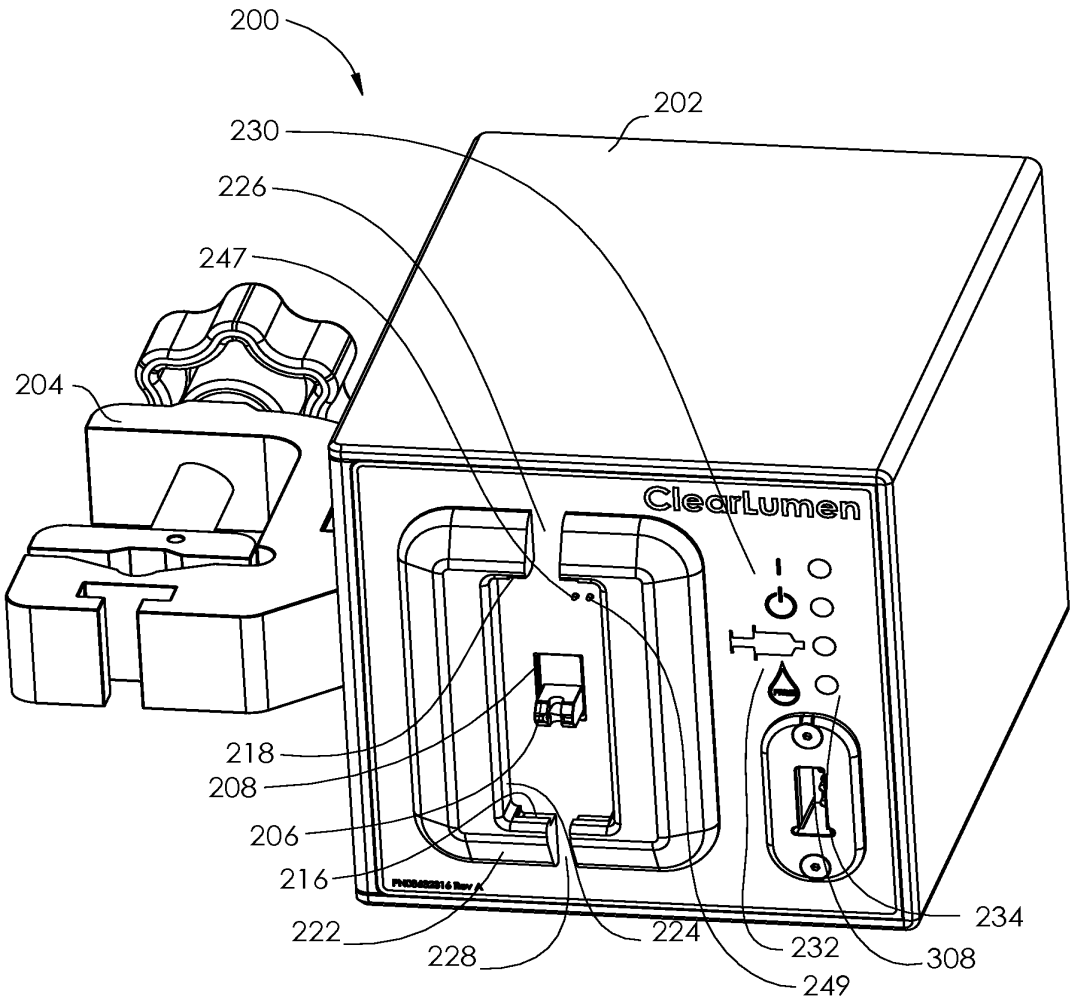

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FIG. 12

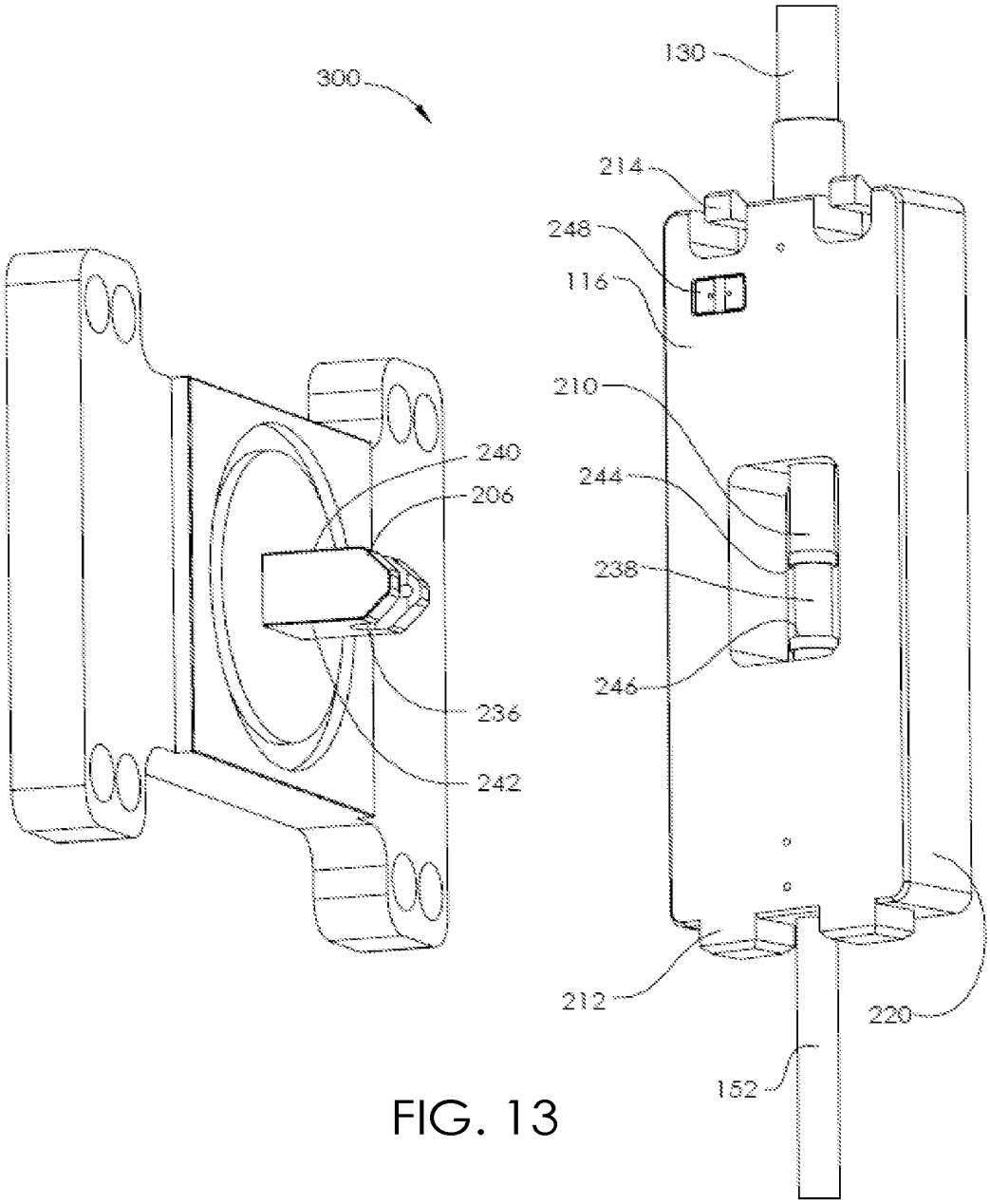


FIG. 13

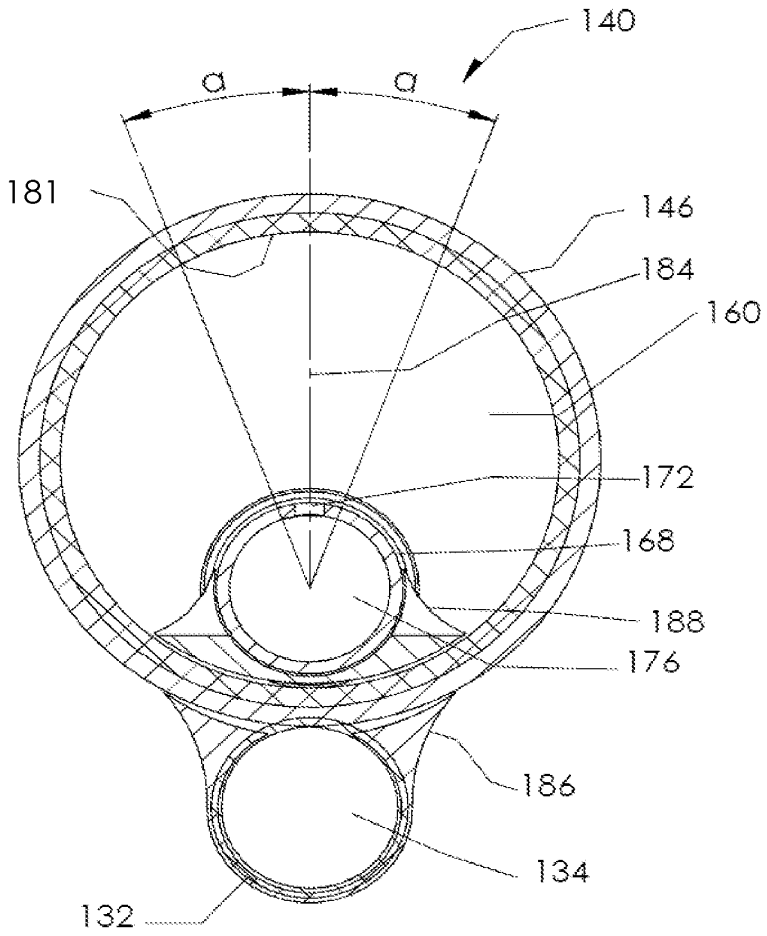


FIG. 14

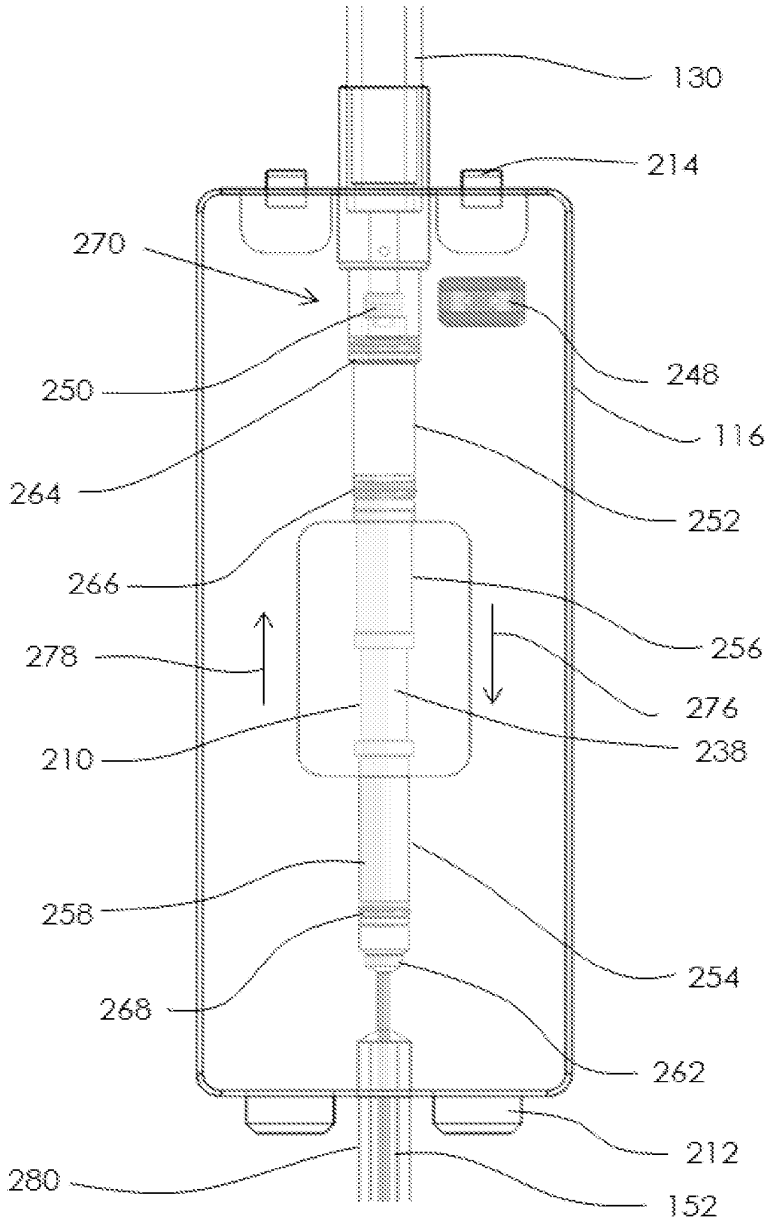

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FIG. 15

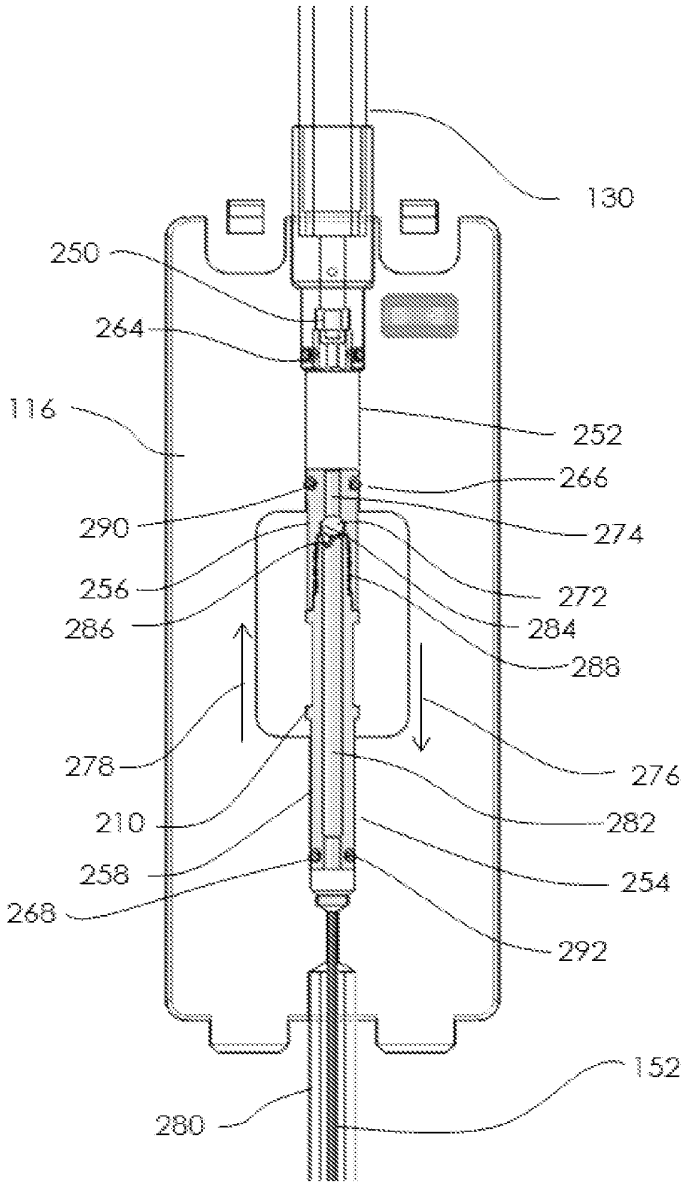

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FIG. 16

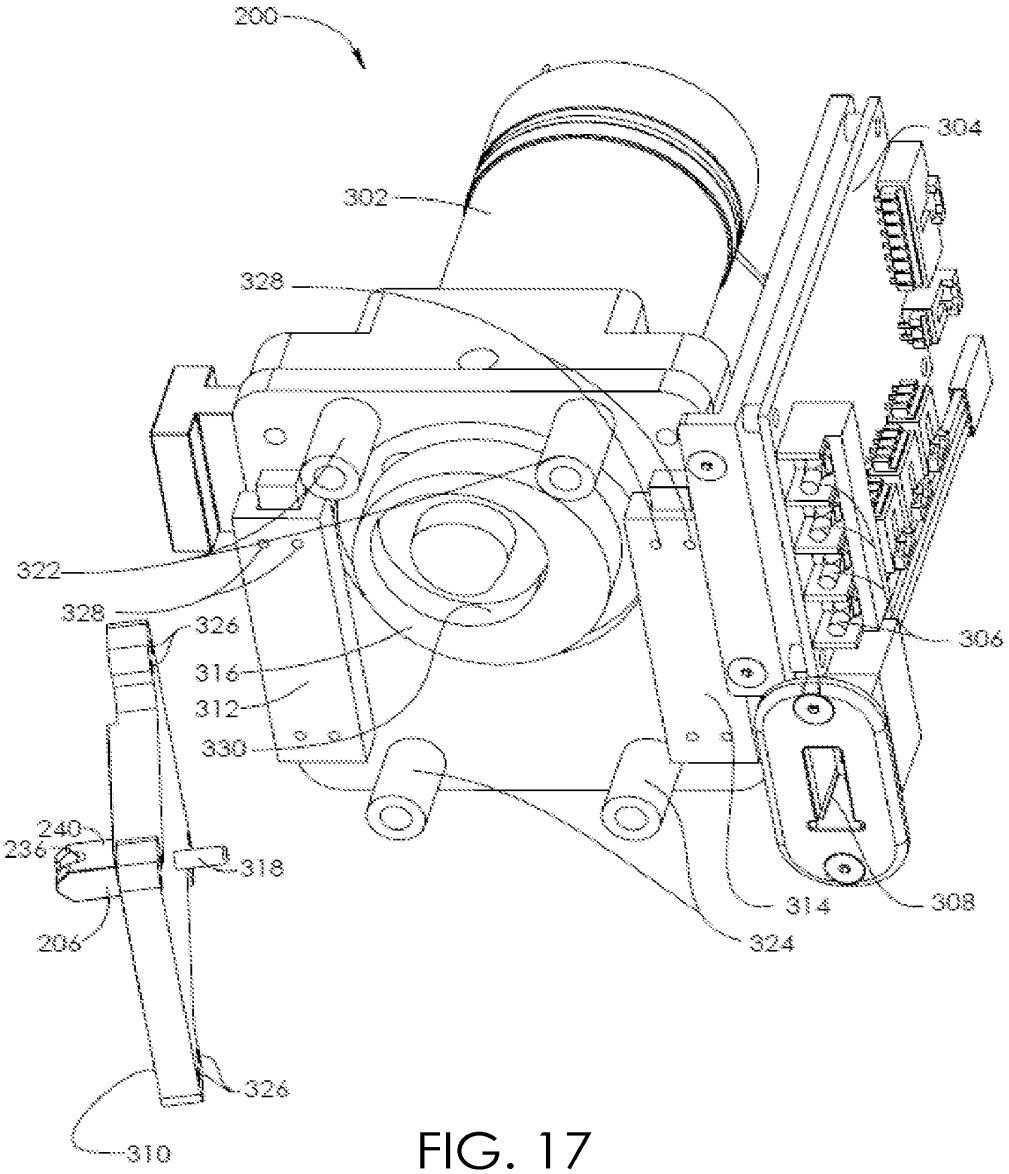

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FIG. 17

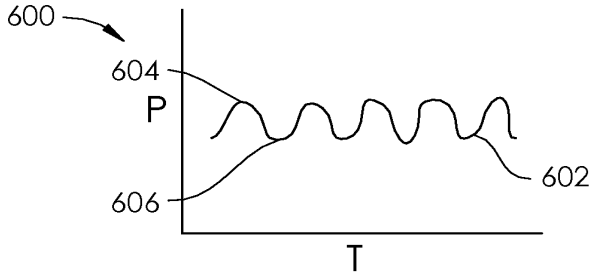


FIG. 18

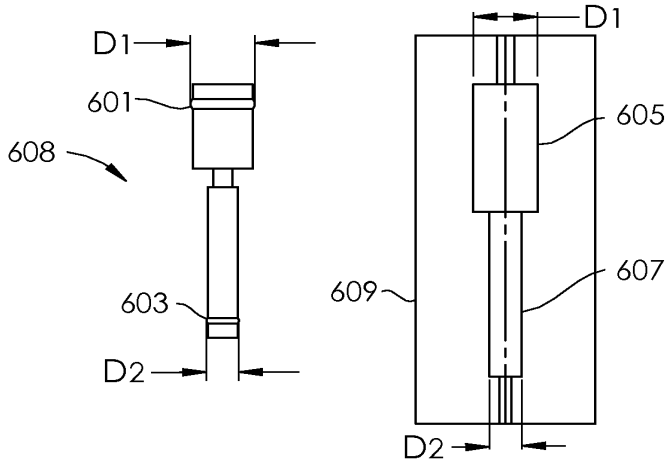


FIG. 19

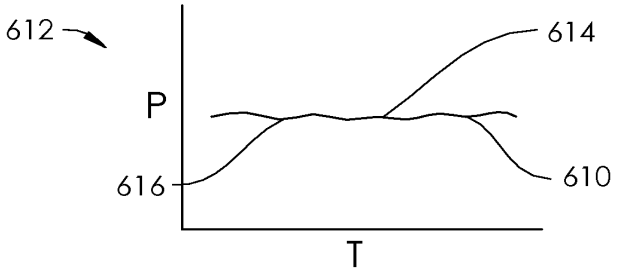


FIG. 20

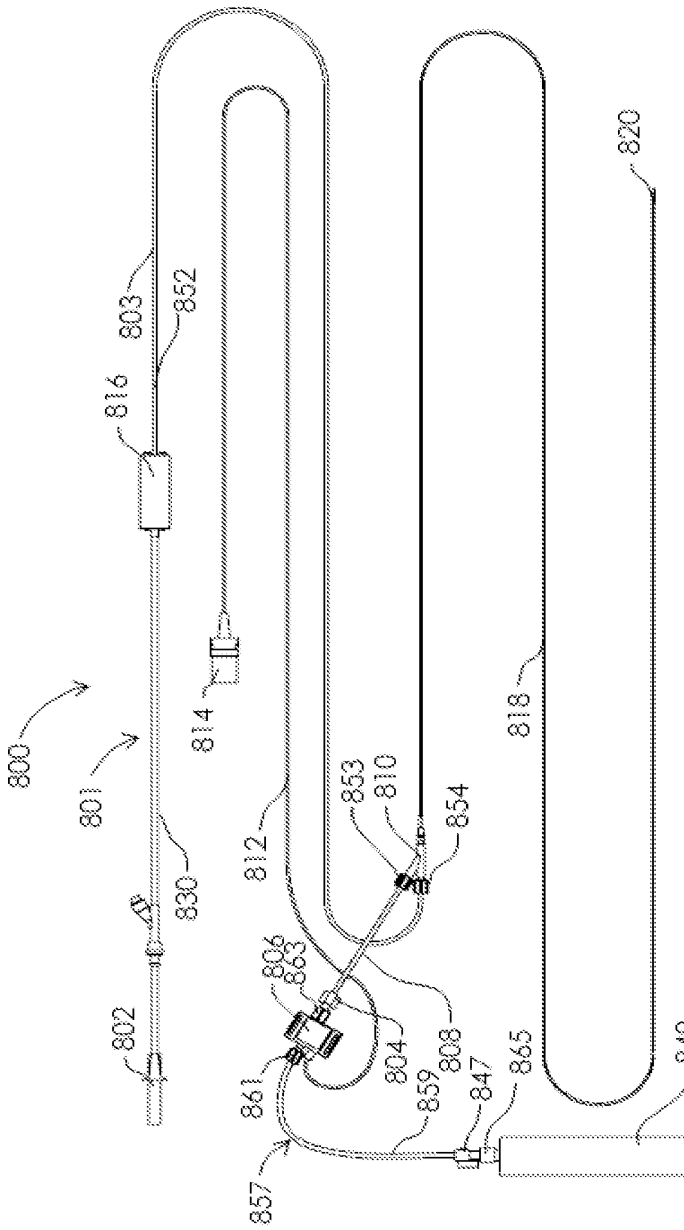

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FIG. 21

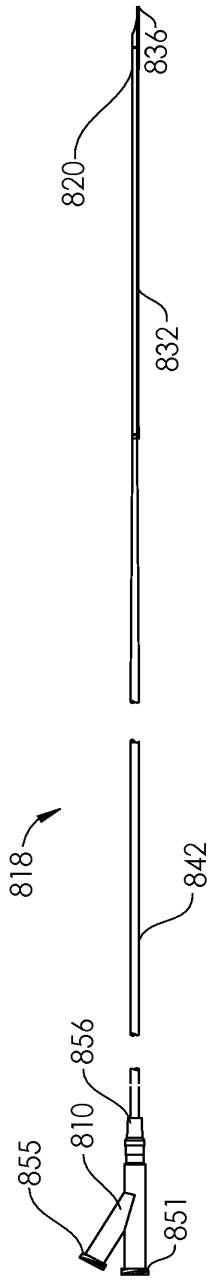


FIG. 22

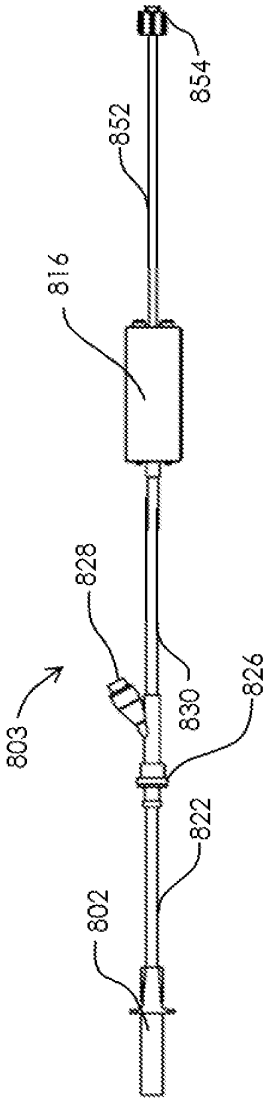


FIG. 23

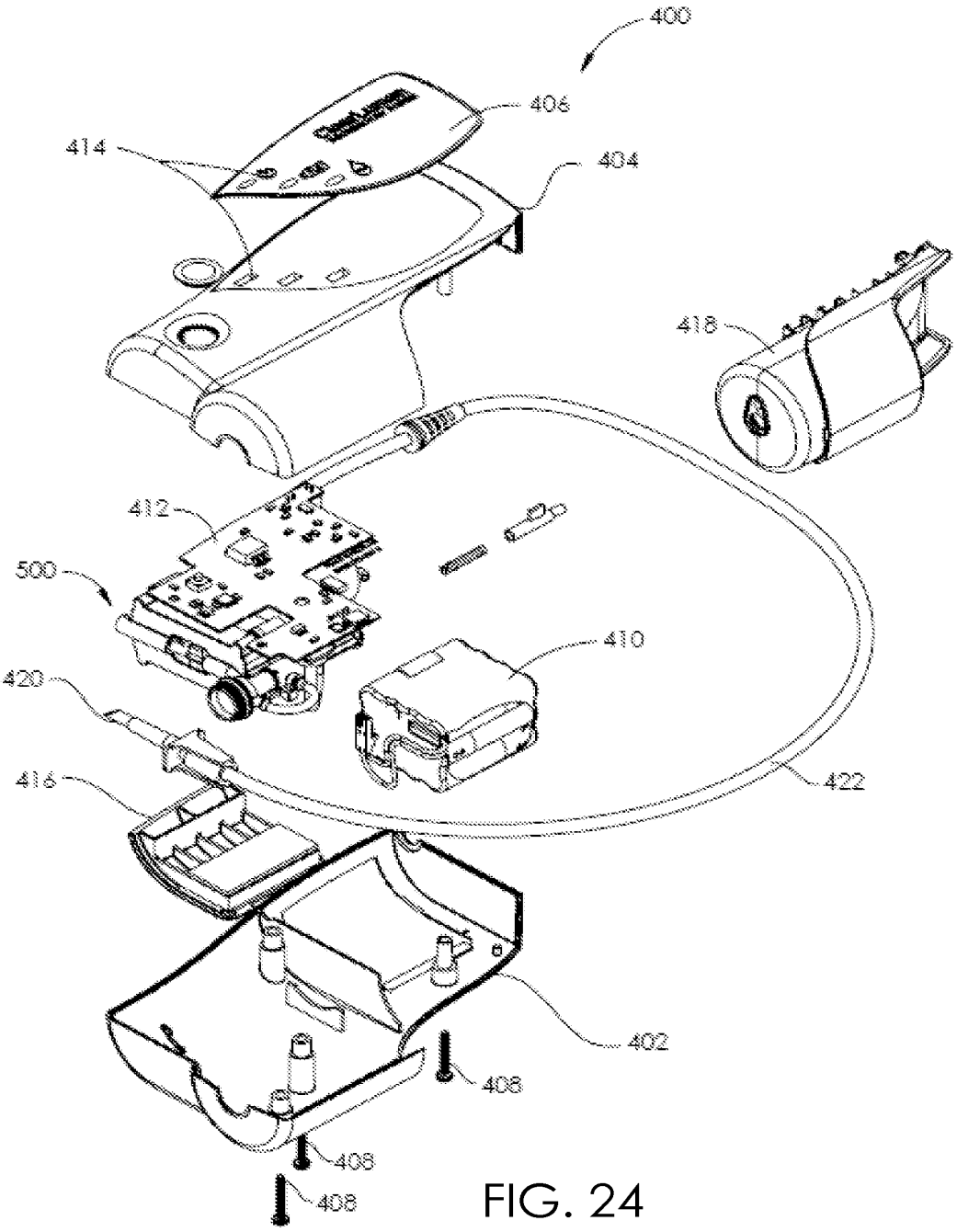


FIG. 24

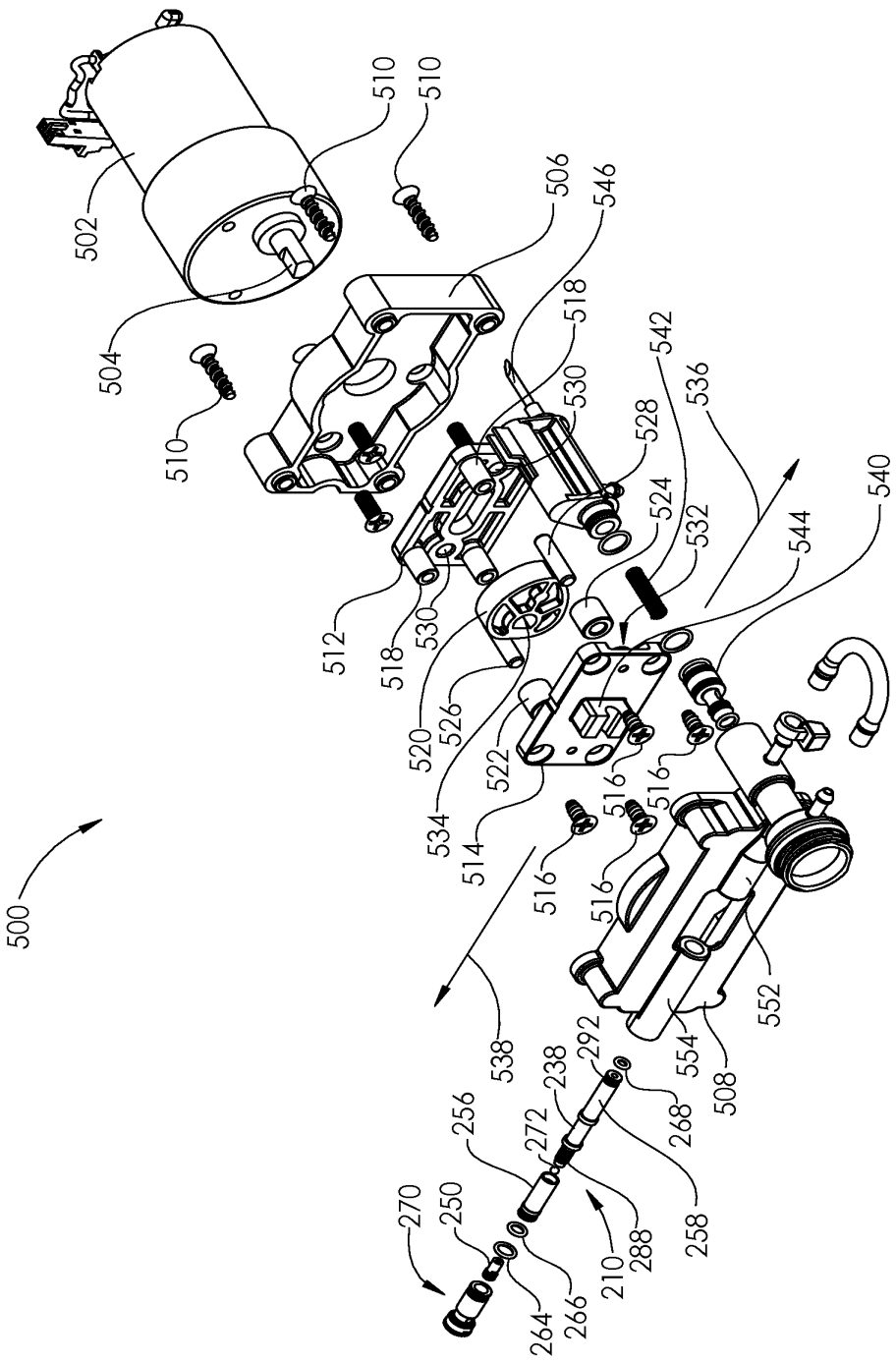

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FIG. 25

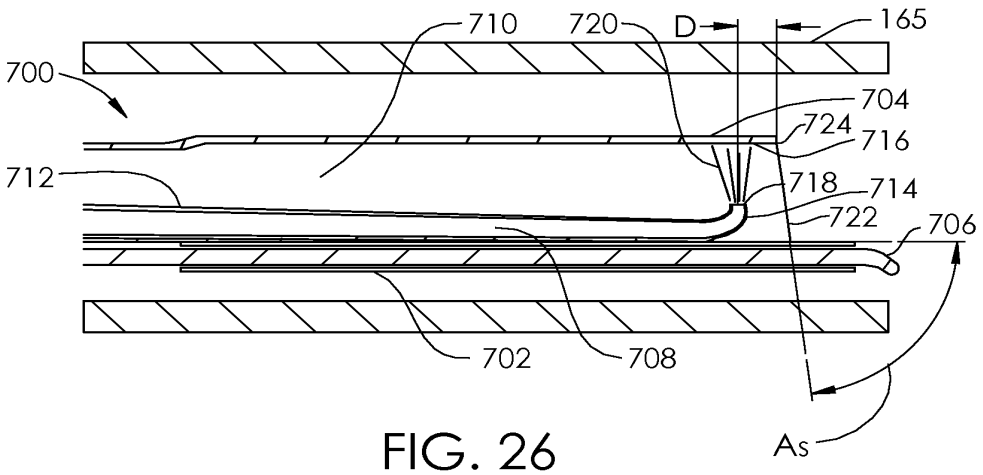

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FIG. 26

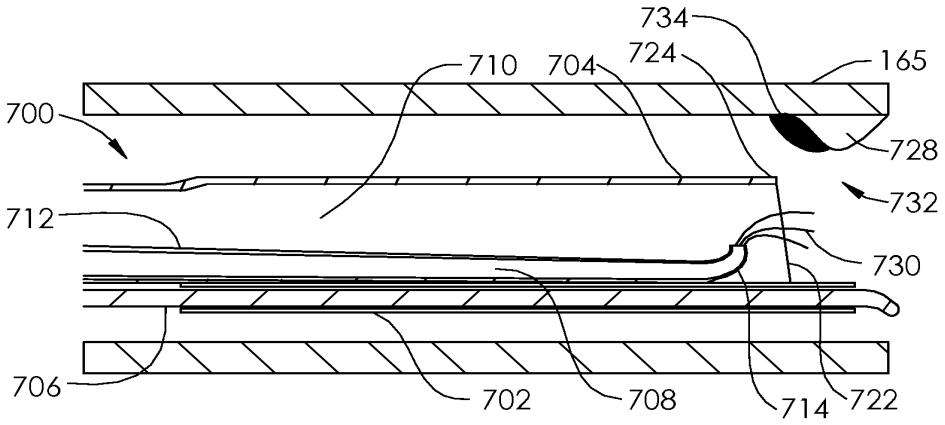

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FIG. 27

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 15/31460

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A61M 1/00 (2015.01)
CPC - A61M 1/0084, A61M 25/003, A61M 1/0023, A61M 2039/082
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - A61M 1/00 (2015.01)
CPC - A61M 1/0084, A61M 25/003, A61M 1/0023, A61M 2039/082

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
604/508, 266-269 (UPC)
(Search term limited; see below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PubWest (PGPB, USPT, EPAB, JPAB); Google; PatBase (All);
Search Terms: Aspirat*, suction*, vacuum*, drain*, catheter*, conduit, lumen, tube, jet, nozzle, spray, clog*, unclog*, declog*, obstruct*, anticlog*, antiobstr*, rinse, flush*, clean*, clear*, pump*, motor*, driv*, piston*, valve, one way, thromb*, blood

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 1990/05493 A1 (SVEDMAN) 31 May 1990 (31.05.1990) Entire document, especially p3, ln 10 - p4, ln 27, p5, ln 11-30 and FIGS. 1, 4.	1-20
Y	US 3,429,313 A (ROMANELLI) 25 February 1969 (25.02.1969) Entire document, especially col 3, ln 10- col 4, ln 5, col 6, ln 67- col 7, ln 4 and FIG. 1.	1-3, 6-7, 10-20
Y	US 3,707,967 A (KITRILAKIS et al.) 02 January 1973 (02.01.1973) Entire document, especially Abstract, col 3, ln 44- col 4, ln 34 and FIGS. 1, 4.	1, 4-5, 8-9
A	US 2012/0289910 A1 (SHTUL et al.) 15 November 2012 (15.11.2012) Entire document.	1-20
A	US 5,713,849 A (BOSMA et al.) 03 February 1988 (03.02.1988) Entire document.	1-20
A	US 4,690,672 A (VELTRUP) 01 September 1987 (01.09.1987) Entire document.	1-20
A	US 3,916,892 A (HANSEN et al.) 11 May 1976 (11.05.1976) Entire document.	1-20
A	US 2,804,075 A (BORDEN) 27 August 1957 (27.08.1957) Entire document.	1-20

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
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Date of the actual completion of the international search	Date of mailing of the international search report
16 July 2015 (16.07.2015)	07 AUG 2015
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	20230218310	07-13-2023	Scheinblum et al.	
	2.	20230218383	07-13-2023	Merritt et al.	
	3.	20230218313	07-13-2023	Rosenbluth et al.	
	4.	20230200970	06-29-2023	Merritt et al.	
	5.				

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1.	WO2023137341	07-20-2023	Inari Medical, Inc.		
	2.	WO2015179329	11-26-2015	WALK VASCULAR, LLC		
	3.					

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[5]
		English translation of Japanese Office Action mailed June 7, 2023 for Japanese Application No. 2021-507564, 7 pages.	

EXAMINER SIGNATURE

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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.

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	Attorney Docket Number	111552-8018.US08

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.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider the listed references. This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information that may be material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, Applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

COPIES OF REFERENCES

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), Applicant has not submitted copies of U.S. patents and U.S. patent applications. Applicant submits herewith copies of foreign patents and non-patent literature in accordance with 37 C.F.R. § 1.98(a)(2).

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	/Matthew S. Williams/	Date (YYYY-MM-DD)	2023-7-24
Name/Print	Matthew S. Williams	Registration Number	77,516

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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PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
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ART UNIT	PAPER NUMBER
3781	

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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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentprocurement@perkinscoie.com

Decision Granting Request for Prioritized Examination (Track I)	**Application No.** 18/329,450	**Applicant(s)** Merritt et al.	
	Examiner FIKIRTE A GEREMEW	**Art Unit** OMBL	**AIA (FITF) Status** Yes

1. THE REQUEST FILED 05 June 2023 IS **GRANTED** .

The above-identified application has met the requirements for prioritized examination

A. ☑ for an original nonprovisional application (Track I).
B. ☐ for an application undergoing continued examination (RCE).

2. **The above-identified application will undergo prioritized examination**. The application will be accorded special status throughout its entire course of prosecution until one of the following occurs:

A. filing a **petition for extension of time** to extend the time period for filing a reply;

B. filing an **amendment to amend the application to contain more than four independent claims, more than thirty total claims** , or a multiple dependent claim;

C. filing a **request for continued examination** ;

D. filing a notice of appeal;

E. filing a request for suspension of action;

F. mailing of a notice of allowance;

G. mailing of a final Office action;

H. completion of examination as defined in 37 CFR 41.102; or

I. abandonment of the application.

Telephone inquiries with regard to this decision should be directed to FIKIRTE GEREMEW at (703) 756-1930. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.

/FIKIRTE A GEREMEW/ PROGRAM SUPPORT ASSISTANT, OMBL	

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(71) Applicant *(for all designated States except US)*: **KERBEROS PROXIMAL SOLUTIONS, INC.** [US/US]; 10600 North Tantau Avenue, Cupertino, California 95014 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **GOFF, Thomas, G.** [US/US]; 214 Oak Court, Menlo Park, California 94025 (US). **YANG, Mark, C.** [US/US]; 141 3rd Avenue, San Francisco, California 94118 (US). **ORTH, Michael, J.** [US/US]; 15875 Walter Breton Drive, Morgan Hill, California 95037 (US). **HULME, Gary** [US/US]; 4365 Lonardo Avenue, San Jose, California 95118 (US). **MACMAHON, John, M.** [US/US], 202 Monroe Drive, Moutain View, California 94040 (US).

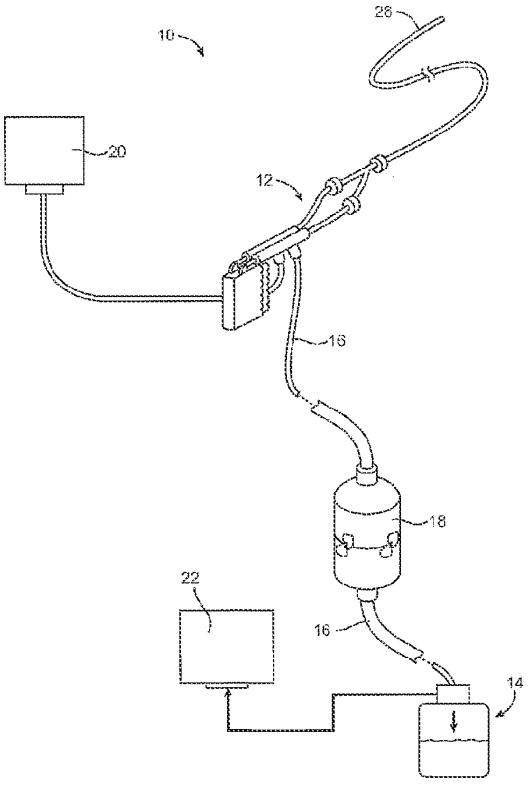
(74) Agents: **HESLIN, James, M.** et al.; TOWNSEND AND TOWNSEND AND CREW LLP, Two Embarcadero Center, 8th Floor, San Francisco, California 94111-3834 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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(54) Title: METHODS AND SYSTEMS FOR FILTERING ASPIRATED MATERIALS



(57) Abstract: Solid materials are separated from hollow body structure aspirates using a filter assembly disposed between an aspiration catheter and an aspirate receptacle. Filter elements having different pore or mesh sizes may be used to size classify the separated solid materials. Multiple filter assemblies may be disposed in parallel or series between the aspiration catheter and aspirate receptacle to provide for different levels of size classification.

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GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

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

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

METHODS AND SYSTEMS FOR FILTERING ASPIRATED MATERIALS

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention. The present invention relates generally to medical apparatus and methods. More particularly, the present invention relates to a method and system for separating and optionally classifying solids removed from a patient in a fluid aspirate.

[0002] Aspiration is a part of many surgical procedures performed in various body structures and lumens. Blood and/or other natural body fluids may be aspirated from various hollow body structures, such as blood vessels, cysts, pseudocysts, abscesses, blood vessel grafts, lung passages, bile ducts, ureters, urethras, fallopian tubes, ear canals, the gastrointestinal tract, and the like. In some instances, aspiration is performed on a natural body fluid(s) only, while in many other instances, a liquid irrigant will be introduced which will form at least part of the aspirated fluid. Such irrigants may comprise saline or other biologically inert fluids. Alternatively, such irrigants may comprise biologically active agents, such as thrombolytic agents introduced to occluded blood vessels, antiseptic or antibiotic agents introduced to infected body locations, or the like.

[0003] Of particular interest to the present invention, fluids aspirated from any of these hollow body structures will often contain solid materials, such as cellular debris, damaged tissue, thrombus, or the like, which is aspirated together with the fluid. In many instances, such removed solid materials will have diagnostic or other value to a treating physician. For example, during aspiration, it may be desirable to monitor the solid materials which are being removed in order to decide when to terminate or alter or adjust the aspiration protocol. Additionally, the identification of the aspirated material may serve as a diagnostic tool to direct further intervention or other therapies.

[0004] While the collected materials may be observed in the aspirate collection bags which are commonly employed in such procedures, it will usually be difficult to remove the materials while additional aspirate is entering the collection bags and the solids will frequently remain suspended and difficult to separate from the collected materials.

[0005] For these reasons, it would be desirable to provide improved and additional systems and protocols for separating solid materials from liquid and fluid aspirates removed from a hollow body structure. It would be particularly desirable if the methods and protocols permitted direct observation and/or removal of the separated solid materials while an aspiration protocol was continuing. It would be further desirable if the separated solid materials were collected in a form substantially separated from a liquid fraction of the materials removed from the hollow body structure and further that the separated solid materials be in a convenient structure or assembly to permit easy removal and observation. In some instances, it would also be desirable to provide for classification of the solid materials, i.e. separation based on size, while the aspiration protocol was being performed. At least some of these objectives will be met by the inventions described and claimed hereinbelow.

[0006] 2. Description of the Background Art. Patient irrigation and aspiration systems which may employ the separation technology of the present application are described in commonly assigned U.S. Patent Nos. 6,827,701 and 6,878,128, the full disclosures of which are incorporated herein by reference.

BRIEF SUMMARY OF THE INVENTION

[0007] In a first aspect of the present invention, methods are provided for separating materials in fluid aspirates removed from a hollow body structure. The fluid is aspirated from the hollow body structure, where the fluid carries entrained solid materials in the aspirate. The solid materials are filtered from the fluid to produce both a filtrate and a fluid stream. The fluid stream is collected separately from the filtrate. In this way, the filtrate may be easily observed and optionally removed from the aspiration circuit even while the aspiration protocol continues.

[0008] The fluid may be aspirated from a variety of hollow body organs and other structures, including blood vessels, cysts, pseudocysts, abscesses, blood vessel grafts, lung passages, bile ducts, ureters, urethras, fallopian tubes, ear canals, joint capsules, the gastrointestinal tract, and the like. Thus, natural body fluids which may be aspirated according to the present invention include blood, bile, urine, synovial fluid, and the like. In addition to such natural body fluids, the hollow body structures may optionally be irrigated prior to and/or during aspiration. The introduction of irrigation fluid may improve debris capture through the aspiration channel by creating localized mixing / turbulence and possibly

decreasing the viscosity of the aspirant. Thus, the aspirated fluids may comprise or consist of a variety of irrigant fluids introduced to the hollow body structure. Suitable irrigant fluids include saline, lactated ringers, and the like. The irrigant fluids may further comprise active agents intended for therapeutic or diagnostic purposes. For example, in the case of occluded blood vessels, thrombolytic agents may be introduced as part of an irrigant stream. Alternatively, in the case of infected hollow body structures, the irrigant may include antibiotics, antiseptics, or the like.

[0009] Most typically, aspiration will be performed by introducing an aspiration catheter, cannula, or other tubular or needle-like device into the hollow body structure. By applying a vacuum to a proximal end of the aspiration device, the fluid may be withdrawn through a port or ports at or near the distal end of the device which has been placed within an interior region of the hollow body structure. For convenience, as used hereinafter and in the claims, the aspiration structure will be referred to as a "catheter," but it will be appreciated that this term is intended to be broad enough to encompass needles, cannulas, tubular structures, conduits, and other aspiration structures known in the medical art.

[0010] The aspirated fluids will usually be collected in an aspirate receptacle, such as a conventional fluid collection bag. A syringe, vacuum connection, or other conventional vacuum source may be connected at or through the catheter and/or the aspiration receptacle in order to aspirate the fluid from the hollow body structure, through the aspiration catheter, and into the aspirate receptacle. The filter(s) may be positioned before or after the aspiration source.

[0011] In a preferred aspect of the present invention, at least one filter assembly including a filter housing and a removable (and replaceable) filter element is placed between the aspiration catheter and the aspirate receptacle in order to remove solid materials from the aspirate before the remaining liquid phase of the aspirate flows to the aspirate receptacle. The filter element may be any conventional filter element, such as a paper, polymer, a woven filter membrane, a screen, other porous member, or the like. The filter element may have any one of a variety of geometries including cup-shaped, conical and the filter could be inclined or slanted in the filter-housing to spread the filtrate over the filter to permit differentiation of the filtrate material. Additionally, the filter element could be coated or otherwise combined with a chemical, biological, or other indication or marker to facilitate identification of different analytes or markers present in the filtrate, typically using colormetric indicating

systems. Preferably, the filter element will allow the separated solid materials to collect on an exposed surface so that the solid materials will be easily removed and/or absorbed. The filter element will have a pore size or screen size selected to separate solid particles at a desired particle size cutoff. For example, suitable filter membranes may have a pore size in the range from 1 μm to 1000 μm, usually from 5 μm to 240 μm, and preferably from 20 μm to 120 μm. For separation of larger particles, screens having mesh sizes in the range from 0.1mm to 5mm, and preferably from 0.2mm to 1mm may be used.

[0012] In a specific aspect of the methods of the present invention, at least two filter assemblies may be provided between the aspiration catheter and the aspirate receptacle. The two or more filter assemblies may be disposed in parallel, in series, or in a combination of parallel and series arrangements. Typically, valving will be provided so that the multiple filter assemblies may be isolated from the flowing stream of aspirate so that the filter elements may be removed and the collected solids observed even while the aspiration protocol continues. In some cases, an unfiltered bypass path will be provided with valving so that a single filter assembly or group of filter assemblies may be isolated while the aspirate is directed or shunted to the aspirate receptacle without any filtration.

[0013] In a further specific aspect of the methods of the present invention, two or more filter elements may be employed in series or in parallel in order to size classify the materials being removed. Most simply, two, three, or more filter elements having progressively smaller pore or mesh sizes may be provided in series in a single filter housing. Alternatively, such a series of progressively smaller filtering elements could be provided in separate filter assemblies which are disposed in series between the aspiration catheter and the aspirate receptacle. Alternatively, separate filter assemblies having filter elements with differing particle size cutoffs could be provided in parallel or in a series-parallel arrangement in order to separately collect and classify particles having different sizes. In any of these ways, the solid materials may be filtered and separated into at least two size groups, often at least three size groups, and into virtually any number of different sized collection groups desired.

[0014] In a second aspect of the present invention, systems for aspirating a hollow body structure comprise an aspiration catheter, an aspirate receptacle connectable to receive aspirate from the aspiration catheter, and at least one filter assembly disposed between the aspiration catheter and the aspirate receptacle. Typically, the aspirate receptacle will be a fluid collection bag, although any other conventional medical receptacle would be suitable.

The aspirate receptacle will typically be connected by a flexible tube between the aspiration catheter and the aspirate receptacle. Usually, a syringe, vacuum connector, or other conventional vacuum source will be provided in order to effect the system aspiration.

[0015] The filter assembly usually comprises at least one filter housing having at least one filter element removably disposed in an interior thereof. The filter element, as described above, may comprise a filter membrane, a mesh, link, or the like, having a pore or mesh size selected to collect and separate solids having a target threshold size or sizes. The filter housing and optionally filter element may be at least partially transparent to permit observation of the solid materials as they collect. In an exemplary embodiment, the filter housing has an upper shell and a lower shell which may be taken apart to permit introduction, removal, and replacement of the filter element in the interior of the housing. The housing will further have conventional connectors to permit connection at an upper end to the aspiration catheter and at a lower end to the aspirate receptacle.

[0016] The system may further comprise at least a second filter assembly, a third filter assembly, or even greater number of filter assemblies which may be disposed in parallel or series to the first filter assembly. Additionally, at least one unfiltered flow path may be provided in parallel to the filter assembly(ies), and valving will be provided to permit selective flow through any one or more of the filter assemblies as well as through the unfiltered flow path. The different filter assemblies may each have a filter element with a different pore or mesh size. Alternatively, two or more filter elements may be provided within a single filter assembly, where the individual filter elements within the individual assembly may optionally have different pore or mesh sizes.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] Fig. 1 illustrates an exemplary system including an irrigant source, an aspiration and irrigation catheter, a filter assembly, an aspirate receptacle, and a vacuum source, constructed in accordance with the principles of the present invention.

[0018] Fig. 2 illustrates an exemplary filter housing constructed in accordance with the principles of the present invention.

[0019] Figs. 3 and 4 illustrate two exemplary filter assembly connection patterns which may be employed in the apparatus and methods of the present invention.

[0020] Fig. 5 illustrates use of filter elements having different pore or mesh sizes disposed in series for classifying solid materials in accordance with the principles of the present invention.

[0021] Fig. 6 illustrates the use of filter elements having different pore or mesh sizes disposed in parallel for classifying solid material sizes in accordance with the principles of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0022] The present invention provides systems and methods for separating solid materials, typically particulate materials, from aspirated body fluids, including both natural body fluids and introduced fluids. As shown in Fig. 1, an exemplary system 10 comprises catheter 12 (move the arrow for 12 distal to the 2-line section) which is connected to an aspirate receptacle 14 by tubing 16. The catheter 12 is illustrated as an irrigation/aspiration catheter which is connectable to a source of irrigant fluid 20. Exemplary irrigation/aspiration catheters are described in commonly assigned U.S. Patent Nos. 6,827,701 and 6,878,128, both of which have been previously incorporated herein by reference. It will be appreciated, however, that the present invention does not require that the catheters 12 provide for irrigation, but rather only that they provide for aspiration and the ability to discharge a fluid aspirate stream to an aspirate collection receptacle.

[0023] The irrigation/aspiration catheter 12 illustrated in Fig. 1 and described in the copending U.S. patents incorporated above, provides for a pair of syringe elements for both introducing the irrigant fluid from the irrigant source 20 and discharging the aspirate stream to the aspirate receptacle 14. In other cases and for other aspiration catheters, it may be desirable to provide a separate vacuum source 22 which may be connected to or through the catheter 12 and/or aspirate receptacle 14 in order to draw the aspirate stream through the tubing 16 or other discharge connections. The present invention, of course, does not depend on what particular mechanism is provided for generating the aspirate stream or the location of the said mechanism with respect to the filter(s).

[0024] The catheter 12 has a distal end or portion 26 which is introducible into a target hollow body structure in order to withdraw fluid therefrom to produce the aspirate stream. In the preferred example of the irrigation aspiration catheter, described in the previously incorporated commonly owned U.S. patents, the catheter 12 will be intended for introduction

to a blood vessel for introducing a thrombolytic agent in order to disrupt clot. In this exemplary use, the solid material aspirated by the catheter will frequently comprise disrupted clot, thrombus, and/or plaque, which is then discharged through the aspirate line 16 to the aspirate receptacle. It will be appreciated, however, that the present invention is not limited to vascular use, clot disruption, or any other particular treatment protocol, and may instead extend to the different hollow body structures and body fluids described above.

[0025] In the simplest embodiment of the present invention, a single filter housing 18 is disposed between the aspiration catheter 12 and the aspirate receptacle 14, as illustrated in Fig. 1. As shown in Fig. 2, the filter assembly 18 typically comprises an upper shell 30, a lower shell 32, and a filter element 34 which may be disposed within the interior of the shells. The upper shell 30 is removable from the lower shell 32, typically including mating connectors 36 disposed about the open peripheries of each shell. All or a portion of the shells 30 and 32, as well as optionally the filter element 34, may be composed of transparent materials in order to permit observation of the collection of solids within the filter element 34 as the aspiration progresses. While the particular structure of filter assembly 18 shown in Fig. 2) is suitable and presently preferred, a variety of other specific filter assembly constructions could also be used.

[0026] The filter elements 34 may comprise any one of a variety of conventional filtering materials, as generally described above in the Summary of the Invention. The geometries in which the filter elements 34 are arranged will depend in large part on the construction of the remainder of the filter assembly. In the embodiment of Fig. 18, the filter element 34 is constructed so that it nests within the lower shell 32 of the filter assembly. A wide variety of other geometries would also be suitable.

[0027] In many instances, it will be desirable to provide two or more filter assemblies 18 between the aspiration catheter 12 and the aspirate receptacle 14. As illustrated in Fig. 3, a pair of filter assemblies 18 are disposed in parallel to receive the aspirate through an upper portion of tubing 16 and discharge the aspirate through a lower portion of tubing 16. Isolation valves 40 are provided so that either of the filter assemblies 18 may be taken off-line to permit access even while the aspiration continues. Optionally, as shown in broken line, a third filter assembly 18 may also be provided in parallel. It is clear that any number of such filter assemblies may be provided in parallel, although the valving may have to be

modified in order to permit any single one of the assemblies to be isolated while all others remain on line.

[0028] The filter assembly arrangement of Fig. 4 illustrates another arrangement within the scope of the present invention. A first filter assembly 18 may be provided and isolated by valves 40 in parallel with an unfiltered flow path 50 having a valve 52 therein. With this embodiment, all flow could be directed through the filter assembly 18 with valve 52 being closed. Should it be desired to gain access to filter 18, the isolation valves 40 could be closed and the flow path valve 52 open.

[0029] As a still further option, as shown in broken line in Fig. 4, additional filter assemblies 18 could be provided, with individual assemblies 18 being disposed in series, where the two series assemblies may be together placed in parallel with first filter assembly 18. It will be appreciated that a wide variety of different parallel and/or series arrangements of filter assemblies and unfiltered flow paths may be provided within the scope of the present invention.

[0030] Referring now to Figs. 5 and 6, it should also be appreciated that filter elements having different pore or mesh sizes may also be provided in series and/or in parallel in order to permit separation and classification of the particulate solid materials which are being separated from the flowing aspirate. For example, as shown in Fig. 5, three filter elements 70, 72, and 74 may be placed in series, with progressively smaller pore or mesh sizes in the direction of flow. Thus, all particles having a size greater than a first threshold would collect on top of the first filter element 70, while intermediate particle sizes having a smaller threshold size would collect on the second filter element 72. Still smaller particles would collect on the third filter element having the smallest pore or mesh sizes, while still smaller particles would pass into the aspirate receptacle without separation. The three filter elements 70, 72, and 74 could be arranged within a single filter housing or alternately within a series of three filter housings.

[0031] The filter elements 70, 72, and 74 could also be arranged in parallel, as shown in Fig. 6. Each of the screens would collect particles having a size greater than the threshold pore or mesh size of the filter element. Such a parallel arrangement of the different sized filter elements, however, would not result in true size classification, since each of the filters would collect the larger elements and would only allow smaller elements to selectively pass. This configuration would allow the use of indicator media which would be placed in the

filter(s). This indicator(s) could detect the presence of a certain biological or chemical components in the aspirant or filtered solids for the diagnostic purposes.

[0032] The collected elements could be used for a variety of therapeutic purposes. For example, when collecting aspirated thrombus in thrombolytic procedures,

[0033] The collected material could be used to diagnose certain disease states or conditions. These diagnostic findings could then be used to direct further interventions and/or treatments.

[0034] While the above is a complete description of the preferred embodiments of the invention, various alternatives, modifications, and equivalents may be used. Therefore, the above description should not be taken as limiting the scope of the invention which is defined by the appended claims.

WHAT IS CLAIMED IS:

1. A method for separating materials removed from a hollow body structure, said method comprising:

aspirating a fluid from the hollow body structure, wherein solid materials from the hollow body structure are entrained in the aspirate;

filtering solids from the aspirate to produce a filtrate and a fluid stream; and

collecting the fluid stream separately from the filtrate.

2. A method as in claim 1, wherein aspirating the fluid comprises introducing an aspiration catheter in the hollow body structure.

3. A method as in claim 1, wherein filtering comprises interposing at least one filter assembly including a filter housing and a removable filter element between the aspiration catheter and an aspirate receptacle.

4. A method as in claim 3, further comprising removing the filter element from the housing to permit inspection of solids collect by the filter element.

5. A method as in claim 4, wherein the filter element is removed while aspirate continues to flow from the aspiration catheter to the aspirate receptacle.

6. A method as in claim 5, wherein the aspirate flow is directed past the filter assembly while the filter element is removed.

7. A method as in claim 6, wherein the aspirate is directed past the filter assembly through at least a second filter assembly disposed in parallel to the first filter assembly.

8. A method as in claim 6, wherein the aspirate is directed past the filter assembly through an unfiltered flow path disposed in parallel to the filter assembly.

9. A method as in claim 1, wherein filtering comprises separating the solids into at least two size groups.

10. A method as in claim 1, wherein filtering comprises separating the solids into at least three size groups.

11. A method as in claim 1, wherein filtering comprises passing the fluid through at least two filter elements, wherein said filter elements have different pore sizes.

12. A method as in claim 11, wherein the at least two filter elements are arranged in series.

13. A method as in claim 11, wherein the at least two filter elements are arranged in parallel.

14. A method as in claim 1, wherein the hollow body structure is selected from the group consisting of blood vessels, cysts, pseudocysts, abscesses, blood vessel grafts, lung passages, bile ducts, ureters, urethras, fallopian tubes, ear canals, and gastrointestinal tracts.

15. A method as in claim 14, wherein the hollow body structure is an artery.

16. A method as in claim 15, wherein the artery is a coronary artery, a peripheral artery, or a cerebral artery.

17. A method as in claim 14, wherein the hollow body structure is a vein.

18. A method as in claim 17, wherein the vein is a peripheral vein.

19. A method as in claim 1, further comprising introducing an irrigation fluid to the hollow body structure, wherein at least a portion of the aspirated fluid comprises the irrigation fluid.

20. A method as in claim 19, wherein aspirating and introducing the irrigation fluid are performed with an irrigation and aspiration catheter positioned in the hollow body structure.

21. A method as in claim 19, wherein the irrigation fluid comprises saline.

22. A method as in claim 1, wherein the irrigation fluid comprises a biologically active agent.

23. A method as in claim 22, wherein the biologically active agent comprises a thrombolytic agent.

24. A system for aspirating a hollow body structure, said system comprising:

an aspiration catheter;

an aspirate receptacle connectable to receive aspirate from the aspiration catheter;

at least one filter assembly disposed between the aspiration catheter and the aspirate receptacle.

25. A system as in claim 24, wherein the aspirate receptacle is a fluid collection bag.

26. A system as in claim 24, further comprising a flexible tube connecting the aspiration catheter to the aspirate receptacle, wherein the filter housing is connected to the flexible tube between the catheter and the receptacle.

27. A system as in claim 24, wherein the filter assembly comprises:

at least one filter housing; and

at least one filter element removably disposed in the filter housing to separate solids from aspirate flowing from the irrigation and aspiration catheter to the aspirate receptacle.

28. A system as in claim 26, wherein the filter housing is at least partly transparent to allow observation of the filter contents.

29. A system as in claim 26, wherein the filter housing comprises an upper shell and a lower shell, wherein the upper shell and lower shell are separable to provide access to the filter element in an interior of the filter housing.

30. A system as in claim 27, further comprising at least a second filter assembly disposed in parallel and/or series to the first filter assembly between the irrigation and aspiration catheter and the aspirate receptacle, and valving to permit selective diversion of aspirate flow through either filter assembly.

31. A system as in claim 30, wherein the second filter assembly has a filter element with a pore size different from that of the first filter assembly.

32. A system as in claim 27, wherein the filter assembly includes at least two filter elements, wherein at least one of said filter elements has a different pore size than that of another filter element.

33. A system as in claim 27, further comprising at least one flow path in parallel to the filter assembly, and valving to permit selective bypass of the filter assembly.

34. A system as in claim 24, wherein the aspiration catheter comprises a catheter shaft having at least one irrigation lumen, at least one aspiration lumen, at least one irrigation port near a distal end of the shaft, and at least one aspiration port near said distal end.

35. A system as in claim 34, wherein the distal end of the shaft is free from isolation balloons.

36. A system as in claim 35, wherein the distal end of the shaft includes at least one isolation balloon disposed proximally of the irrigation and aspiration ports.

37. A system as in claim 34, wherein the distal end of the shaft includes at least a second isolation balloon disposed proximally of the irrigation and aspiration ports.

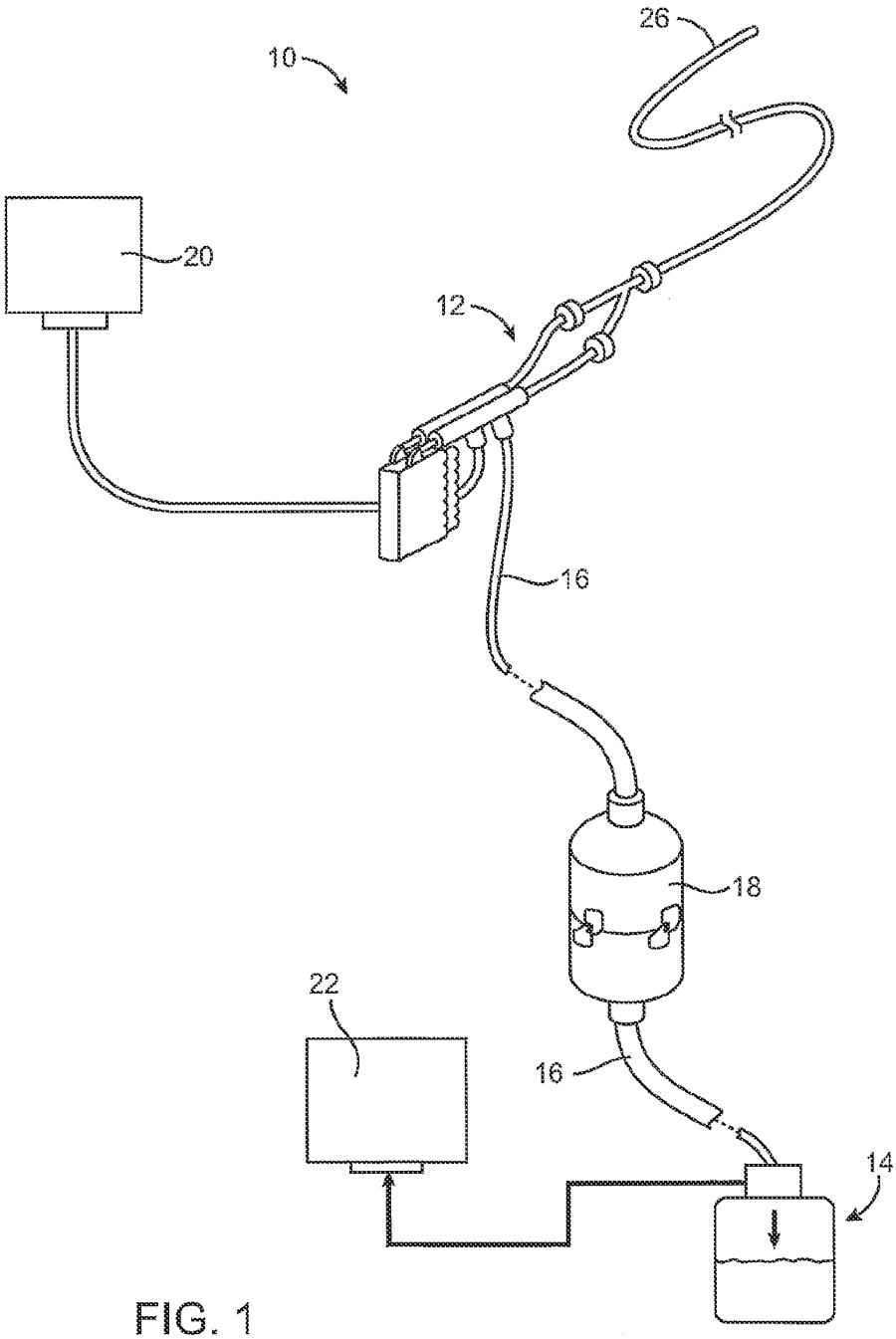


FIG. 1

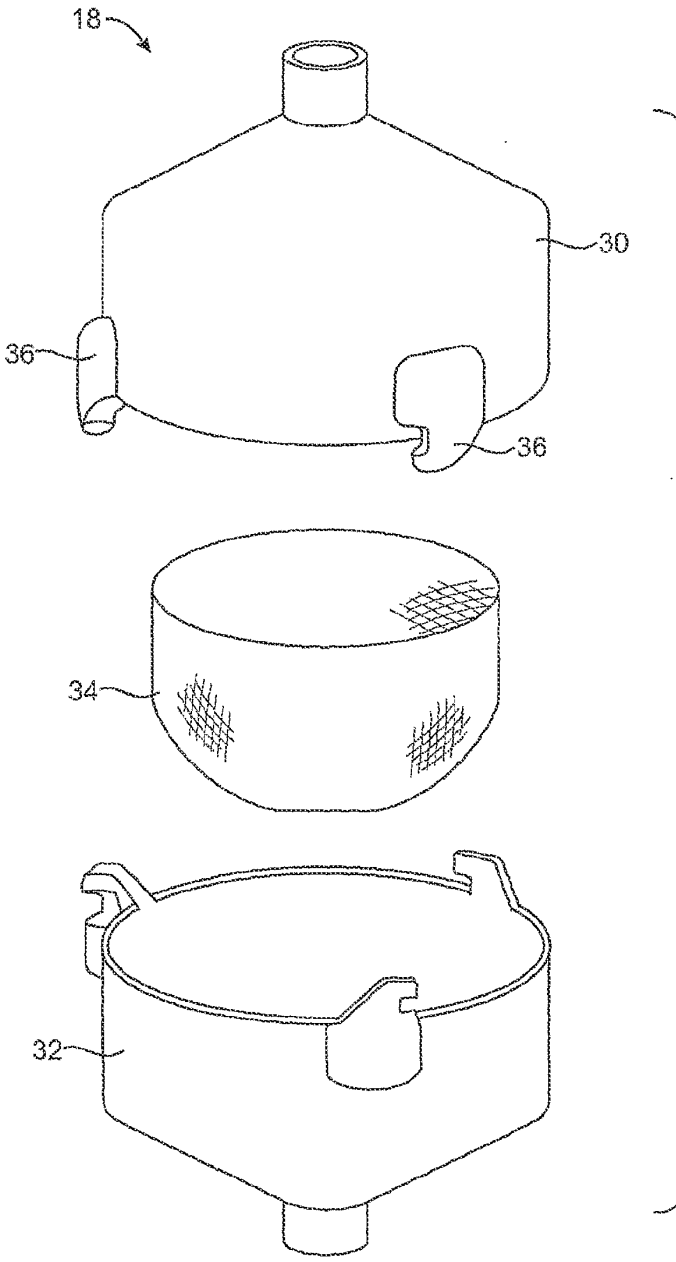


FIG. 2

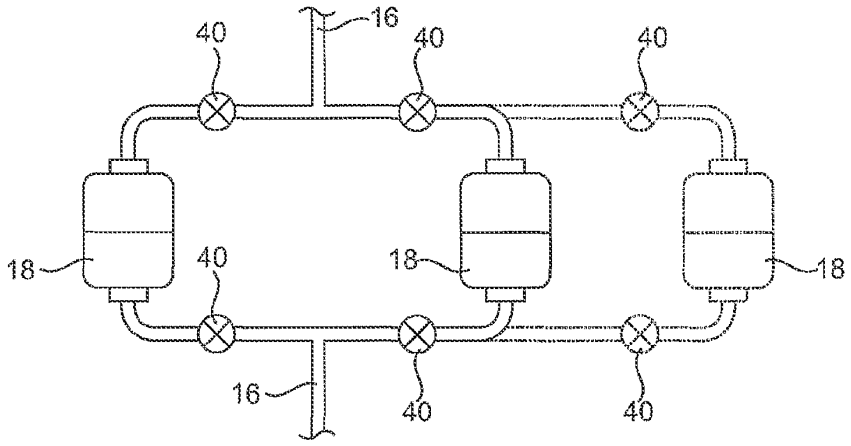


FIG. 3

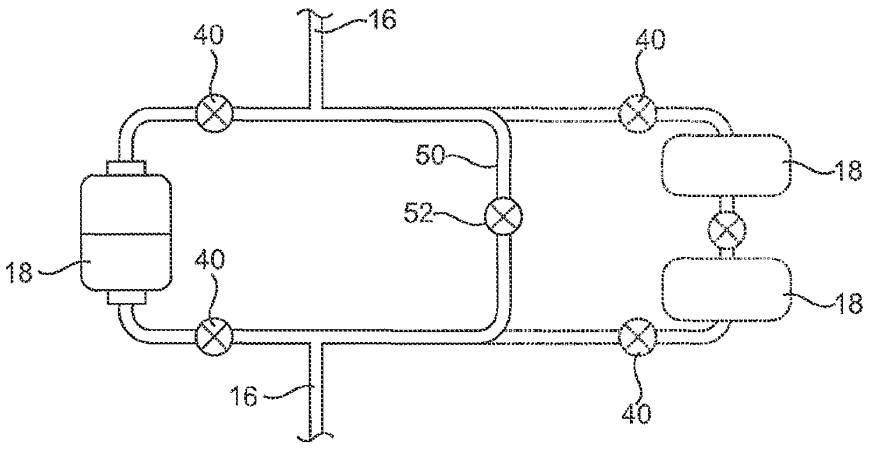


FIG. 4

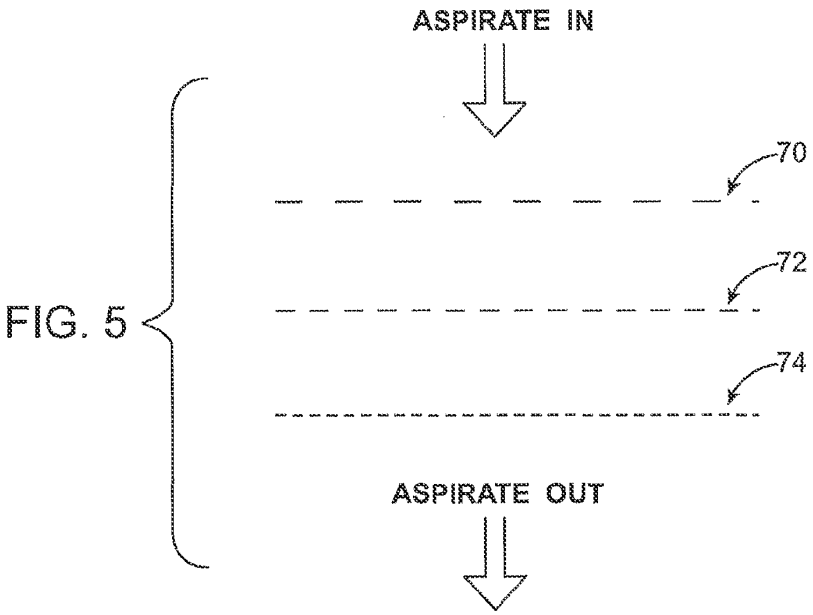

ASPIRATE IN
70
72
74
ASPIRATE OUT

FIG. 5

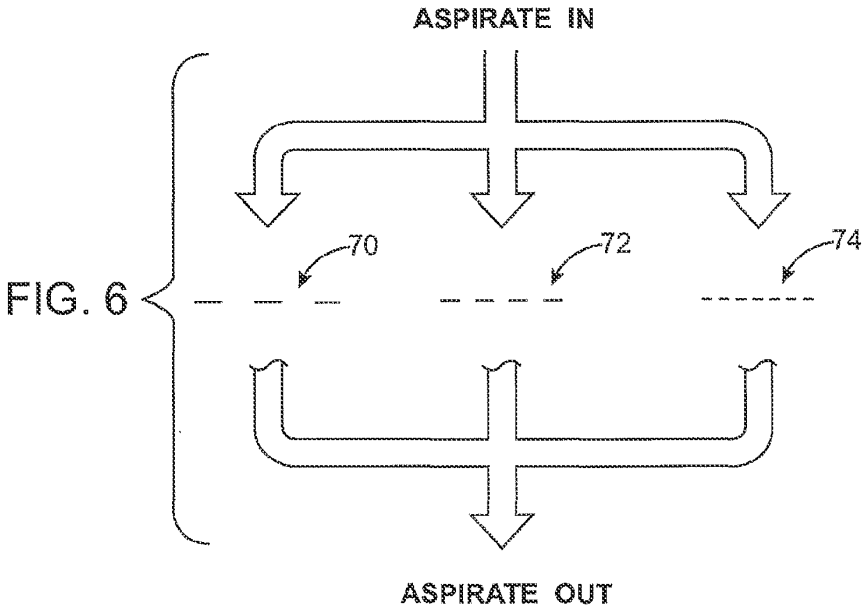

ASPIRATE IN
70
72
74
ASPIRATE OUT

FIG. 6

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	Application Number	18/329,450- Conf# 1035
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	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

U.S. PATENTS AND PUBLICATIONS

Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	2846179	08-05-1958	Monckton	
	2.	2955592	10-11-1960	Maclean	
	3.	3088363	05-07-1963	W. Sparks	
	4.	3197173	07-27-1965	Taubenheim	
	5.	3435826	04-01-1969	T. J. Fogarty	
	6.	3515137	06-02-1970	Santomieri	
	7.	3892161	07-01-1975	Sokol	
	8.	3923065	12-02-1975	Nozick et al.	
	9.	4030503	06-21-1977	Clark,III	
	10.	4034642	07-12-1977	Iannucci et al.	
	11.	4222380	09-16-1980	Terayama	
	12.	4243040	01-06-1981	Beecher	
	13.	4287808	09-08-1981	Leonard et al.	
	14.	4324262	04-13-1982	Hall	
	15.	4393872	07-19-1983	Reznik et al.	
	16.	4469100	09-04-1984	Hardwick	
	17.	4523738	06-18-1985	Raftis et al.	
	18.	4551862	11-12-1985	Haber	
	19.	4604094	08-05-1986	Shook	
	20.	4646736	03-03-1987	Auth et al.	
	21.	4650466	03-17-1987	Luther	
	22.	4863440	09-05-1989	Chin et al.	
	23.	4883458	11-28-1989	Shiber	
	24.	4890611	01-02-1990	Monfort et al.	
	25.	4946440	08-07-1990	Hall	
	26.	4960259	10-02-1990	Sunnanvader et al.	
	27.	4978341	12-18-1990	Niederhauser	
	28.	5059178	10-22-1991	Ya	
	29.	5100423	03-31-1992	Fearnot	

PTO/SB/08a (01-10)
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	30.	5127626	07-07-1992	Hilal et al.	
	31.	5129910	07-14-1992	Phan et al.	
	32.	5192286	03-09-1993	Phan et al.	
	33.	5192290	03-09-1993	Hilal	
	34.	5329923	07-19-1994	Lundquist	
	35.	5360417	11-01-1994	Gravener et al.	
	36.	5364345	11-15-1994	Lowery et al.	
	37.	5389100	02-14-1995	Bacich et al.	
	38.	5419774	05-30-1995	Willard et al.	
	39.	5443443	08-22-1995	Shiber	
	40.	5476450	12-19-1995	Ruggio	
	41.	5490859	02-13-1996	Mische et al.	
	42.	5591137	01-07-1997	Stevens	
	43.	5662703	09-02-1997	Yurek et al.	
	44.	5746758	05-05-1998	Nordgren et al.	
	45.	5749858	05-12-1998	Cramer	
	46.	5782817	07-21-1998	Franzel et al.	
	47.	5827229	10-27-1998	Auth et al.	
	48.	5873866	02-23-1999	Kondo et al.	
	49.	5873882	02-23-1999	Straub et al.	
	50.	5876414	03-02-1999	Straub	
	51.	5911710	06-15-1999	Barry et al.	
	52.	5941869	08-24-1999	Patterson et al.	
	53.	5971938	10-26-1999	Hart et al.	
	54.	5972019	10-26-1999	Engelson et al.	
	55.	5974938	11-02-1999	Lloyd	
	56.	5989233	11-23-1999	Yoon	
	57.	5993483	11-30-1999	Gianotti	
	58.	6066158	05-23-2000	Engelson et al.	

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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	59.	6068645	05-30-2000	Tu	
	60.	6152946	11-28-2000	Broome et al.	
	61.	6156055	12-05-2000	Ravenscroft	
	62.	6168579	01-02-2001	Tsugita	
	63.	6221006	04-24-2001	Dubrulet al.	
	64.	6228060	05-08-2001	Howell	
	65.	6238412	05-29-2001	Dubrulet al.	
	66.	6245078	06-12-2001	Ouchi	
	67.	6254571	07-03-2001	Hart	
	68.	6258115	07-10-2001	Dubrul	
	69.	6306163	10-23-2001	Fitz	
	70.	6350271	02-26-2002	Kurz et al.	
	71.	6364895	04-02-2002	Greenhalgh	
	72.	6368339	04-09-2002	Amplatz	
	73.	6383205	05-07-2002	Samson et al.	
	74.	6413235	07-02-2002	Parodi	
	75.	6423032	07-23-2002	Parodi	
	76.	6458103	10-01-2002	Albert et al.	
	77.	6511492	01-28-2003	Rosenbluth et al.	
	78.	6514273	02-04-2003	Voss et al.	
	79.	6530935	03-11-2003	Wensel et al.	
	80.	6544278	04-08-2003	Vrba et al.	
	81.	6544279	04-08-2003	Hopkins et al.	
	82.	6551342	04-22-2003	Shen et al.	
	83.	6589263	07-08-2003	Hopkins et al.	
	84.	6596011	07-22-2003	Johnson et al.	
	85.	6602271	08-05-2003	Adams et al.	
	86.	6605074	08-12-2003	Zadno-azizi et al.	
	87.	6605102	08-12-2003	Mazzocchi et al.	

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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	88.	6620179	09-16-2003	Brook et al.	
	89.	6623460	09-23-2003	Heck	
	90.	6635068	10-21-2003	Dubrul et al.	
	91.	6645222	11-11-2003	Parodi et al.	
	92.	6660013	12-09-2003	Rabiner et al.	
	93.	6663650	12-13-2003	Sepetka et al.	
	94.	6692504	02-17-2004	Kurz et al.	
	95.	6699260	03-02-2004	Dubrulet al.	
	96.	6755847	06-29-2004	Eskuri	
	97.	6767353	07-27-2004	Shiber	
	98.	6800080	10-05-2004	Bates	
	99.	6824553	11-30-2004	Gene et al.	
	100.	6830561	12-14-2004	Jansen et al.	
	101.	6846029	01-25-2005	Ragner et al.	
	102.	6939361	09-06-2005	Kleshinski	
	103.	6942682	09-13-2005	Vrba et al.	
	104.	6960222	11-01-2005	Vo et al.	
	105.	7004954	02-28-2006	Voss et al.	
	106.	7036707	05-02-2006	Aota et al.	
	107.	7041084	05-09-2006	Fotjik	
	108.	7052500	05-30-2006	Bashiriet al.	
	109.	7056328	06-06-2006	Arnott	
	110.	7069835	07-04-2006	Nishri et al.	
	111.	7094249	08-22-2006	Thomas et al.	
	112.	7179273	02-20-2007	Palmer et al.	
	113.	7232432	06-19-2007	Fulton III et al.	
	114.	7244243	07-17-2007	Lary	
	115.	7285126	10-23-2007	Sepetka et al.	
	116.	7306618	12-11-2007	Demond et al.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	117.	7320698	01-22-2008	Eskuri	
	118.	7323002	01-29-2008	Johnson et al.	
	119.	7331980	02-19-2008	Dubrul et al.	
	120.	7534234	05-19-2009	Fotjik	
	121.	7578830	08-25-2009	Kusleika et al.	
	122.	7621870	11-24-2009	Berrada et al.	
	123.	7674247	03-09-2010	Fotjik	
	124.	7691121	04-06-2010	Rosenbluth et al.	
	125.	7695458	04-13-2010	Belley et al.	
	126.	7763010	07-27-2010	Evans et al.	
	127.	7766934	08-03-2010	Pal et al.	
	128.	7775501	08-17-2010	Kees	
	129.	7780696	08-24-2010	Daniel et al.	
	130.	7905877	03-15-2011	Oscar et al.	
	131.	7905896	03-15-2011	Straub	
	132.	7938809	05-10-2011	Lampropoulos et al.	
	133.	7938820	05-10-2011	Webster et al.	
	134.	7967790	06-28-2011	Whiting et al.	
	135.	7976511	07-12-2011	Fotjik	
	136.	7993302	08-09-2011	Hebert et al.	
	137.	7993363	08-09-2011	Demond et al.	
	138.	8043313	10-25-2011	Krolik et al.	
	139.	8052640	11-08-2011	Fiorella et al.	
	140.	8057496	11-15-2011	Fischer Jr.	
	141.	8066757	11-29-2011	Ferrera et al.	
	142.	8070769	12-06-2011	Broome	
	143.	8070791	12-06-2011	Ferrera et al.	
	144.	8075510	12-13-2011	Aklog et al.	
	145.	8088140	01-03-2012	Ferrera et al.	

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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	146.	8092486	01-10-2012	Berrada et al.	
	147.	8100935	01-24-2012	Rosenbluth et al.	
	148.	8109962	02-07-2012	Pal	
	149.	8118829	02-21-2011	Carrison et al.	
	150.	8197493	06-12-2012	Ferrera et al.	
	151.	8246641	08-21-2012	Osborne et al.	
	152.	8261648	09-11-2012	Marchand et al.	
	153.	8267897	09-18-2012	Wells	
	154.	8298257	10-30-2012	Sepetka et al.	
	155.	8317748	11-27-2012	Fiorella et al.	
	156.	8337450	12-25-2012	Fotjik	
	157.	8357178	01-22-2013	Grandfield et al.	
	158.	8361104	01-29-2013	Jones et al.	
	159.	8409215	04-02-2013	Sepetka et al.	
	160.	8486105	07-16-2013	Demond et al.	
	161.	8491539	07-23-2013	Fotjik	
	162.	8512352	08-20-2013	Martin	
	163.	8535334	09-17-2013	Martin	
	164.	8545526	10-01-2013	Martin et al.	
	165.	8568432	10-29-2013	Straub	
	166.	8574262	11-05-2013	Ferrera et al.	
	167.	8579915	11-12-2013	French et al.	
	168.	8585713	11-19-2013	Ferrera et al.	
	169.	8657867	02-25-2014	Dorn et al.	
	170.	8696622	04-15-2014	Fiorella et al.	
	171.	8715314	05-06-2014	Janardhan et al.	
	172.	8721714	05-13-2014	Kelley	
	173.	8771289	07-08-2014	Mohiuddin et al.	
	174.	8777893	07-15-2014	Malewicz	

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	175.	8784441	07-22-2014	Rosenbluth et al.	
	176.	8784442	07-22-2014	Jones et al.	
	177.	8795305	08-05-2014	Martin et al.	
	178.	8795345	08-05-2014	Grandfield et al.	
	179.	8801748	08-12-2014	Martin	
	180.	8814927	08-26-2014	Shin et al.	
	181.	8820207	09-02-2014	Marchand et al.	
	182.	8826791	09-09-2014	Thompson et al.	
	183.	8828044	09-09-2014	Aggerholm et al.	
	184.	8833224	09-16-2014	Thompson et al.	
	185.	8845621	09-30-2014	Fotjik	
	186.	8852226	10-07-2014	Gilson et al.	
	187.	8939991	01-27-2015	Krolik et al.	
	188.	8945143	02-03-2015	Ferrera et al.	
	189.	8945172	02-03-2015	Ferrera et al.	
	190.	8956384	02-17-2015	Berrada et al.	
	191.	8992504	03-31-2015	Castella et al.	
	192.	9005172	04-14-2015	Chung	
	193.	9028401	05-12-2015	Bacich et al.	
	194.	9101382	08-11-2015	Krolik et al.	
	195.	9125683	09-08-2015	Farhangnia et al.	
	196.	9126016	09-08-2015	Fulton	
	197.	9149609	10-06-2015	Ansel et al.	
	198.	9155552	10-13-2015	Ulm III	
	199.	9161766	10-20-2015	Slee et al.	
	200.	9173668	11-03-2015	Ulm III	
	201.	9186487	11-17-2015	Dubrul et al.	
	202.	9204887	12-08-2015	Cully et al.	
	203.	9259237	02-16-2016	Quick et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
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	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	204.	9283066	03-15-2016	Hopkins et al.	
	205.	9351747	05-31-2016	Kugler et al.	
	206.	9358037	01-07-2016	Farhangnia et al.	
	207.	9439664	09-13-2016	Sos	
	208.	9439751	09-13-2016	White et al.	
	209.	9456834	10-04-2016	Folk	
	210.	9463035	10-11-2016	Greenhalgh et al.	
	211.	9463036	10-11-2016	Brady et al.	
	212.	9526864	12-27-2016	Quick	
	213.	9526865	12-27-2016	Quick	
	214.	9566424	02-14-2017	Pessin	
	215.	9579116	02-28-2017	Nguyen et al.	
	216.	9616213	04-11-2017	Furnish et al.	
	217.	9636206	05-02-2017	Nguyen et al.	
	218.	9643035	05-09-2017	Mastenbroek	
	219.	9700332	07-11-2017	Marchand et al.	
	220.	9717514	08-01-2017	Martin et al.	
	221.	9717519	08-01-2017	Rosenbluth et al.	
	222.	9744024	08-29-2017	Nguyen et al.	
	223.	9757137	09-12-2017	Krolik et al.	
	224.	9844386	12-19-2017	Nguyen et al.	
	225.	9844387	12-19-2017	Marchand et al.	
	226.	9848975	12-26-2017	Hauser	
	227.	9849014	12-26-2017	Kusleika	
	228.	9962178	05-08-2018	Greenhalgh et al.	
	229.	9999493	06-19-2018	Nguyen et al.	
	230.	10004531	06-26-2018	Rosenbluth et al.	
	231.	10010335	07-03-2018	Greenhalgh et al.	
	232.	10016266	07-10-2018	Hauser	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. 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	18/329,450- Conf# 1035
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	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	233.	10028759	07-24-2018	Wallace et al.	
	234.	10045790	08-14-2018	Cox et al.	
	235.	10098651	10-16-2018	Marchand et al.	
	236.	10130385	11-20-2018	Farhangnia et al.	
	237.	10226263	03-12-2019	Look et al.	
	238.	10238406	03-26-2019	Cox et al.	
	239.	10271864	04-30-2019	Greenhalgh et al.	
	240.	10327883	06-25-2019	Yachia	
	241.	10335186	07-02-2019	Rosenbluth et al.	
	242.	10342571	07-09-2019	Marchand et al.	
	243.	10349960	07-16-2019	Quick	
	244.	10383644	08-20-2019	Molaei et al.	
	245.	10524811	01-07-2020	Marchand et al.	
	246.	10588655	03-17-2020	Rosenbluth et al.	
	247.	10912577	02-09-2021	Marchand et al.	
	248.	11058445	07-13-2021	Cox et al.	
	249.	11058451	07-13-2021	Marchand et al.	
	250.	RE43902	01-01-2013	Hopkins et al.	
	251.	6569181	05-27-2003	Burns	
	252.	20020173819	11-21-2002	Leeflang et al.	
	253.	5383887	01-24-1995	Nadal	
	254.	6902540	06-07-2005	Dorros et al.	
	255.	5135484	08-04-1992	Wright	
	256.	6432122	08-13-2002	Gilson et al.	
	257.	6620182	09-16-2003	Khosravi et al.	
	258.	5947985	09-07-1999	Imram	
	259.	6126635	10-03-2000	Simpson et al.	
	260.	6165196	12-26-2000	Stack et al.	
	261.	5846251	12-08-1998	Hart	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. 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)		
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	Attorney Docket Number	111552.8018.US08

U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	262.	6264663	07-24-2001	Cano	
	263.	20020169474	11-14-2002	Kusleika	
	264.	4643184	02-17-1987	Mobin-Uddin	
	265.	4776337	10-11-1988	Palmaz	
	266.	4790812	12-13-1988	Hawkins Jr. et al.	
	267.	4870953	10-03-1989	DonMichael et al.	
	268.	4886062	12-12-1989	Wiktor	
	269.	4898575	02-06-1990	Fischell et al.	
	270.	5456667	10-10-1995	Ham et al.	
	271.	5496365	03-05-1996	Sgro	
	272.	5527326	06-18-1996	Hermann et al.	
	273.	5549626	08-27-1996	Miller et al.	
	274.	5769816	06-23-1998	Barbut et al.	
	275.	5800457	09-01-1998	Gelbfish	
	276.	5860938	01-19-1999	Lafontaine et al.	
	277.	5895406	04-20-1999	Gray et al.	
	278.	5911733	06-15-1999	Parodi	
	279.	5911754	06-15-1999	Kanesaka et al.	
	280.	5954737	09-21-1999	Lee	
	281.	6030397	02-29-2000	Moneti et al.	
	282.	6142987	11-07-2000	Tsugita	
	283.	6146396	11-14-2000	Konya et al.	
	284.	6146403	11-14-2000	St. Germain	
	285.	6179859	01-30-2001	Bates et al.	
	286.	6245089	06-12-2001	Daniel et al.	
	287.	6322572	11-27-2001	Lee	
	288.	6361545	03-26-2002	Macoviak et al.	
	289.	6402771	06-11-2002	Palmer et al.	
	290.	6475236	11-05-2002	Roubin et al.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. 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.

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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	291.	6485502	11-26-2002	Don Michael	
	292.	6508782	01-21-2003	Evans et al.	
	293.	6530923	03-11-2003	Dubrul et al.	
	294.	6544276	04-08-2003	Azizi	
	295.	6575995	06-10-2003	Huter et al.	
	296.	6610077	08-26-2003	Hancock et al.	
	297.	6620148	09-16-2003	Tsugita	
	298.	6660014	12-09-2003	Demarais et al.	
	299.	6702830	03-09-2004	Demarais et al.	
	300.	6824545	11-30-2004	Sepetka et al.	
	301.	6824550	11-30-2004	Noriega et al.	
	302.	6945977	09-20-2005	Demarais et al.	
	303.	7063707	06-20-2006	Bose et al.	
	304.	7300458	11-27-2007	Henkes et al.	
	305.	8608754	12-17-2013	Wensel et al.	
	306.	6159230	12-12-2000	Samuels	
	307.	6790204	09-14-2004	Zadno-azizi et al.	
	308.	20020049452	04-25-2002	Kurz et al.	
	309.	20020188276	12-12-2002	Evans et al.	
	310.	20050085846	04-21-2005	Carrison et al.	
	311.	20070093744	04-26-2007	Elmaleh	
	312.	20020161392	10-31-2002	Dubrul	
	313.	20210330344	10-28-2021	Rosenbluth et al.	
	314.	20210378694	12-09-2021	Thress et al.	
	315.	11154314	10-26-2021	Quick	
	316.	11147571	10-19-2021	Cox et al.	
	317.	20210290925	09-23-2021	Merritt et al.	
	318.	20220000507	01-06-2022	Hauser	
	319.	20220000506	01-06-2022	Hauser	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. 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.

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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	320.	20220000505	01-06-2022	Hauser	
	321.	20130126559	05-23-2013	Cowan et al.	
	322.	20040122359	06-24-2004	Wenz et al.	
	323.	20040267272	12-30-2004	Henniges et al.	
	324.	10709471	07-14-2020	Rosenbluth et al.	
	325.	20220039815	02-10-2022	Thress et al.	
	326.	20220022898	01-27-2022	Cox et al.	
	327.	20220015798	01-20-2022	Marchand et al.	
	328.	5376101	12-27-1994	Green et al.	
	329.	5192274	03-09-1993	Bierman	
	330.	20130116708	05-09-2013	Ziniti et al.	
	331.	20040260344	12-23-2004	Lyons et al.	
	332.	20060074401	04-06-2006	Ross	
	333.	20160151605	06-02-2016	Welch et al.	
	334.	20130197454	08-01-2013	SHIBATA et al.	
	335.	20100016837	01-21-2010	Howat	
	336.	20040138525	07-15-2004	Saadat et al.	
	337.	20090192495	07-30-2009	Ostrovsky et al.	
	338.	11000682	05-11-2021	Merritt et al.	
	339.	10695159	06-30-2020	Hauser	
	340.	10799331	10-13-2020	Hauser	
	341.	20020022859	02-21-2002	Hogendijk	
	342.	20020151918	10-17-2002	Lafontaine et al.	
	343.	11000682	05-11-2021	Merritt et al.	
	344.	5154724	10-13-1992	Andrews	
	345.	20030216774	11-20-2003	Larson	
	346.	20010004699	06-21-2001	Gittings et al.	
	347.	20010041909	11-15-2001	Tsugita et al.	
	348.	20010051810	12-13-2001	Dubrul et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	349.	20020022858	02-21-2002	Demond et al.	
	350.	20020026211	02-28-2002	Khosravi et al.	
	351.	20020032455	03-14-2002	Boock et al.	
	352.	20020095161	07-18-2002	Dhindsa	
	353.	20020095171	07-18-2002	Belef	
	354.	20020111648	08-15-2002	Kusleika et al.	
	355.	20020120277	08-29-2002	Hauschild et al.	
	356.	20020147458	10-10-2002	Hiblar et al.	
	357.	20020156457	10-24-2002	Fisher	
	358.	20030083693	05-01-2003	Daniel et al.	
	359.	20030100919	05-29-2003	Hopkins et al.	
	360.	20030114875	06-19-2003	Sjostrom	
	361.	20030116731	06-26-2003	Hartley	
	362.	20030125663	07-03-2003	Coleman et al.	
	363.	20030135230	07-17-2003	Massey et al.	
	364.	20030135258	07-17-2003	Andreas et al.	
	365.	20030153873	08-14-2003	Luther et al.	
	366.	20030153973	08-14-2003	Soun et al.	
	367.	20030168068	09-11-2003	Poole et al.	
	368.	20030176884	09-18-2003	Berrada et al.	
	369.	20030191516	10-09-2003	Weldon et al.	
	370.	20030208224	11-06-2003	Broome	
	371.	20040039412	02-26-2004	Isshiki et al.	
	372.	20040068288	04-08-2004	Palmer et al.	
	373.	20040073243	04-15-2004	Sepetka et al.	
	374.	20040098033	05-20-2004	Leeflang et al.	
	375.	20040133232	07-08-2004	Rosenbluth et al.	
	376.	20040138692	07-15-2004	Phung et al.	
	377.	20040167567	08-26-2004	Cano et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	378.	20040199201	10-07-2004	Kellett et al.	
	379.	20040199202	10-07-2004	Dubrul et al.	
	380.	20050033172	02-10-2005	Dubrul et al.	
	381.	20050038468	02-17-2005	Panetta et al.	
	382.	20050055047	03-10-2005	Greenhalgh	
	383.	20050085826	04-21-2005	Nair et al.	
	384.	20050085849	04-21-2005	Sepetka et al.	
	385.	20050119668	06-02-2005	Teague et al.	
	386.	20050177132	08-11-2005	Lentz et al.	
	387.	20050187570	08-25-2005	Nguyen et al.	
	388.	20050283165	12-22-2005	Gadberry	
	389.	20050283166	12-22-2005	Greenhalgh et al.	
	390.	20050283186	12-22-2005	Berrada et al.	
	391.	20060020286	01-26-2006	Niermann	
	392.	20060042786	03-02-2006	West	
	393.	20060047286	03-02-2006	West	
	394.	20060089533	04-27-2006	Ziegler et al.	
	395.	20060100662	05-11-2006	Daniel et al.	
	396.	20060155305	07-13-2006	Freudenthal et al.	
	397.	20060173525	08-03-2006	Behl et al.	
	398.	20060195137	08-31-2006	Sepetka et al.	
	399.	20060200221	09-07-2006	Malewicz	
	400.	20060224177	10-05-2006	Finitsis	
	401.	20060229645	10-12-2006	Bonnette et al.	
	402.	20060247500	11-02-2006	Voegele et al.	
	403.	20060253145	11-09-2006	Lucas	
	404.	20060276874	12-07-2006	Wilson et al.	
	405.	20060282111	12-14-2006	Morsi	
	406.	20060293696	12-28-2006	Fahey et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	407.	20070038225	02-15-2007	Osborne	
	408.	20070112374	05-17-2007	Paul, JR. et al.	
	409.	20070118165	05-24-2007	DeMello et al.	
	410.	20070149996	06-28-2007	Coughlin	
	411.	20070161963	07-12-2007	Smalling	
	412.	20070179513	08-02-2007	Deutsch	
	413.	20070191866	08-16-2007	Palmer et al.	
	414.	20070198028	08-23-2007	Miloslavskiet al.	
	415.	20070208361	09-06-2007	Okushi et al.	
	416.	20070208367	09-06-2007	Fiorella et al.	
	417.	20070213753	09-13-2007	Waller	
	418.	20070213765	09-13-2007	Adams et al.	
	419.	20070255252	11-01-2007	Mehta	
	420.	20070288054	12-13-2007	Tanaka et al.	
	421.	20080015541	01-17-2008	Rosenbluth et al.	
	422.	20080088055	04-17-2008	Ross	
	423.	20080157017	07-03-2008	Macatangay et al.	
	424.	20080167678	07-10-2008	Morsi	
	425.	20080183136	07-31-2008	Lenker et al.	
	426.	20080228209	09-18-2008	DeMello et al.	
	427.	20080234722	09-25-2008	Bonnette et al.	
	428.	20080262528	10-23-2008	Martin	
	429.	20080269798	10-30-2008	Ramzipoor et al.	
	430.	20080300466	12-04-2008	Gresham	
	431.	20090018566	01-15-2009	Escudero et al.	
	432.	20090054918	02-26-2009	Henson	
	433.	20090062841	03-05-2009	Amplatz et al.	
	434.	20090069828	03-12-2009	Martin et al.	
	435.	20090076417	03-19-2009	Jones	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	436.	20090160112	06-25-2009	Ostrovsky	
	437.	20090163846	06-25-2009	Aklog et al.	
	438.	20090182362	07-16-2009	Thompson et al.	
	439.	20090281525	11-12-2009	Harding et al.	
	440.	20090292307	11-26-2009	Razack	
	441.	20090299393	12-03-2009	Martin et al.	
	442.	20100030256	02-04-2010	Dubrul et al.	
	443.	20100042136	02-18-2010	Berrada et al.	
	444.	20100087844	04-08-2010	Fischer Jr.	
	445.	20100087850	04-08-2010	Razack	
	446.	20100114113	05-06-2010	Dubrulet al.	
	447.	20100121312	05-13-2010	Gielenz et al.	
	448.	20100137846	06-03-2010	Desaietal	
	449.	20100190156	07-29-2010	Van Wordragen et al.	
	450.	20100204712	08-12-2010	Mallaby	
	451.	20100249815	09-30-2010	Jantzen et al.	
	452.	20100268264	10-21-2010	Bonnette et al.	
	453.	20100318178	12-16-2010	Rapaport et al.	
	454.	20110034987	02-10-2011	Kennedy	
	455.	20110054405	03-03-2011	Whiting et al.	
	456.	20110060212	03-10-2011	Slee et al.	
	457.	20110118817	05-19-2011	Gunderson et al.,	
	458.	20110125181	05-26-2011	Brady et al.	
	459.	20110144592	06-16-2011	Wong et al.	
	460.	20110152823	06-23-2011	Mohiuddin et al.	
	461.	20110152993	06-23-2011	Marchand et al.	
	462.	20110160742	06-30-2011	Ferrera et al.	
	463.	20110160763	06-30-2011	Ferrera et al.	
	464.	20110190806	08-04-2011	Wittens	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	465.	20110196414	08-11-2011	Porter et al.	
	466.	20110213290	09-01-2011	Chin et al.	
	467.	20110213403	09-01-2011	Aboytes	
	468.	20110224707	09-15-2011	Miloslavskiet al.	
	469.	20110245807	10-06-2011	Sakata et al.	
	470.	20110251629	10-13-2011	Galdonik et al.	
	471.	20110264133	10-27-2011	Hanlon et al.	
	472.	20110265681	11-03-2011	Allen et al.	
	473.	20110288529	11-24-2011	Fulton	
	474.	20110288572	11-24-2011	Martin	
	475.	20110319917	12-29-2011	Ferrera et al.	
	476.	20120059309	03-08-2012	di Palma et al.	
	477.	20120059356	03-08-2012	di Palma et al.	
	478.	20120083824	04-05-2012	Berrada et al.	
	479.	20120083868	04-05-2012	Shrivastava	
	480.	20120089216	04-12-2012	Rapaport et al.	
	481.	20120101480	04-26-2012	Ingle et al.	
	482.	20120101510	04-26-2012	Lenker et al.	
	483.	20120138832	06-07-2012	Townsend	
	484.	20120143239	06-07-2012	Aklog et al.	
	485.	20120165919	06-28-2012	Cox et al.	
	486.	20120179181	07-12-2012	Straub et al.	
	487.	20120197277	08-02-2012	Stinis	
	488.	20120232655	09-13-2012	Lorrison et al.	
	489.	20120271105	10-25-2012	Nakamura et al.	
	490.	20120271231	10-25-2012	Agrawal	
	491.	20120277788	11-01-2012	Cattaneo	
	492.	20120310166	12-06-2012	Huff	
	493.	20130030460	01-31-2014	Marks et al.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. 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)		
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	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	494.	20130046332	02-21-2013	Jones et al.	
	495.	20130066348	03-14-2013	Fiorella et al.	
	496.	20130092012	04-18-2013	Marchand et al.	
	497.	20130096571	04-18-2013	Massicotte et al.	
	498.	20130102996	04-25-2013	Strauss	
	499.	20130116721	05-09-2013	Takagi et al.	
	500.	20130144326	06-06-2013	Brady et al.	
	501.	20130165871	06-27-2013	Fiorella et al.	
	502.	20130184703	07-18-2013	Shireman et al.	
	503.	20130197567	08-01-2013	Brady et al.	
	504.	20130226196	08-29-2013	Smith	
	505.	20130289608	10-31-2013	Tanaka et al.	
	506.	20130317589	11-28-2013	Martin et al.	
	507.	20130345739	12-26-2013	Brady et al.	
	508.	20140005712	01-02-2014	Martin	
	509.	20140005713	01-02-2014	Bowman	
	510.	20140005715	01-02-2014	Castella et al.	
	511.	20140005717	01-02-2014	Martin et al.	
	512.	20140025048	01-23-2014	Ward	
	513.	20140031856	01-30-2014	Martin	
	514.	20140046133	02-13-2014	Nakamura et al.	
	515.	20140046243	02-13-2014	Ray et al.	
	516.	20140121672	05-01-2014	Folk	
	517.	20140155830	06-05-2014	Bonnette et al.	
	518.	20140155908	07-22-2014	Rosenbluth et al.	
	519.	20140155980	06-05-2014	Turjman	
	520.	20140180397	06-26-2014	Gerberding et al.	
	521.	20140188143	04-03-2018	Martin et al.	
	522.	20140236219	08-21-2014	Dubrul et al.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. 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)		
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	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	523.	20140243882	08-28-2014	Ma	
	524.	20140257253	09-11-2014	Jemison	
	525.	20140276403	09-18-2014	Follmer et al.	
	526.	20140318354	10-30-2014	Thompson et al.	
	527.	20140324091	10-30-2014	Rosenbluth et al.	
	528.	20140330286	11-06-2014	Wallace et al.	
	529.	20140336691	11-13-2014	Jones et al.	
	530.	20140343593	11-20-2014	Chin et al.	
	531.	20140364896	12-11-2014	Consigny	
	532.	20140371779	12-18-2014	Vale et al.	
	533.	20150005781	01-01-2015	Lund-Clausen et al.	
	534.	20150005792	01-01-2015	Ahn	
	535.	20150018859	01-15-2015	Quick et al.	
	536.	20150018860	01-15-2015	Quick	
	537.	20150018929	01-15-2015	Martin et al.	
	538.	20150025555	01-22-2015	SOS	
	539.	20150032144	01-29-2015	Holloway	
	540.	20150059908	03-05-2015	Mollen	
	541.	20150088190	03-26-2015	Jensen	
	542.	20150127035	05-07-2015	Trapp et al.	
	543.	20150133990	05-14-2015	Davidson	
	544.	20150150672	06-04-2015	Ma	
	545.	20150164523	06-18-2015	Brady et al.	
	546.	20150164666	06-18-2015	Johnson et al.	
	547.	20150190155	07-09-2015	Ulm III	
	548.	20150190156	07-09-2015	Ulm III	
	549.	20150196380	07-16-2015	Berrada et al.	
	550.	20150196744	07-16-2015	Aboytes	
	551.	20150209058	07-30-2015	Ferrera et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	552.	20150209165	07-30-2015	Grandfield et al.	
	553.	20150238207	08-27-2015	Cox et al.	
	554.	20150250578	09-10-2015	Cook et al.	
	555.	20150265299	09-24-2015	Cooper et al.	
	556.	20150305756	10-29-2015	Rosenbluth	
	557.	20150305859	10-29-2015	Eller	
	558.	20150352325	12-10-2015	Quick	
	559.	20150360001	12-17-2015	Quick	
	560.	20150374391	12-31-2015	Quick	
	561.	20160008014	08-09-2016	Rosenbluth	
	562.	20160022293	01-28-2016	Dubrul et al.	
	563.	20160058540	03-03-2016	Don Michael	
	564.	20160074627	03-17-2016	Cottone	
	565.	20160106448	04-21-2016	Brady et al.	
	566.	20160106449	04-21-2016	Brady et al.	
	567.	20160113663	04-28-2016	Brady et al.	
	568.	20160113664	04-28-2016	Brady et al.	
	569.	20160113665	04-28-2016	Brady et al.	
	570.	20160113666	04-28-2016	Quick	
	571.	20160143721	05-26-2016	Rosenbluth	
	572.	20160206344	07-21-2016	Bruzzi et al.	
	573.	20160228134	08-11-2016	Martin et al.	
	574.	20160262790	09-15-2016	Rosenbluth et al.	
	575.	20160287276	10-06-2016	Cox et al.	
	576.	20160367285	12-22-2016	Sos	
	577.	20170014560	01-19-2017	Minskoff et al.	
	578.	20170037548	02-09-2017	Lee	
	579.	20170042571	02-16-2017	Levi	
	580.	20170058623	03-02-2017	Jaffrey et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	581.	20170079672	03-23-2017	Quick	
	582.	20170086864	03-30-2017	Greenhalgh et al.	
	583.	20170100142	04-13-2017	Look et al.	
	584.	20170105743	04-20-2017	Vale et al.	
	585.	20170105745	04-20-2017	Rosenbluth et al.	
	586.	20170112513	07-11-2017	Marchand et al.	
	587.	20170112514	04-27-2017	Marchand et al.	
	588.	20170189041	07-06-2017	Cox et al.	
	589.	20170233908	08-17-2017	Kroczynski et al.	
	590.	20170265878	09-21-2017	Marchand et al.	
	591.	20170303939	10-26-2017	Greenhalgh et al.	
	592.	20170303942	10-26-2017	Greenhalgh et al.	
	593.	20170303947	10-26-2017	Greenhalgh et al.	
	594.	20170303948	10-26-2017	Wallace et al.	
	595.	20170325839	11-16-2017	Rosenbluth et al.	
	596.	20170348014	12-07-2017	Wallace et al.	
	597.	20180042624	02-15-2018	Greenhalgh et al.	
	598.	20180042626	02-15-2018	Greenhalgh et al.	
	599.	20180064453	03-08-2018	Garrison et al.	
	600.	20180064454	03-08-2018	Losordo et al.	
	601.	20180070968	03-15-2018	Wallace et al.	
	602.	20180092652	04-05-2018	Marchand et al.	
	603.	20180105963	04-19-2018	Quick	
	604.	20180125512	05-10-2018	Nguyen et al.	
	605.	20180193043	07-12-2018	Marchand et al.	
	606.	20180236205	08-23-2018	Krautkremer et al.	
	607.	20180256178	09-13-2018	Cox et al.	
	608.	20180296240	10-18-2018	Rosenbluth et al.	
	609.	20180344339	12-06-2018	Cox et al.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	610.	20180361116	12-20-2018	Quick et al.	
	611.	20190000492	01-03-2019	Casey et al.	
	612.	20190046219	02-14-2019	Marchand et al.	
	613.	20190070401	03-07-2019	Merritt et al.	
	614.	20190117244	04-25-2019	Wallace et al.	
	615.	20190133622	05-06-2019	Wallace et al.	
	616.	20190133623	05-09-2019	Wallace et al.	
	617.	20190133624	05-09-2019	Wallace et al.	
	618.	20190133625	05-09-2019	Wallace et al.	
	619.	20190133626	05-09-2019	Wallace et al.	
	620.	20190133627	05-09-2019	Wallace et al.	
	621.	20190150959	05-23-2019	Cox et al.	
	622.	20190231373	08-01-2019	Quick	
	623.	20190321071	10-24-2019	Marchand et al.	
	624.	20190336148	11-07-2019	Greenhalgh et al.	
	625.	20200046368	02-13-2020	Merritt et al.	
	626.	20210113224	04-22-2021	Dinh	
	627.	20210186541	06-24-2021	Thress	
	628.	20220125451	04-28-2022	Hauser	
	629.	20220160382	05-26-2022	Hauser	
	630.	20140303658	10-09-2014	Bonnette et al.	
	631.	20050085769	04-21-2005	MacMahon et al.	
	632.	20220160383	05-26-2022	Hauser	
	633.	20220160381	05-26-2022	Hauser	
	634.	20170049942	02-23-2017	Conlan et al.	
	635.	20220240959	08-04-2022	Quick	
	636.	20220211992	07-07-2022	Merritt et al.	
	637.	6564828	05-20-2003	Ishida	
	638.	5197485	03-30-1993	Grooters	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	639.	20130035628	02-07-2013	Garrison et al.	
	640.	8057497	11-15-2011	Raju et al.	
	641.	20150173782	06-25-2015	Garrison et al.	
	642.	20130281788	10-24-2013	Garrison	
	643.	20170196576	07-13-2017	Long et al.	
	644.	20070010787	01-11-2007	Hackett et al.	
	645.	20170319221	11-09-2017	CHU	
	646.	20110196309	08-11-2011	Wells	
	647.	20140296868	10-02-2014	Garrison et al.	
	648.	20010049486	12-06-2001	Evans et al.	
	649.	20100217276	08-26-2010	Garrison et al.	
	650.	20140257363	09-11-2014	Lippert	
	651.	20170056032	03-02-2017	Look et al.	
	652.	20160220741	08-04-2016	Garrison et al.	
	653.	20180104404	04-19-2018	Ngo-Chu	
	654.	6719717	04-13-2004	Johnson et al.	
	655.	10478535	11-19-2019	Ogle	
	656.	6960189	11-01-2005	Bates et al.	
	657.	7004931	02-28-2006	Hogendijk	
	658.	7223253	05-29-2007	Hogendijk	
	659.	20220211400	07-07-2022	Cox et al.	
	660.	11433218	09-06-2022	Quick et al.	
	661.	20040127936	07-01-2004	Salahieh et al.	
	662.	20210022843	01-28-2021	Hauser	
	663.	5158564	10-27-1992	Schnepp-Pesch et al.	
	664.	20220347455	11-03-2022	Merritt et al.	
	665.	20220346800	11-03-2022	Merritt et al.	
	666.	20220346813	11-03-2022	Quick	
	667.	20220346814	11-03-2022	Quick	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	668.	3675657	07-11-1972	Gauthier	
	669.	9216277	12-22-2015	Myers	
	670.	9980813	05-29-2018	Eller	
	671.	6451036	09-17-2002	Heitzmann et al.	
	672.	20080234715	09-25-2008	Pesce et al.	
	673.	20110034986	02-10-2011	Chou et al.	
	674.	20190336142	11-07-2019	Torrie et al.	
	675.	20190239910	08-08-2019	Brady et al.	
	676.	20060217664	09-28-2006	Hattler et al.	
	677.	20170252057	09-07-2017	Bonnette et al.	
	678.	20170340867	11-30-2017	Accisano, II	
	679.	11457936	10-04-2022	Buck et al.	
	680.	11259821	03-01-2022	Buck et al.	
	681.	11439799	09-13-2022	Buck et al.	
	682.	20210315598	10-14-2021	Buck et al.	
	683.	11529158	12-20-2022	Hauser	
	684.	20220362512	11-17-2022	Quick et al.	
	685.	20220142638	05-12-2022	Enright et al.	
	686.	20220151647	05-19-2022	Dolendo et al.	
	687.	20220152355	05-19-2022	Dolendo et al.	
	688.	5653684	08-05-1997	Laptewicz et al.	
	689.	5908435	06-01-1999	Samuels	
	690.	4611594	09-16-1986	Grayhack et al.	
	691.	9827084	11-28-2017	Bonnette et al.	
	692.	20210137667	05-13-2021	Sonnette et al.	
	693.	20180256177	09-13-2018	Cooper et al.	
	694.	11013523	05-25-2021	Arad Hadar	
	695.	20200113412	04-16-2020	Jensen	
	696.	11406801	08-09-2022	Fojtik et al.	

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	697.	11554005	01-17-2023	Merritt et al.	
	698.	11559382	01-24-2023	Merritt et al.	
	699.	6818006	11-16-2004	Douk et al.	
	700.	9078682	07-14-2015	Lenker et al.	
	701.	20140052161	02-20-2014	Cully et al.	
	702.	20180042623	02-15-2018	Batiste	
	703.	20180184912	07-05-2018	Al-Ali	
	704.	20160262774	09-15-2016	HONDA	
	705.	20120172918	07-05-2012	Fifer et al.	
	706.	20050054995	03-10-2005	Barzell et al.	
	707.	20030116731	06-26-2003	Hartley	
	708.	5421824	06-06-1995	Clement et al.	
	709.	20210236148	08-05-2021	Marchand et al.	
	710.	5158533	10-27-1992	Strauss et al.	
	711.	20230046775	02-16-2023	Quick	
	712.	20140188127	07-03-2014	Dubrul et al.	
	713.	20140074144	03-13-2014	Shrivastava et al.	
	714.	8535283	09-17-2013	Heaton et al.	
	715.	8753322	06-17-2014	Hu et al.	
	716.	8808259	08-19-2014	Walton et al.	
	717.	20230062809	03-02-2023	Merritt et al.	
	718.	20230070120	03-09-2023	Cox et al.	
	719.	20010031981	10-18-2001	Evans et al.	
	720.	20040102807	05-27-2004	Kusleika et al.	
	721.	6059814	05-09-2000	Ladd	
	722.	11648028	05-16-2023	Rosenbluth et al.	
	723.	5030201	07-09-1991	Palestrant	
	724.	11642209	05-09-2023	Merritt et al.	
	725.	6540722	04-01-2003	Boyle et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
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	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	726.	7678131	03-16-2010	Muller	
	727.	9301769	04-05-2016	Brady et al.	
	728.	20210393278	12-23-2021	O'MALLEY et al.	
	729.	20210038385	02-11-2021	Popp et al.	
	730.	20050203605	09-15-2005	Dolan	
	731.	6152144	11-28-2000	Lesh et al.	
	732.	9011551	04-21-2015	Oral et al.	
	733.	8647367	02-11-2014	Kassab et al.	
	734.	11166703	11-09-2021	Kassab et al.	
	735.	8834519	09-16-2014	van der Burg et al.	
	736.	7713282	05-11-2010	Frazier et al.	
	737.	8080032	12-20-2011	van der Burg et al.	
	738.	7722641	05-25-2010	van der Burg et al.	
	739.	8523897	09-03-2013	van der Burg et al.	
	740.	8535343	09-17-2013	van der Burg et al.	
	741.	7152605	12-26-2006	Khairkhahan et al.	
	742.	9168043	10-27-2015	van der Burg et al.	
	743.	7128073	10-31-2006	van der Burg et al.	
	744.	10772636	09-15-2020	Kassab et al.	
	745.	8480708	07-09-2013	Kassab et al.	
	746.	9717488	08-01-2017	Kassab et al.	
	747.	8784469	07-22-2014	Kassab	
	748.	9566073	02-14-2017	Kassab et al.	
	749.	20160192912	07-07-2016	Kassab et al.	
	750.	20160030708	02-04-2016	Casiello et al.	
	751.	20160135829	05-19-2016	Holoehwost et ah	
	752.	20060264905	11-23-2006	Eskridge et al.	
	753.	5244619	09-14-1993	Burnham	
	754.	20170021130	01-26-2017	Dye	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
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	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

U.S. PATENTS AND PUBLICATIONS					
Examiner Initial*	Cite No.	Patent Number	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	755.	20160106353	04-21-2016	Schuetz et al.	
	756.	10960114	03-30-2021	Goisis	
	757.	10531883	01-14-2020	Deville et al.	
	758.	9581942	02-28-2017	Shippert	
	759.	5234403	08-10-1993	Yoda et al.	
	760.	20100106081	04-29-2010	Brandeis	
	761.	20100094201	04-15-2010	Mallaby	
	762.	20050004534	01-06-2005	Lockwood et al.	
	763.	20190365395	12-05-2019	Tran et al.	
	764.	20160038267	02-11-2016	ALLEN et al.	
	765.	20140222070	08-07-2014	BELSON et al.	
	766.	20130204297	08-08-2013	Melsheimer et al.	
	767.	11697012	07-11-2023	Merritt et al.	
	768.	11697011	07-11-2023	Merritt et al.	
	769.				

FOREIGN PATENT DOCUMENTS						
Examiner Initial*	Cite No.	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	1. **	JP2004097807	04-02-2004	Takaakiet al.		
	2. **	JP2005230132	09-02-2005	Tomihisa		
	3. **	JP2005323702	11-24-2005	Tomihisa		
	4. **	JP2006094876	04-13-2006	Tomihisa		
	5. **	JPH6190049	07-12-1994	Deyuaa Edowaado lindo		
	6. **	WO1997017889	05-22-1997	Applied Medical Resources Corporation		
	7. **	WO2000053120	09-14-2000	Microvena Corporation		
	8. **	WO2005046736	05-29-2005	Bonnette		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
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	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No.	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	9. **	WO2006110186	10-19-2006	Bonnette		
	10. **	WO2007092820	08-16-2007	Lazarus Effect Inc.		
	11. **	WO2009155571	12-23-2009	Coherex Medical Inc.		
	12. **	WO2010010545	01-28-2010	Neuravi Limited		
	13. **	WO2010023671	03-04-2010	Rapid Medical Ltd.		
	14. **	WO2010049121	05-06-2010	Acandis GMBH & Co		
	15. **	WO2010102307	09-10-2010	Lazarus Effect Inc.		
	16. **	WO2011054531	05-12-2011	Cattaneo		
	17. **	WO2012065748	05-24-2012	Monstadt et al.		
	18. **	WO2012009675	01-19-2012	Martin		
	19. **	WO2014047650	03-27-2014	Inceptus Medical LLC		
	20. **	WO2014081892	05-30-2014	Rosenbluth et al.		
	21. **	WO2015061365	04-30-2015	Inceptus Medical LLC		
	22. **	WO2015006782	01-13-2015	Inceptus Medical LLC		
	23. **	JP2011526820 (corresponds to WO2010/003135)	01-07-2010	Hot-Spur Technologies, Inc.		
	24. **	JP2001522631 (corresponds to WO99/23958)	05-20-1999	Prolifix Medical, Inc.		
	25. **	WO2010002549	01-07-2010	Hot-Spur Technologies, Inc.		
	26. **	EP1867290	02-27-2013	Cordis Corporation		
	27. **	JP 2005-095242	06-15-2005	Ishimaru		
	28. **	WO9838920	09-11-1998	Daniel et al.		
	29. **	WO03015840	02-27-2003	Advanced Bio Prosthetic Surfaces Ltd.		
	30. **	WO2004093696	11-04-2004	Kellett et al.		
	31. **	WO1999044542	09-10-1999	SCHIMED Life Systems, Inc.		
	32. **	WO2012011097	01-26-2012	The Medical Research, Infrastructure and Health Services Fund of the Tel Aviv Medical Center		
	33. **	WO2018080590	05-03-2018	Inari Medical, Inc.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
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	Attorney Docket Number	111552.8018.US08

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No.	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	34. **	WO2017070702	04-27-2017	Inari Medical, Inc.		
	35. **	WO2017024258	02-09-2017	KP MEDCURE, INC.		
	36. **	DE102017004383	07-12-2018	Verlage		
	37. **	WO2019075444	04-18-2019	Inceptus Medical, LLC		
	38. **	WO2015191646	12-17-2015	Inceptus Medical, LLC		
	39. **	WO2019050765	03-14-2019	Inari Medical, Inc.		
	40. **	WO2017106877	06-22-2017	Inari Medical, Inc.		
	41. **	WO2012120490	09-13-2012	Neuravi Llimited		
	42. **	CN103932756	07-23-2014	Wu et al.		
	43. **	WO2011032712	03-24-2011	MAGIERKA ALEXANDRINA		
	44. **	WO2015121424	08-20-2015	Technip France		
	45. **	WO2004018916	03-04-2004	Asahi Organic Chemicals Industry Co., LTD.		
	46. **	WO2020036809	02-20-2020	Inari Medical, Inc.		
	47. **	WO2021127202	06-24-2021	Inari Medical, Inc.		
	48. **	CN108348319	07-31-2018	GW Medical LLC		
	49. **	CN111281482	06-16-2020	Stryker Corporation		
	50. **	CN103764049	04-30-2014	Marks et al.		
	51. **	CN104068910	10-01-2014	Shanghai Microport Medical Group Co Ltd		
	52. **	CN102186427	09-14-2011	Hotspur Technologies Inc.		
	53. **	WO2015189354	12-17-2015	Neuravi Ltd.		
	54. **	WO0202162	01-10-2002	Concentric Medical Inc.		
	55. **	EP1254634	11-06-2002	Radi Medical Systems		
	56. **	WO2019222117	11-21-2019	Stryker Corporation		
	57. **	GB2498349	07-17-2013	Cook Medical Technologies		
	58. **	WO0032118	06-08-2000	Atropos Limited		
	59. **	WO2017058280	04-06-2017	GW Medical LLC		
	60. **	WO2012049652	04-19-2012	Endogrowht		
	61. **	WO2017189535	11-02-2017	Stryker Corporation		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
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	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No.	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	62. **	WO2017189550	11-02-2017	Stryker Corporation		
	63. **	WO2017189591	11-02-2017	Stryker Corporation		
	64. **	WO2017189615	11-02-2017	Stryker Corporation		
	65. **	WO2017210487	12-07-2017	Stryker Corporation		
	66. **	GB1588072	04-15-1981	Beecher		
	67. **	AU2015210338	08-27-2015	Shifamed Holdings LLC		
	68. **	WO2018049317	03-15-2018	Stryker Corporation		
	69. **	WO2019010318	01-10-2019	Stryker Corporation		
	70. **	WO2019094456	05-16-2019	Stryker Corporation		
	71. **	WO2012162437	11-29-2012	Lazarus Effect Inc.		
	72. **	WO2009086482	07-09-2009	Lazarus Effect Inc.		
	73. **	WO9839053	09-11-1998	Scimed Life Systems Inc.		
	74. **	WO9833443	08-06-1998	Angioguard		
	75. **	WO9851237	11-19-1998	Gertler		
	76. **	WO2009082513	07-02-2009	Vortex Medical		
	77. **	WO2018148174	08-16-2018	KP MEDCURE, INC.		
	78. **	WO2021248042	12-09-2021	Inari Medical, Inc.		
	79. **	WO2021076954	04-22-2021	Inari Medical, Inc.		
	80. **	WO2011073176	06-23-2011	Novartis AG		
	81. **	WO2021067134	04-08-2021	BECTON, DICKINSON AND COMPANY		
	82. **	WO2022032173	02-10-2022	Inari Medical, Inc.		
	83. **	CN110652645	01-07-2020	Shanghai Warbey Medical Technology Co Ltd		
	84. **	WO2019246240	12-26-2019	INTU ITIVE SURGICAL OPERATIONS, INC.		
	85. **	JPH07323090A	12-12-1995	Heisei		
	86. **	WO2022103848	05-19-2022	Inari Medical, Inc.		
	87. **	WO2022109021	05-27-2022	Inari Medical, Inc.		
	88. **	WO2022109034	05-27-2022	Inari Medical, Inc.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
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	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No.	Foreign Document Number[3]	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	89.	WO2006124307	11-23-2006	KERBEROS PROXIMAL SOLUTIONS, INC.		
	90.	WO2016014955	01-28-2016	OSTEOMEDIX, INC.		
	91.	EP2942624	11-11-2015	Kim, Hong		
	92.	WO2006029270	03-16-2006	SMITH & NEPHEW, INC.		

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[5]
	1. **	GIBBS, et al., "Temporary Stent as a bail-out device during percutaneous transluminal coronary angioplasty: preliminary clinical experience," British Heart Journal, 1994, 71:372-377, October 12, 1993, 6 pgs.	
	2. **	GUPTA, S. et al., "Acute Pulmonary Embolism Advances in Treatment", JAPI, Association of Physicians India, March 2008, Vol. 56, 185-191.	
	3. **	International Search Report and Written Opinion for International App. No. PCT/US13/61470, mailed January 17, 2014, 7 pages.	
	4. **	International Search Report and Written Opinion for International App. No. PCT/US2014/046567, mailed 11/3/2014, 13 pages	
	5. **	International Search Report and Written Opinion for International App. No. PCT/US2014/061645, mailed 1/23/2015, 15 pages.	
	6. **	International Search Report for International App. No. PCT/US13/71101, mailed March 31, 2014, 4 pages.	
	7. **	KONSTANTINIDES, S. et al., "Pulmonary embolism hotline 2012 - Recent and expected trials", Thrombosis and Haemostasis, January 9, 2013:33; 43-50.	
	8. **	KONSTANTINIDES, S. et al., "Pulmonary embolism: risk assessment and management", European Society of Cardiology; European Heart Journal, September 7, 2012:33, 3014-3022.	
	9. **	KUCHER, N. et al., "Percutaneous Catheter Thrombectomy Device for Acute Pulmonary Embolism: In Vitro and in Vivo Testing", Circulation, September, 2005:112:e28-e32.	
	10. **	KUCHER, N., "Catheter Interventions in Massive Pulmonary Embolism", Cardiology Rounds, March, 2006 Volume 10, Issue 3, 6 pages.	
	11. **	KUCHER, N. et al., "Management of Massive Pulmonary Embolism", Radiology, September 2005:236:3 852-858.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

	12. **	KUCHER, N. et al., "Randomized, Controlled Trial of Ultrasound-Assisted Catheter-Directed Thrombolysis for Acute Intermediate-Risk Pulmonary Embolism." Circulation, 2014, 129, pages 9 pages.	
	13. **	KUO, W. et al., "Catheter-directed Therapy for the Treatment of Massive Pulmonary Embolism: Systematic Review and Meta-analysis of Modern Techniques", Journal of Vascular and Interventional Radiology, November 2009:20:1431-1440.	
	14. **	KUO, W. et al., "Catheter-Directed Embolectomy, Fragmentation, and Thrombolysis for the Treatment of Massive Pulmonary Embolism After Failure of Systemic Thrombolysis", American College of CHEST Physicians 2008: 134:250-254.	
	15. **	KUO, W. MD, "Endovascular Therapy for Acute Pulmonary Embolism", Continuing Medical Education Society of Interventional Radiology ("CME"); Journal of Vascular and Interventional Radiology, February 2012: 23:167-179.	
	16. **	LEE, L. et al, "Massive pulmonary embolism: review of management strategies with a focus on catheter-based techniques", Expert Rev. Cardiovasc. Ther. 8(6), 863-873 (2010)	
	17. **	LIU, S. et al, "Massive Pulmonary Embolism: Treatment with the Rotarex Thrombectomy System", Cardiovascular Interventional Radiology; 2011: 34:106-113.	
	18. **	MULLER-HULSBECK, S. et al. "Mechanical Thrombectomy of Major and Massive Pulmonary Embolism with Use of the Amplatz Thrombectomy Device", Investigative Radiology, June 2001:36:6:317-322.	
	19. **	REEKERS, J. et al., "Mechanical Thrombectomy for Early Treatment of Massive Pulmonary Embolism", CardioVascular and Interventional Radiology, 2003: 26:246-250.	
	20. **	SCHMITZ-RODE et al., "New Mesh Basket for Percutaneous Removal of Wall-Adherent Thrombi in Dialysis Shunts," Cardiovasc Intervent Radiol 16:7-10 1993 4 pgs.	
	21. **	SCHMITZ-RODE et al., "Temporary Pulmonary Stent Placement as Emergency Treatment of Pulmonary Embolism," Journal of the American College of Cardiology, Vol. 48, No.4, 2006 (5 pgs.)	
	22. **	SCHMITZ-RODE, T. et al., "Massive Pulmonary Embolism: Percutaneous Emergency Treatment by Pigtail Rotation Catheter", JACC Journal of the American College of Cardiology, August 2000:36:2:375-380.	
	23. **	SPIOTTA, A et al., "Evolution of thrombectomy approaches and devices for acute stroke: a technical review." J NeuroIntervent Surg 2015, 7, pages 7 pages.	
	24. **	SVILAAS, T. et al., "Thrombus Aspiration During Primary Percutaneous Coronary Intervention." The New England Journal of Medicine, 2008, Vol. 358, No. 6, 11 pages.	
	25. **	TAPSON, V., "Acute Pulmonary Embolism", The New England Journal of Medicine, March 6, 2008:358:2037-52.	
	26. **	The Penumbra Pivotal Stroke Trial Investigators, "The Penumbra Pivotal Stroke Trial: Safety and Effectiveness of a New Generation of Mechanical Devices for Clot Removal in Intracranial Large Vessel Occlusive Disease." Stroke, 2009, 40: page 9 pages.	
	27. **	TRUONG et al., "Mechanical Thrombectomy of Iliocaval Thrombosis Using a Protective Expandable Sheath," Cardiovasc Intervent Radiol27-254-258, 2004, 5 pgs.	
	28. **	TURK et al., "ADAPT FAST study: a direct aspiration first pass technique for acute stroke thrombectomy." J NeuroIntervent Surg, Vol. 6, 2014, 6 pages.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

	29. **	UFLACKER, R., "Interventional Therapy for Pulmonary Embolism", Journal of Vascular and Interventional Radiology, February 2001: 12:147-164.	
	30. **	VERMA, R., MD et al. "Evaluation of a Newly Developed Percutaneous Thrombectomy Basket Device in Sheep With Central Pulmonary Embolisms", *Investigative Radiology*, October 2006, 41, 729-734.	
	31. **	International Search Report and Written Opinion for International App. No. PCT/US2015/034987 filed June 9, 2015, Applicant: Inceptus Medical, LLC, Date of Mailing: September 17, 2015, 12 pages.	
	32. **	International Search Report and Written Opinion for International App. No. PCT/US2016/067628 filed December 19, 2016, Applicant: Inari Medical, Inc., Date of Mailing: April 10, 2017, 11 pages.	
	33. **	GOLDHABER, S. et al. "Percutaneous Mechanical Thrombectomy for Acute Pulmonary Embolism - A Double-Edged Sword," American College of CHEST Physicians, August 2007, 132:2, 363-372.	
	34. **	GOLDHABER, S., "Advanced treatment strategies for acute pulmonary embolism, including thrombolysis and embolectomy," Journal of Thrombosis and Haemostasis, 2009: 7 (Suppl. 1): 322-327.	
	35. **	International Search Report and Written Opinion for International App. No. PCT/US2017/029696, Date of Filing: April 26, 2017, Applicant: Inari Medical, Inc., Date of Mailing: September 15, 2017, 19 pages.	
	36. **	International Search Report and Written Opinion for International App. No. PCT/US2016/058536, Date of Filing: October 24, 2016, Applicant: Inari Medical, Inc., Date of Mailing: March 13, 2017, 14 pages.	
	37. **	International Search Report and Written Opinion for International App. No. PCT/US2018/048786, Date of Filing: August 30, 2018, Applicant: Inari Medical, Inc., Date of Mailing: December 13, 2018, 12 pages.	
	38. **	International Search Report and Written Opinion for International App. No. PCT/US2018/055780, Date of Filing: October 13, 2018, Applicant: Inceptus Medical LLC., Date of Mailing: January 22, 2019, 8 pages.	
	39. **	International Search Report and Written Opinion for International App. No. PCT/US2019/045794, Date of Filing: August 8, 2019, Applicant: Inari Medical, Inc., Date of Mailing: November 1, 2019, 17 pages.	
	40. **	International Search Report and Written Opinion for International App. No. PCT/US2020/056067, Date of Filing: October 16, 2020; Applicant: Inari Medical, Inc., Date of Mailing: January 22, 2021, 8 pages.	
	41. **	International Search Report and Written Opinion for International App. No. PCT/US2020/055645, Date of Filing: December 17, 2020; Applicant: Inari Medical, Inc., Date of Mailing: April 14, 2021, 12 pages.	
	42. **	VORWERK, D. MD, et al., "Use of a Temporary Caval Filter to Assist Percutaneous Iliocaval Thrombectomy: Experimental Results." SCVIR, 1995, 4 pages.	
	43. **	WIKIPEDIA; Embolectomy; retrieved from the internet: https://en.wikipedia.org/wiki/Embolectomy; 4 pgs.; retrieved/printed: 3/24/2016	
	44. **	O'SULLIVAN; Thrombolysis versus thrombectomy in acute deep vein thrombosis; Interventional Cardiology; 3(5); pp. 589-596; October 2011	
	45. **	CAPTURE VASCULAR SYSTEMS; (company website); retrieved from the internet: http://www.capturevascular.com; 3 pgs.; retrieved/printed: 3/24/2016	
	46. **	EDWARDS LIFESCIENCES; Fogarty® Occlusion Catheters (product brochure); retrieved from the internet: http://web.archive.org/web/20150228193218/http://www.edwards.com/products/vascular/atraumaticocclusion/pages/occlusioncatheter.aspx; ©2011; 2 pgs.; retrieved/printed: 3/24/2011	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

	47. **	BOSTON SCIENTIFIC; Fetch(TM) 2 Aspiration Catheter (product information);retrieved from the internet: http://www.bostonscientific.com/en-US/products/thrombectomy-systems/fetch2-aspiration-catheter.html; 2 pgs.; retrieved/printed: 3/24/2016	
	48. **	PENUMBRA, INC.; Indigo® System (product information); retrieved from the internet: http://www.penumbrainc.com/peripherallpercutaneous-thromboembolectomy/ indigo-system; 7 pgs.; retrieved/printed: 3/24/2016	
	49. **	YOUTUBE; Merci Retrieval System X Series Animation; uploaded March 16,2009 (product information); posted on May 7, 2009 by SSMDePAUL, time 1:09, retrieved from the internet: https://www.youtube.com/watch?v=MGX7deuFkhc; 3 pgs.; retrieved/printed: 3/24/2016	
	50. **	COVIDIEN; Solitaire(TM) AS Neurovascular Remodeling Device (product information); retrieved from the internet: http://www.ev3.net/neuro/intl/remodeling-devices/solitaire-ab. htm; ©2015; 2 pgs.; retrieved/printed: 3/24/2016	
	51. **	International Search Report and Written Opinion for International App. No. PCT/US21/35965, Date of Filing: June 4, 2021, Applicant: Inari Medical, Inc., Date of Mailing: September 28, 2021, 12 pages.	
	52. **	International Search Report and Written Opinion for International App. No. PCT/US21/45072 Date of Filing: August 6, 2021, Applicant: Inari Medical, Inc., Date of Mailing: January 20, 2022, 10 pages.	
	53. **	International Search Report and Written Opinion for International App. No. PCT/US21/58793; Date of Filing: November 10, 2021, Applicant: Inari Medical, Inc., Date of Mailing: March 16, 2022, 13 pages.	
	54. **	International Search Report and Written Opinion for International App. No. PCT/US21/59718; Date of Filing: November 17, 2021, Applicant: Inari Medical, Inc., Date of Mailing: March 22, 2022, 13 pages.	
	55. **	International Search Report and Written Opinion for International App. No. PCT/US21/59735; Date of Filing: November 17, 2021, Applicant: Inari Medical, Inc., Date of Mailing: March 22, 2022, 11 pages.	
	56.	International Search Report and Written Opinion for International App. No. PCT/US23/60502; Date of Filing: January 11, 2023, Applicant: Inari Medical, Inc., Date of Mailing: May 25, 2023, 9 pages.	
	57.	International Search Report and Written Opinion for International App. No. PCT/US23/61256; Date of Filing: January 25, 2023, Applicant: Inari Medical, Inc., Date of Mailing: June 7, 2023, 8 pages.	
	58.	Gross et al., "Dump the pump: manual aspiration thrombectomy (MAT) with a syringe is technically effective, expeditious, and cost-efficient," J NeuroIntervent Surg, 2018, 4 pages.	

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.

CERTIFICATION STATEMENT
Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	18/329,450- Conf# 1035
	Filing Date	June 5, 2023
	First Named Inventor	Ben Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552.8018.US08

☐ 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.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98 and the Examiner is respectfully requested to consider the listed references. This Information Disclosure Statement is not to be construed as a representation that: (i) a search has been made; (ii) additional information that may be material to the examination of this application does not exist; (iii) the information, protocols, results and the like reported by third parties are accurate or enabling; or (iv) the cited information is, or is considered to be, material to patentability. In addition, Applicant does not admit that any enclosed item of information constitutes prior art to the subject invention and specifically reserves the right to demonstrate that any such reference is not prior art.

COPIES OF REFERENCES

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), Applicant has not submitted copies of U.S. patents and U.S. patent applications. Applicant submits herewith copies of foreign patents and non-patent literature in accordance with 37 C.F.R. § 1.98(a)(2). Those documents which are marked with a double asterisk (**) next to the Cite No. in the attached form PTO/SB/08 are not supplied because they were previously cited by or submitted to the Office in prior application number **16/536,185** and filed on **August 8, 2019** and relied upon in this application for an earlier filing date under 35 U.S.C. § 120.

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	/Matthew S. Williams/	Date (YYYY-MM-DD)	2023-07-13
Name/Print	Matthew S. Williams	Registration Number	77,516

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.**

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**07/13/2023 07:00:38 PM ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	62439598	FILING DATE	06/05/2023
CUSTOMER #	25096	FIRST NAMED INVENTOR	Ben Merritt
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 8

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2023-7-13 IDS SB08 - 111552-8018US8.PDF	35	Information Disclosure Statement (IDS) Form (SB08)	386 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
NPL_ISR_PCT_2023-61256-June-7-2023-8-pages.PDF	8	Non Patent Literature	1063 KB
FOR_EP2942624.PDF	24	Foreign Reference	1188 KB
FOR_WO2006029270.PDF	33	Foreign Reference	1157 KB
FOR_WO2006124307.PDF	19	Foreign Reference	2080 KB

FOR_WO2016014955.PDF	63	Foreign Reference	2325 KB
NPL-Gross-Dump the Pump.PDF	4	Non Patent Literature	870 KB
NPL_ISR_WO_PCTUS2023060502_May_25_2023_9pages.PDF	9	Non Patent Literature	3976 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
2023-7-13 IDS SB08 - 111552-8018US8.PDF	207315D8804338839BA9FC058B878CCD21E1EACC931FE0A8EB133EA40D57DC7B7A2EC8FB1E09F5ED4EEAE4BB0147738748B3AF15CD9FC518F0E2CD650AA57B26
NPL_ISR_PCT_2023-61256-June-7-2023-8-pages.PDF	E29F558402CAA5ECA7B480DBF767FC910107364FF8EB3919C86E39BC20664311EDA23D81B18626667115B85F0FF8707387E626478C646A16AA39EB2CD5DE7AAA
FOR_EP2942624.PDF	76F180E3DB96728ABCFFD31B77A2404E0AC8EA38F6420ED879A30A22CD22FA1628FB338AD6869D29C985D62AFB79F292882F89866AD893AB9B9EB39BC5CE38DF
FOR_WO2006029270.PDF	9F9FCC67AFD589CE61E4B384802B8F1B3B2118E927157C959323391A302F028ADA8961E7CC81A93CDF03C5DD57AD1D8FB16AE710689466AD8D1ED27132ACD968
FOR_WO2006124307.PDF	4CA9E275B28C639DF92082C698747D391EB4FEFEEA1BB6C9B742A1F4DE7964B77944A82E842650ED0069421D200988267A5E6CE83FEC33F777AC3CCFF6120555
FOR_WO2016014955.PDF	DE12ACD76BAE4B0E156B6F9D382CAEBE3E6243ED877F035256811EF33F0A9463A0204B3777321B5207E9E06058DD462E99A3EA229302CDF42B2A63C4E5792EF2
NPL-Gross-Dump the	D44985D30C015BE8DA101967568EDF70598C9DCC517B882F1

Pump.PDF	524CC5F8D5C8C53620135568E11D3A8E76C94DABDD42BADC78DE5603483BF94B00DA3679A300F1D
NPL_ISR_WO_PCTUS2023060502_May_25_2023_9pages.PDF	D531F14961694901D7333C4BAA563CF184EF439838AFD5147B2BDDC50612BF18C97B659466792D95F507F17FF02F9D7F5C1806B1068BFC456412E490186AEEF2

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 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: 18/329,450

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			N/A	320
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	700
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	800
TOTAL CLAIMS (37 CFR 1.16(i))	22 minus 20 =	* 2			OR	x 100 =	200
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4 minus 3 =	* 1				x 480 =	480
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
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	2300

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	RATE($)	ADDITIONAL FEE($)		RATE($)	ADDITIONAL FEE($)
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
18/329,450	06/05/2023		2500	111552.8018.US08	22	4

CONFIRMATION NO. 1035

FILING RECEIPT



25096
PERKINS COIE LLP - SEA General
PATENT-SEA
P.O. BOX 1247
SEATTLE, WA 98111-1247

Date Mailed: 06/28/2023

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)

Ben Merritt, San Clemente, CA;
Jacqueline Macias, Fullerton, CA;
Brian Michael Strauss, San Clemente, CA;
Thomas Tu, Louisville, KY;

Applicant(s)

Inari Medical, Inc., Irvine, CA;

Power of Attorney: The patent practitioners associated with Customer Number 25096

Domestic Priority data as claimed by applicant

This application is a CON of 18/167,757 02/10/2023
which is a CON of 17/976,711 10/28/2022
which is a CON of 17/865,315 07/14/2022 PAT 11,642,209
which is a CON of 16/536,185 08/08/2019 PAT 11,559,382
which claims benefit of 62/718,269 08/13/2018
and claims benefit of 62/718,248 08/13/2018

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: 06/26/2023
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/329,450**
Projected Publication Date: 10/05/2023
Non-Publication Request: No
Early Publication Request: No
Title

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Preliminary Class

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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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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UNITED STATES
PATENT AND TRADEMARK OFFICE

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	06/05/2023 07:32:30 PM ET	111552.8018.US08

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	62212594	AUTHORIZED BY	Matthew Williams
CUSTOMER #	25096	FILING DATE	-
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Ben Merritt

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 3369	E202365J32506891	JiYoung Anderson

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1201	EACH INDEPENDENT CLAIM IN EXCESS OF THREE	480.00	1	480.00
			TOTAL AMOUNT:	$480.00

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 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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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**06/05/2023 07:32:30 PM ET**	**111552.8018.US08**

Title of Invention

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CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 0

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)

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Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82B (07-13)
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 persons are required to respond to a collection of information unless it displays a valid OMB control number

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 25096

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

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OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name					
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Inari Medical, Inc.

☐ Inventor or Joint Inventor (title not required below)
☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)
☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)
☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	10 Dec 2021
Name	Brian Strauss		
Title	Vice President, Inari Medical, Inc.		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 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) 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.

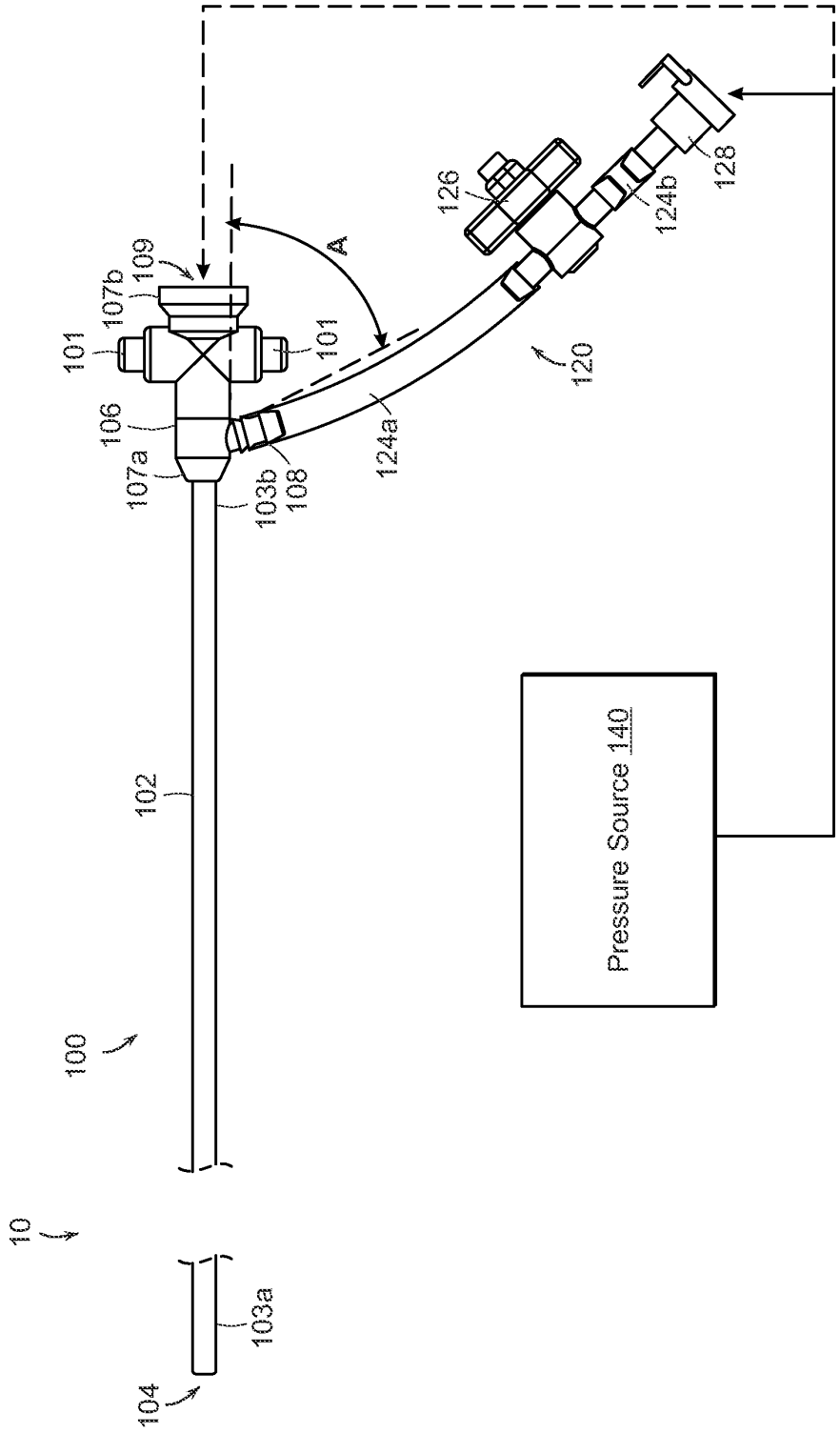

A
101
107b
109
101
106
107a
103b
108
124a
120
126
124b
128
102
100
10
103a
104
Pressure Source 140

FIG. 1

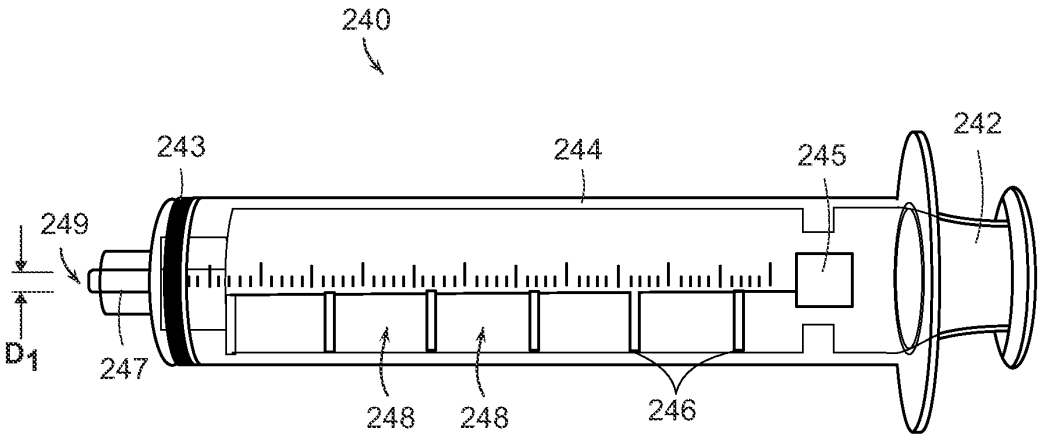

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243
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245
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D_1
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246

FIG. 2

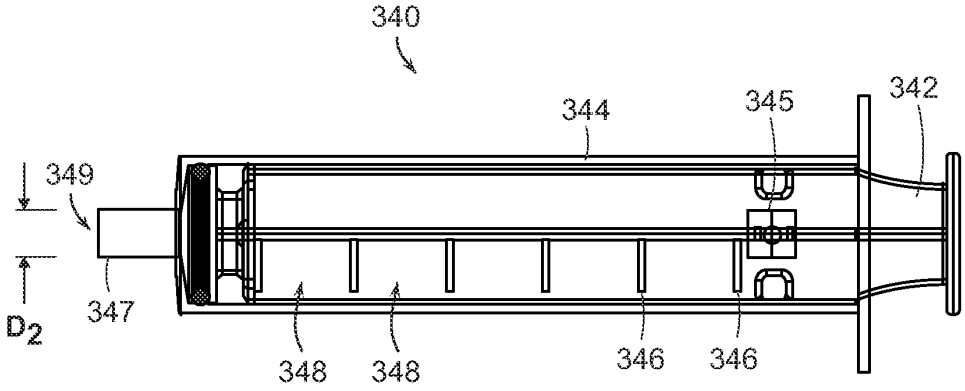

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D_2
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346

FIG. 3A

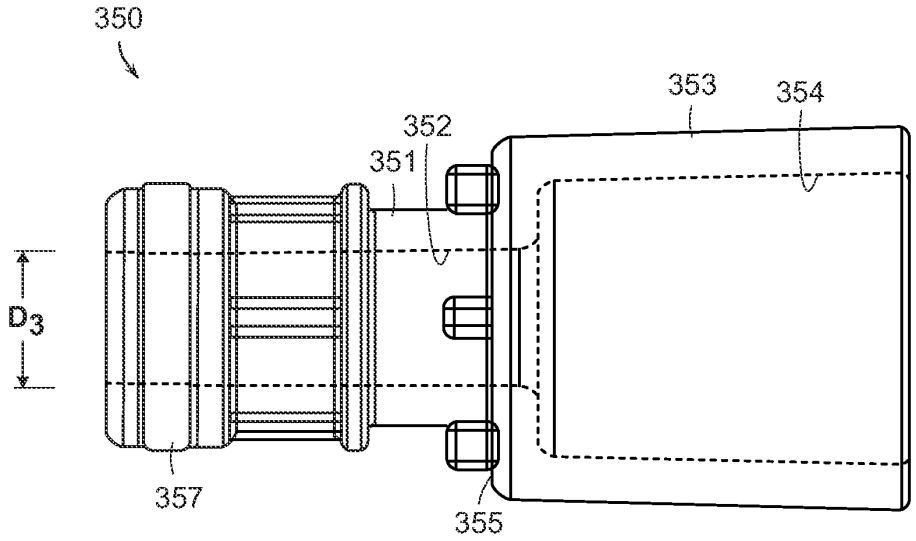


FIG. 3B

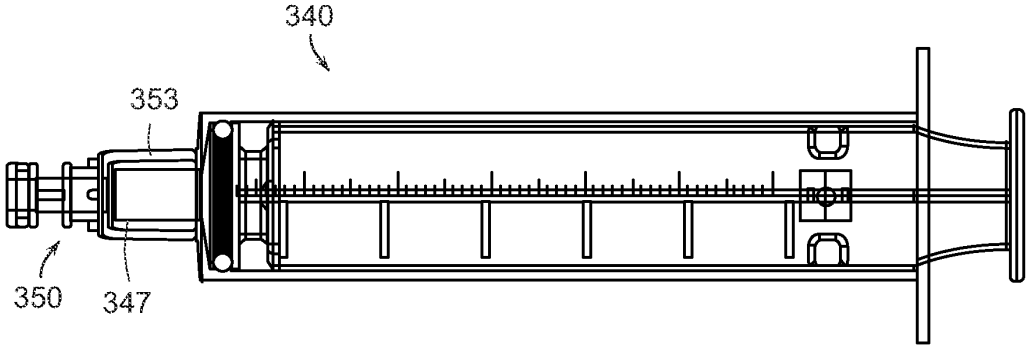


FIG. 3C

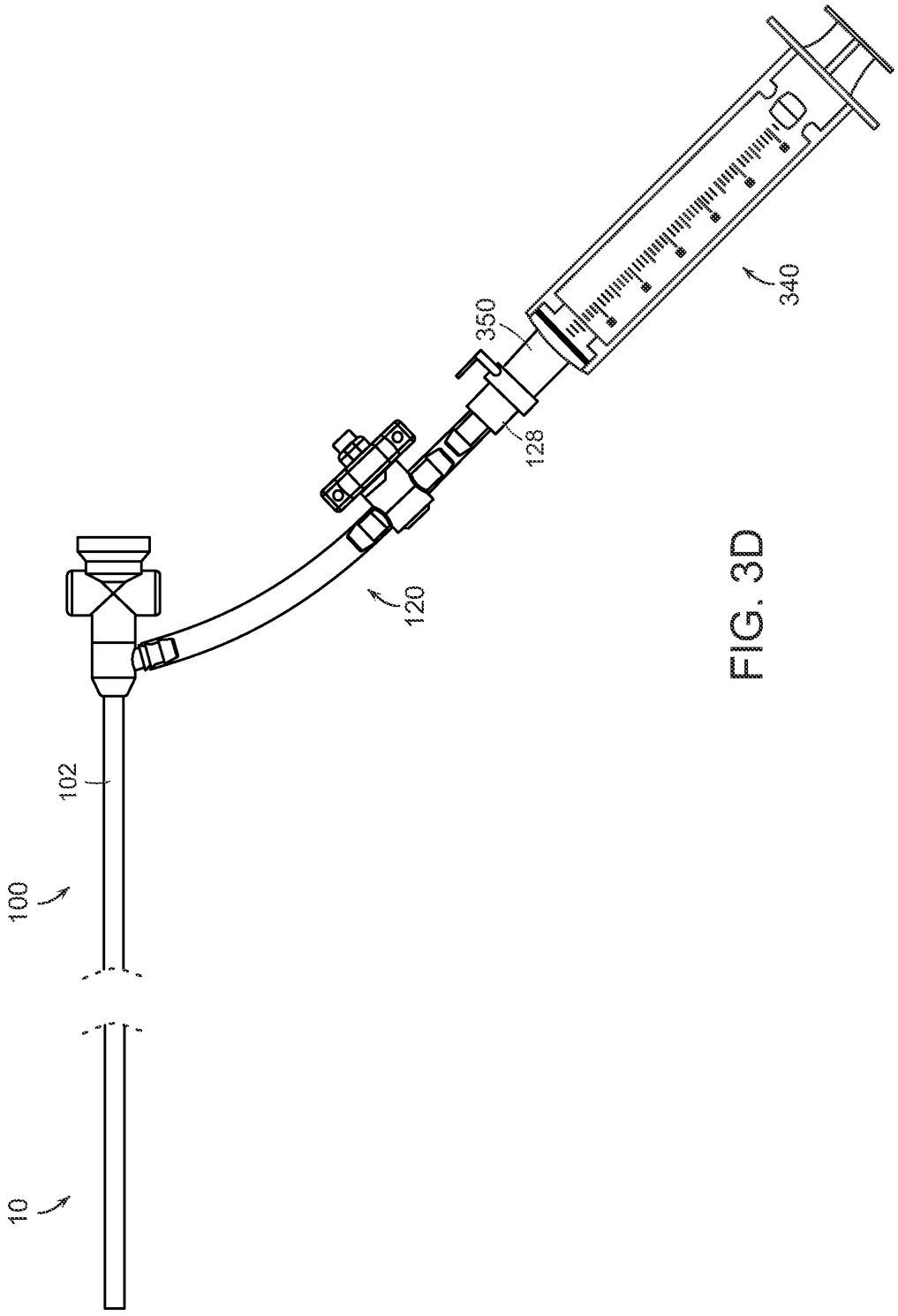
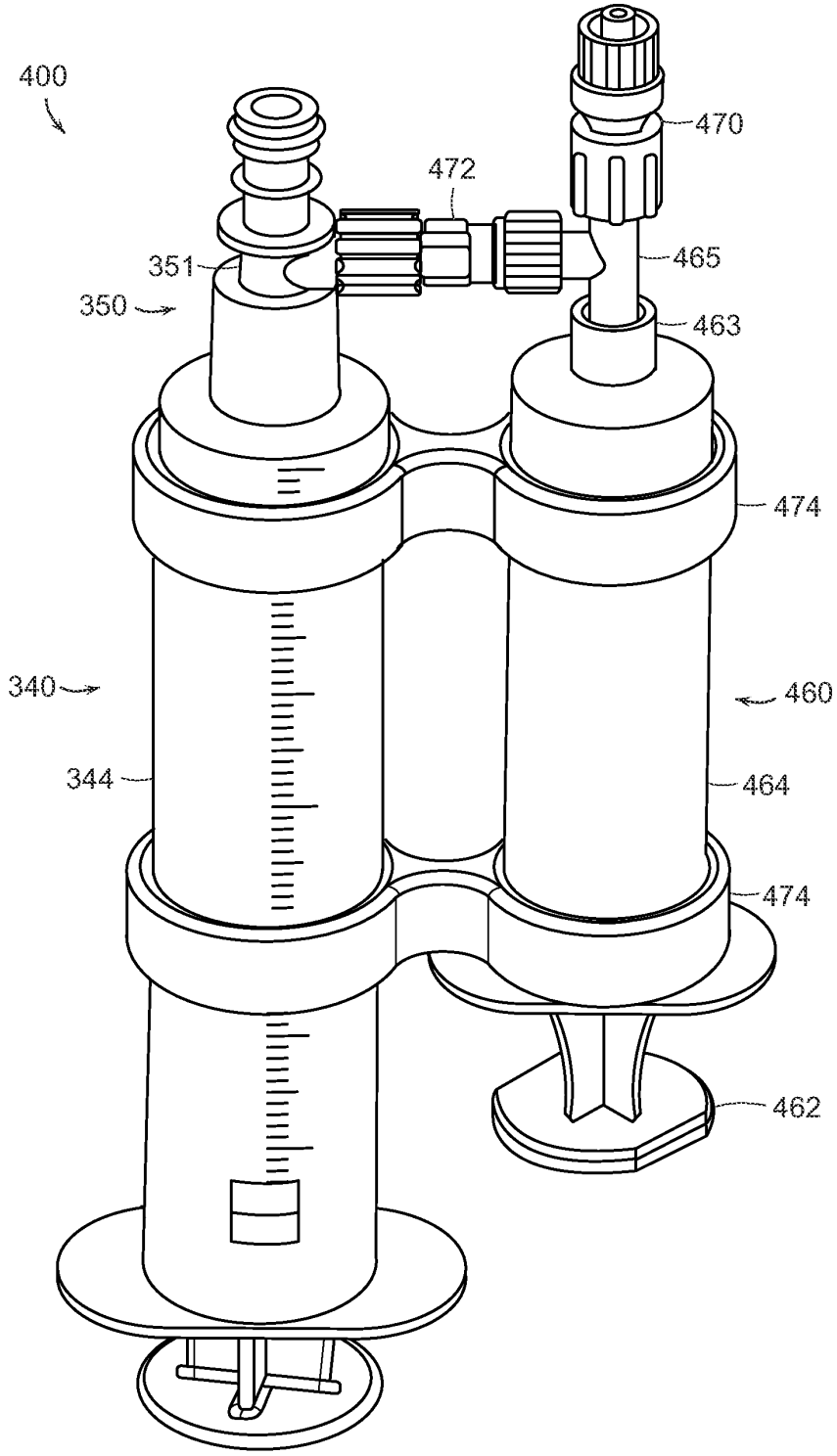


FIG. 3D

FIG. 4A



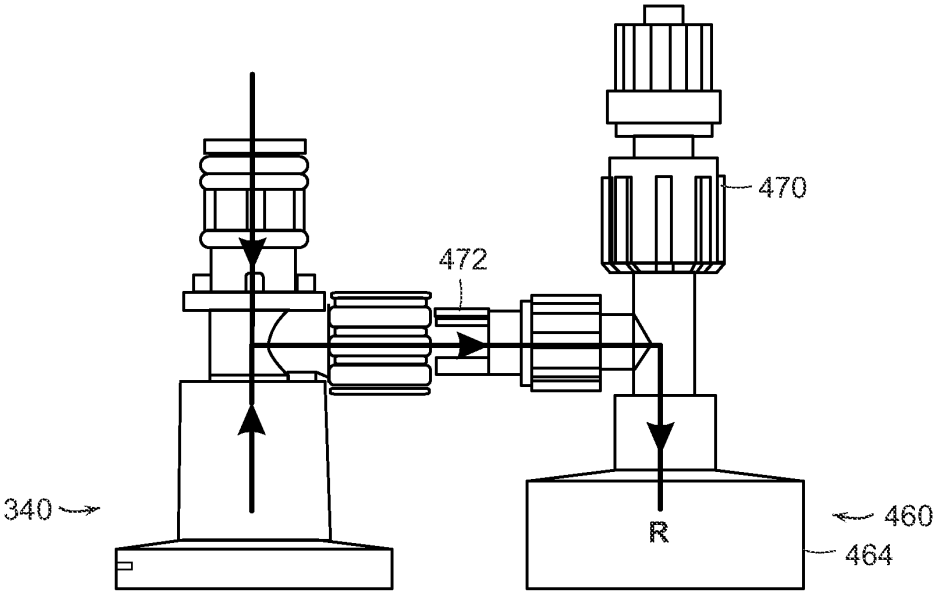


FIG. 4B

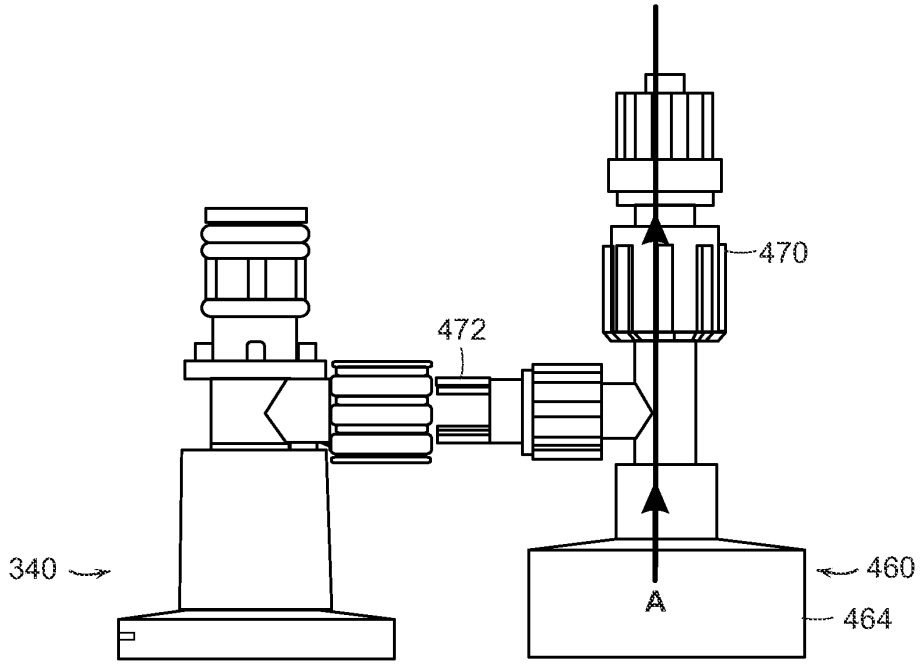


FIG. 4C

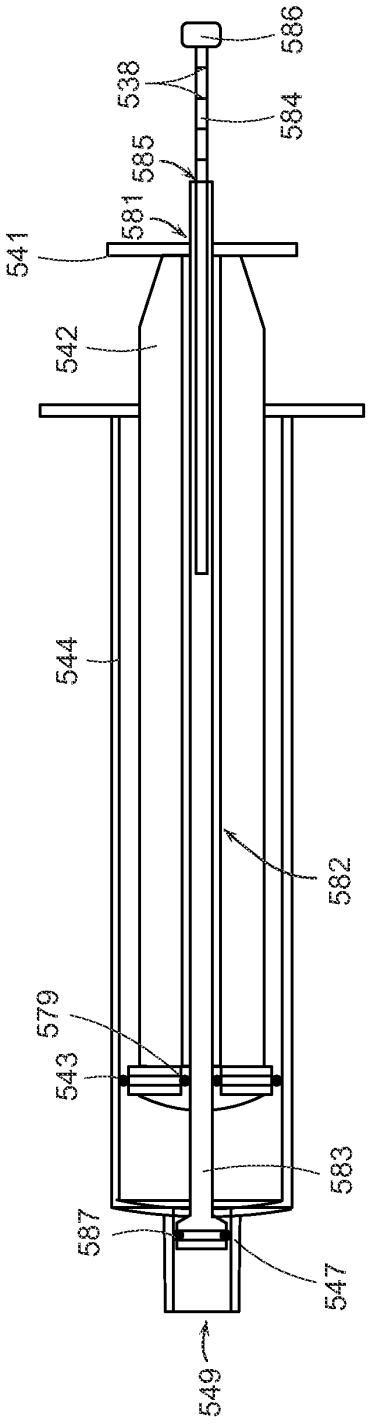


FIG. 5

FIG. 6

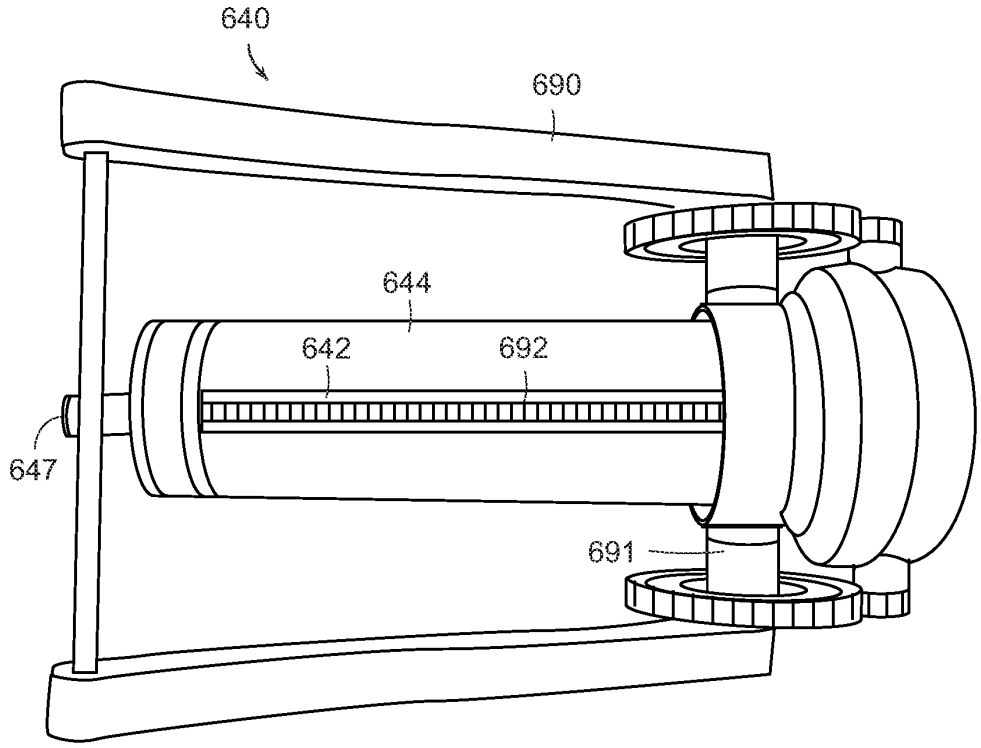
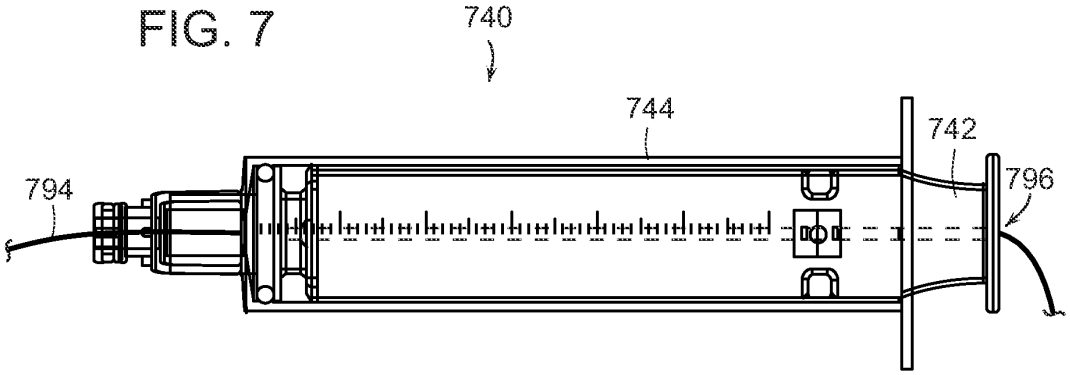


FIG. 7



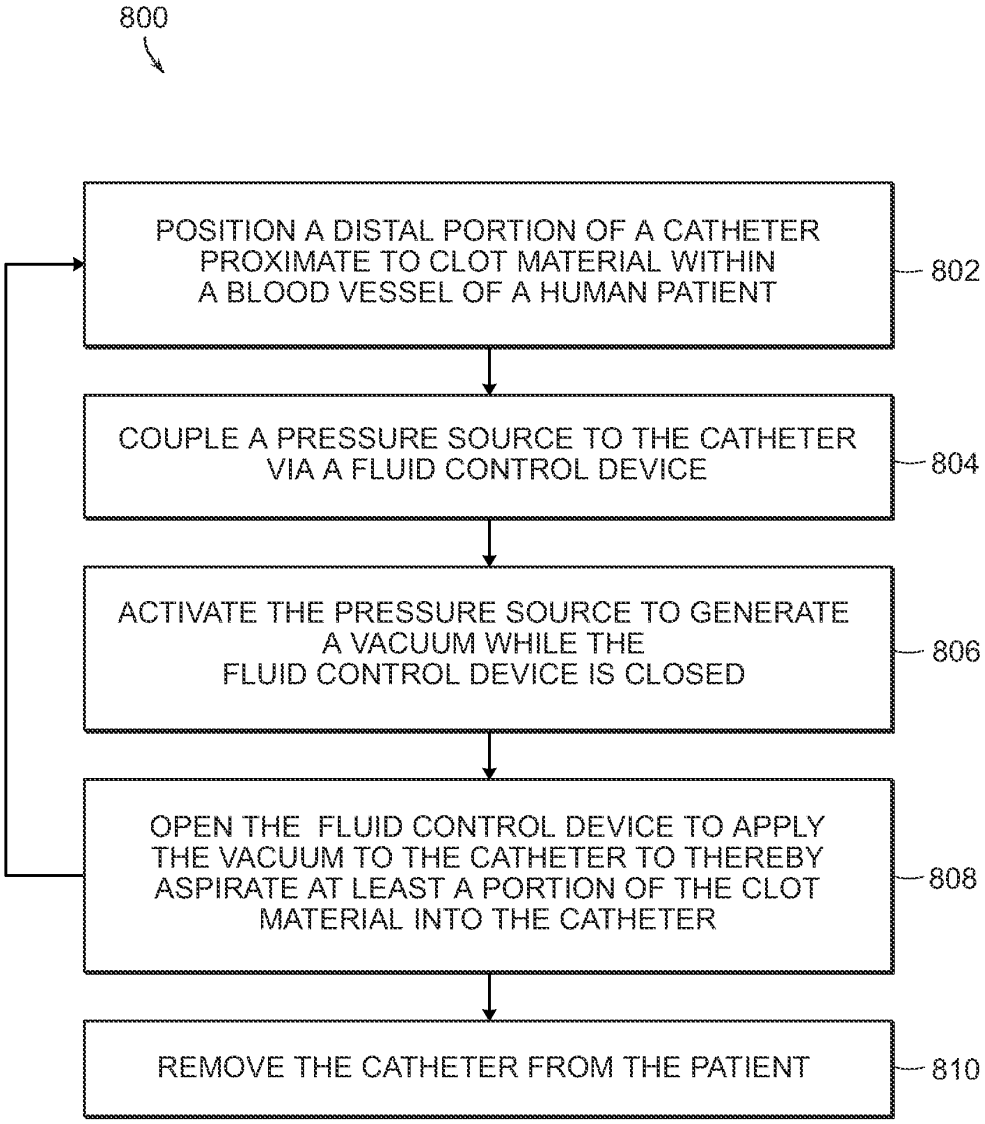

800
POSITION A DISTAL PORTION OF A CATHETER PROXIMATE TO CLOT MATERIAL WITHIN A BLOOD VESSEL OF A HUMAN PATIENT
802
COUPLE A PRESSURE SOURCE TO THE CATHETER VIA A FLUID CONTROL DEVICE
804
ACTIVATE THE PRESSURE SOURCE TO GENERATE A VACUUM WHILE THE FLUID CONTROL DEVICE IS CLOSED
806
OPEN THE FLUID CONTROL DEVICE TO APPLY THE VACUUM TO THE CATHETER TO THEREBY ASPIRATE AT LEAST A PORTION OF THE CLOT MATERIAL INTO THE CATHETER
808
REMOVE THE CATHETER FROM THE PATIENT
810

FIG. 8

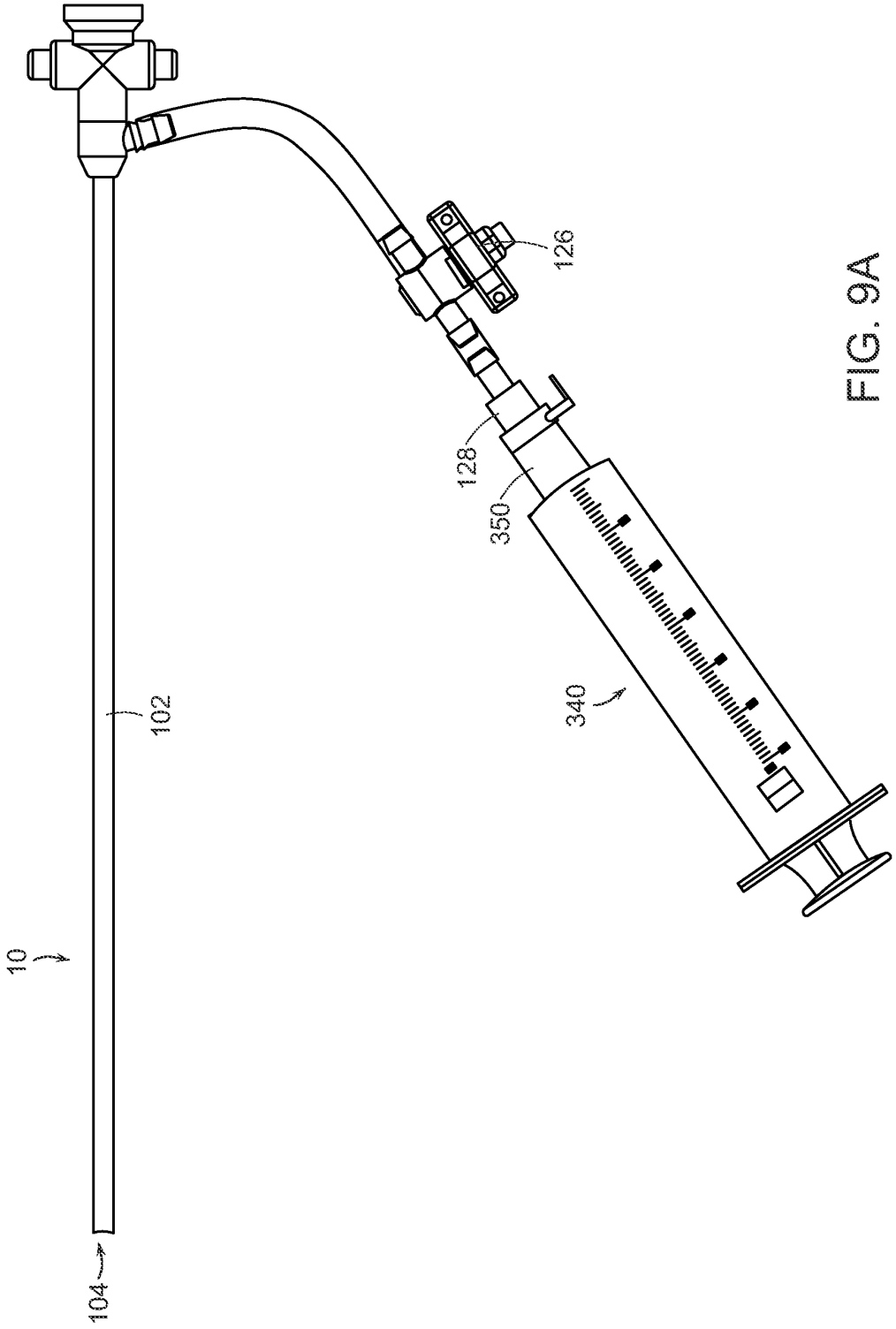


FIG. 9A

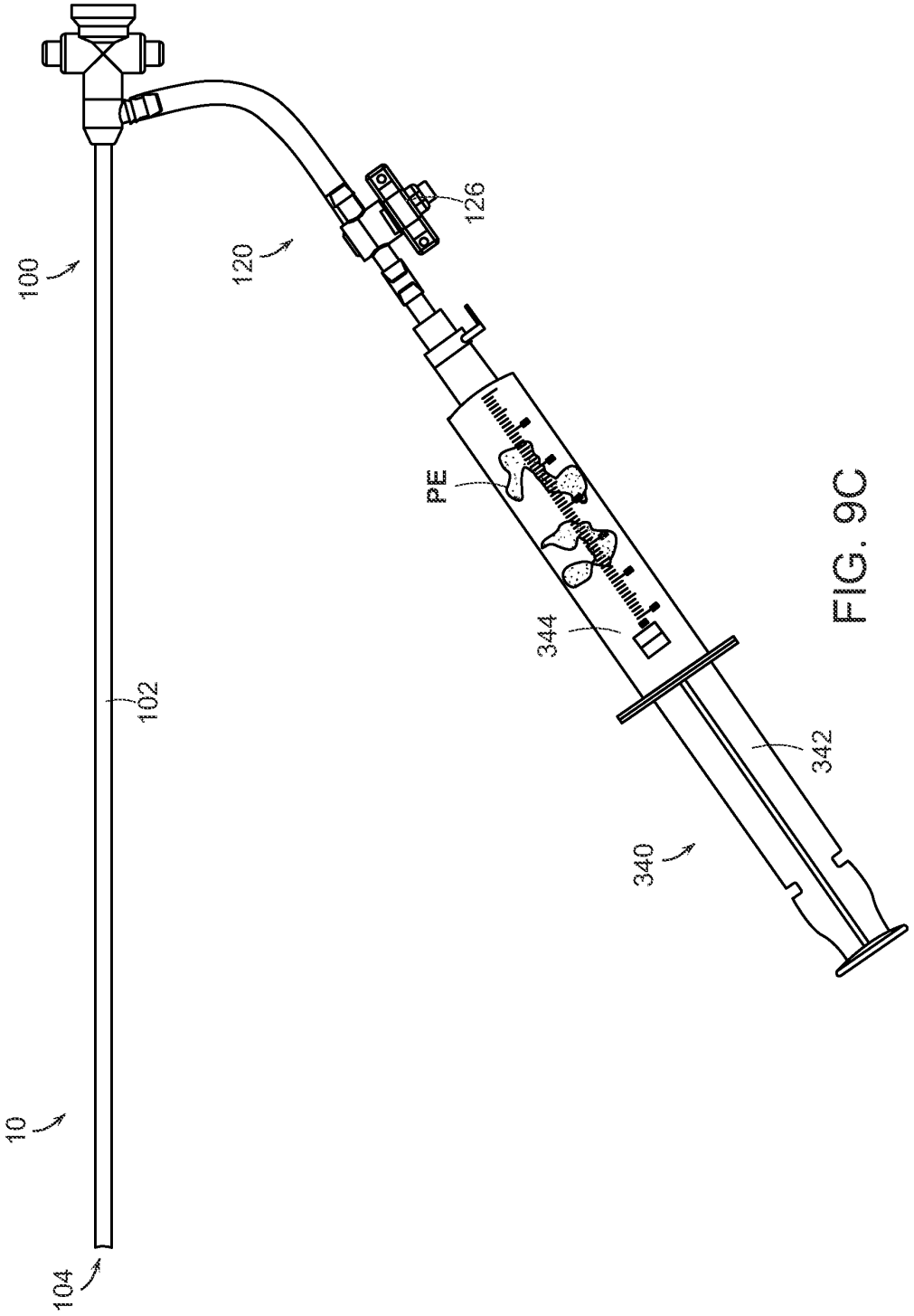


FIG. 9C

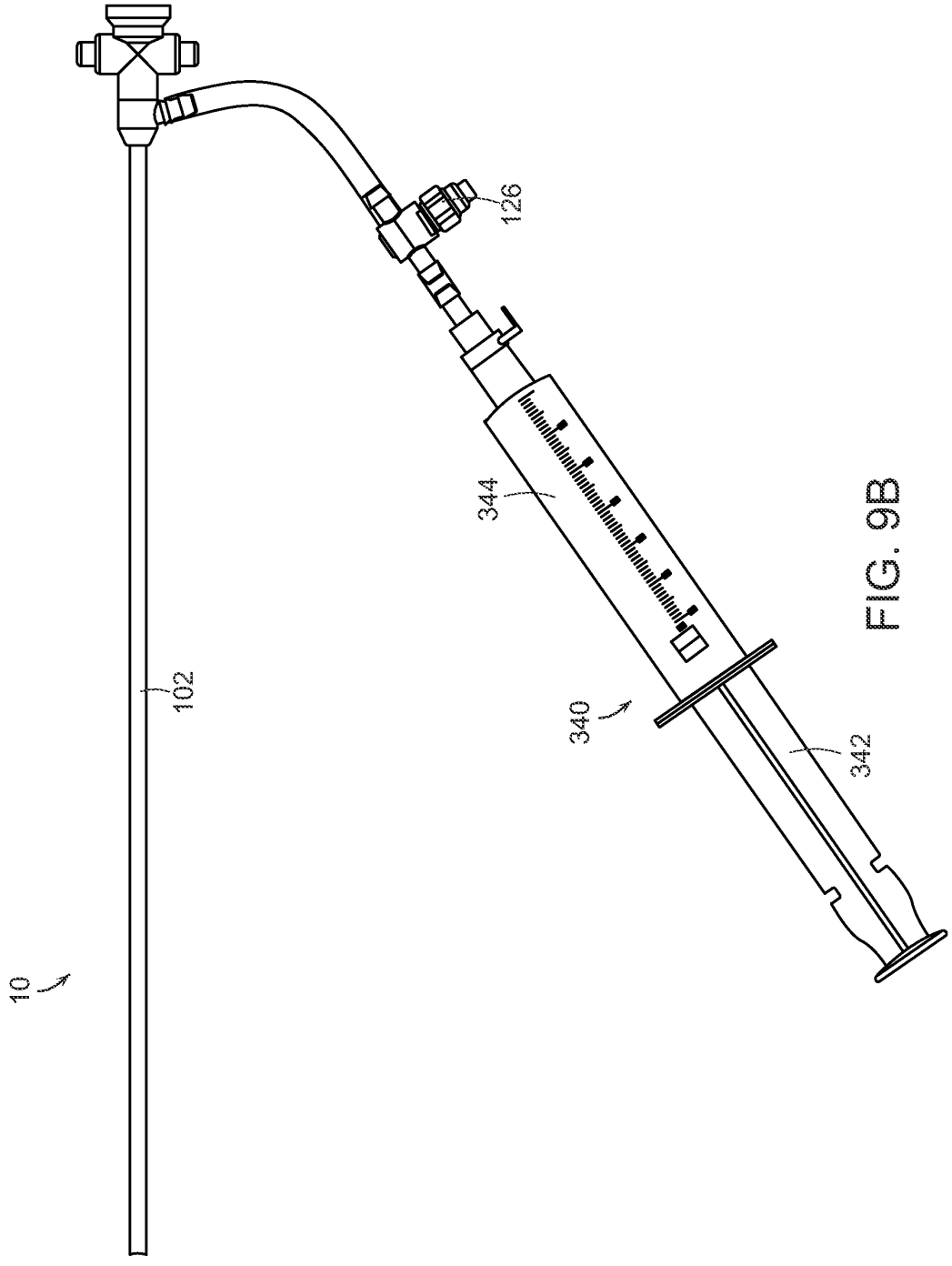


FIG. 9B

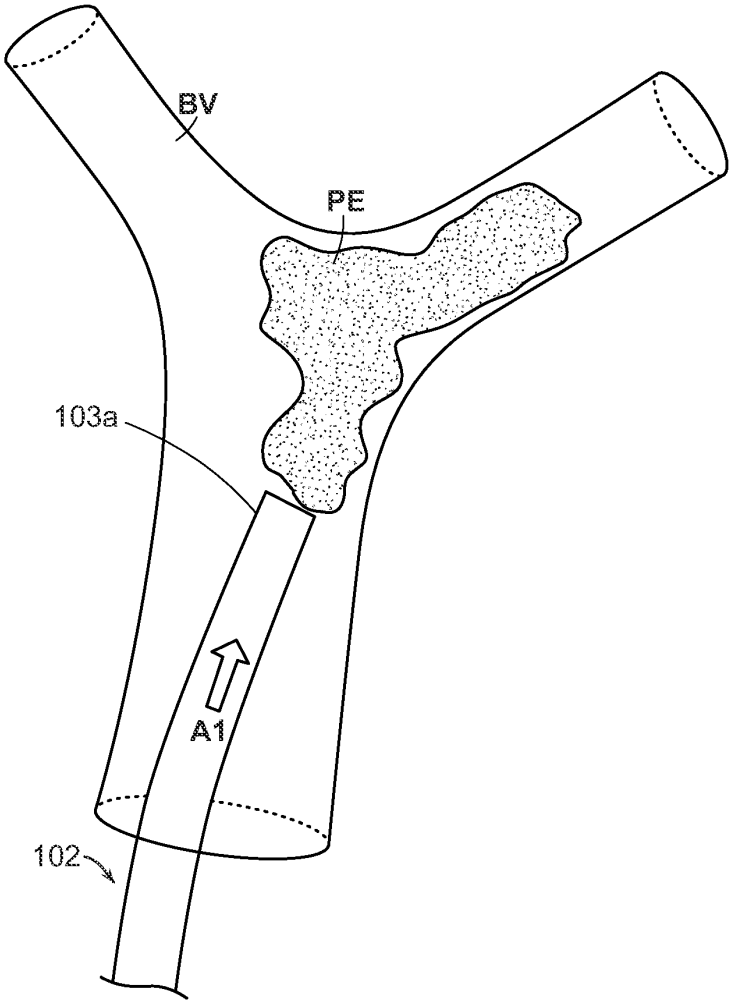


FIG. 10A

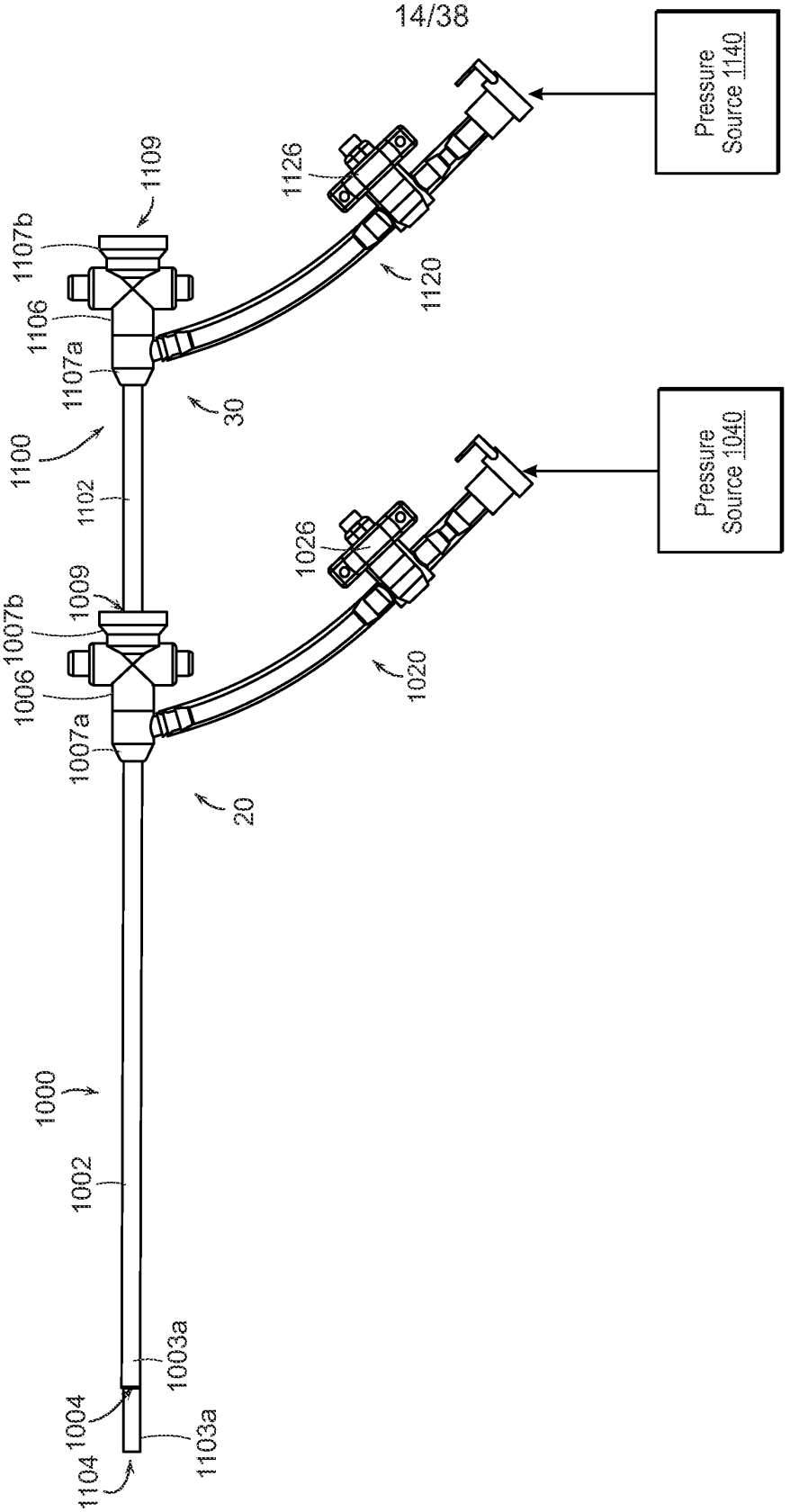

Pressure Source 1140
Pressure Source 1040
1109
1126
1107b
1120
1106
1107a
30
1100
1102
1026
1009
1007b
1020
1006
1007a
20
1000
1002
1003a
1004
1103a
1104

FIG. 11

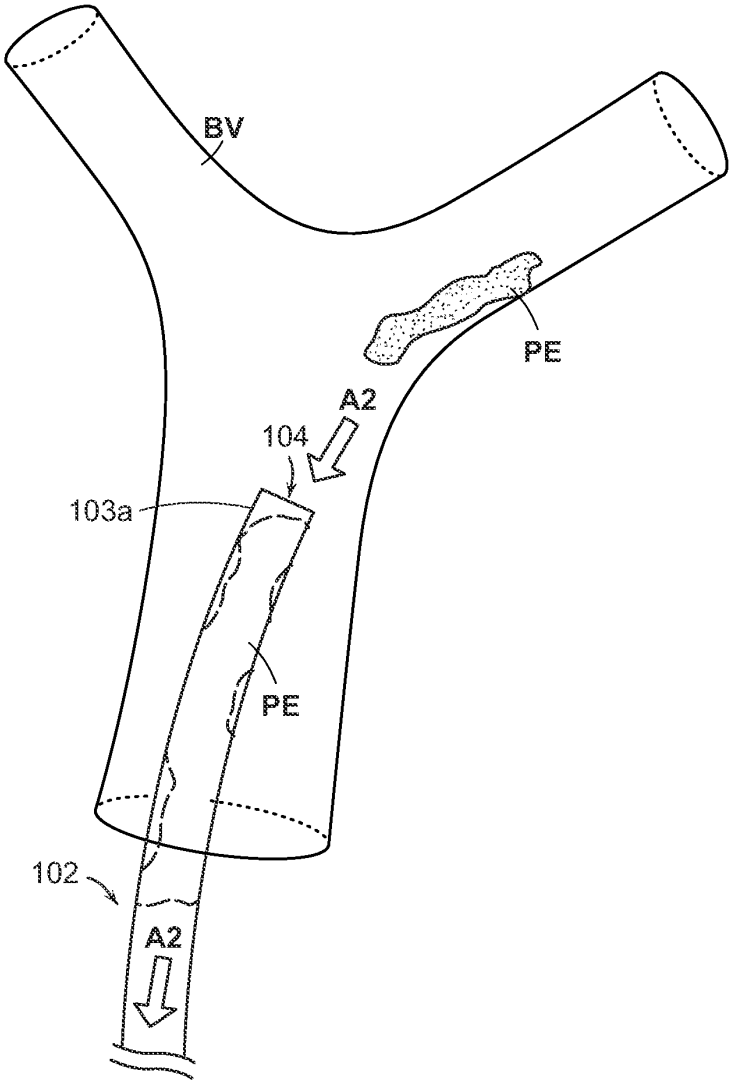


FIG. 10B

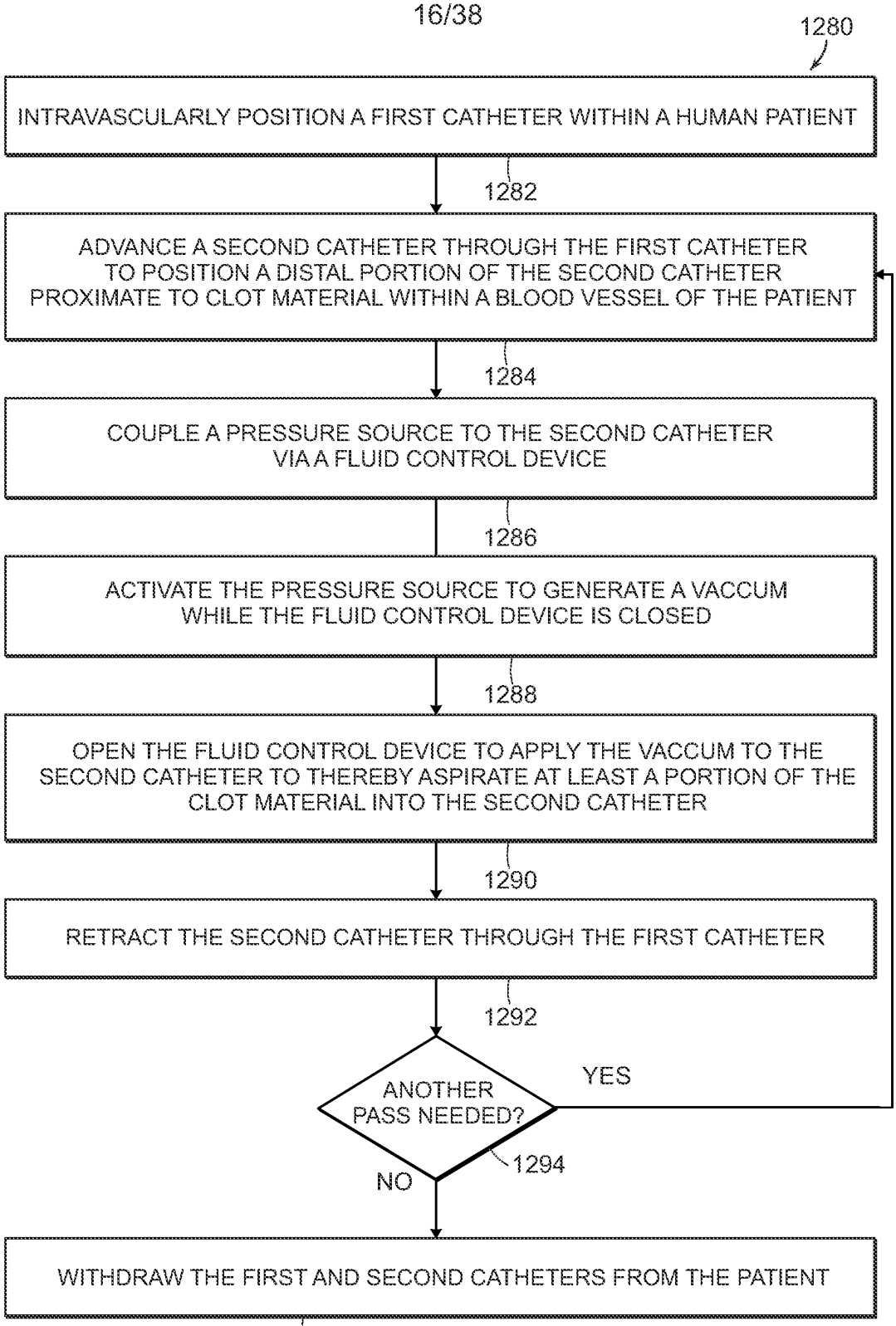

1280
INTRAVASCULARLY POSITION A FIRST CATHETER WITHIN A HUMAN PATIENT
1282
ADVANCE A SECOND CATHETER THROUGH THE FIRST CATHETER TO POSITION A DISTAL PORTION OF THE SECOND CATHETER PROXIMATE TO CLOT MATERIAL WITHIN A BLOOD VESSEL OF THE PATIENT
1284
COUPLE A PRESSURE SOURCE TO THE SECOND CATHETER VIA A FLUID CONTROL DEVICE
1286
ACTIVATE THE PRESSURE SOURCE TO GENERATE A VACCUM WHILE THE FLUID CONTROL DEVICE IS CLOSED
1288
OPEN THE FLUID CONTROL DEVICE TO APPLY THE VACCUM TO THE SECOND CATHETER TO THEREBY ASPIRATE AT LEAST A PORTION OF THE CLOT MATERIAL INTO THE SECOND CATHETER
1290
RETRACT THE SECOND CATHETER THROUGH THE FIRST CATHETER
1292
ANOTHER PASS NEEDED?
YES
1294
NO
WITHDRAW THE FIRST AND SECOND CATHETERS FROM THE PATIENT
1296

FIG. 12

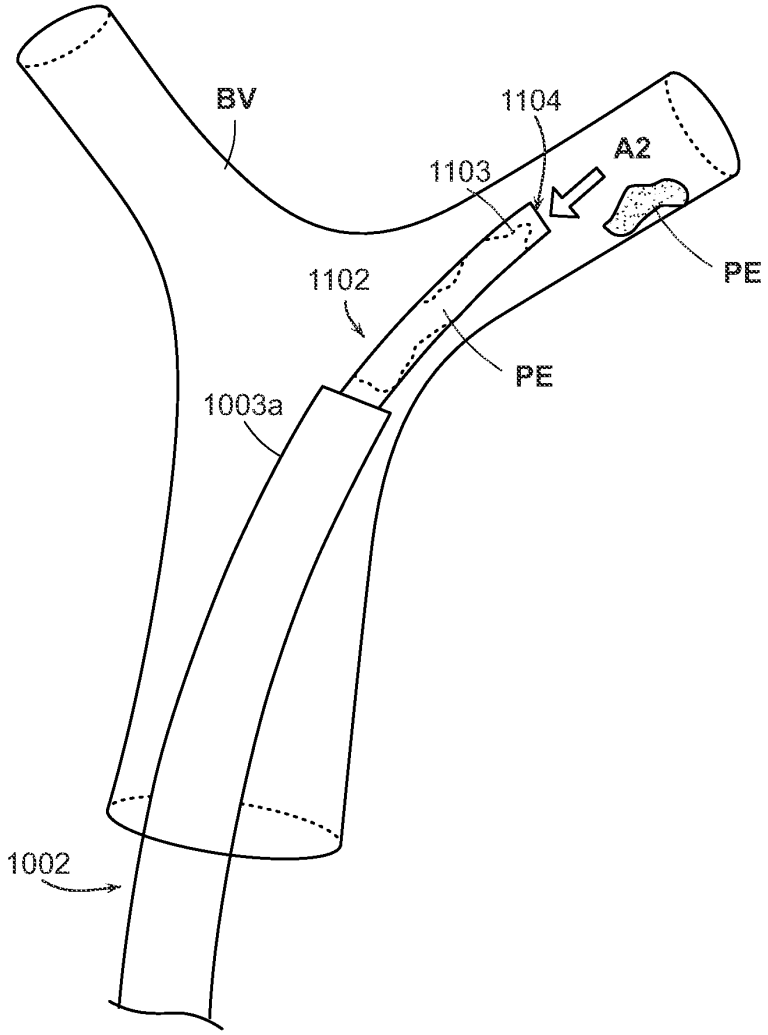


FIG. 13B

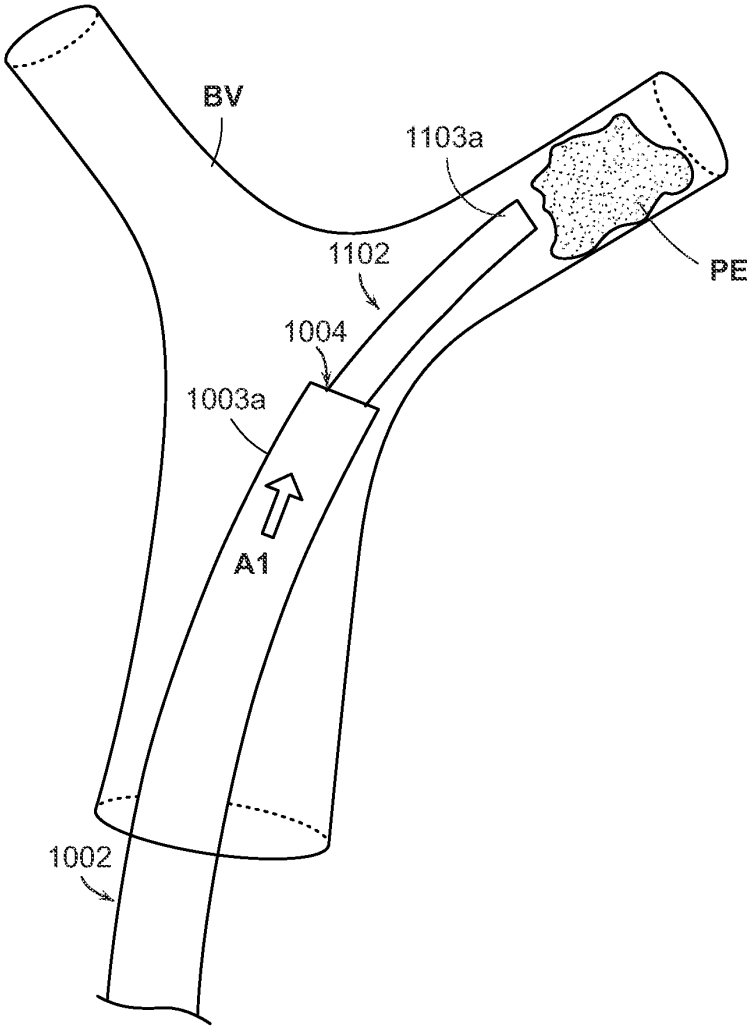


FIG. 13A

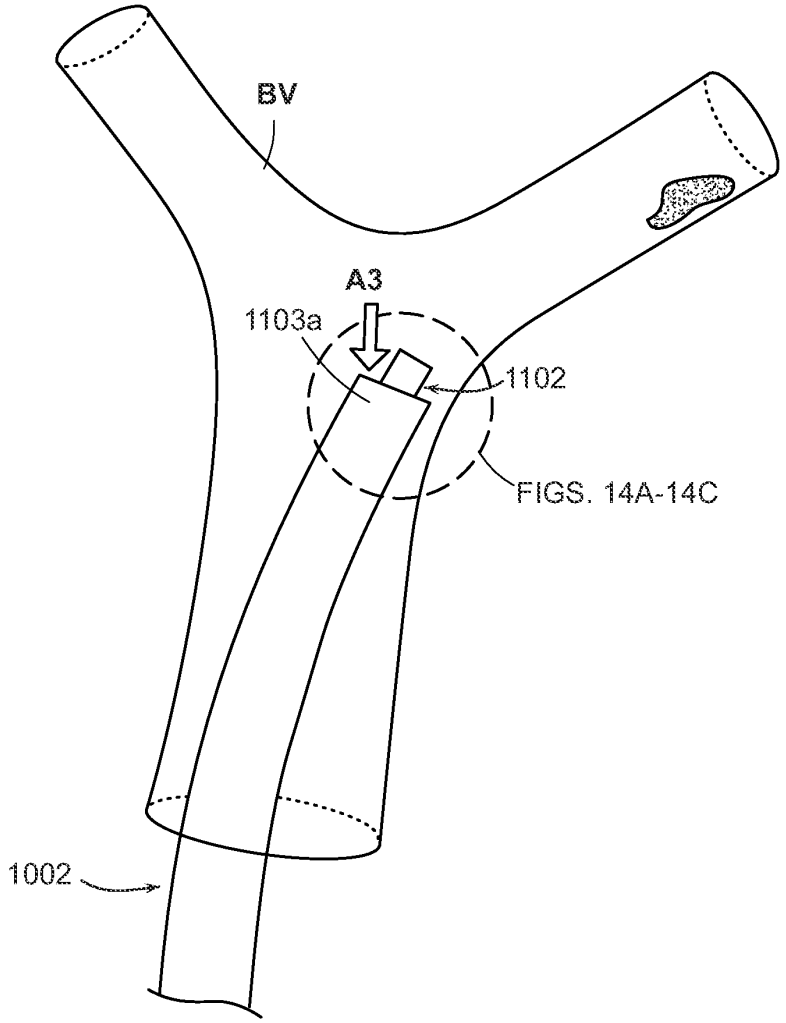


FIG. 13C

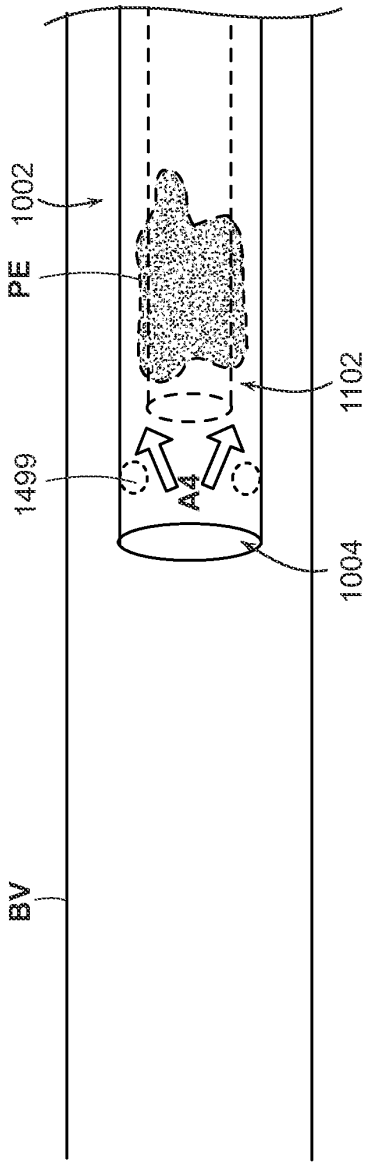


FIG. 14C

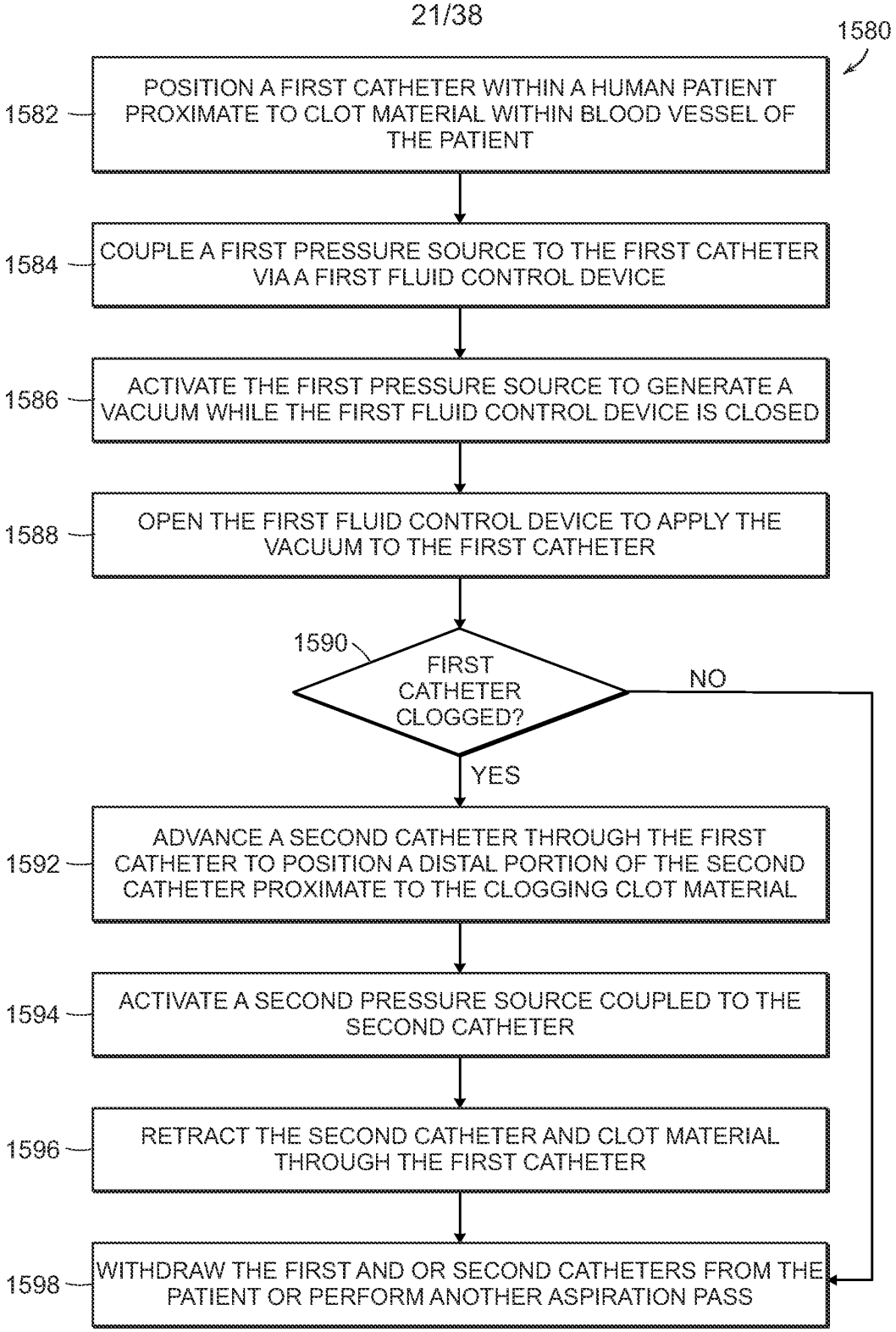

1580
1582
POSITION A FIRST CATHETER WITHIN A HUMAN PATIENT PROXIMATE TO CLOT MATERIAL WITHIN BLOOD VESSEL OF THE PATIENT
1584
COUPLE A FIRST PRESSURE SOURCE TO THE FIRST CATHETER VIA A FIRST FLUID CONTROL DEVICE
1586
ACTIVATE THE FIRST PRESSURE SOURCE TO GENERATE A VACUUM WHILE THE FIRST FLUID CONTROL DEVICE IS CLOSED
1588
OPEN THE FIRST FLUID CONTROL DEVICE TO APPLY THE VACUUM TO THE FIRST CATHETER
1590
FIRST CATHETER CLOGGED?
NO
YES
1592
ADVANCE A SECOND CATHETER THROUGH THE FIRST CATHETER TO POSITION A DISTAL PORTION OF THE SECOND CATHETER PROXIMATE TO THE CLOGGING CLOT MATERIAL
1594
ACTIVATE A SECOND PRESSURE SOURCE COUPLED TO THE SECOND CATHETER
1596
RETRACT THE SECOND CATHETER AND CLOT MATERIAL THROUGH THE FIRST CATHETER
1598
WITHDRAW THE FIRST AND OR SECOND CATHETERS FROM THE PATIENT OR PERFORM ANOTHER ASPIRATION PASS

FIG. 15

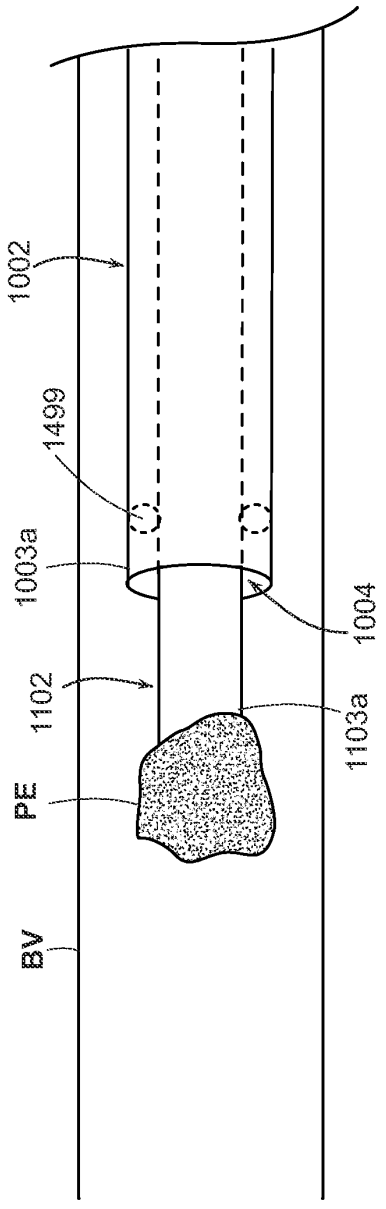


FIG. 14A

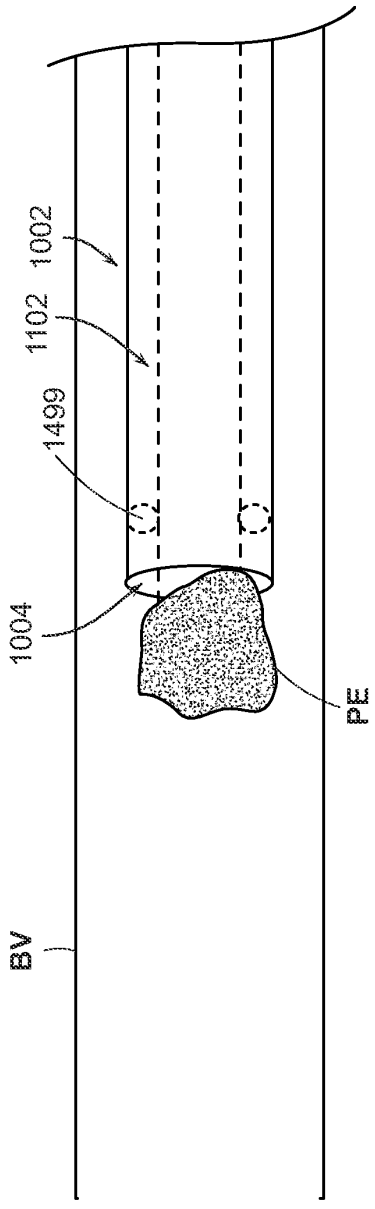


FIG. 14B

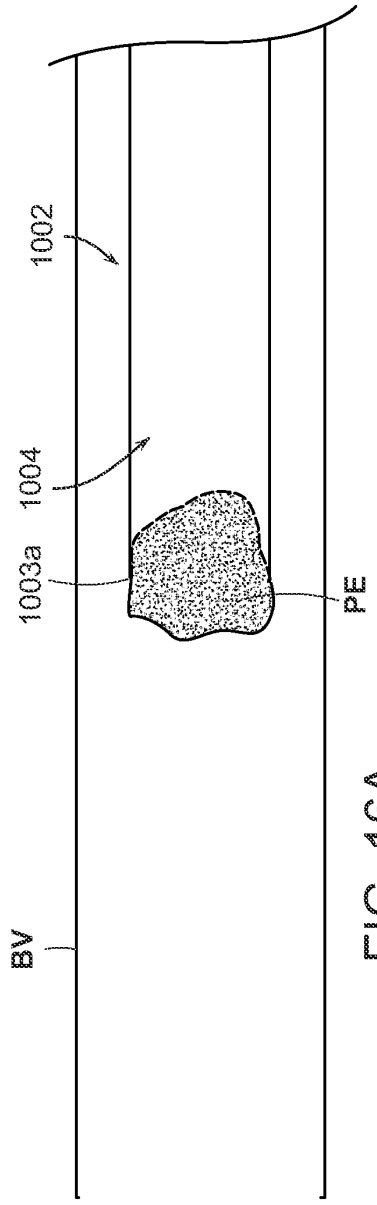


FIG. 16A

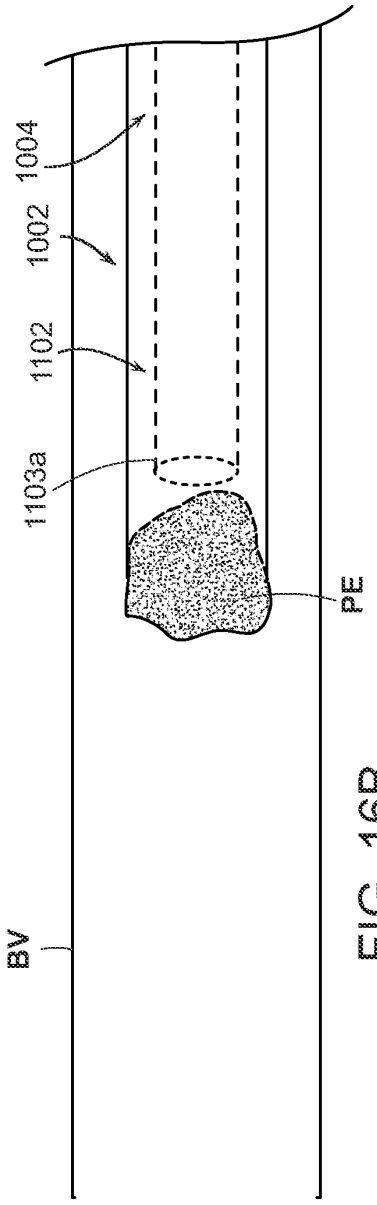


FIG. 16B

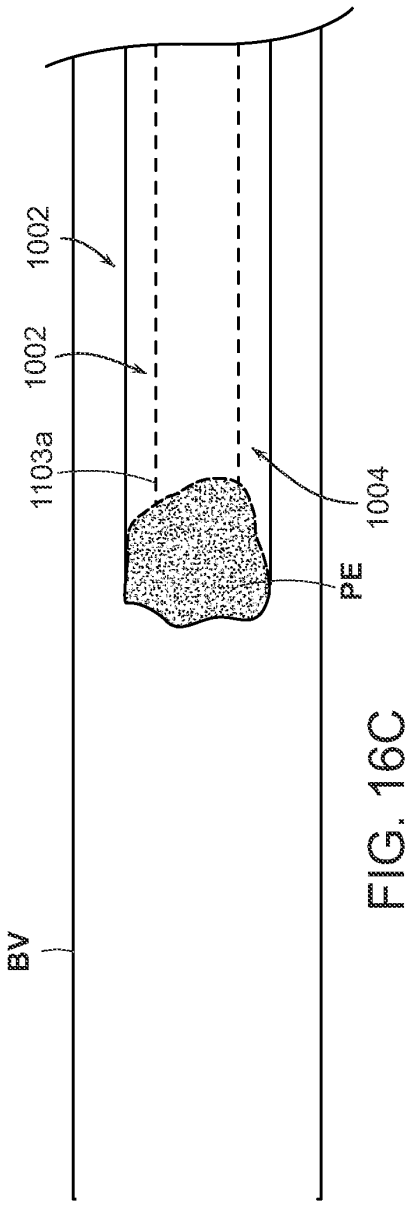


FIG. 16C

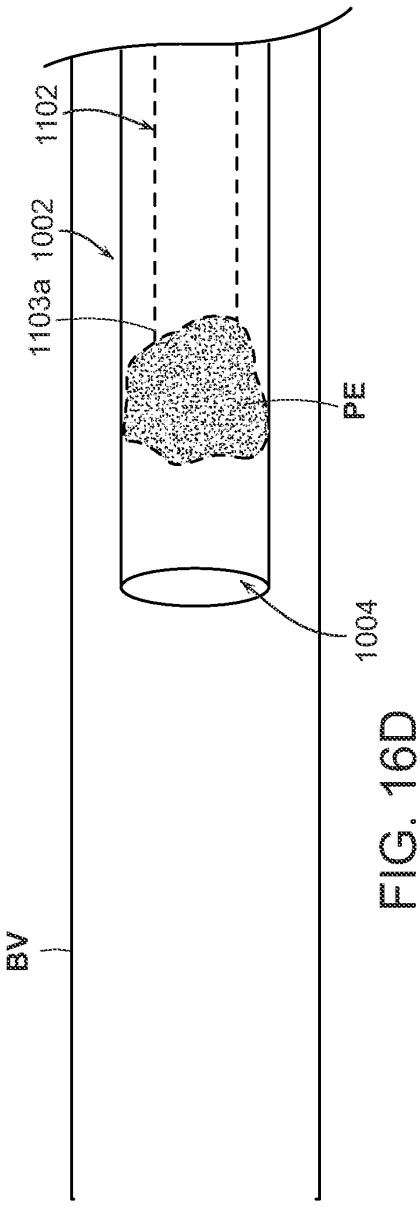


FIG. 16D

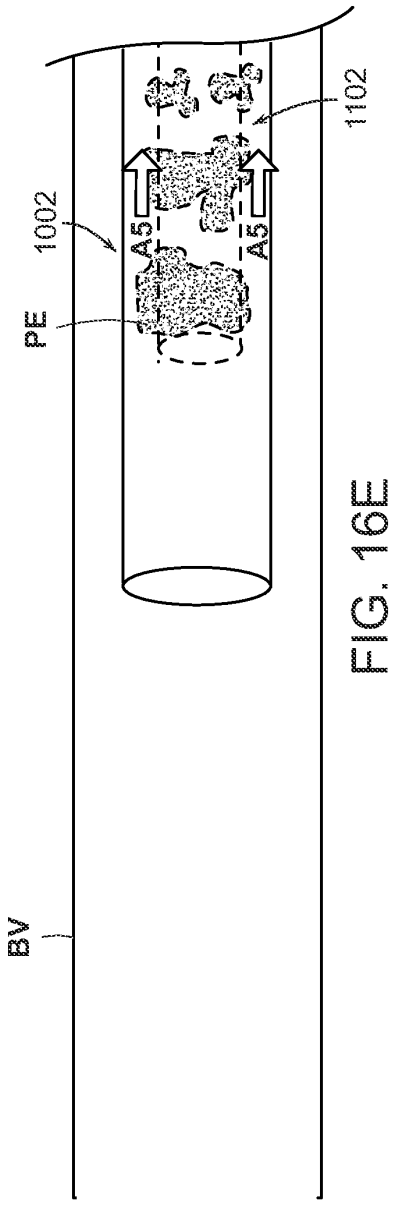


FIG. 16E

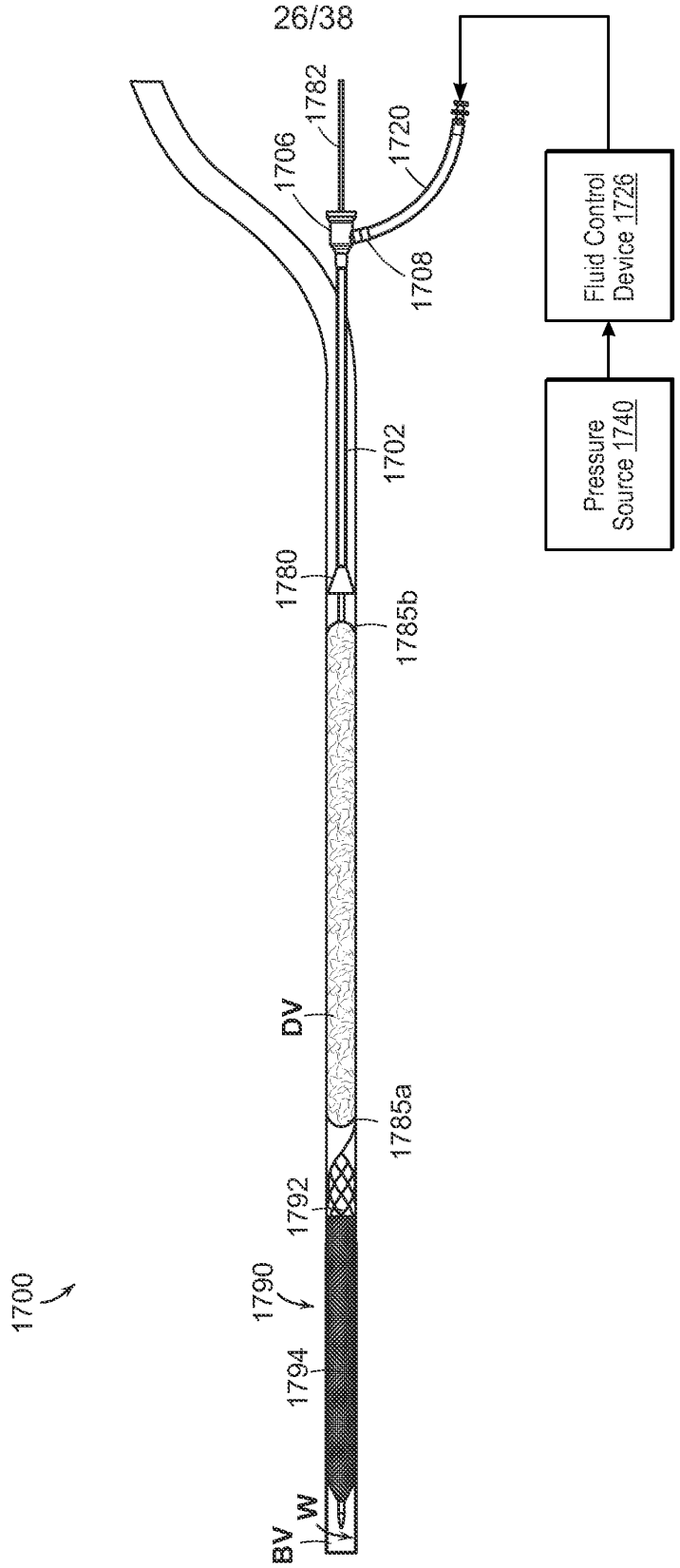

1782
1706
1720
1708
Fluid Control Device 1726
Pressure Source 1740
1702
1780
1785b
DV
1785a
1792
1790
1794
BV
W
1700

FIG. 17

FIG. 18A

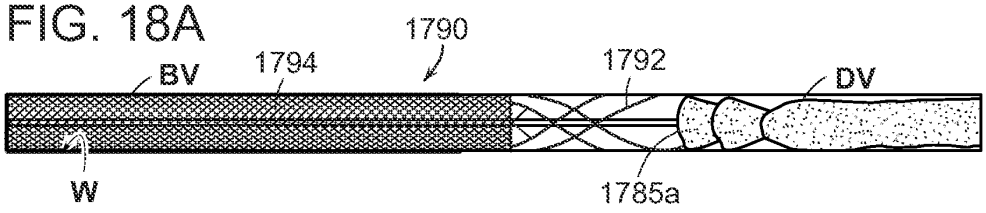


FIG. 18B

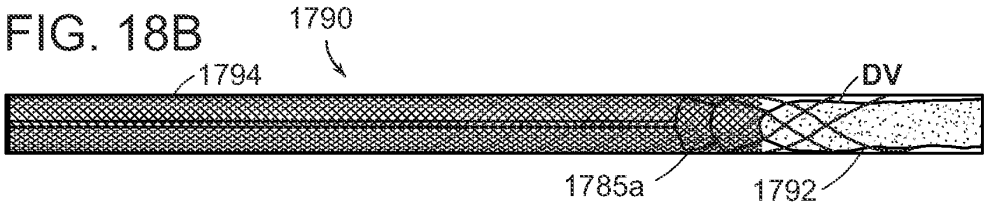


FIG. 18C

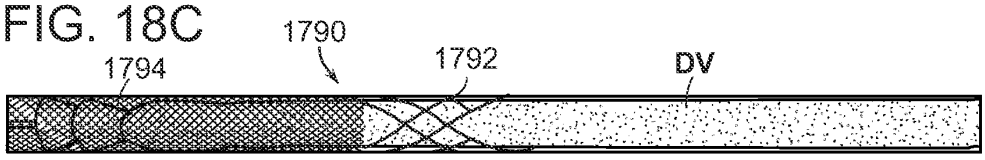


FIG. 18D

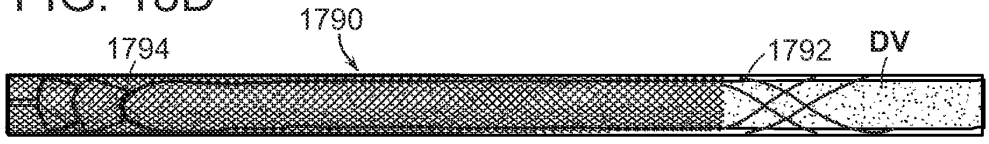


FIG. 18E

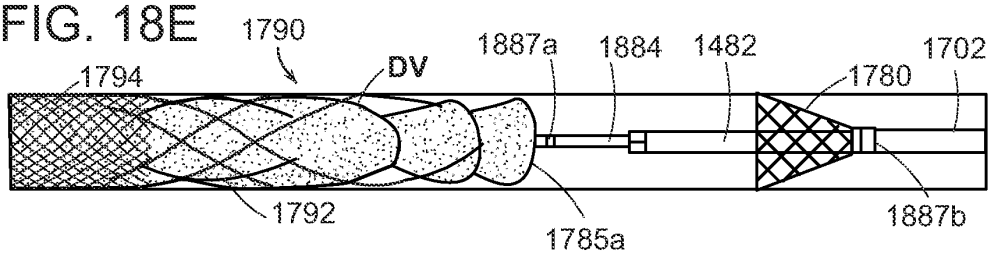


FIG. 18F

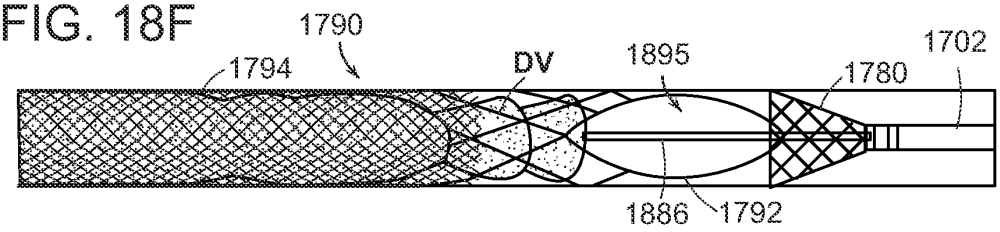


FIG. 18G

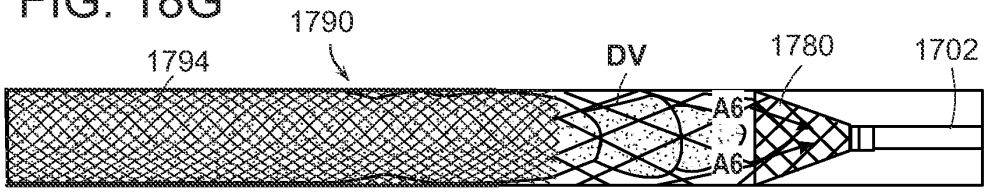
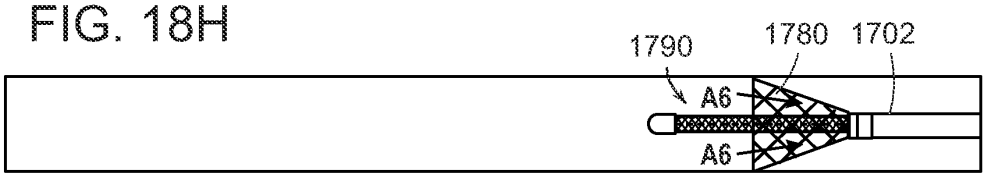


FIG. 18H



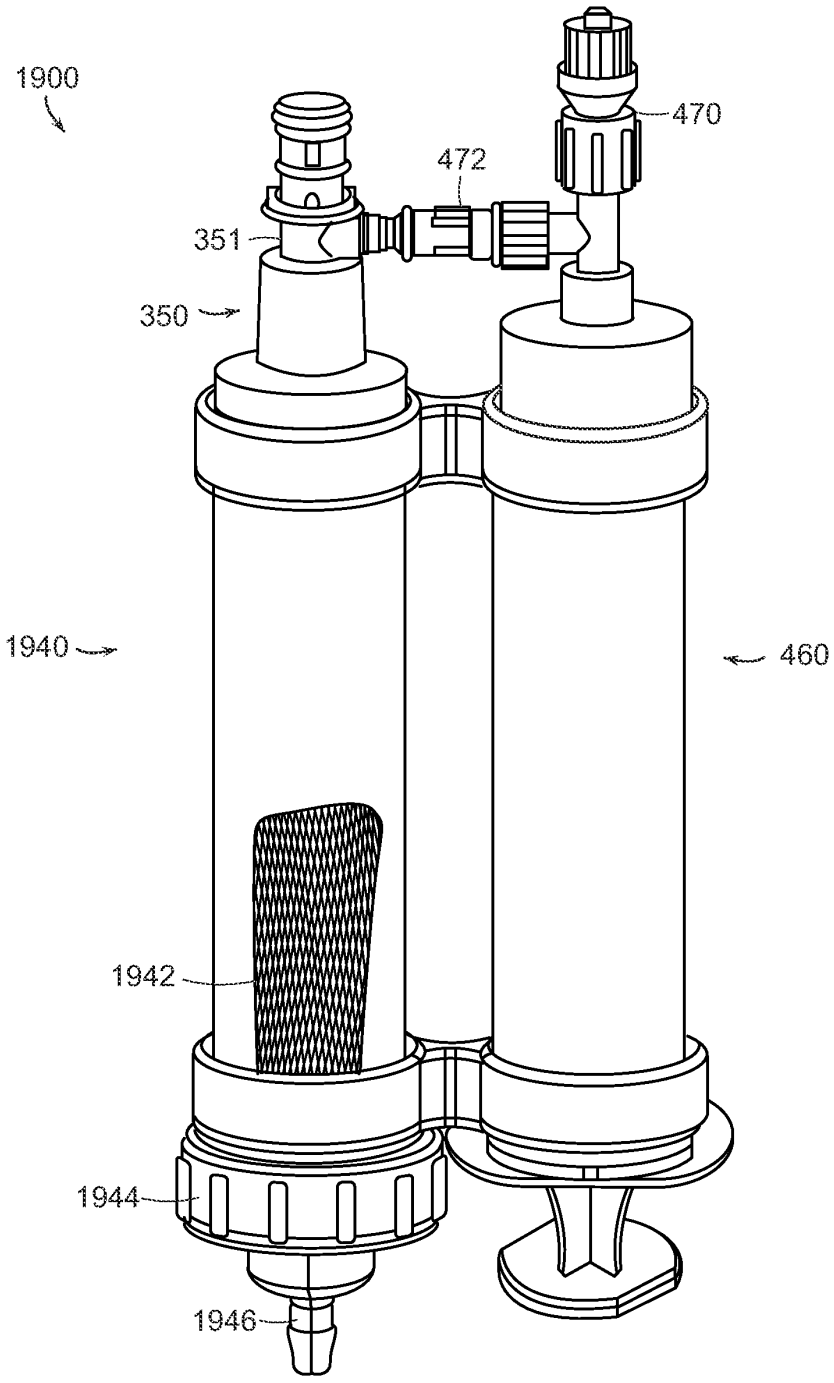


FIG. 19

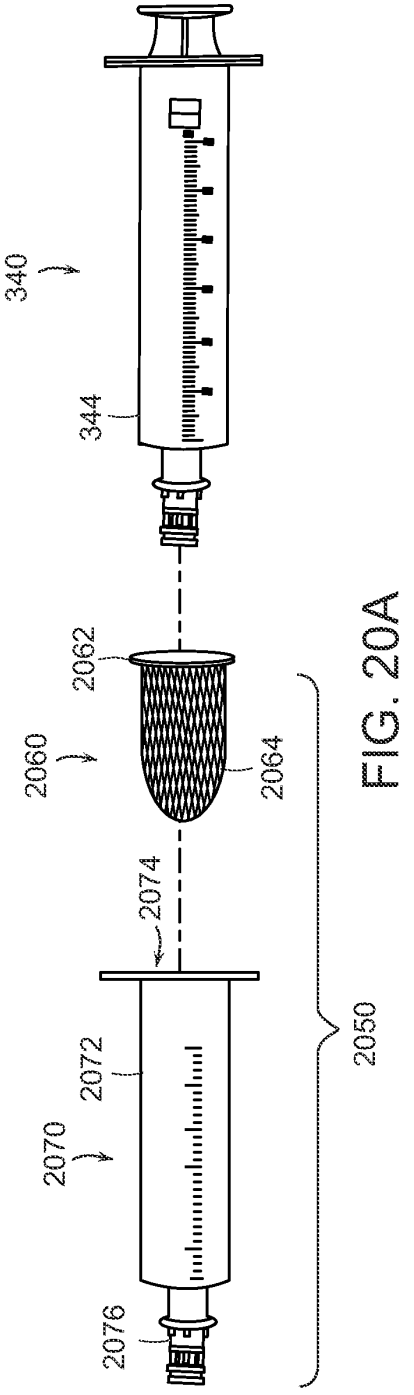


FIG. 20A

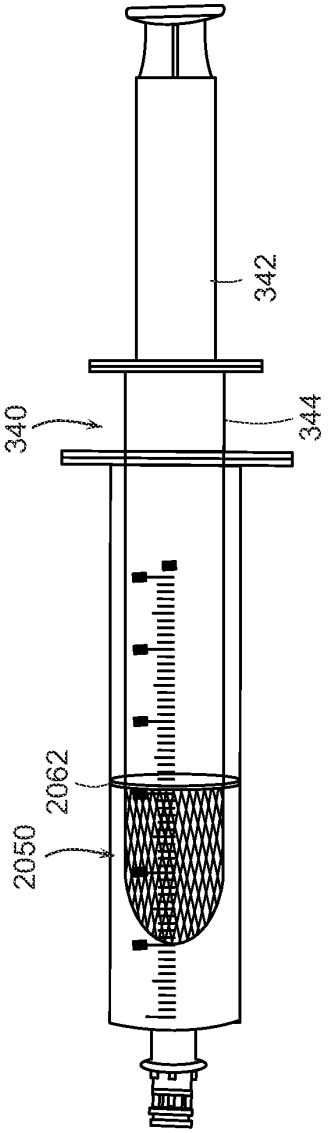


FIG. 20B

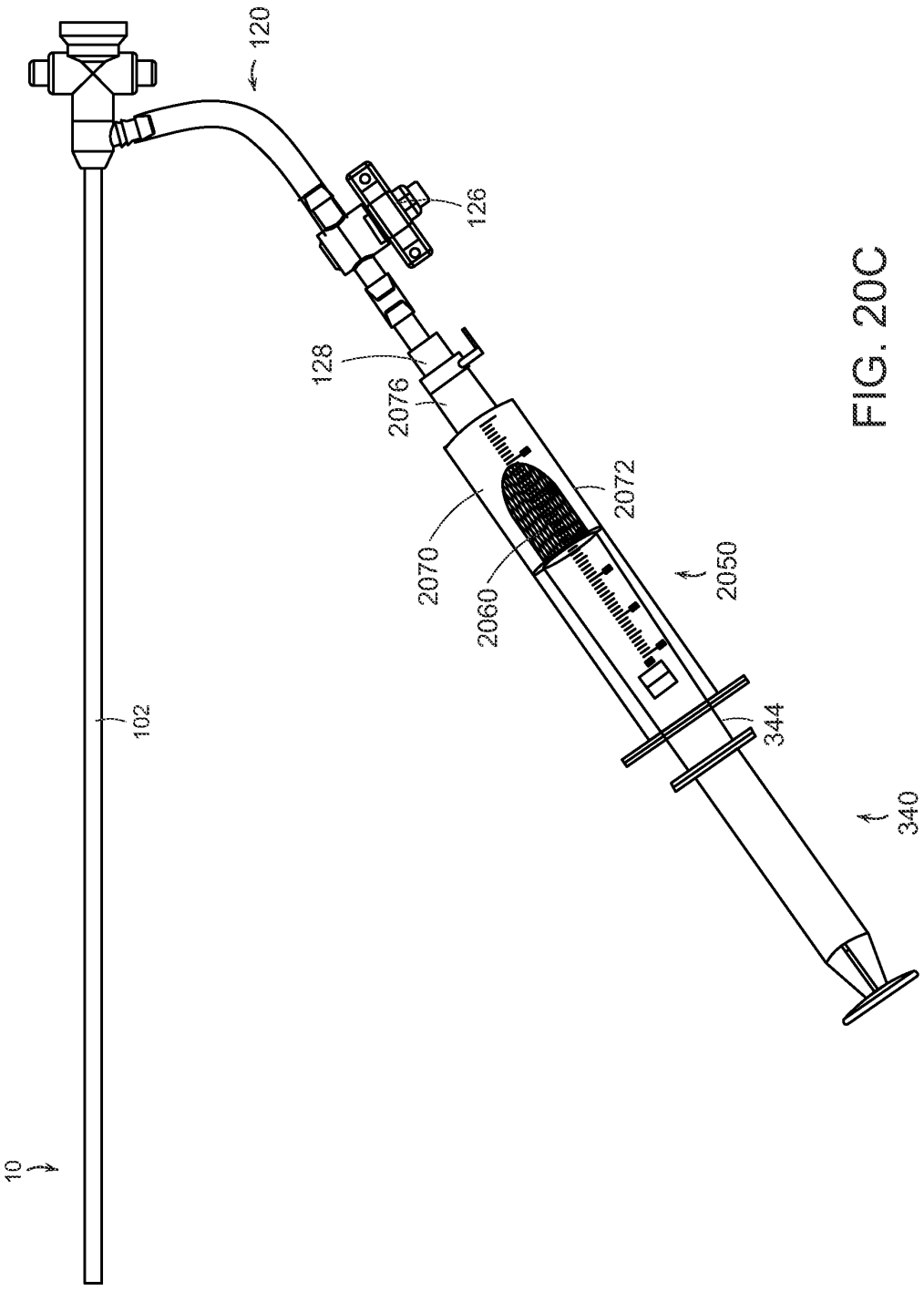


FIG. 20C

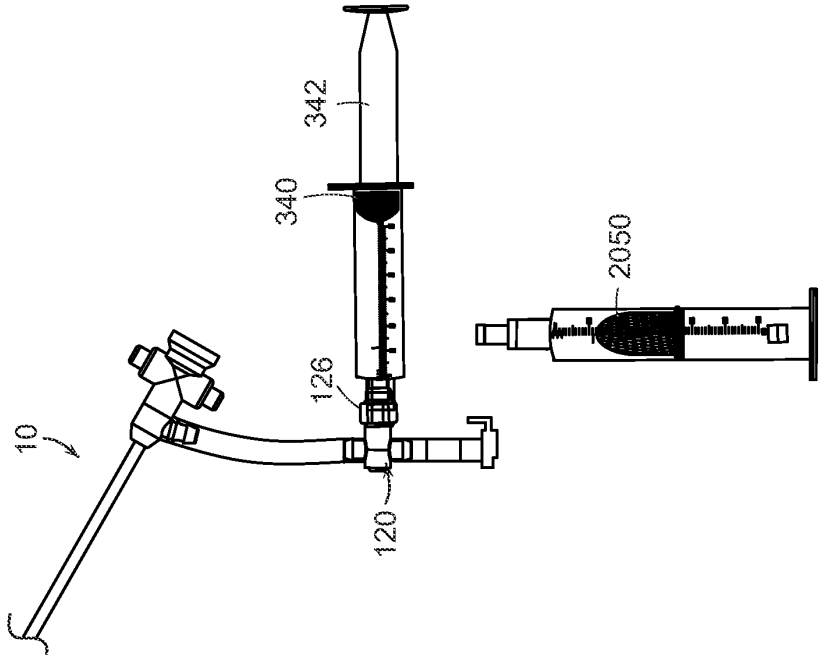


FIG. 20E

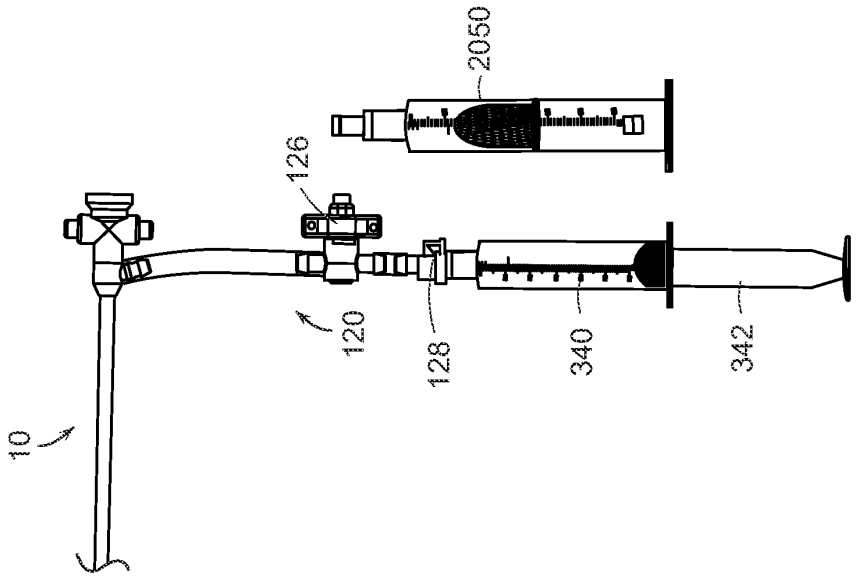


FIG. 20D

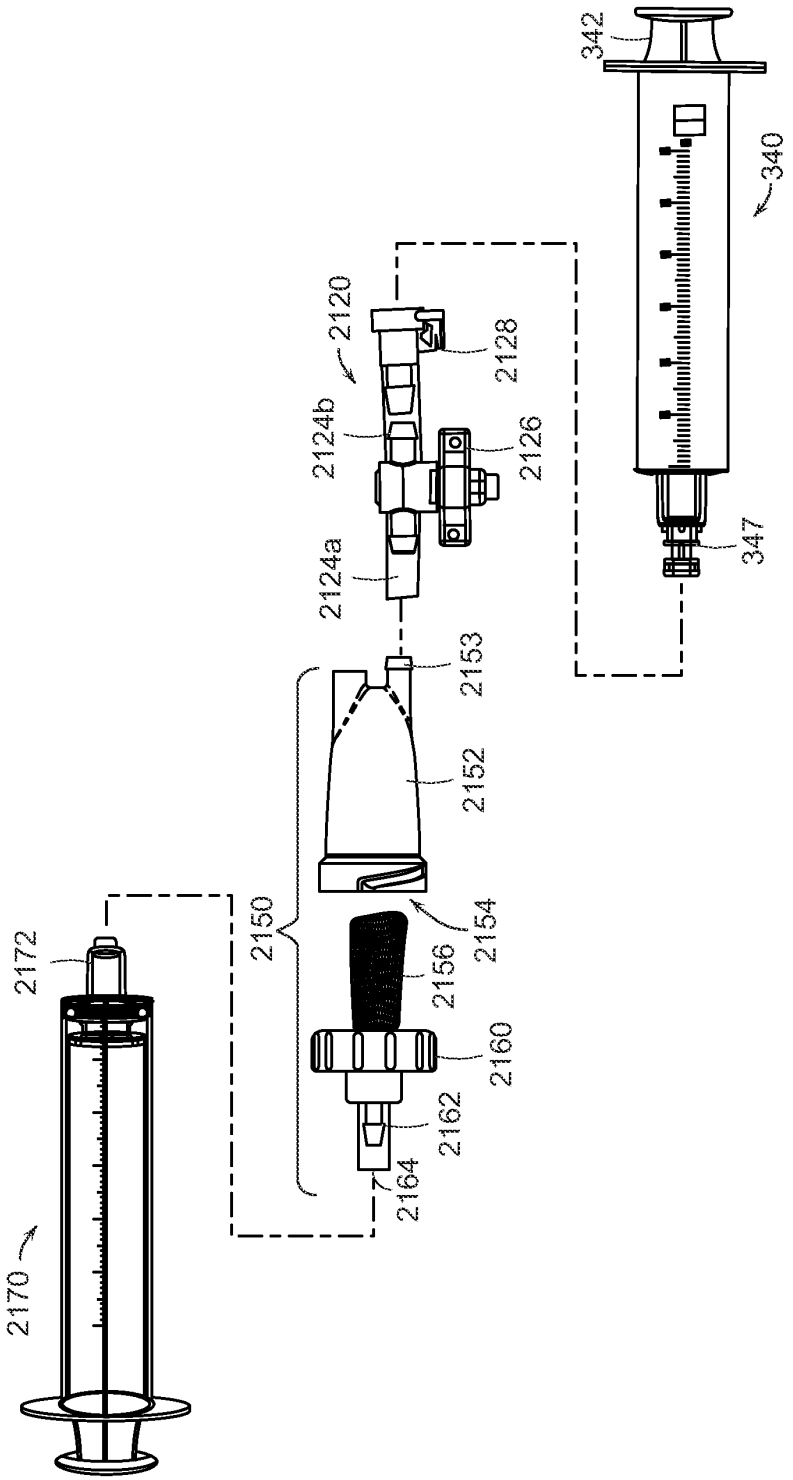

342
340
2120
2128
2124b
2126
347
2124a
2153
2152
2150
2154
2156
2160
2162
2164
2172
2170

FIG. 21A

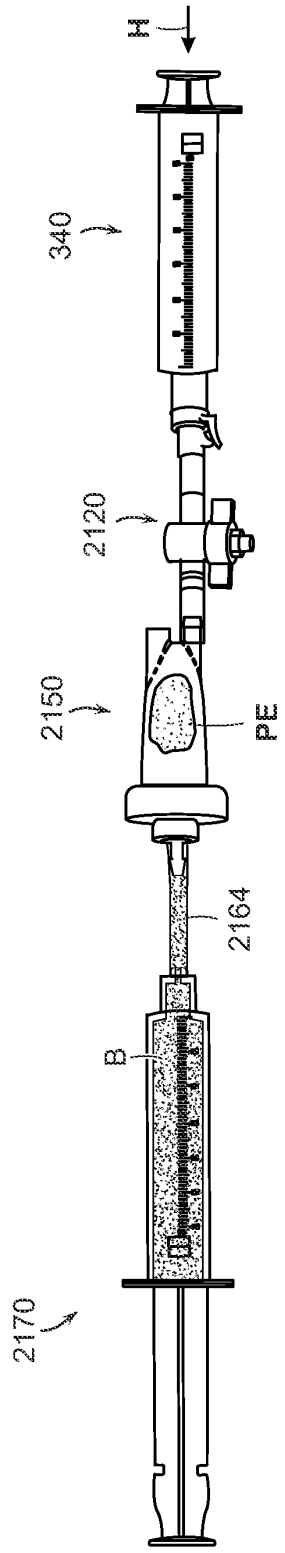


FIG. 21B

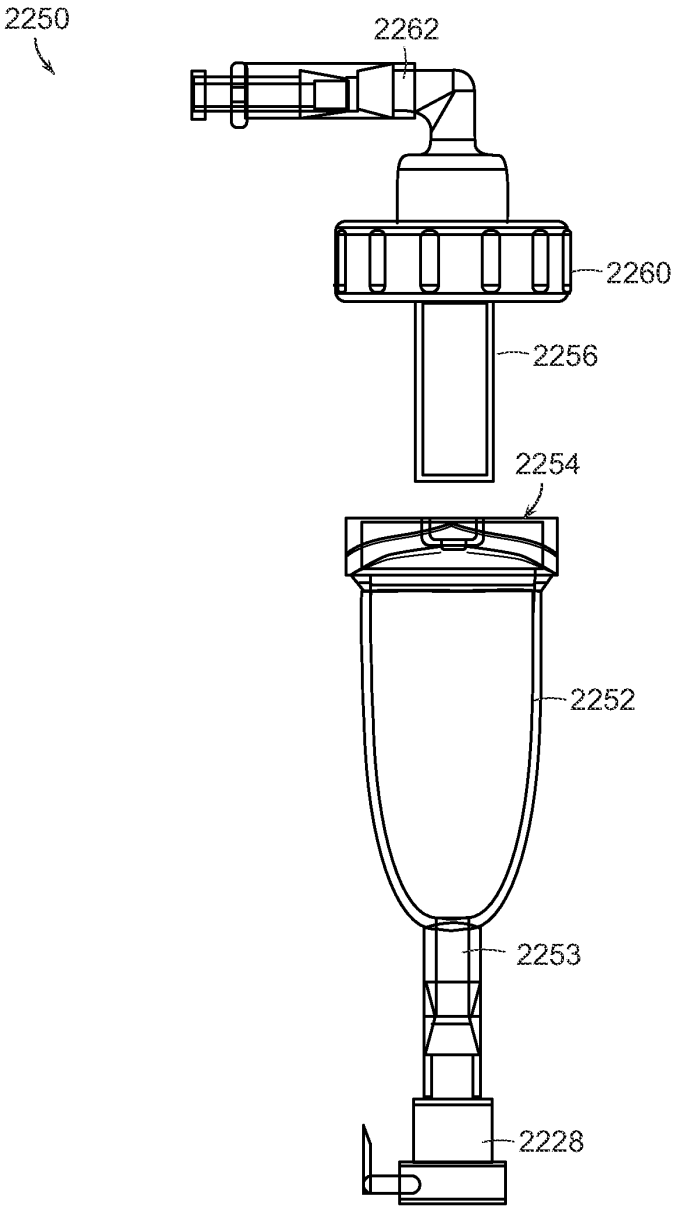


FIG. 22

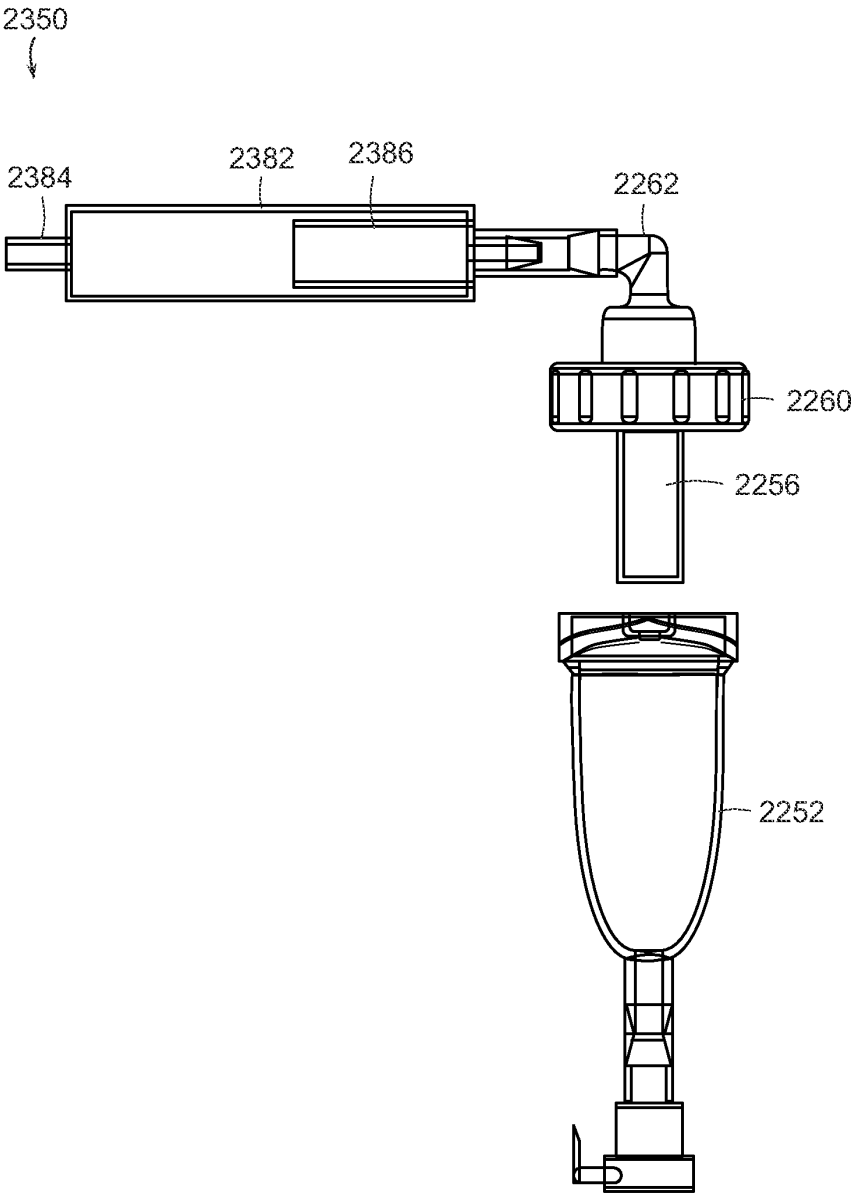


FIG. 23

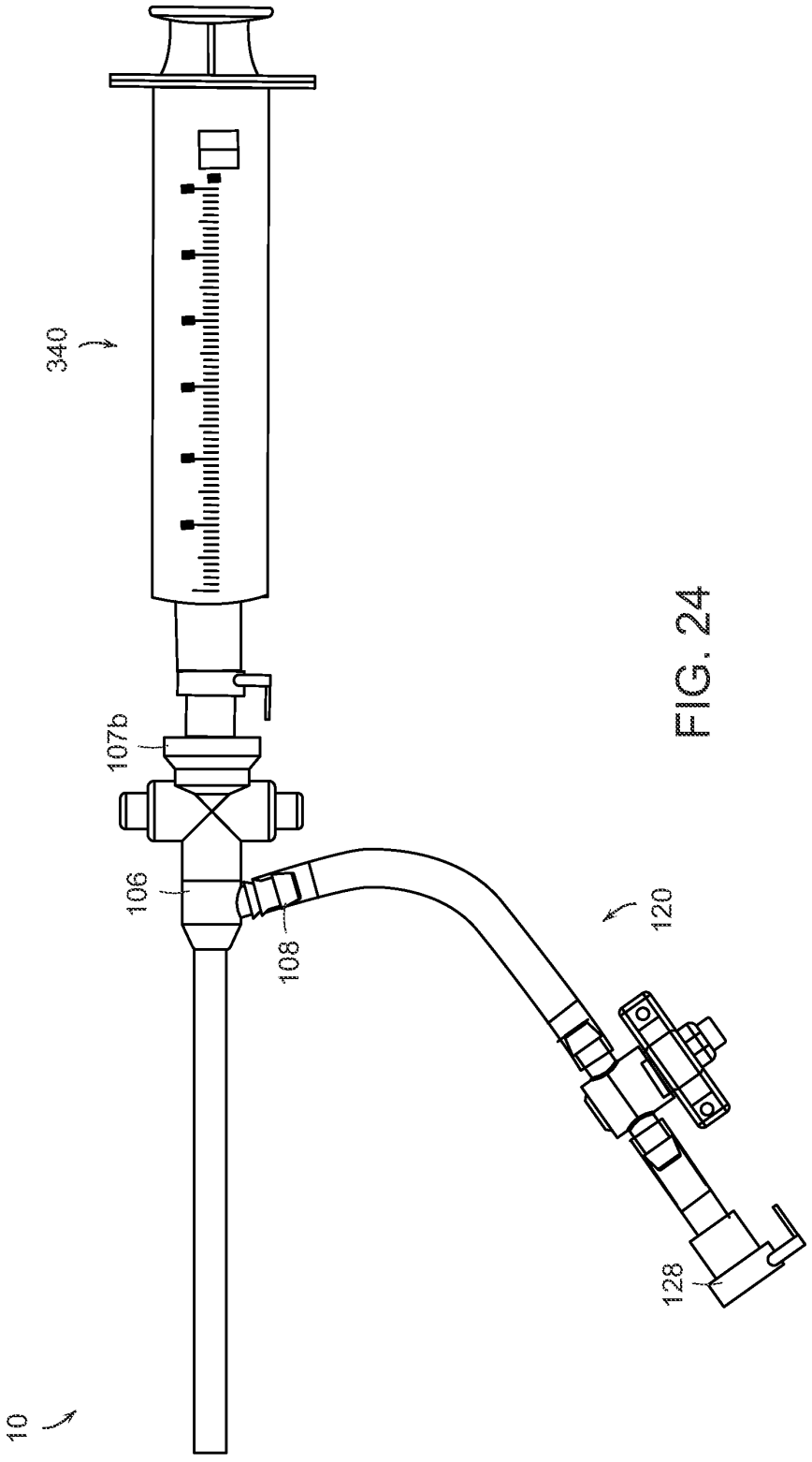


FIG. 24

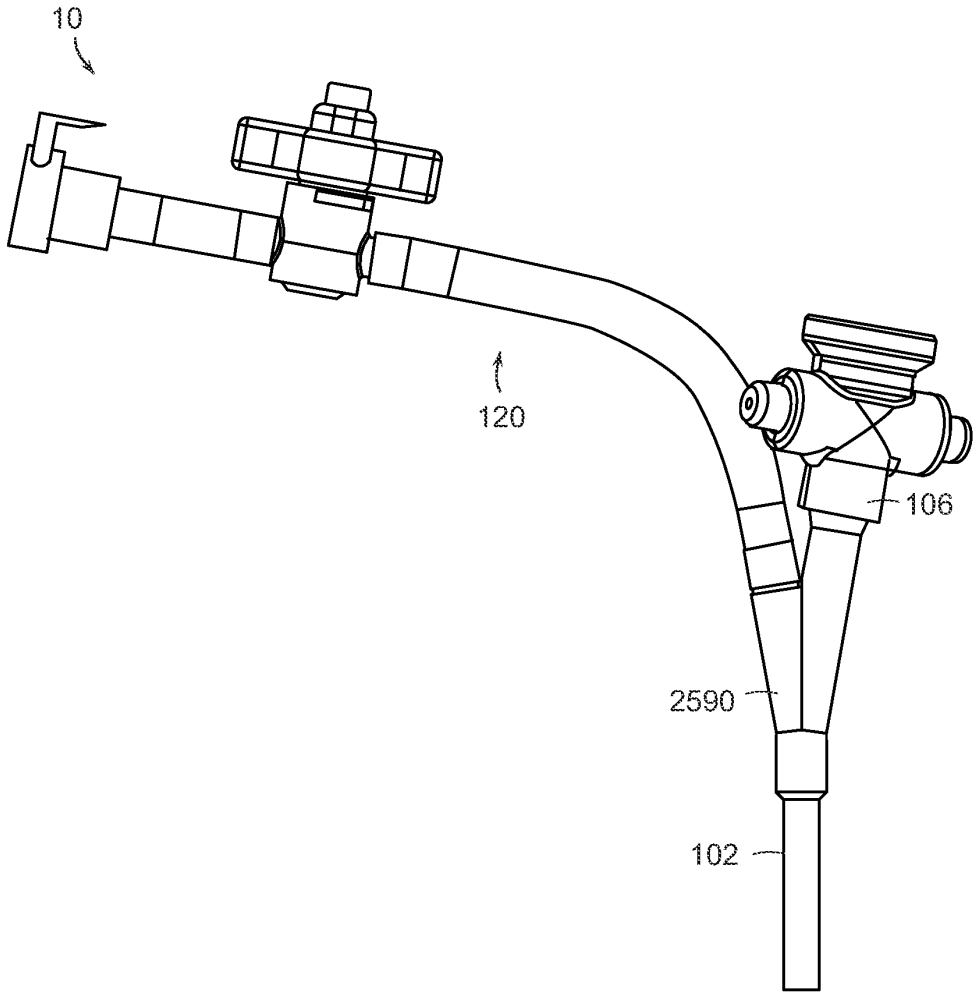


FIG. 25

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Document Description: Power of Attorney

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Application Number	Not Yet Assigned
Filing Date	Concurrently Herewith
First Named Inventor	Ben Merritt
Title	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS
Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned
Attorney Docket Number	111552.8018.US08

SIGNATURE of Applicant or Patent Practitioner

Signature	/Matthew S. Williams/	Date (Optional)	2023-06-05
Name	Matthew S. Williams	Registration Number	77,516
Title (if Applicant is a juristic entity)	Attorney for Applicant		
Applicant Name (if Applicant is a juristic entity)	Inari Medical, Inc.		

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SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent Application No. 18/167,757, filed February 10, 2023, which is a continuation of U.S. Patent Application No. 17/976,711, filed October 28, 2022, which is a continuation of U.S. Patent Application No. 17/865,315, filed July 14, 2022, which is a continuation of U.S. Patent Application No. 16/536,185, filed August 8, 2019, and issued as U.S. Patent No. 11,559,382, which claims the benefit of U.S. Provisional Patent Application No. 62/718,269, filed on August 13, 2018, and U.S. Provisional Patent Application No. 62/718,248, filed on August 13, 2018, each of which is herein incorporated by reference in its entirety.

TECHNICAL FIELD

[0002] The present technology relates generally to systems, methods, and devices for the intravascular treatment of emboli and/or thrombi within a blood vessel of a human patient. In particular, some embodiments of the present technology relate to systems for releasing stored vacuum pressure to aspirate clot material from a blood vessel.

BACKGROUND

[0003] Thromboembolic events are characterized by an occlusion of a blood vessel. Thromboembolic disorders, such as stroke, pulmonary embolism, heart attack, peripheral thrombosis, atherosclerosis, and the like, affect many people. These disorders are a major cause of morbidity and mortality.

[0004] When an artery is occluded by a clot, tissue ischemia develops. The ischemia will progress to tissue infarction if the occlusion persists. However, infarction does not develop or is greatly limited if the flow of blood is reestablished rapidly. Failure to reestablish blood flow can accordingly lead to the loss of limb, angina pectoris, myocardial infarction, stroke, or even death.

[0005] In the venous circulation, occlusive material can also cause serious harm. Blood clots can develop in the large veins of the legs and pelvis, a common condition known as deep venous thrombosis (DVT). DVT commonly occurs where there is a propensity for stagnated blood (e.g., long distance air travel, immobility, etc.) and clotting (e.g., cancer, recent surgery, such as orthopedic surgery, etc.). DVT can obstruct drainage of venous blood from the legs leading to swelling, ulcers, pain and infection. DVT can also create a reservoir in which blood clots can collect and then travel to other parts of the body including the heart, lungs, brain (stroke), abdominal organs, and/or extremities.

[0006] In the pulmonary circulation, the undesirable material can cause harm by obstructing pulmonary arteries—a condition known as pulmonary embolism. If the obstruction is upstream, in the main or large branch pulmonary arteries, it can severely compromise total blood flow within the lungs, and therefore the entire body. This can result in low blood pressure and shock. If the obstruction is downstream, in large to medium pulmonary artery branches, it can prevent a significant portion of the lung from participating in the exchange of gases to the blood resulting in low blood oxygen and buildup of blood carbon dioxide.

[0007] There are many existing techniques to reestablish blood flow through an occluded vessel. Embolectomies, for example, are a surgical technique involving incising a blood vessel and placing a balloon-tipped device (such as the Fogarty catheter) at the location of the occlusion. The balloon is then inflated at a point beyond the clot and used to withdraw the obstructing material back to the point of incision. The obstructing material is then removed by the surgeon. Although such surgical techniques have been useful, exposing a patient to surgery may be traumatic and best avoided when possible. Additionally, the use of a Fogarty catheter may be problematic due to the possible risk of damaging the interior lining of the vessel as the catheter is being withdrawn.

[0008] Percutaneous methods are also utilized for reestablishing blood flow. A common percutaneous technique is referred to as balloon angioplasty where a balloon-tipped catheter is introduced to a blood vessel (e.g., typically through an introducing catheter). The balloon-tipped catheter is then advanced to the point of the occlusion and inflated to dilate the stenosis. Balloon angioplasty is appropriate for treating vessel stenosis, but it is generally not effective for treating acute thromboembolisms as none of the occlusive material is removed and restenosis regularly

occurs after dilation. Another percutaneous technique involves placing a catheter near the clot and infusing streptokinase, urokinase, or other thrombolytic agents to dissolve the clot. Unfortunately, thrombolysis typically takes hours to days to be successful. Additionally, thrombolytic agents can cause hemorrhage, and in many patients the thrombolytic agents cannot be used at all.

[0009] Various devices exist for performing a thrombectomy or removing other foreign material. However, such devices have been found to have structures which are either highly complex, cause trauma to the treatment vessel, or lack the ability to be appropriately fixed against the vessel. Furthermore, many of the devices have highly complex structures that lead to manufacturing and quality control difficulties as well as delivery issues when passing through tortuous or small diameter catheters. Less complex devices may allow the user to pull through the clot, particularly with inexperienced users, and such devices may not completely capture and/or collect all of the clot material.

[0010] Thus, there exists a need for improved systems and methods for embolic extraction.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Many aspects of the present technology can be better understood with reference to the following drawings. The components in the drawings are not necessarily to scale. Instead, emphasis is placed on illustrating clearly the principles of the present disclosure.

[0012] Figure 1 is a partially schematic side view of a clot removal system configured in accordance with the present technology.

[0013] Figure 2 is a side view of a locking syringe configured in accordance with the present technology.

[0014] Figure 3A is a side view of a locking syringe configured in accordance with the present technology.

[0015] Figure 3B is a side view of an adaptor for connecting the locking syringe of Figure 3A to the clot removal system of Figure 1 configured in accordance with the present technology.

[0016] Figure 3C is a side view of the adaptor of Figure 3B coupled to the locking syringe of Figure 3A.

[0017] Figure 3D is a side view of the locking syringe of Figure 3A coupled to the clot removal system of Figure 1 via the adaptor of Figure 3B.

[0018] Figure 4A is a perspective side view of another pressure source configured in accordance with the present technology, and Figures 4B and 4C are enlarged schematic side views of the pressure source of Figure 4A during operation.

[0019] Figure 5 is a cross-sectional side view of an automatic release syringe configured in accordance with the present technology.

[0020] Figure 6 is a perspective top view of a syringe configured in accordance with the present technology.

[0021] Figure 7 is a side view of an over-wire locking syringe configured in accordance with the present technology.

[0022] Figure 8 is a flow diagram of a process or method for operating a clot removal system in accordance with the present technology.

[0023] Figures 9A–9C are side views of a proximal portion of the clot removal system of Figure 1 during a clot removal procedure using the locking syringe of Figure 3 in accordance with the present technology.

[0024] Figures 10A and 10B are schematic illustrations of a distal portion of the clot removal system of Figure 1 during a clot removal procedure in accordance with the present technology.

[0025] Figure 11 is a partially schematic side view of another clot removal system configured in accordance with the present technology.

[0026] Figure 12 is a flow diagram of another process or method for operating a clot removal system in accordance with the present technology.

[0027] Figures 13A–14C are schematic illustrations of a distal portion of the clot removal system of Figure 11 during a clot removal procedure in accordance with the present technology.

[0028] Figure 15 is a flow diagram of another process or method for operating a clot removal system in accordance with the present technology.

[0029] Figures 16A–16E are schematic illustrations of a distal portion of the clot removal system of Figure 11 during a clot removal procedure in accordance with the present technology.

[0030] Figure 17 is a partially schematic side view of another clot removal system configured in accordance with the present technology.

[0031] Figures 18A–18H are side views of a distal portion of the clot removal system shown of Figure 17 during a clot removal procedure in accordance with the present technology.

[0032] Figure 19 is a perspective side view of a pressure source for filtering blood from aspirated clot material during a clot removal procedure configured in accordance with the present technology.

[0033] Figure 20A is a partially-exploded side view of a filter device and pressure source configured in accordance with the present technology.

[0034] Figure 20B is a perspective side view of the syringe of Figure 20A coupled to the filter device of the Figure 20A.

[0035] Figure 20C is a side view of the filter device and syringe of Figure 20B coupled to the clot removal system of Figure 1.

[0036] Figures 20D and 20E are side views of the syringe of Figure 20A coupled to the clot removal system of Figure 1 for reintroducing blood to a patient.

[0037] Figure 21A is a partially-exploded side view of a filter device, a pressure source, and a reinfusion syringe configured in accordance with the present technology.

[0038] Figure 21B is a perspective side view of the filter device of Figure 21A coupled to the pressure source and the reinfusion syringe of Figure 21A.

[0039] Figure 22 is a partially-exploded side view of a filter device configured in accordance with the present technology.

[0040] Figure 23 is a partially-exploded side view of a filter device configured in accordance with the present technology.

[0041] Figure 24 is an enlarged isometric view of the clot removal system of Figure 1 configured in accordance with the present technology.

[0042] Figure 25 is an enlarged isometric view of the clot removal system of Figure 1 configured in accordance with the present technology.

DETAILED DESCRIPTION

[0043] The present technology is generally directed to methods and systems for removing clot material from a blood vessel of a human patient. In some embodiments, a catheter can be intravascularly positioned within a blood vessel such that a distal portion (e.g., a distal opening) of the catheter is positioned proximate to clot material within the blood vessel. The catheter can be fluidly coupled to a pressure source via a valve or other fluid control device positioned outside of the patient. With the valve closed, the pressure source can be activated to charge a vacuum chamber of the pressure source with a vacuum. The valve can then be opened to apply the vacuum to the catheter to thereby aspirate at least a portion of the clot material from the blood vessel into the catheter. In some embodiments, an interventional device can be delivered through the catheter and used to engage the clot material before and/or after the vacuum is applied to the catheter.

[0044] In one aspect of the present technology, the pressure source is configured to generate a vacuum and store the vacuum before the pressure source is fluidly connected to the catheter. Therefore, opening the fluid control device can instantaneously or nearly instantaneously apply the stored vacuum pressure to the catheter, thereby generating suction throughout the catheter. In particular, the suction is applied at the distal portion of the catheter proximate to the clot material. Pre-charging or storing the vacuum before applying the vacuum to the catheter can generate greater suction forces (and corresponding fluid flow velocities) at and/or near the distal portion of the catheter compared to, for example, simply activating the pressure source while it is fluidly connected to the catheter. The greater suction forces generated by application of the stored vacuum can be used to aspirate or otherwise remove clot material from within a blood vessel of a human patient.

[0045] Although many of the embodiments are described below with respect to devices, systems, and methods for treating a pulmonary embolism, other applications and other embodiments in addition to those described herein are within the scope of the technology (e.g., intravascular procedures other than the treatment of emboli, intravascular procedures for treating cerebral embolism, intravascular procedures for treating deep vein thrombosis (DVT), etc.).

Additionally, several other embodiments of the technology can have different configurations, states, components, or procedures than those described herein. Moreover, it will be appreciated that specific elements, substructures, advantages, uses, and/or other features of the embodiments described with reference to Figures 1–25 can be suitably interchanged, substituted or otherwise configured with one another in accordance with additional embodiments of the present technology. Furthermore, suitable elements of the embodiments described with reference to Figures 1–25 can be used as standalone and/or self-contained devices. A person of ordinary skill in the art, therefore, will accordingly understand that the technology can have other embodiments with additional elements, or the technology can have other embodiments without several of the features shown and described below with reference to Figures 1–25.

[0046] With regard to the terms "distal" and "proximal" within this description, unless otherwise specified, the terms can reference a relative position of the portions of a catheter subsystem with reference to an operator and/or a location in the vasculature. Also, as used herein, the designations "rearward," "forward," "upward," "downward," etc. are not meant to limit the referenced component to use in a specific orientation. It will be appreciated that such designations refer to the orientation of the referenced component as illustrated in the Figures; the systems of the present technology can be used in any orientation suitable to the user.

[0047] The headings provided herein are for convenience only and should not be construed as limiting the subject matter disclosed.

I. Selected Embodiments of Clot Removal Systems

[0048] Figure 1 is a partially schematic side view of a clot treatment or clot removal system comprising an aspiration assembly 10 ("assembly 10") configured in accordance with an embodiment of the present technology. In the illustrated embodiment, the assembly 10 includes a catheter subsystem 100, a tubing subsystem 120, and a pressure source 140. The catheter subsystem 100 includes a catheter 102 (e.g., an aspiration catheter) comprising an elongated shaft defining a lumen 104 and having a distal portion 103a and a proximal portion 103b. The catheter subsystem 100 further includes a valve 106 that can be integral with or coupled to the proximal portion 103b of the catheter 102.

[0049] In the illustrated embodiment, the valve 106 includes a distal portion 107a, a proximal portion 107b, and a lumen 109 extending therethrough from the distal portion 107a to the proximal portion 107b. The valve 106 further includes a flow controller (obscured in Figure 1) in the lumen 109. In some embodiments, the valve is a hemostasis valve that is configured to maintain hemostasis during a clot removal procedure by preventing fluid flow in the proximal direction through the valve 106 as various components such as delivery sheaths, pull members, guidewires, interventional devices, other aspiration catheters (e.g., as described in detail with reference to Figures 11–16E), etc., are inserted through the valve 106 to be delivered through the catheter 102 to a treatment site in a blood vessel. The valve 106 further includes a branch or side port 108 positioned distally of the flow controller in the lumen 109 and configured to fluidly couple the lumen 104 of the catheter 102 to the tubing subsystem 120. In the illustrated embodiment, the valve 106 includes buttons 101 that can be actuated (e.g., depressed) to open a conduit within the lumen 109. In some embodiments, the valve 106 can be a valve of the type disclosed in U.S. Patent Application No. 16/117,519, filed August 30, 2018, and titled "HEMOSTASIS VALVES AND METHODS OF USE," which is incorporated herein by reference in its entirety. In some embodiments, the proximal portion 107b of the valve 106 is further configured to be detachably coupled (e.g., via a snap-fit arrangement) to a retraction/aspiration device for aspirating the lumen 104 of the catheter 102 and/or for retracting an interventional device, catheter, delivery sheath, catheter, etc., positioned within the lumen 104. Specific details of such retraction/aspiration devices and associated methods are disclosed in U.S. Patent Application No. 9,526,864, filed June 9, 2015, and titled "RETRACTION AND ASPIRATION DEVICE FOR TREATING EMBOLISM AND ASSOCIATED SYSTEMS AND METHODS," which is incorporated herein by reference in its entirety.

[0050] The tubing subsystem 120 fluidly couples the catheter subsystem 100 to the pressure source 140. More specifically, the tubing subsystem 120 can include one or more tubing sections 124 (individually labeled as a first tubing section 124a and a second tubing section 124b), at least one fluid control device 126 (e.g., a valve), and at least one connector 128 for fluidly coupling the tubing subsystem 120 to the pressure source 140 and/or other suitable components. More specifically, in the illustrated embodiment, the fluid control device 126 is a stopcock that is fluidly coupled to (i) the side port 108 of the valve 106 via the first tubing section 124a and (ii) the

connector 128 via the second tubing section 124b. In some embodiments, the fluid control device 126 can define a lumen having a diameter (or other cross-sectional dimension) that is greater than or equal to a diameter of the lumen 104 of the catheter 102, a diameter of the first tubing section 124a, and/or a diameter of the second tubing section 124b.

[0051] The fluid control device 126 is externally operable by a user to regulate the flow of fluid therethrough and, specifically, from the lumen 104 of the catheter 102 to the pressure source 140. In other embodiments, the fluid control device 126 can be a clamp that can be actuated (e.g., compressed or squeezed by the hand of a user) to partially or fully restrict fluid flow through the tubing section 124a and/or the tubing section 124b. In yet other embodiments, the fluid control device 126 can be omitted and its functionality incorporated into the pressure source 140 (e.g., as described in detail below with reference to Figure 5). In some embodiments, the fluid control device 126 can include a quick-release mechanism (e.g., a spring-loaded apparatus) for rapidly opening, unclamping, etc., the fluid control device 126 to (e.g., instantaneously or nearly instantaneously) fluidly connect the pressure source 140 and the catheter 102. In some embodiments, the fluid control device 126 can be opened/closed automatically (e.g., by a motor, switch, etc.). When the pressure source 140 is pre-charged with a vacuum, as described in detail below, such a quick-release fluid control device 126 can reduce the time needed for pressure in the assembly 10 to equalize after opening of the fluid control device 126, and can thereby increase suction forces generated at the distal portion 103a of the catheter 102.

[0052] In some embodiments, the connector 128 is a quick-release connector (e.g., a quick disconnect fitting) that enables rapid coupling/decoupling of the catheter 102 and the fluid control device 126 to/from the pressure source 140. In other embodiments, the tubing subsystem 120 can have more or fewer tubing sections, connectors, and/or fluid control devices, and can have other suitable configurations. In some embodiments, one or more of the components can be permanently connected and/or integrally formed.

[0053] The pressure source 140 is configured to generate (e.g., form, create, charge, build-up, etc.) a vacuum (e.g., negative relative pressure) and store the vacuum for subsequent application to the catheter subsystem 100. Further details of suitable pressure sources are described in detail below with reference to Figures 2–7. During operation of the assembly 10, a

user can first close the fluid control device 126 before activating the pressure source 140 to build up vacuum pressure within the pressure source 140 (e.g., a vacuum chamber of the pressure source 140). In some embodiments, the user can control or select the volume of the generated vacuum. In this manner, a vacuum is charged within the pressure source 140 before the pressure source 140 is fluidly connected to the catheter subsystem 100. To aspirate the lumen 104 of the catheter 102, the user can open the fluid control device 126 to fluidly connect the pressure source 140 to the catheter subsystem 100 and thereby apply or release the vacuum stored in the pressure source 140 to the lumen 104 of the catheter 102. Opening of the fluid control device 126 instantaneously or nearly instantaneously applies the stored vacuum pressure to the tubing subsystem 120 and the catheter 102, thereby generating suction throughout the catheter 102. In particular, the suction is applied at the distal portion 103a of the catheter 102. In one aspect of the present technology, pre-charging or storing the vacuum before applying the vacuum to the lumen 104 of the catheter 102 is expected to generate greater suction forces (and corresponding fluid flow velocities) at and/or near the distal portion 103a of the catheter 102 compared to simply activating the pressure source 140 while it is fluidly connected to the catheter 102. As described in detail below, the suction forces generated by application of the stored vacuum can be used to aspirate or otherwise remove clot material from within a blood vessel of a human patient.

II. Selected Embodiments of Pressure Sources for Use with Clot Removal Systems

[0054] As described in detail above with reference to Figure 1, the assembly 10 of the present technology includes a pressure source (e.g., a vacuum source, negative pressure source, etc.) configured to charge a vacuum that can be applied to the catheter subsystem 100 to generate suction forces for aspirating clot material from within a blood vessel. In general, the pressure source can be any suitable source or combination of sources for generating and/or storing negative pressure. In some embodiments, the pressure source can be a pump (e.g., an electric pump coupled to a vacuum chamber) while, in other embodiments, the pressure source can include one or more syringes that can be actuated or otherwise activated by a user of the assembly 10 to generate and store a vacuum therein.

[0055] Figure 2 is a side view of a pressure source 240 comprising a vacuum-pressure locking syringe ("syringe 240") configured in accordance with the present technology. In some

embodiments, the syringe 240 can be of the kind sold under the trademark "VacLok" by Merit Medical System, Inc. In the illustrated embodiment, the syringe 240 includes a plunger 242 slidably and rotatably positioned within a chamber or barrel 244. The barrel 244 is shown as transparent in Figure 2 for the sake of clarity. The plunger 242 includes a seal 243 and a plurality of index members 246 defining slots 248 between adjacent pairs thereof. A tab member 245 projects inwardly from the interior surface of the barrel 244 and is configured to be removably positioned in the slots 248 for locking the plunger 242 in position relative to the barrel 244. In some embodiments, the barrel 244 can be made of a transparent material that permits a user to visualize material (e.g., clot material) within the barrel 244 and to visualize the relative position between the slots 248 and tab member 245 for locking the syringe 240.

[0056] Referring to both Figures 1 and 2 together, the syringe 240 further includes a tip 247 for coupling the syringe 240 to the tubing subsystem 120. In the illustrated embodiment, the tip 247 is a standard luer connector that can be coupled to the connector 128 via one or more suitable adaptors. The tip 247 further defines a lumen or bore 249 having an inner diameter D_1. In some embodiments, the diameter D_1 is about 0.103", or about 0.080" to about 0.200", or about 0.100" to about 0.150", or about 0.100" to about 0.110". In some embodiments, the inner diameter D_1 is about 14 French.

[0057] During operation of the assembly 10, a user can first close the fluid control device 126 and then grip the plunger 242 and/or the barrel 244 to withdraw (e.g., retract) the plunger 242 at least partially out of the barrel 244 to thereby generate a vacuum in the barrel 244. Once the user has withdrawn the plunger 242 to a sufficient or desired volume, the user can lock the plunger 242 by rotating the plunger 242 relative to the barrel 244 such that the tab member 245 is positioned within a corresponding one of the slots 248. In other embodiments, the syringe 240 may not be a locking syringe, and the user can instead hold the plunger 242 in position relative to the barrel 244. Moreover, the user can control the volume of the vacuum—by withdrawing the plunger 242 more or less—to provide a desired amount or level of suction/aspiration upon opening of the fluid control device 126. In some embodiments, the syringe has a volume of about 60 cc or less than about 60 cc.

[0058] Figure 3A is a side view of a pressure source 340 comprising a vacuum-pressure locking syringe ("syringe 340") configured in accordance with the present technology. The syringe 340 can have some features generally similar to the features of the syringe 240 described above with reference to Figure 2. For example, the syringe 340 includes a plunger 342 slidably and rotatably positioned within a barrel 344, and the plunger 342 includes a plurality of index members 346 defining slots 348 between adjacent pairs thereof. The barrel 344 is shown as transparent in Figure 3A (and Figure 3C) for the sake of clarity. While withdrawing the plunger 342, a user can lock the plunger 342 at a specified volume by rotating the plunger 342 relative to the barrel 344 such that a tab member 345 on the interior surface of the barrel 344 is positioned within a corresponding one of the slots 348. In some embodiments, the syringe 340 has a maximum volume of about 60 cc or greater than 60 cc.

[0059] In the illustrated embodiment, the syringe 340 includes a large-bore tip 347, such as a Toomey tip, defining an inner lumen or bore 349. In some embodiments, the bore 349 can have an inner diameter D_2 that is greater than or equal to the largest inner diameter of the assembly 10 (e.g., of the catheter 102 and tubing subsystem 120). In certain embodiments, the tip 347 can be about 26 French or greater. Accordingly, referring to Figures 2 and 3A together, the diameter D_2 can be greater than the dimension D_1. For example, the dimension D_2 can be about two, three, four, or more times greater than the diameter D_1.

[0060] Figure 3B is a side view of an adaptor 350 for connecting the syringe 340 to the catheter subsystem 100 configured in accordance with the present technology. Figure 3C is a side view of the adaptor 350 coupled to the syringe 340, and Figure 3D is a side view of the syringe 340 coupled to the tubing subsystem 120 via the adaptor 350. The adaptor 350 is shown as partially transparent in Figure 3C for the sake of illustration. Referring to Figure 3B, the, the adaptor 350 includes (i) a first portion 351 defining a first lumen or bore 352 having an inner diameter D_3, (ii) a second portion 353 defining a second lumen or bore 354, and (iii) a stepped surface or interface 355 between the first and second portions 351, 353. The first portion 351 can further include a seal 357 such as an O-Ring around an exterior surface thereof.

[0061] Referring to Figures 3A–3D together, the second bore 354 of the adaptor 350 is configured to removably receive the tip 347 of the syringe 340 therein. In some embodiments, the

tip 347 can be snuggly received in the second bore 354 via an interference fit. In some embodiments, a seal (e.g., an O-ring) can be positioned between an exterior surface of the tip 347 and an interior surface of the second bore 354. In other embodiments, the syringe 340 can be permanently coupled or integrally formed with the adaptor 350. The first portion 351 of the adaptor 350 is configured to be removably positioned within the connector 128 of the tubing subsystem 120 to fluidly couple the syringe 340 to the tubing subsystem 120. In some embodiments, the first portion 351 of the adaptor 350 can be pushed into the connector 128 until the interface 355 abuts the connector 128. When the first portion 351 of the adaptor 350 is positioned within the connector 128, the seal 357 seals the interface between the connector 128 and the adaptor 350.

[0062] The diameter D_3 of the first bore 352 of the adaptor 350 can be selected to be about the same as or greater than the greatest inner diameter of the assembly 10 (e.g., of the catheter 102 and the tubing subsystem 120). For example, the catheter 102 can be about 9 French or greater, and the diameter D_3 can be selected to be larger than the size of the catheter 102. Accordingly, when the fluid control device 126 is open, the continuous lumen between the catheter 102 and the syringe 340 can have a generally constant diameter and/or does not contain any narrowing at the interface between the syringe 340 and the tubing subsystem 120. That is, the adaptor 350 can connect the syringe 340 and the tubing subsystem 120 without any restriction or narrowing of the fluid path. In contrast, a standard luer connector (e.g., the syringe 240) can only provide a continuous lumen for catheters of about 8 French or smaller. Any narrowing of the fluid pathway between the catheter 102 and the syringe 340 can reduce the volumetric flow rate (e.g., suction forces and fluid velocities) that can be generated when a vacuum stored in the syringe 340 is applied to the catheter 102.

[0063] In general, the syringe 340 and the adaptor 350 can reduce the fluid resistance in the assembly 10 and therefore facilitate a more rapid pressure equalization in the assembly 10 when the fluid control device 126 is opened to apply the charged vacuum to the catheter 102. In some embodiments, for example, when the syringe 240 (Figure 2) is charged with a 60 cc vacuum and the fluid control device 126 is opened, the pressure in the assembly 10 can take about 1–2 seconds to equalize. In contrast, when the syringe 340 is charged with a 60 cc vacuum and the fluid control device 126 is opened, the pressure in the assembly 10 can take less than about 1 second (e.g.,

about 0.5 seconds) to equalize. More specifically, Table 1 illustrates representative pressure equalization times and associated flow rates when the syringe 240 is coupled to a 20 French catheter (i.e., the catheter 102). Table 2 illustrates representative pressure equalization times and associated flow rates when the syringe 340 and the adaptor 350 are coupled to a 20 French catheter (i.e., the catheter 102).

Table 1

Pressure Equalization Time (seconds)	Flow Rate (cc/sec)
2.0	30.0
1.9	31.6
1.8	33.3
1.7	35.3
1.6	37.5
1.5	40.0
1.4	42.9
1.3	46.2

Table 2

Pressure Equalization Time (seconds)	Flow Rate (cc/sec)
0.9	66.7
0.8	75.0
0.7	85.7
0.6	100.0
0.5	120.0
0.4	150.0
0.3	200.0

0.2	300.0
0.1	600.0

[0064] In each instance, the syringe 340 provides for relatively faster equalization times and correspondingly greater flow rates. It is expected that the more rapid pressure equalization and flow rates provided by the syringe 340 will provide correspondingly greater suction forces at the distal portion 103a of the catheter 102. That is, in general, it is expected that increasing the bore size of a syringe used to provide vacuum pressure will provide greater suction forces over a smaller period of time (e.g., will provide a larger vacuum impulse). In some embodiments, the greater suction forces can facilitate the removal of clot material from a blood vessel of a patient even where the clot material is strongly lodged or attached within the blood vessel (e.g., a chronic clot).

[0065] Moreover, as shown in Figure 3D, the adaptor 350 can couple the syringe 340 to the connector 128 without the need for any intervening tubing sections or additional adaptors. This arrangement can minimize the total length, volume, etc., of the components fluidly coupling the catheter 102 to the syringe 340. It is expected that the magnitude of suction forces generated at the distal portion 103a of the catheter 102—e.g., when a vacuum charged in the syringe 340 is applied to the catheter 102 by opening of the fluid control device 126—is proportional to the length of the fluid path between the pressure source 340 and catheter 102. Thus, operation of the assembly 10 with the syringe 340 and adaptor 350 is expected to increase the suction forces generated at the distal portion 103a of the catheter 102. In some embodiments, the greater suction forces can facilitate the removal of clot material from a blood vessel of a patient even where the clot material is strongly lodged or attached within the blood vessel (e.g., a chronic clot).

[0066] Figure 4A is a side perspective view a pressure source 400 including the syringe 340 ("primary syringe 340") shown in Figures 3A–3D and a secondary syringe 460 configured in accordance with the present technology. The secondary syringe 460 can include a plunger 462 slidably positioned within a chamber or barrel 464. The primary and secondary syringes 340, 460 can have the same volume or different volumes. In the illustrated embodiment, a tip 463 of the secondary syringe 460 is coupled to a first one-way valve (e.g., a check valve) 470 via a coupling

member 465, such as a tube. The first one-way valve 470 is configured to fluidly connect the secondary syringe 460 to the ambient environment or another device coupled to the first one-way valve 470. A second one-way valve (e.g., a check valve) 472 spans between and is configured to fluidly connect the primary syringe 340 to the secondary syringe 460. More specially, in the illustrated embodiment the second one-way valve 472 is connected between the first portion 351 of the adaptor 350 and the coupling member 465. In other embodiments, the second one-way valve 472 can couple the primary and secondary syringes 340, 460 in different manners. For example, the second one-way valve 472 can span between and directly connect the barrels 344,464. The primary and secondary syringes 340, 460 can be coupled or fastened together via one or more connectors 474 that fix the positions of the barrel 344, 464 relative to one another.

[0067] In some embodiments, the second one-way valve 472 is a normally-open check valve configured to (i) permit fluid (e.g., air) flow from the primary syringe 340 and the adaptor 350 to the secondary syringe 460 and (ii) inhibit fluid flow in the opposite direction from the secondary syringe 460 into the primary syringe 340. In some embodiments, the second one-way valve 472 has a cracking (e.g., opening) pressure of about 0 psi. In one aspect of the present technology, this arrangement maximizes the magnitude of the vacuum that can be charged within the primary syringe 340. That is, the cracking pressure of the second one-way valve 472 does not reduce the effective vacuum within the primary syringe 340. In other embodiments a normally-closed or other type of valve could be used for the second one-way valve 472. However, in such embodiments the vacuum efficiency of the pressure source 400 would be reduced by the cracking pressure of the second one-way valve 472. Similarly, the first one-way valve 470 can be a check valve configured to (i) permit fluid flow from the secondary syringe 460 to the ambient environment (or other device) and (ii) inhibit fluid flow in the opposite direction from the ambient environment into the secondary syringe 460.

[0068] Figures 4B and 4C are enlarged schematic side views of the pressure source 400 during operation. More specifically, Figures 4B and 4C illustrate fluid flow paths through the first and second one-way valves 470, 472 during retraction and advancement, respectively, of the plunger 462 through the barrel 464 of the secondary syringe 460. Referring first to Figures 4A and 4B together, during retraction/withdrawal of the plunger 462, (i) the first one-way valve 470 is closed to inhibit fluid from flowing into the secondary syringe 460 while (ii) the second one-

way valve is open 472 to permit fluid to flow from the primary syringe 340, the catheter subsystem 100 (Figure 1), and/or the tubing subsystem 120 (Figure 1) into the secondary syringe 460. This flow path is indicated by the arrows R in Figure 4B. Referring to Figures 4A and 4C together, during advancement of the plunger 462, (i) the first one-way valve 470 is open to permit fluid flow (e.g., fluid expulsion) from the secondary syringe 460 to the ambient environment (or other device) while (ii) the second one-way valve 472 is closed to inhibit fluid flow from the secondary syringe 460 into (e.g., back into) the primary syringe 360, the catheter subsystem 100, and/or the tubing subsystem 120. This flow path is indicated by the arrows A in Figure 4C.

[0069] Referring to Figures 1 and 3A–4C together, the pressure source 400 can be coupled to the tubing subsystem 120 by coupling the primary syringe 340 to the connector 128 (e.g., as shown in Figure 3D). When the pressure source is coupled to the tubing subsystem 120, retraction of the plunger 462 of the secondary syringe 460 evacuates an evacuatable volume of the assembly 10. For example, when the fluid control device 126 is closed, retraction of the plunger 462 of the secondary syringe 460 evacuates fluid, through the second one-way valve 472, from (i) the primary syringe 340 (e.g., from the barrel 344, the tip 347, and/or the adaptor 350) and (ii) the portion of the tubing subsystem 120 between the fluid control device 126 and the primary syringe 340. This can enable a greater charged/stored vacuum to be generated for subsequent application to the catheter subsystem 100 for aspirating clot material. In some embodiments, the plunger 462 of the secondary syringe 460 can be withdrawn/advanced (e.g., "cycled") one or more times before withdrawing the plunger 342 of the primary syringe 340 to evacuate air from (i) the tip 347 of the primary syringe 340 and/or (ii) the portion of the tubing subsystem 120 between the fluid control device 126 and the tip 347. In other embodiments, the plunger 462 of the secondary syringe 460 can alternatively or additionally be withdrawn after withdrawing the plunger 342 of the primary syringe 340 to further evacuate the barrel 344 of the primary syringe 340. In some embodiments, the plunger 462 can be cycled when the fluid control device 126 is open to, for example, facilitate the removal of clot material stuck or clogged within the catheter subsystem 100. That is, cycling the secondary syringe 460 when the fluid control device 126 is open can generate vacuum pressure and suction in the catheter 102 to aid in the aspiration/removal of clot material.

[0070] In some embodiments, the volumes of the primary and secondary syringes 340, 460 can be selected based on one or more desired characteristics of a clot removal procedure using the

pressure source 400. For example, the secondary syringe 460 can have a larger volume than the primary syringe 340 to permit a high vacuum to be charged within the primary syringe 340 while also limiting blood loss from the patient.

[0071] In one aspect of the present technology, the pressure source 340 permits a greater vacuum to be generated without increasing the volume of the primary syringe 340. For example, the vacuum generated by the primary syringe 340 alone is directly proportional to the volume of the primary syringe 340. Thus, to generate a greater vacuum using the primary syringe 340 alone, the volume of the primary syringe 340 must be increased. In contrast, inclusion of the secondary syringe 460 in the pressure source 400 and the configuration of the first and second one-way valves 470, 472 allows the (e.g., maximum) generated vacuum to be independent of the volume of the primary syringe 340. Therefore, for example, the generated vacuum can be increased without correspondingly increasing the volume of blood withdrawn from the patient when applying the vacuum to the catheter subsystem 100.

[0072] In some embodiments, (e.g., as described in greater detail below with reference to Figure 19), the primary syringe 340 of the pressure source 400 can be replaced with a simple pressure vessel or other volume, such as a canister, barrel, tube, etc. In such embodiments, a vacuum can be generated in the canister simply by cycling the secondary syringe 460 one or more times. In some embodiments, the secondary syringe 460 can comprise a pump or vacuum source other than a syringe. Likewise, the secondary syringe 460 or other vacuum source can be fluidly coupled to the primary syringe 340 in other manners (e.g., via a different arrangement of check valves) to produce the same or similar flow patterns as shown in Figures 4B and 4C. Moreover, in some embodiments the first and second one-way valves 470, 472 can be other types of flow control devices that are mechanically activated/deactivated (e.g., opened and closed) rather than passively operated via pressure differentials within the pressure source 400. For example, the flow control devices 470, 472 can be mechanically coupled to the plunger 462 of the secondary syringe 460 such that cycling the plunger 462 activates/deactivates the flow control devices 470, 472 to operate the pressure source 400 in the manner illustrated in Figures 4B and 4C.

[0073] Figure 5 is a side cross-sectional view of a pressure source 540 comprising an automatic release syringe ("syringe 540") configured in accordance with the present technology.

In general, the syringe 540 is configured to automatically apply a charged vacuum of a selected volume to the catheter subsystem 100 without requiring the actuation of an intervening fluid control device, such as the fluid control device 126 shown in Figure 1. The syringe 540 can have some features generally similar to the features of the syringes 240, 340 described in detail above with reference to Figures 2 and 3A–3D. For example, the syringe 540 includes a first plunger 542 slidably positioned within a chamber or barrel 544. The first plunger 542 further includes a first seal 543 that engages an interior surface of the barrel 544 such that a vacuum is formed within the barrel 544 as the first plunger 542 is withdrawn through the barrel 544. Likewise, referring to both Figures 1 and 5 together, the syringe 540 includes a tip 547 (e.g., a Toomey tip) for coupling the syringe 540 to the tubing subsystem 120 (e.g., via a Toomey tip adaptor) and defining a bore 549. In some embodiments, the bore 549 has a relatively large diameter selected to provide rapid pressure equalization in the assembly 10 after a vacuum stored in the syringe 540 is released.

[0074] The first plunger 542 can further include (i) a grip portion 541 configured to be engaged by a user for retracting the first plunger 542 and (ii) a lumen 581 extending lengthwise therethrough. In the illustrated embodiment, a plunger assembly 582 is slidably positioned within and extends through the lumen 581 of the first plunger 542. The plunger assembly 582 includes (i) a second plunger 583 and (ii) a release member 584 slidably and/or rotatably positioned within a lumen 585 of the second plunger 583. The release member 584 includes an engagement member 586 configured to engage the grip portion 541 of the first plunger 542 when the first plunger 542 is withdrawn from the barrel 544. The second plunger 583 includes a second seal 587 configured to engage and seal an interior surface of the bore 549 of the syringe 540 to enable a vacuum to be formed in the barrel 544 as the first plunger 542 is withdrawn through the barrel 544. That is, the second seal 587 can seal (e.g., fluidly disconnect) the barrel 544 of the syringe from the tubing subsystem 120 and the catheter subsystem 100. In some embodiments, the syringe 540 can further include an O-ring 579 or other suitable component for sealing an interface between the first and second plungers 542, 582 to maintain the vacuum formed within the barrel 544, while also permitting the first plunger 542 to move (e.g., translate) relative to the second plunger 583.

[0075] The plunger assembly 582 further includes a locking mechanism (not shown) configured to permit/inhibit the release member 584 from moving longitudinally relative to the second plunger 583. In some embodiments, for example, rotation of the release member 584 in a

first direction relative to the second plunger 583 can lock the two components in position, while rotation of the release member 584 in a second direction relative to the second plunger 583 can unlock the two components so that the release member 584 can be withdrawn or pushed into the lumen 585 of the second plunger 583. In other embodiments, the release member 584 and the second plunger 583 can be integrally formed or permanently locked together.

[0076] The plunger assembly 582 enables (i) a user of the syringe 540 to select a desired volume for a vacuum to be formed in the syringe 540 and (ii) the automatic release or application of a generated vacuum via opening (e.g., unplugging) of the bore 549. Specifically, during operation of the syringe 540, a user can first unlock the release member 584 and slide the release member 584 to a position corresponding to a desired vacuum volume. For example, the release member 584 can have tick marks 588 or other indicia along its length that correspond to a volume of the syringe 540 (e.g., a vacuum chamber volume). After selecting a desired volume, the user can lock the release member 584 relative to the second plunger 583 (e.g., by rotating the release member 584) to inhibit relative movement of the two components. After locking the release member 584, the user can grasp the grip portion 541 to retract the first plunger 542 relative to the barrel 544 and the plunger assembly 582 to generate a vacuum within the barrel 544 between the first and second seals 543, 587. When the first plunger 542 has been retracted to the desired volume, the grip portion 541 engages the engagement member 586 of the release member 584 such that further retraction of the first plunger 542 simultaneously retracts the plunger assembly 582. As the plunger assembly 582 is retracted, the second seal 587 of the second plunger 583 is pulled out of the bore 549, thereby releasing the vacuum stored in the barrel 544. In this manner, the syringe 540 provides for the automatic release of charged vacuum pressure at a specified volume and with a single retraction of the first plunger 542. Put differently, the syringe 540 has a built-in fluid control device and thus eliminates the need for a separate fluid control device 126 and/or an additional step for opening the fluid control device 126.

[0077] Figure 6 is a top perspective view of a pressure source 640 comprising a syringe ("syringe 640") configured in accordance with the present technology. The syringe 640 can include some features generally similar to the features of the syringes 240, 340, and 540 described in detail above with reference to Figures 2–3D and 5. For example, the syringe 640 includes a plunger 642 slidably positioned within a barrel 644, and a tip 647 (e.g., a large-bore tip). In the

illustrated embodiment, the syringe 640 further includes a lever or handle 690 operably coupled to the plunger 642. The handle 690 provides mechanical leverage for withdrawing the plunger 642 to create a vacuum within the barrel 644. More specifically, the handle 690 can be coupled to a crossbar 691 that rotates relative to the plunger 642 via actuation (e.g., rotation) of the handle 690. The crossbar 691 can be coupled to a gear (obscured in Figure 6) configured to engage a track 692 on the plunger 642. Accordingly, rotation of the handle 690 in a first direction retracts the plunger 642 relative to the barrel 644 to charge a vacuum in the barrel 644. And, rotation of the handle 690 in a second (e.g., opposite) direction advances the plunger 642 into the barrel 644 to, for example, expel fluid, material, etc., from the barrel 644.

[0078] In one aspect of the present technology, the handle 690 provides additional mechanical leverage relative to a standard syringe, and can thus reduce the force (e.g., strain, energy, etc.) required by a user of the syringe 640 to form a vacuum in the syringe 640. Therefore, use of the syringe 640 can reduce the time needed to remove clot material with the assembly 10. In some embodiments, the syringe 640 can have a volume greater than 60 cc (e.g., greater than 80 cc, greater than 100 cc, greater than 120 cc, greater than 140 cc, etc.). In a particular embodiment, for example, the syringe 640 can have a volume of about 140 cc. With such large volumes, it may be difficult for some users to manually retract the plunger 642 without the additional mechanical leverage provided by the handle 690. Thus, the syringe 640 can enable the use of larger volume syringes that can generate correspondingly greater suction forces in the catheter subsystem 100.

[0079] Referring again to Figure 1, it is expected that less tortuous (e.g., more linear) fluid paths between the pressure source 140 and the catheter subsystem 100 will produce greater suction forces and corresponding fluid velocities at the distal portion 103a of the catheter 102 when stored vacuum pressure is applied to the catheter subsystem 100. Accordingly, in some embodiments the side port 108 of the valve 106 can be formed to have an angle A that is less than about 90°, less than about 75°, less than about 60°, less than about 45°, less than about 30°, less than about 15° etc. Reducing the relative angle between the side port 108 and the lumen 109 of the valve 106 (and thus the lumen 104 of the catheter 102) reduces the tortuosity of the fluid path between the pressure source 140 and the catheter 102. Moreover, in some embodiments, the pressure source 140 can be coupled to the proximal portion 107b of the valve 106 instead of or in addition to the side port 108 to provide a more linear fluid path between the pressure source 140 and the catheter

102. For example, Figure 24 is an enlarged isometric view of the assembly 10 showing the pressure source 340 coupled directly to the proximal portion 107b of the valve rather than to the connector 128 of the tubing subsystem 120 and the side port 108 of the valve 106. Although the pressure source 340 is illustrated in Figure 24, any of the pressure sources described in detail above with reference to Figures 2–6 can be configured to be coupled to the proximal portion 107b of the valve 106 rather than the side port 108. In other embodiments, the side port 108 can be omitted and the valve 106 and the tubing subsystem 120 can be coupled to the catheter 102 via a Y-connector. For example, Figure 25 is an enlarged isometric view of the assembly 10 showing the valve 106 and the tubing subsystem 120 coupled to the catheter 102 via a Y-connector 2590. In yet other embodiments, the tubing system 120 is linearly coupled to the catheter 102, and the valve 106 protrudes at an angle from the catheter 102.

[0080] In some embodiments, however, a guidewire or other component is positioned within the valve 106 during the duration of a clot removal procedure (e.g., for delivering interventional devices to a treatment site within a patient). Accordingly, in some embodiments, to facilitate coupling of the pressure source 140 to the proximal portion 107b of the valve 106—even when a guidewire is inserted therethrough—the pressure source 140 can be a syringe configured for over-wire delivery. For example, Figure 7 is a side view of a pressure source 740 comprising a vacuum-pressure locking syringe ("syringe 740") configured in accordance with the present technology for delivery and operation over a guidewire 794. The syringe 740 can have some features generally similar to the features of the syringe 340 described in detail above with reference to Figure 3. For example, the syringe 740 includes a plunger 742 slidably and rotatably positioned within a barrel 744. The barrel 744 is shown as transparent in Figure 7 for the sake of clarity. In the illustrated embodiment, the plunger 742 includes a lumen 796 (shown in broken lines) extending longitudinally therethrough. The guidewire 794 can be inserted through the lumen 796 of the plunger 742 such that the syringe 740 can be advanced over the guidewire 794 for attachment to the proximal portion 107b of the valve 106. The syringe 740 can further include one or more sealing components (e.g., valves, O-rings, etc.; not shown) for maintaining a seal between the guidewire 794 and the plunger 742 to permit build-up and storage of a vacuum in the barrel 744.

[0081] In general, one skilled in the art will understand that the various embodiments of pressure sources disclosed herein may be combined to, for example, include multiple pressure

sources or pressure sources having different components or combinations of components. For example, in some embodiments the secondary syringe 460 (Figures 4A–4C) can be coupled via one or more one-way valves to the syringes 240, 540, 640 or 740 (Figures 2 and 5–7, respectively) to generate additional vacuum. In some embodiments, multiple pressure sources can be coupled to the catheter 102 via the tubing subsystem 120 and/or via the valve 106. Moreover, the individual pressure sources can be the same or different, and can be coupled to the catheter subsystem 100 via a single fluid control device, such as the fluid control device 126, or can be coupled to the catheter subsystem 100 via separate fluid control devices. Therefore, the profile of the vacuum applied to the catheter 102 can be selected or adjusted by using multiple different pressure sources. For example, a specific vacuum profile can depend at least on (i) the individual characteristics of the multiple pressure sources (e.g., volume, bore-size, etc.), (ii) the manner in which the pressure sources are coupled to the catheter subsystem 100 (e.g., via individual valves, via the same valve, etc.), and (iii) the timing of the application or release of the vacuum of each pressure source to the catheter subsystem 100 (e.g., staggered release, simultaneous release, etc.). As one example, in some embodiments, the syringe 240 (Figure 2) and the syringe 340 (Figure 3) can both be coupled to the tubing subsystem 120 via, for example, a Y-connector. After charging both syringes 240, 340 with vacuum pressure, opening the fluid control device 126 can simultaneously apply the combined vacuum to the catheter 102. The larger-bored syringe 340 can provide a short but powerful impulse of vacuum pressure, while the smaller-bored syringe 240 can provide a longer and more sustained vacuum pull. This combination can apply a large, fast-acting suction force to dislodge and capture clot material in the catheter 102, and simultaneously apply a more sustained suction force to capture more clot material.

III. Selected Embodiments of Methods of Clot Removal

[0082] Figure 8 is a flow diagram of a process or method 800 for operating a clot removal system including the assembly 10 to remove clot material from within a blood vessel (e.g., a pulmonary blood vessel) of a human patient in accordance with the present technology. Figures 9A–9C are side views of a proximal portion of the assembly 10, and Figures 10A and 10B are schematic illustrations of a distal portion of the assembly 10, during a clot removal procedure in accordance with embodiments of the present technology. In particular, Figures 9A–9C are side

views of the assembly 10 including the syringe 340 and adaptor 350 (Figures 3A–3D), and Figures 10A and 10B are side views of the catheter 102 with the distal portion 103a of the catheter 102 positioned proximate to an embolism or clot material PE within a blood vessel BV (e.g., a pulmonary blood vessel). Although some features of the method 800 are described in the context of the embodiments shown in Figures 1, 3A–3D, and 9A–10B for the sake of illustration, one skilled in the art will readily understand that the method 800 can be carried out using other suitable systems and/or devices described herein. In particular, although described in the context of the syringe 340, the method 800 can be carried out using any one or combination of the pressure sources described in detail above with reference to Figures 2–7.

[0083] At block 802, the method 800 includes positioning the distal portion 103a of the catheter 102 proximate to clot material within a blood vessel of a human patient (e.g., at a treatment site). For example, in the embodiment illustrated in Figure 10A, a distal terminus of the distal portion 103a of the catheter 102 is positioned proximate to a proximal portion of the clot material PE. It is expected that reducing the distance between the distal terminus of the catheter 102 and the proximal portion of the clot material PE—without contacting the clot material PE with the catheter 102—will maximize the suction forces on the clot material PE when the fluid control device 126 is opened. It is also expected that reducing the distance (e.g., clearance) between the inner diameter of the blood vessel BV and the outer diameter of the catheter will maximize the suction forces on the clot material PE. However, in other embodiments, the distal terminus of the catheter 102 can be positioned at least partially within the clot material PE, or the distal terminus of the catheter 102 can be positioned distal of the clot material PE.

[0084] Access to the pulmonary vessels can be achieved through the patient's vasculature, for example, via the femoral vein. In some embodiments, the catheter subsystem 100 can include an introducer (e.g., a Y-connector with a hemostasis valve; not shown) that can be partially inserted into the femoral vein. A guidewire (not shown) can be guided into the femoral vein through the introducer and navigated through the right atrium, the tricuspid valve, the right ventricle, the pulmonary valve, and into the main pulmonary artery. Depending on the location of the embolism, the guidewire can be guided to one or more of the branches of the right pulmonary artery and/or the left pulmonary artery. In some embodiments, the guidewire can be extended entirely or partially through the clot material PE. In other embodiments, the guidewire can be extended to a

location just proximal of the clot material PE. After positioning the guidewire, the catheter 102 can be placed over the guidewire and advanced (e.g., as indicated by arrow A1) to a position proximate to the clot material PE as illustrated in Figure 10A.

[0085] In some embodiments, to confirm the position of the distal portion 103a of the catheter 102, a contrast agent can be injected through the catheter 102 and viewed using fluoroscopic imaging techniques, as is known in the art. In some embodiments, the valve 106 can be opened to determine the position of the distal portion 103a of the catheter 102 relative to the clot material PE. For example, the activation buttons 101 can be depressed to open the lumen 109 of the valve 106. If there is substantially no back-bleeding through the valve 106, the operator can determine that the distal portion 103a of the catheter 102 is fully engaged with the clot material PE. Conversely, if there is some back-bleeding through the valve 106, the operator can determine that the distal portion 103a of the catheter is not fully engaged with the clot material PE. Accordingly, to locate the distal portion 103a of the catheter 102 just proximal of the clot material PE, the operator can (i) first determine that distal portion 103a of the catheter is fully engaged with the clot material PE by activating the valve 106 and detecting no back-bleeding and (ii) then reposition the catheter 102 (e.g., by withdrawing the catheter 102 proximally) and activate the valve 106 until back-bleeding is detected—thereby confirming that the distal portion 103a of the catheter 102 is positioned proximal of the clot material PE. In some embodiments, the valve 106 can be opened during retraction of the catheter 102 until back-bleeding is detected. In other embodiments, the valve 106 can be closed during retraction of the catheter 102, and the catheter 106 can be retracted a set (e.g., predetermined) distance before the valve 106 is opened again. In one aspect of the present technology, determining the position of the distal portion 103a of the catheter 102 via activation of the valve 106 can be used when it is difficult to determine the position of the catheter 102 via radiographic techniques. In contrast, many conventional hemostasis valves cannot be activated in this manner.

[0086] In some embodiments, the guidewire can then be withdrawn while, in other embodiments, the guidewire can remain and can be used to guide other catheters (e.g., delivery catheters, additional aspiration catheters, etc.), interventional devices, etc., to the treatment site. It will be understood, however, that other access locations into the venous circulatory system of a patient are possible and consistent with the present technology. For example, the user can gain

access through the jugular vein, the subclavian vein, the brachial vein, or any other vein that connects or eventually leads to the superior vena cava. Use of other vessels that are closer to the right atrium of the patient's heart can also be advantageous as it reduces the length of the instruments needed to reach the pulmonary embolism.

[0087] At block 804, the method 800 includes coupling a pressure source (e.g., the syringe 340) to the catheter 102 via the fluid control device 126. For example, in the embodiment illustrated in Figure 9A, the tip 347 (shown in Figures 3A and 3C but obscured in Figure 9A) of the syringe 340 can be coupled to the connector 128 via the adaptor 350. Once the syringe 340 is coupled to the catheter 102, (i) opening the fluid control device 126 fluidly connects the syringe 340 to the lumen 104 of the catheter 102, and (ii) closing the fluid control device 126 fluidly disconnects the syringe 340 from the lumen 104 of the catheter 102. The fluid control device 126 is in an open position in Figure 9A.

[0088] At block 806, the method 800 includes activating the syringe 340 to generate a vacuum while the fluid control device 126 is closed. For example, as shown in Figure 9B, the user can first actuate the fluid control device 126 to close the fluid control device 126, and then retract the plunger 342 to generate a vacuum in the barrel 344 of the syringe 340. The user can subsequently lock the plunger 342 relative to the barrel 344, as described in detail above, to store or maintain a vacuum of known volume in the syringe 340. In this manner, the syringe 340 can be pre-charged with a vacuum before the vacuum is applied to the catheter 102. In contrast, many conventional aspiration techniques include activating a negative pressure source (e.g., a pump, a syringe, etc.) while the pressure source is fluidly connected to a lumen to be aspirated. In some embodiments, when the pressure source 400 with the secondary syringe 460 (Figures 4A–4C) is used with the primary syringe 340; the secondary syringe 460 can be cycled one or more times before or after retracting the plunger 342 to increase the vacuum pressure.

[0089] At block 808, the method 800 includes opening the fluid control device 126 to apply the vacuum to the lumen 104 of the catheter 102. For example, with reference to Figure 9C, the user can actuate (e.g., twist a handle of) the fluid control device 126 to open the fluid control device 126 and apply the vacuum stored in the syringe 340 to the catheter subsystem 100. As shown in Figure 10B, application of the vacuum causes suction at the distal tip 103a of the catheter 102

(e.g., as indicated by arrow A2) that aspirates at least a portion of the clot material PE from the blood vessel BV and into the lumen 104 of the catheter 102. In some embodiments, opening the fluid control device 126 instantaneously or nearly instantaneously generates suction at the distal portion 103a of the catheter 102. In certain embodiments, application of the vacuum can generate suction for less than about 1 second (e.g., about 0.5 second), substantially less than about 1 second (e.g., about 0.3 second, about 0.1 second, etc.) less than about 2 seconds, or greater than about 2 seconds—until the pressure in the assembly 10 equalizes. In some embodiments, depending on the volume of the vacuum chamber formed in the syringe 340 and the dimensions of the catheter subsystem 100 and the tubing subsystem 120 (e.g., where the syringe 340 has a volume that is greater than or about equal to a volume of the catheter subsystem 100), at least some of the clot material PE can be aspirated entirely through the lumen 104 of the catheter 102 and into the barrel 344 of the syringe 340. In some such embodiments, the user can determine whether subsequent steps for treating the clot material PE are necessary or desirable by visualizing the amount of clot material collected in the syringe 340. Figure 9C, for example, illustrates the syringe 340 and the tubing subsystem 120 after the fluid control device 126 has been opened to apply the vacuum stored in the syringe 340 to the catheter 102. In the illustrated embodiment, some of the clot material PE is visible in the syringe 340.

[0090] In some embodiments, the fluid control device 126 or another fluid control device can be intermittently operated to provide discrete bursts of suction. For example, the fluid control device 126 can be quickly opened and closed to provide a first burst of suction (e.g., vacuum release) without fully equalizing the pressure in the assembly 10. The fluid control device 126 can then be opened again to provide a second burst of suction, or opened and closed repeatedly to provide a desired suction pattern. In some embodiments, the assembly 10 can be specifically configured to facilitate the application of multiple bursts of suction. For example, (i) the fluid control device 126 can be spring-loaded, electronically controlled, etc., to rapidly open and close the valve, and/or (ii) the pressure source 140 can have a large vacuum chamber and/or small bore size to increase the time required for pressure in the assembly 10 to equalize (e.g., to increase a discharge time of the pressure source 140).

[0091] Sometimes, as shown in Figure 10B, discharging the vacuum stored in the pressure source to aspirate the lumen 104 of the catheter 102 may not remove all of the clot material PE (or

a desired amount of the clot material PE) from the blood vessel BV. That is, a single aspiration may not adequately remove the clot material PE from the blood vessel BV. In such instances, the user of the assembly 10 may wish to again apply vacuum pressure (conduct an "aspiration pass") to remove all or a portion of the remaining clot material PE in the blood vessel BV. In such instances, the pressure source can be disconnected from the tubing subsystem 120 and drained (e.g., aspirated clot removal removed) before the method 800 returns to block 802. For example, the adaptor 350 and the syringe 340 can be decoupled from the connector 128, and the plunger 342 can be pushed into the barrel 344 to expel the clot material PE and associated fluid from the barrel 344 via the tip 347. With the distal portion of the catheter 102 positioned proximate to the remaining clot material PE (e.g., unmoved relative the last aspiration pass), the pressure source can then be re-coupled to the connector 128 (block 804), primed again (block 806), and the vacuum pressure discharged (block 808) to aspirate all or a portion of the remaining clot material PE.

[0092] Blocks 802–808 can be repeated until a desired amount of clot material is removed from the patient or until the catheter 102 becomes clogged. In some embodiments, to check for clogging of the catheter 102, the fluid control device 126 and/or the valve 106 can be opened to check for back bleeding. A lack of back bleeding can indicate that the catheter 102 is likely clogged. Similarly, if the barrel 344 of the syringe 340 contains mostly air and relatively little blood and clot material (e.g., less than 5–10 cc) after aspiration of the catheter 102 (block 808), it can indicate that the catheter 102 is likely clogged. When the catheter 102 is clogged or a sufficient amount of clot material PE has been removed from the patient, the method 800 can proceed to block 810 and the catheter 102 can be removed from the patient. When the catheter 102 is clogged, the catheter 102 can be flushed and cleared prior to reentry into the patient (block 802). In other embodiments, a different (e.g., new, unused, etc.) catheter can be inserted into the patient and positioned to remove the remaining clot material PE from the patient.

[0093] In some embodiments, rather than removing the catheter 102 from the patient if the catheter 102 is clogged, the syringe 340 can be recharged and used to apply one or more subsequent vacuum pulses to the catheter 102. More specifically, the fluid control device 126 can be closed and the syringe 340 can be removed from the connector 128 and evacuated to remove the clot material and blood therein. Then, blocks 804–808 can be repeated to apply another pulse of vacuum to the catheter 102. That is, rather than removing the catheter 102 after a clog is detected,

the syringe 340 can be "cycled" until the vacuum force on the clot material PE overcomes the forces between the clot material PE and the catheter 102 and sucks the clot material PE into the syringe 340. In some embodiments, when the pressure source 400 with the secondary syringe 460 (Figures 4A–4C) is used with the primary syringe 340, the secondary syringe 460 can be cycled one or more times to increase the vacuum in the assembly 10 (e.g., in the catheter 102) and thus increase the suction force exerted against the clot material PE. That is, rather than removing the catheter 102 after a clog is detected, the secondary syringe 460 can be cycled until the vacuum force on the clot material PE overcomes the forces between the clot material PE and the catheter 102 and sucks the clot material PE into the syringe 340. In some embodiments, as described in detail below with reference to Figures 15–16E, a second clot removal assembly can be telescoped through the first assembly 10 to facilitate removal of the clogged clot material PE.

[0094] In some embodiments, an interventional device such as a clot removal and/or clot treatment device can be delivered to the treatment site through the catheter 102 for engaging and facilitating clot removal before and/or after application of a stored vacuum to the catheter 102. Suitable interventional devices and associated methods are disclosed in U.S. Patent Application No. 9,526,864, filed June 9, 2015, and titled "RETRACTION AND ASPIRATION DEVICE FOR TREATING EMBOLISM AND ASSOCIATED SYSTEMS AND METHODS," and U.S. Patent Application No. 8,784,434, filed March 15, 2013, and titled "METHODS AND APPARATUS FOR TREATING EMBOLISM," both of which are incorporated herein by reference in their entireties. In some embodiments, for example, the user can first advance an interventional device to the treatment site and at least partially engage the clot material PE with the interventional device to loosen (e.g., scour) the clot material PE. Such loosening of the clot material PE can facilitate the removal of the clot material PE upon a subsequent aspiration pass. Likewise, in some embodiments, the user can use an interventional device to engage residual clot material PE (Figure 10B) after a first aspiration pass.

IV. Selected Embodiments of Telescoping Clot Removal Systems and Associated Methods of Clot Removal

[0095] Figure 11 is a partially schematic side view of another clot treatment or clot removal system configured in accordance with the present technology. In the illustrated embodiment, the

clot removal system includes a first aspiration assembly 20 and a second aspiration assembly 30. The first and second aspiration assemblies 20, 30 ("assemblies 20, 30") can include some features generally similar to the features of the aspiration assembly 10 described in detail above with reference to Figures 1–10B. For example, the first aspiration assembly 20 includes (i) a first catheter subsystem 1000 having a first catheter 1002 and a first valve 1006, (ii) a first tubing subsystem 1020 having a first fluid control device 1026 (e.g., a stopcock), and (iii) a first pressure source 1040 that can be fluidly coupled to the first catheter subsystem 1000 via the first tubing subsystem 1020. Likewise, the second aspiration assembly 30 includes (i) a second catheter subsystem 1100 having a second catheter 1102 and a second valve 1106, (ii) a second tubing subsystem 1120 having a second fluid control device 1126 (e.g., a stopcock), and (iii) a second pressure source 1140 that can be fluidly coupled to the second catheter subsystem 1100 via the second tubing subsystem 1120.

[0096] The first and second catheters 1002, 1102 each comprise an elongated shaft defining a lumen 1004, 1104 and having a distal portion 1003a, 1103a, respectively. The first and second valves 1006, 1106 each include (i) a distal portion 1007a, 1107a, (ii) a proximal portion 1007b, 1107b, (iii) a lumen 1009, 1109 extending therethrough, and (iv) a flow controller (obscured in Figure 10) in the lumen 1009, 1109, respectively. The first fluid control device 1026 is operable to regulate or control fluid flow between (e.g., fluidly connect or disconnect) the first pressure source 1040 and the first catheter subsystem 1000. The second fluid control device 1126 is operable to regulate or control fluid flow between (e.g., fluidly connect or disconnect) the second pressure source 1140 and the second catheter subsystem 1100.

[0097] In the illustrated embodiment, the second catheter 1102 has a smaller cross-sectional dimension (e.g., diameter) than the first catheter 1002 so that the second catheter 1102 can be inserted through the first valve 1006 and into the lumen 1004 of the first catheter 1002. In some embodiments, the second catheter 1102 can be telescoped through the lumen 1004 of the first catheter 1002 until the distal portion 1103a of the second catheter 1102 extends beyond a distal terminus of the first catheter 1002. Accordingly, the second catheter 1102 can be longer than the first catheter 1002. In some embodiments, the second catheter 1102 can have a size of 16 French or smaller and the first catheter 1002 can have a size of 20 French or greater. The first valve 1006 can provide a hemostatic seal that inhibits fluid flow (e.g., blood flow) through the first valve 1006

and from the first catheter subsystem 1000 when the second catheter 1102 is positioned within the first catheter 1002. In some embodiments (e.g., as described in detail below with reference to Figures 14A–14C), a sealing member 1499 can be positioned between the first catheter 1002 and the second catheter 1102 for sealing the lumen 1004 of the first catheter 1002 when the second catheter 1102 is advanced distally past the sealing member.

[0098] In some embodiments, the first and second pressure sources 1040, 1140 ("pressure sources 1040, 1140") are separate sources each configured to generate and store a vacuum for subsequent application to the first and second catheter subsystems 1000, 1100, respectively, as described in detail above with reference to Figures 1–10B. In other embodiments, one or both of the pressure sources 1040, 1140 can be configured to provide sustained negative pressure rather than a charge or burst of stored vacuum pressure. In yet other embodiments, one of the pressures sources 1040, 1140 can be omitted, or the pressure sources 1040, 1140 can be fluidly coupled and/or integrally formed.

[0099] Figure 12 is a flow diagram of a process or method 1280 for operating a clot removal system including the assemblies 20 and 30 to remove clot material from within a blood vessel (e.g., a pulmonary blood vessel) of a human patient in accordance with the present technology. Figures 13A–13C are schematic illustrations of a distal portion of the assemblies 20, 30 during a clot removal procedure in accordance with the present technology. Figures 14A–14C are schematic side views of a distal portion of the assemblies 20, 30 during a clot removal procedure and including an optional sealing member in accordance with the present technology. Although some features of the method 1280 are described in the context of the embodiments shown in Figures 11 and 13A–14C for the sake of illustration, one skilled in the art will readily understand that the method 1280 can be carried out using other suitable systems and/or devices.

[0100] At block 1282, the method 1280 includes intravascularly positioning the first catheter 1002 within a human patient. Figure 13A, for example, illustrates the first catheter 1002 after it has been advanced (e.g., as indicated by arrow A1) to a position within a blood vessel BV (e.g., a pulmonary blood vessel). More specifically, the first catheter 1002 can be advanced within the blood vessel BV until the distal portion 1003a of the first catheter 1002 is positioned proximal to clot material PE within the blood vessel BV. In some embodiments, the position of the distal

portion 1003a of the first catheter 1002 relative to the clot material PE can be determined by activating the first valve 1006 and determining whether there is back-bleeding through the first valve 1006, as described in detail above. In the illustrated embodiment, the clot material PE is located within a branch (e.g., a reduced diameter portion) of the blood vessel BV. In some embodiments, access to the blood vessel BV can be achieved using an introducer and guidewire as described in detail above with reference to Figure 8.

[0101] At block 1284, the method 1280 includes advancing the second catheter 1102 through the first catheter 1002 until the distal portion 1103a of the second catheter 1102 is positioned proximate to the clot material PE within the blood vessel BV (e.g., at a treatment site). To advance the second catheter 1102 through the first catheter 1002, the user can first insert the distal portion 1103a of the second catheter 1102 through the first valve 1006 before advancing the second catheter 1102 (e.g., as indicated by the arrow A1) through the lumen 1004 of the first catheter 1002. In some embodiments, the first valve 1006 can be actuated (e.g., by depressing one or more buttons) to open the lumen 1009 of the first valve 1006 so that the second catheter 1102 can be inserted therethrough. In some embodiments, the position of the distal portion 1103a of the second catheter 1102 relative to the clot material PE can be determined by activating the second valve 1106 and determining whether there is back-bleeding through the second valve 1106, as described in detail above. In other embodiments, the (smaller) second catheter 1102 can be intravascularly positioned proximate to the clot material PE before intravascularly positioning the (larger) first catheter 1002. In such embodiments, the second catheter 1102 can act as a guide or rail for guiding the advancement of the first catheter 1002 to the treatment site.

[0102] Figure 13A illustrates the second catheter 1102 after it has been advanced through the first catheter 1002 and past a distal terminus of the first catheter 1002 to position a distal terminus of the second catheter 1102 proximate to a proximal portion of the clot material PE. In other embodiments, the distal terminus of the second catheter 1102 can be positioned at least partially within the clot material PE, or the distal terminus of the second catheter 1102 can be positioned distal of the clot material PE. In one aspect of the present technology, because the second catheter 1102 has a smaller cross-sectional dimension than the first catheter 1002, the second catheter 1102 can be advanced to narrower (e.g., more distal) treatment sites within the blood vessel BV. In the embodiment illustrated in Figure 13A, for example, the first catheter 1002

may be too large to be positioned within the branch of the blood vessel BV, while the second catheter 1102 can be positioned within the branch proximate to or within the clot material PE.

[0103] At block 1286, the method 1280 includes coupling the second pressure source 1140 to the second catheter 1102 via the second fluid control device 1126. For example, any one or combination of the pressure sources described in detail above with reference to Figures 2–7 can be coupled to the second catheter 1102 via the second tubing subsystem 1120. Once the second pressure source 1140 is coupled to the second catheter 1102, (i) opening of the second fluid control device 1126 fluidly connects the second pressure source 1140 to the lumen 1104 of the second catheter 1102, and (ii) closing of the second fluid control device 1126 fluidly disconnects the second pressure source 1140 from the lumen 1104 of the second catheter 1102. In some embodiments, the method 1280 can further include coupling the first pressure source 1040 to the first catheter 1002 (e.g., via the first tubing subsystem 1020).

[0104] At block 1288, the method 1280 includes activating the second pressure source 1140 to generate a vacuum while the second fluid control device 1126 is closed. In particular, the second pressure source 1140 can be activated to build-up or pre-charge a vacuum for subsequent application to the second catheter 1102. In some embodiments, the first pressure source 1040 can also be activated to generate and store a vacuum for subsequent application to the first catheter 1002.

[0105] At block 1290, the method 1280 includes opening the second fluid control device 1126 to apply the vacuum stored in second pressure source 1140 to the lumen 1104 of the second catheter 1102. As shown in Figure 13B, application of the vacuum causes suction (e.g., as indicated by arrow A2) that aspirates at least a portion of the clot material PE from the blood vessel BV and into the lumen 1104 of the second catheter 1102. In some embodiments, opening the second fluid control device 1126 instantaneously or nearly instantaneously generates suction at the distal portion 1103a of the second catheter 1102. In one aspect of the present technology, pre-charging or storing the vacuum before applying the vacuum to the lumen 1104 of the second catheter 1102 is expected to generate greater suction forces (and corresponding fluid flow velocities) at and/or near the distal portion 1103a of the second catheter 1102 compared to simply

activating the second pressure source 1140 while it is fluidly connected to the second catheter 1102.

[0106] In some embodiments, where the first pressure source 1040 is also activated to generate and store a vacuum (e.g., at block 1288), the method 1280 can further comprise opening the first fluid control device 1026 to generate suction at the distal portion 1003a of the first catheter 1002. One skilled in the art will understand that the suction profile in the blood vessel BV can be selected or modified based on the characteristics of the pressure sources 1040, 1140 (e.g., volume, bore size, etc.) and the timing of the opening of the first and second fluid control devices 1026, 1126. For example, the first fluid control device 1026 can be opened at the same time as the second fluid control device 1126 to generate a combined and relatively large suction force in the blood vessel BV. In other embodiments, the first fluid control device 1026 can be opened after the second fluid control device 1126 to generate staggered or stepped suction forces in the blood vessel BV. For example, the first fluid control device 1026 can be opened after the second fluid control device 1126 to aspirate any of the clot material PE (i) remaining in the blood vessel BV after aspiration of the second catheter 1102 and/or (ii) stuck to or extending from the second catheter 1102. In other embodiments, the first pressure source 1040 can be a pump or other source for providing sustained negative pressure—rather than a built-up charge of negative pressure—and thus can generate sustained (e.g., constant) suction at the distal portion 1003a of the first catheter 1002. In some such embodiments, the first fluid control device 1026 can remain open during the clot removal procedure to provide sustained suction throughout the procedure.

[0107] In some embodiments, an interventional device can be delivered through the second catheter 1102 and used to engage the clot material PE before and/or after the vacuum is applied to the second catheter 1102. Specific details of suitable interventional devices and associated methods of use are disclosed in, for example, provisional U.S. Patent Application No. 16/258,344, filed January 25, 2019, and titled "SINGLE INSERTION DELIVERY SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED SYSTEMS AND METHODS," which is incorporated herein by reference in its entirety.

[0108] At block 1292, the method 1280 includes retracting the second catheter 1102 proximally through the first catheter 1002. In some embodiments, multiple aspiration passes can

be performed with the second catheter 1102 before retracting the second catheter 1102. In some embodiments, as shown in Figure 13C, the first pressure source 1040 or another pressure source coupled to the first catheter 1002 can be activated to generate suction (e.g., as indicated by arrow A3) at the distal portion 1003a of the first catheter 1002 during retraction of the second catheter 1102. The suction can be constant or provided in one or more bursts, as described in detail above. In some embodiments, the second catheter 1102 can be fully withdrawn from the patient and disposed of or cleaned (e.g., flushed with a sterile liquid) for reuse.

[0109] Sometimes, the clot material PE is not fully pulled into the second catheter 1102 when the vacuum is applied to the second catheter 1102 (block 1290) and can therefore stick to or dangle from the distal portion 1103a of the second catheter 1102. Figure 14A, for example, is an enlarged view of the distal portion of the assemblies 20, 30 shown in Figure 13C and illustrating a portion of the clot material PE stuck to or dangling from the distal portion 1103a of the second catheter 1102. In the illustrated embodiment, an optional seal 1499 is disposed between the first and second catheters 1002, 1102 to facilitate the removal of such dangling clot material PE. More specifically, the seal 1499 (shown in cross-section) can be disposed between an outer surface of the second catheter 1102 and an inner surface of the first catheter 1002. The seal 1499 can be an O-ring, grommet, or other suitable component that fluidly disconnects the lumen 1004 of the first catheter 1002 from the blood vessel BV when the second catheter 1102 is positioned therethrough (e.g., when the distal terminus of the second catheter 1102 is positioned distally of the seal 1499).

[0110] Figures 14B and 14C are enlarged views of the distal portion of the assemblies 20, 30 and illustrating further retraction of the second catheter 1102 (and the dangling clot material PE) into the lumen 1004 of the first catheter 1002. In some embodiments, the first pressure source 1040 can be activated to charge a vacuum in the lumen 1004 of the first catheter 1002. For example, after the second catheter 1102 is advanced through the first catheter 1002 and past the seal 1499 (e.g., block 1284)—thereby sealing the lumen 1004 of the first catheter 1002—the operator can open the first fluid control device 1026 and activate the first pressure source 1040 to build up the vacuum in the lumen 1004 of the first catheter 1002. Referring to Figure 14C, when the distal terminus of the second catheter 1102 is retracted proximally past the seal 1499, the lumen 1004 of the first catheter 1002 becomes fluidly connected to the blood vessel BV and the vacuum is instantaneously or nearly instantaneously released to generate suction (e.g., as indicated by

arrows A4). In the illustrated embodiment, the suction acts to separate or otherwise dislodge the clot material PE from the second catheter 1102 and pull the clot material PE proximally through the lumen 1004 of the first catheter 1002. In this manner, a second burst of suction is automatically applied via the first catheter 1002 during retraction of the second catheter 1102. In one aspect of the present technology, the user does not need to take any additional step to release the vacuum stored in the first catheter 1002—as release is automatically triggered by retraction of the second catheter 1102.

[0111] At block 1294, the user can determine whether it is necessary or desirable to redeploy the second catheter 1102 or another catheter through the first catheter 1002 in order to remove any residual clot material PE that was not removed during the first aspiration pass and/or any clot material located elsewhere in the blood vessel BV (e.g., to initiate a second aspiration pass). In some embodiments, the operator can visualize the amount of clot material PE collected in the first pressure source 1040 and/or the second pressure source 1140 to at least partially determine whether another aspiration pass is needed. In other embodiments, the operator can rely on imaging (e.g., fluoroscopic imaging) of the blood vessel BV or other techniques known in the art to determine whether an additional aspiration pass is necessary or desirable.

[0112] If another pass is not needed (e.g., the clot material PE was adequately removed), the user can elect to fully withdraw the assemblies 20, 30 from the patient at block 1296. If clot material PE remains in the vessel, the method can return to block 1284. In particular, the same second catheter 1102 can be cleaned (e.g., flushed with saline) and advanced again through the first catheter 1002 until the distal portion 1103a of the second catheter 1102 is positioned proximate to the remaining clot material PE within the blood vessel BV. In some embodiments, a new second catheter 1102 can be used for each pass to reduce the likelihood of contamination (e.g., reintroduction of clot material PE). In some embodiments, the first catheter 1002 can be aspirated (e.g., via the first pressure source 1040) prior to redeployment of the second catheter 1102 to, for example, remove any clot material PE that may be in the first catheter 1002 to inhibit its reintroduction into the blood vessel BV as the second catheter 1102 is advanced therethrough during another pass. Once the desired amount of clot material PE has been removed from the patient, the assemblies 20, 30 may be fully withdrawn from the patient (block 1294).

[0113] In one aspect of the present technology, the method 1280 provides for an aspiration catheter to be deployed multiple times without requiring that the first catheter 1002 be removed after each deployment. Accordingly, the present technology allows for only a single insertion of a guide catheter during a procedure including multiple passes to remove clot material—increasing the speed of the procedure and reducing trauma to the patient since the guide catheter does not need to be reintroduced (e.g., advanced through the vasculature and past the heart) before each pass. Moreover, in certain embodiments, the present technology can enable the first catheter 1002 to be relocated to an alternate treatment site within the patient without removing the first catheter 1002 from the patient and, therefore, without reintroducing the first catheter 1002 through the heart. For example, the first catheter 1002 can be relocated to another treatment site within the lungs including a treatment site in the opposite lung. More specifically, (i) a dilator can be reintroduced into the first catheter 1002, (ii) the first catheter 1002 can be withdrawn into the main pulmonary artery, (iii) a guidewire can be redirected to the new treatment site, (iv) the first catheter 1002 can be advanced over the guidewire to the new treatment site, and (v) the dilator can be removed.

[0114] Figure 15 is a flow diagram of another process or method 1580 for operating a clot removal system including the assemblies 20, 30 (Figure 1) to remove clot material from within a blood vessel (e.g., a pulmonary blood vessel) of a human patient in accordance with the present technology. Figure 16A is an enlarged side view of a distal portion of the first assembly 20, and Figures 16B–16E are side views of a distal portion of the assemblies 20, 30 during a clot removal procedure in which clot material clogs the first assembly 20 in accordance with the present technology. Although some features of the method 1580 are described in the context of the embodiments shown in Figures 11 and 16A–16E for the sake of illustration, one skilled in the art will readily understand that the method 1580 can be carried out using other suitable systems and/or devices.

[0115] Some features of the method 1580 are generally similar to those of the methods 880 and/or 1280 described in detail above with reference to Figures 8 and 12, respectively. For example, at block 1582 the method includes intravascularly positioning the first catheter 1002 of the first assembly 20 within a human patient. At block 1584, the method 1580 includes coupling the first pressure source 1040 to the first catheter 1002 via the first fluid control device 1026. For

example, any one or combination of the pressure sources described in detail above with reference to Figures 2–7 can be coupled to the second catheter 1002 via the first tubing subsystem 1020. At block 1586, the method 1580 includes activating the first pressure source 1040 to generate a vacuum while the first fluid control device 1026 is closed. In particular, the first pressure source 1040 can be activated to build-up or pre-charge a vacuum for subsequent application to the first catheter 1002. At block 1588, the method 1580 includes opening the first fluid control device 1026 to apply the vacuum stored in the first pressure source 1040 to the lumen 1004 of the first catheter 1002. As described in detail above, opening the first fluid control device 1026 instantaneously or nearly instantaneously generates suction at the distal portion 1003a of the first catheter 1002.

[0116] Sometimes, however, clot material is not fully pulled into the first catheter 1002 and/or clogs the first catheter 1002 when the vacuum is applied to the first catheter 1002 (block 1588). Figure 16A, for example, is an enlarged view of the distal portion of the first assembly 20 illustrating a portion of clot material PE that extends beyond from the distal portion 1003a of the first catheter 1002 and blocks/clogs the lumen 1004 of the first catheter 1002. As such, a portion of the clot material PE is not within the first catheter 1002. Accordingly, at block 1590, the method 1580 can include determining whether the first catheter 1002 is clogged. In some embodiments, the operator can determine that the first catheter 1002 is clogged based on the vacuum chamber of the first pressure source 1040 containing little to no clot material PE and blood. For example, since the clot material PE clogs the first catheter 1002, the vacuum chamber of the first pressure source 1040 cavitates when the first fluid control device 1026 is opened. If the first catheter 1002 is not clogged, the method 1580 can proceed to block 1598 and the first catheter 1002 can be withdrawn from the patient or the operator can perform another aspiration pass (e.g., as described in detail above with reference to blocks 808 and 810 of the method 800 shown in Figure 8).

[0117] If the first catheter 1002 is clogged, the method 1580 can proceed to block 1592 which includes advancing the second catheter 1102 through the first catheter 1002 until the distal portion 1103a of the second catheter 1102 is positioned in or proximate to the clogging clot material PE. For example, Figure 16B illustrates the second catheter 1102 after it has been advanced to a position within the first catheter 1002 in which the distal terminus of the second catheter 1102 is at or proximate to the clogging clot material PE. To advance the second catheter

1102 through the first catheter 1002, the user can first insert the distal portion 1103a of the second catheter 1102 through the first valve 1006 (Figure 11) before advancing the second catheter 1102 through the lumen 1004 of the first catheter 1002.

[0118] At block 1594, the method 1580 includes activating the second pressure source 1140 (Figure 11) coupled to the second catheter 1102. More specifically, the second pressure source 1140 (e.g., any one or combination of the pressure sources described in detail above with reference to Figures 2–7) can be coupled to the second catheter 1102 via the second fluid control device 1126 (Figure 11), and the second pressure source 1140 can be activated to build-up or pre-charge a vacuum while the second fluid control device 1126 is closed. The second fluid control device 1126 can then be actuated to apply the vacuum stored in the second pressure source 1140 to the lumen 1104 of the second catheter 1102. In other embodiments, the second pressure source 1140 can simply provide a sustained vacuum rather than an instantaneous release of vacuum. That is, in some embodiments the second pressure source 1140 is not pre-charged with a vacuum.

[0119] Applying the vacuum to second catheter 1102 can aspirate at least a portion of the clogging clot material PE into the second catheter 1102 and/or suck the clot material PE against the distal terminus of the second catheter 1102. Figure 16C, for example, illustrates a portion of the clot material PE stuck to or extending from the distal portion 1103a of the second catheter 1102 after aspirating the second catheter 1102. In the embodiment illustrated in Figure 16C, the added vacuum pressure generated through the second catheter 1102 is still not enough to break apart the clot material PE such that it can be fully aspirated through the first and/or second catheters 1002, 1102. That is, the clot material PE clogs the lumen 1004 of the first catheter 1002. In other embodiments, the added vacuum pressure from the second pressure source 1140 is sufficient to break apart the clot material PE such that it is aspirated into, for example, the vacuum chambers of the first and/or second pressure sources 1040, 1140.

[0120] At block 1596, the method can include retracting the second catheter 1102 and the clot material PE through the lumen 1004 of the first catheter 1002. For example, Figure 16D illustrates retracting the second catheter 1102, which in turn retracts the attached clot material PE, through the lumen 1004 of the first catheter 1002. In some embodiments, the second catheter 1102 and clot material PE can be fully withdrawn through the first catheter 1002. In other embodiments,

retracting the clot material PE through the first catheter 1002 causes the clot material PE to break apart and be aspirated into the vacuum chambers of the first and/or second pressure sources 1040, 1140. Figure 16E, for example, illustrates the clot material PE breaking apart as the vacuum of the first and/or second pressure sources 1040, 1140 is instantaneously or nearly instantaneously released to suck the clot material PE proximally (e.g., as indicated by arrows A5).

[0121] At block 1598, the first and second catheters 1002, 1102 can be withdrawn from the patient or the operator can perform another aspiration pass using one or both of the first and second catheters 1002, 1102.

[0122] In one aspect of the present technology, the method 1580 removes clot material even when a first aspiration pass clogs the first catheter 1002. More particularly, the second catheter 1102 can be used to remove clogged clot material PE without requiring the first catheter 1002 and the clogged clot material PE to be withdrawn through the blood vessel BV.

V. Additional Selected Embodiments of Clot Removal Systems and Associated Methods of Clot Removal

[0123] From the foregoing, it will be appreciated that specific embodiments of the present technology have been described herein for purposes of illustration, but that various modifications may be made without deviating from the scope of the present technology. For example, in many of the embodiments described above, stored vacuum pressure can be used to aspirate or suck clot material from a blood vessel and into a catheter without the need to engage an interventional device with the clot material. However, one skilled in the art will understand that the aspiration devices and techniques disclosed herein can be used in conjunction with any suitable interventional device and/or during a clot removal procedure utilizing an interventional device. In some embodiments, for example, a clot removal system can be configured to apply stored vacuum pressure to a guide catheter to generate a burst of suction while an interventional device is retracted into and/or through the guide catheter.

[0124] Figure 17, for example, is a partially schematic view of a clot removal system 1700 ("system 1700") configured in accordance with the present technology. The system 1700 includes some features generally similar to the features of the clot removal system described in detail above with reference to Figure 1. For example, the system 1700 includes a catheter or sheath 1702

comprising an elongated shaft, and a valve 1706 coupled to a proximal portion of the sheath 1702. The valve 1706 has a side port 1708 that fluidly couples a lumen of the sheath 1702 to a tubing subsystem 1720 and a pressure source 1740 (shown schematically). A fluid control device 1726 (e.g., a stopcock or clamp; shown schematically) is operable to fluidly disconnect or connect the pressure source 1740 from/to the lumen of the sheath 1702. The pressure source 1740 can be any suitable pressure source for generating and storing vacuum pressure, as described in detail above.

[0125] In the illustrated embodiment, the system 1700 further includes (i) a self-expanding (e.g., mesh) funnel 1780 coupled to a proximal portion of the sheath 1702 and (ii) an interventional device (e.g., a thrombus extraction device) 1790. In the illustrated embodiment, the interventional device 1790 includes an expandable coring element (e.g., a first portion) 1792 coupled to an expandable cylindrical element (e.g., a second portion) 1794. In some embodiments, the interventional device 1790 is configured to self-expand from a compressed delivery state to an expanded deployed state. The interventional device 1790 is shown in the deployed state in Figure 17. An elongated shaft 1782 and/or one or more shafts positioned within the elongated shaft 1782 (e.g., an intermediate shaft 1884 and an inner shaft 1886 as shown in Figures 18E and 18F, respectively) are coupled to the interventional device 1790 and configured to retract, advance, and/or manipulate (e.g., move between the delivery and deployed states) the interventional device 1790. In some embodiments, the system 1700 can be generally the same as or similar to any of the clot removal systems disclosed in U.S. Patent Application Publication No. 2018/0193043, filed April 26, 2017, and titled "DEVICES AND METHODS FOR TREATING VASCULAR OCCLUSION," which is incorporated herein by reference in its entirety.

[0126] In the illustrated embodiment, the system 1700 is shown intravascularly positioned within a blood vessel BV of a human patient and proximate to clot material DV (e.g., a deep vein thrombus) within the blood vessel BV. Specifically, Figure 17 shows the system 1700 after (i) advancing the sheath 1702 to a position proximate to a proximal portion 1785b of the clot material DV, (ii) deploying the funnel 1780, (iii) deploying the interventional device 1790 from the sheath 1702 (e.g., by advancing the interventional device 1790 through the valve 1706 and the sheath 1702 to a position distal of a distal portion 1785a of the clot material DV), and (iv) expanding the interventional device 1790 from the compressed delivery state to the deployed state.

[0127] Figures 18A–18H are enlarged views of a distal portion of the system 1700 during a clot removal procedure in accordance with the present technology. In general, Figures 18A–18H illustrate the proximal retraction of the interventional device 1790 through the clot material DV to capture at least a portion of the clot material DV, and the subsequent joint retraction of the interventional device 1790 and the captured clot material DV into the funnel 1780 and the sheath 1702. In one aspect of the present technology, charged vacuum pressure generated in the vacuum source 1740 can be applied to the sheath 1702 at one or more times during the illustrated process to generate suction for aspirating the captured clot material DV through the sheath 1702 and/or to inhibit clogging of the sheath 1702.

[0128] Referring first to Figure 18A, proximal retraction of the interventional device 1790 causes the coring element 1792 to separate and/or core the distal end portion 1785a of the clot material DV from the walls W of the blood vessel BV. As shown in Figure 18B, continued proximal retraction of the interventional device 1790 through the clot material DV causes the cylindrical element 1794 to capture the distal end portion 1785a of the clot material therein. Figures 18C–18E illustrate further proximal retraction of the interventional device 1790 which causes further separation, coring, and/or capture of the clot material DV. As seen in Figure 18E, the proximal end portion 1785b of the clot material DV is cored and captured as the interventional device 1790 is proximally retracted toward the funnel 1780 and the sheath 1702. As further shown in Figure 18E, a first radiopaque marker 1887a can be positioned on a distal end portion of the inner shaft 1884 and a second radiopaque marker 1887b can be positioned on a distal end portion of the sheath 1702.

[0129] In some embodiments, as shown in Figure 18F, the interventional device 1790 can be proximally retracted until a portion of the coring element 1792 is contained (e.g., positioned) within the funnel 1780. More specifically, the interventional device 1790 can be proximally retracted until a mouth 1895 of the coring element 1792 is contained within the funnel 1780. In some embodiments, the containment of the mouth 1895 within the funnel 1780 can be fluoroscopically verified by visualization of the radiopaque markers 1887 (Figure 18E). In some embodiments, for example, the mouth 1895 can be determined as wholly contained within the funnel 1780 via fluoroscopic monitoring based on the alignment of the distal end portion of the inner shaft 1884 (e.g., the first radiopaque marker 1885a) relative to the distal end portion of the

sheath 1702 (e.g., the second radiopaque marker 1885b). In some embodiments, when the mouth 1895 of the coring element 1792 is positioned within the funnel 1780, the interventional device 1790 can be moved or transformed from the expanded deployed state to the compressed delivery state to compress and secure the clot material DV captured by the interventional device 1790. In some embodiments, for example, the intermediate shaft 1884 can be unlocked and/or decoupled from the inner shaft 1886 (e.g., via user actuation of a plunger or other device) such that the inner shaft 1886 can be advanced distally relative to the intermediate shaft 1884 to collapse or compress the interventional device 1790.

[0130] After the interventional device 1790 has been collapsed, the interventional device 1790 can be proximally retracted through the funnel 1780 and into the sheath 1702 as depicted in Figure 18G. As shown in Figure 18H, the interventional device 1790 can continue to be proximally retracted until the interventional device 1790 and the captured clot material DV are fully contained within the sheath 1702. In some embodiments, the interventional device 1790 and the captured clot material DV can then be withdrawn through the sheath 1702 and the valve 1706 (Figure 17), and from the patient's body.

[0131] In some embodiments, the collapse of the interventional device 1790 and/or the retraction of the interventional device 1790 into the funnel 1780 and/or the sheath 1702 can result in one or more portions of the clot material DV breaking away from the clot material DV contained in the interventional device 1790. For example, all or a portion of the captured clot material DV can be extruded through pores of the (e.g., mesh) cylindrical element 1794 as the interventional device 1790 collapses. In some embodiments, any such clot material can be captured by the funnel 1780. Referring to Figure 17, in some embodiments, the pressure source 1740 can be activated to charge a vacuum, and the fluid control device 1726 can subsequently be opened to apply the charged vacuum to the sheath 1702 (as described in detail above). The vacuum can be applied to the sheath 1702 at any point during retraction of the interventional device 1790. As shown in Figures 18G and 18H, application of the vacuum can generate instantaneous or nearly instantaneous suction (e.g., as indicated by arrows A6) at the distal end portion the sheath 1702 that can aspirate the extruded portions and/or other portions of the clot material DV into and/or through the sheath 1702. In particular, the generated suction can aspirate some or all of the clot material DV captured by the funnel 1780. Moreover, in some embodiments, application of a

vacuum from the pressure source 1740 can facilitate smooth retraction of the captured clot material DV through the sheath 1702. For example, a burst of suction generated by application of the vacuum can help inhibit clogging of the sheath 1702, and/or help resolve (e.g., break apart) a clog formed in the sheath 1702 during retraction.

VI. Selected Embodiments of Clot Removal Systems Having Filters and Associated Methods of Clot Removal

[0132] The systems and methods for clot removal described herein can include applying a pre-charged vacuum to generate suction for aspirating clot removal from the blood vessel of a patient. In one aspect of the present technology, aspiration of the clot material also aspirates blood from the patient. It can be advantageous to reintroduce the aspirated blood to the patient to lessen the trauma to the patient—especially where the removal procedure may comprise multiple aspiration passes that can together withdraw a significant amount of blood. However, the aspirated blood is often mixed with clot material and is therefore not suitable for reintroduction into the patient. Figures 19–20E illustrate various devices for filtering aspirated blood from removed clot material to reintroduce the aspirated blood into the patient without reintroducing a significant amount of clot material.

[0133] For example, Figure 19 is a perspective side view of a pressure source 1900 for filtering blood from aspirated clot material during a clot removal procedure configured in accordance with the present technology. The pressure source 1900 is generally similar to the pressure source 400 described in detail above with reference to Figures 4A–4C. For example, the pressure source 1900 includes the secondary syringe 460 ("syringe 460") and the first and second one-way valves 470 and 472. However, the secondary syringe 460 is coupled to a canister 1940 rather than the primary syringe 340 (Figures 4A–4C). The canister 1940 includes a tip (obscured) coupled to the adaptor 350 and is configured to be removably positioned within the connector 128 of the tubing subsystem 120 (Figure 1) to fluidly couple the canister 1940 to the tubing subsystem 120. Because the canister 1940 does not include a plunger or other component for changing a volume thereof, the syringe 460 is the only vacuum source for evacuating the canister 1940 (e.g., via repeated cycling of the secondary syringe 460).

[0134] In the illustrated embodiment, the canister 1940 further includes a filter 1942. The canister 1940 is shown as transparent in Figure 19 for the sake of clarity. The filter 1942 is coupled to and/or covers a removable end cap 1944 having a blood separation port 1946. In operation, when blood and clot material are aspirated into the canister 1940 (e.g., via any of the methods described in detail above), the filter 1942 separates the blood from the clot material within the canister 1940. The filtered blood can be removed via the blood separation port 1946. For example, a syringe (not shown) or other device can be fluidly coupled to the blood separation port 1946 and used to draw the blood through the filter 1942 and out of the canister 1940. The filtered blood can then be reintroduced to the patient via, for example, the fluid control device 126 and/or the connector 128 of the tubing subsystem 120. Once the blood is removed from the canister 1940, the end cap 1944 can be removed from the canister 1940 (e.g., by unscrewing the end cap 1944 from the body of the canister 1940) for removing the captured clot material. In some embodiments, the filter 1942 is attached to the end cap 1944 such that removing the end cap 1944 removes the filter 1942 and permits clot material to be dumped, scooped, or otherwise removed from the canister 1940.

[0135] Figures 20A–20E illustrate a filter device 2050 for filtering blood from aspirated clot material during a clot removal procedure configured in accordance with the present technology. The filter device 2050 is configured as an in-line filter for use with, for example, one or more of the pressure sources described in detail above with reference to Figures 2–7. For example, Figure 20A is a partially-exploded side view of the filter device 2050 and the pressure source 340 (Figures 3A–3D). In the illustrated embodiment, the filter device 2050 comprises a filter portion 2060 that is removably positionable within a barrel portion 2070. In the illustrated embodiment, the barrel portion 2070 includes a barrel 2072 that defines a chamber 2074, and a large bore tip 2076 configured to fluidly couple the chamber 2074 to external components, such as the tubing subsystem 120 (e.g., as shown in Figure 20C). The filter portion 2060 includes a seal 2062 configured to engage (i) an interior surface of the barrel 2072 when the filter portion 2060 is positioned within the chamber 2074 of the barrel portion 2070 and (ii) an exterior surface of the syringe 340 (e.g., an exterior surface of the barrel 344) when the syringe 340 is inserted into the filter device 2050. In other embodiments, the filter portion 2060 can be permanently attached to or integrally formed with the barrel portion 2070. The filter portion 2060 further includes a filter

(e.g., a mesh) 2064 configured (e.g., sized and shaped) to inhibit clot material from passing therethrough. In some embodiments, the filter 2064 can be configured to inhibit clots larger than about 100 μm (e.g., larger than about 110 μm) from passing therethrough.

[0136] Figure 20B is a perspective side view of the syringe 340 coupled to the filter device 2050. The barrel 2072 of the barrel portion 2070 is shown as transparent in Figure 20B (and Figures 20C–20E) for the sake of clarity. In the illustrated embodiment, the seal 2062 is positioned between the exterior surface of the barrel 344 of the syringe 340 and the interior surface of the barrel 2072 of the barrel portion 2070. The filter 2064 is positioned around (e.g., covers) the tip 347 of the syringe 340 to inhibit clot material from entering the barrel 344 of the syringe 340 during operation.

[0137] Figure 20C is a side view of the filter device 2050 and syringe 340 coupled to the tubing subsystem 120 of the assembly 10. More specifically, the tip 2076 can be inserted into the connector 128 of the tubing subsystem 120 as described in detail above. When the filter device 2050 and the syringe 340 are coupled to the tubing subsystem 120, the filter device 2050 is positioned in-line (e.g., in series) with the syringe 340. In the embodiment illustrated in Figure 20C, the plunger 342 of the syringe 340 has been withdrawn to generate negative pressure in the combined volume of the barrels 2072 and 344. As described in detail above, opening the fluid control device 126 nearly instantaneously applies the negative pressure to the catheter 102 to generate suction therein. When clot material and blood are aspirated through the catheter 102 and the tubing subsystem 120, the filter portion 2060 inhibits the clot material from entering the barrel 344 of the syringe 340. Thus, aspirated blood is collected in the barrel 344 of the syringe 340 while the aspirated clot material is collected in the barrel 2072 of the barrel portion 2070 of the filter device 2050. In this manner, clot material and blood can be separated during aspiration.

[0138] In one aspect of the present technology, separating the blood from the clot material such that the blood is within the syringe 340 permits the blood to be easily reintroduced to the patient. For example, Figures 20D and 20E are side views of the syringe 340 coupled to the tubing subsystem 120 of the assembly 10 for reintroducing blood to a patient. In some embodiments, as shown in Figure 20D, the syringe 340 can be decoupled from the filter device 2050 and directly coupled to the connector 128. With the fluid control device 126 in an open position, the blood can

then be reintroduced to the patient through the assembly 10 by depressing the plunger 342 of the syringe 340. In some embodiments, as shown in Figure 20E, the syringe 340 can be decoupled from the filter device 2050 and directly coupled to a port on the fluid control device 126. With the fluid control device 126 in a closed position, the blood can then be reintroduced to the patient through the assembly 10 by depressing the plunger 342 of the syringe 340. Referring to Figures 20A–20E together, after or before reintroducing filtered blood to the patient, the filter portion 2060 of the filter device 2050 can be removed from the barrel portion 2070 so that the collected clot material can be removed and the filter device 2050 cleaned. In some embodiments, the filter device 2050 and a coupled pressure source can be used to filter blood from clot material after—as opposed to during—an aspiration pass. For example, the filter device 2050 and coupled pressure source could be used to withdraw blood and clot material collected in the canister 1940 of the pressure source 1900 (e.g., where the canister 1940 does not include the filter 1942).

[0139] Figures 21A and 21B illustrate a filter device 2150 for filtering blood from aspirated clot material during a clot removal procedure configured in accordance with the present technology. The filter device 2150 is configured for use with, for example, one or more of the pressure sources described in detail above with reference to Figures 2–7. For example, Figure 21A is a partially-exploded side view of the filter device 2150 and the pressure source 340 (Figures 3A–3D). In the illustrated embodiment, the filter device 2150 includes a housing 2152 defining a chamber 2154, a filter 2156 configured to be positioned within the housing 2152, and a cap assembly 2160 configured to be releasably coupled to the housing 2152 (e.g., via a threaded connection, snap-fit connection, etc.). In some embodiments, the filter 2156 can have a porosity of between about 50–200 microns.

[0140] The housing 2152 can include a port 2153 configured to be removably, fluidly coupled to the pressure source 340 via a tubing subsystem 2120. In the illustrated embodiment, the tubing subsystem 2120 includes tubing sections 2124 (individually labeled as a first tubing section 2124a and a second tubing section 2124b), a fluid control device 2126 (e.g., a valve, stop cock, clamp, etc.), and a connector 2128 (e.g., a large bore connector) for fluidly coupling the tubing subsystem 2120 to the pressure source 340. In the illustrated embodiment, the cap assembly 2160 includes a fluid connector 2162 (e.g., a standard Luer or large bore connector) configured to be connected to a receiving/reinfusion syringe 2170 via, for example, a tubing section 2164. In

some embodiments, the cap assembly 2160 can include a valve (e.g., a one-way valve, a check valve, etc.) that provides for one-way fluid flow through filter assembly 2150.

[0141] In operation, during a clot removal procedure, the pressure source 340 can be decoupled from the connector 128 (Figure 1) after an aspiration pass and when the pressure source 340 is full of blood and clot material. After connecting the filter device 2150 to the receiving syringe 2170, the pressure source 340 can be coupled to the filter device 2150. For example, Figure 21B is a perspective side view of the filter device 2150 coupled to (i) the pressure source 340 via the tubing subsystem 2120 and (ii) the reinfusion syringe 2170 via the tubing section 2164. More specifically, referring to Figures 21A and 21B together, the tip 347 of the pressure source 340 can be coupled to the connector 2128 of the tubing subsystem 2120, and a tip 2172 of the reinfusion syringe 2170 can be coupled to the tubing section 2164. In other embodiments, the filter device 2150 can be coupled to the pressure source 340 and/or the reinfusion syringe 2170 in other manners (e.g., directly such that the all or part of the tubing subsystem 120 is omitted). Alternatively, the filter device 2150 can be directly attached to the side port 108 (Figure 1), an IV line (not shown), or another suitable connection point for reintroducing blood to the patient,

[0142] After coupling the pressure source 340 to the filter device 2150, the fluid control device 2128 can be opened to fluidly connect the pressure source 340 to the filter device 2150. Then, the operator can depress the plunger 342 of the pressure source 340 to drive the blood and clot material from the pressure source 340 into and/or through the filter device 2150. The filter 2156 of the filter device 2150 filters the blood from the clot material such that the blood flows into the reinfusion syringe 2170 and the clot material remains in the chamber 2154 of the filter device 2150. For example, as shown in Figure 21B, blood B fills the reinfusion syringe 2170 and clot material PE remains within the chamber 2154 of the filter device 2150 after depressing the plunger 342 of the pressure source 340 in the direction indicated by the arrow H.

[0143] Next, the reinfusion syringe 2170 can be decoupled from the filter device 2150 so that the blood B can be reintroduced to the patient. For example, the reinfusion syringe 2170 could be directly coupled to a port on the fluid control device 126 (Figure 1). The cap assembly 2160 can be decoupled from the housing 2152 of the filter device 2150 to, for example, permit an

operator to remove the clot material PE collected in the housing 2152 and thereby clean and prepare the filter device 2150 for another use.

[0144] Figure 22 is a partially-exploded side view of a filter device 2250 for filtering blood from aspirated clot material during a clot removal procedure configured in accordance with the present technology. The filter device 2250 is configured for use with, for example, one or more of the pressure sources described in detail above with reference to Figures 2–7. In general, the filter device 2250 is generally similar to the filter device 2150 described in detail with reference to Figures 21A and 21B. For example, the filter device 2250 includes a housing 2252 defining a chamber 2254, a filter 2256 configured to be positioned within the housing 2252, and a cap assembly 2260 configured to be releasably coupled to the housing 2252. However, in the illustrated embodiment the filter device 2250 includes a port 2253 that is directly connected to a connector 2228 configured to be coupled to a pressure source (e.g., the pressure source 340 shown in Figures 3A–3D). The cap assembly 2260 includes a fluid connector 2162 (e.g., a standard Luer or large bore connector) configured to be connected to a reinfusion syringe, a sheath, an IV line, etc., (not shown). In some embodiments, the fluid connector 2262 is angled relative to the filter 2260 and/or the housing 2252. For example, the fluid connector 2262 is formed to have an approximately right angle in Figure 22. In one aspect of the present technology, this arrangement makes the filter device more ergonomic during use.

[0145] Figure 23 is a partially-exploded side view of a filter device 2350 for filtering blood from aspirated clot material during a clot removal procedure configured in accordance with the present technology. The filter device 2350 is configured for use with, for example, one or more of the pressure sources described in detail above with reference to Figures 2–7. The filter device 2350 is generally identical to the filter device 2250 described in detail with reference to Figure 22—including, for example, the housing 2252 ("a first housing 2252"), the filter 2256 ("a first filter 2256"), and the cap assembly 2260 including the fluid connector 2262 ("a first fluid connector 2262"). However, in the illustrated embodiment a second housing 2382 and a second filter 2386 are fluidly connected to the fluid connector 2262. The second housing 2382 includes a second fluid connector 2384 that can be fluidly connected to a reinfusion syringe, a sheath, an IV line, etc., (not shown). The second filter 2386 is configured to provide a second stage of filtration. For example, in some embodiments the first filter 2256 has a larger porosity than the second filter

2386. For example, the first filter 2256 can have a porosity of between about 50–200 microns and the second filter 2386 can have a porosity of between about 50–170 microns.

[0146] In general, one skilled in the art will understand that the various embodiments of filter devices disclosed herein may have different components or combinations of components. For example, the filter devices 2050, 2150, 2250, and/or 2350 ("the filter devices") could be utilized with any of several different pressure sources other than the syringe 340 (e.g., those shown in Figures 2 and 4–7). In some embodiments, the filter devices can be formed as a component of the tubing subsystem 120 (Figure 1). Moreover, the filter devices can include any number of filters and/or housings to provide any number of filtration stages.

Conclusion

[0147] The above detailed descriptions of embodiments of the technology are not intended to be exhaustive or to limit the technology to the precise form disclosed above. Although specific embodiments of, and examples for, the technology are described above for illustrative purposes, various equivalent modifications are possible within the scope of the technology as those skilled in the relevant art will recognize. For example, although steps are presented in a given order, alternative embodiments may perform steps in a different order. The various embodiments described herein may also be combined to provide further embodiments.

[0148] From the foregoing, it will be appreciated that specific embodiments of the technology have been described herein for purposes of illustration, but well-known structures and functions have not been shown or described in detail to avoid unnecessarily obscuring the description of the embodiments of the technology. Where the context permits, singular or plural terms may also include the plural or singular term, respectively.

[0149] Moreover, unless the word "or" is expressly limited to mean only a single item exclusive from the other items in reference to a list of two or more items, then the use of "or" in such a list is to be interpreted as including (a) any single item in the list, (b) all of the items in the list, or (c) any combination of the items in the list. Additionally, the term "comprising" is used throughout to mean including at least the recited feature(s) such that any greater number of the same feature and/or additional types of other features are not precluded. It will also be appreciated that specific embodiments have been described herein for purposes of illustration, but that various

modifications may be made without deviating from the technology. Further, while advantages associated with some embodiments of the technology have been described in the context of those embodiments, other embodiments may also exhibit such advantages, and not all embodiments need necessarily exhibit such advantages to fall within the scope of the technology. Accordingly, the disclosure and associated technology can encompass other embodiments not expressly shown or described herein.

CLAIMS

I/We claim:

1. A clot treatment system, comprising:

an aspiration catheter defining a lumen, wherein the aspiration catheter is flexible and shaped to be intravascularly positioned within a blood vessel of a patient;

a hemostasis valve fluidly coupled to the aspiration catheter, wherein the hemostasis valve is actuatable by a user to selectively provide fluid access to the lumen;

a clot canister selectively fluidly coupled to the lumen of the aspiration catheter;

a filter positioned within the clot canister and configured to filter blood from clot material;

an aspiration source fluidly coupled to the clot canister;

a flow path extending from the lumen of the aspiration catheter, through the clot canister, and to the aspiration source; and

a user-actuatable valve between the aspiration catheter and the clot canister along the flow path, wherein the valve is movable by user actuation between (a) a closed position in which fluid is prevented from flowing along the flow path from the aspiration catheter to the clot canister and (b) an open position in which fluid is allowed to flow from the aspiration catheter to the clot canister,

wherein the aspiration source is configured to generate vacuum pressure within the clot canister when the valve is in the closed position, and

wherein, upon user actuation to move the valve to the open position with the vacuum pressure having been generated in the clot canister, the clot canister is positioned to apply the vacuum pressure to the lumen of the aspiration catheter to aspirate the blood and the clot material into the clot canister.

2. The clot treatment system of claim 1 wherein the clot canister has a first volume, and wherein the aspiration source has a second volume different than the first volume.

3. The clot treatment system of claim 1 wherein the clot canister has a first volume, and wherein the aspiration source has a second volume greater than the first volume.

4. The clot treatment system of claim 1 wherein the clot canister is proximal to the aspiration catheter along the flow path.

5. The clot treatment system of claim 1 wherein the aspiration source is proximal to the clot canister along the flow path.

6. The clot treatment system of claim 1 wherein the clot canister is proximal to the aspiration catheter along the flow path, and wherein the aspiration source is proximal to the clot canister along the flow path.

7. The clot treatment system of claim 1 wherein the clot canister includes a fluid outlet, wherein the filter includes a mouth positioned around the fluid outlet, and wherein the fluid outlet is configured to direct the filtered blood through the fluid outlet.

8. The clot treatment system of clam 1 wherein the blood vessel is a first blood vessel, and further comprising a reintroduction catheter, wherein the reintroduction catheter is flexible and shaped to be intravascularly positioned within a second blood vessel of a patient, and wherein the reintroduction catheter is configured to direct the filtered blood into the second blood vessel.

9. The clot treatment system of claim 8 wherein the first blood vessel is the same as the second blood vessel.

10. The clot treatment system of claim 8 wherein the aspiration catheter is the reintroduction catheter.

11. The clot treatment system of claim 1 wherein the user-actuatable valve includes a lever graspable by a user.

12. The clot treatment system of claim 1 wherein the filter is removable from the clot canister, and wherein the clot canister is transparent.

13. The clot treatment system of claim 1 wherein the aspiration source is an electric pump.

14. The clot treatment system of claim 1, further comprising a clot treatment device configured to be advanced through the hemostasis valve and the lumen of the aspiration catheter to physically engage and disrupt at least a portion of the clot material.

15. The clot treatment system of claim 14 wherein the hemostasis valve comprises:

a tubular member defining a lumen configured to slidably receive the clot treatment device; and

a filament extending at least partially around the tubular member, wherein the filament is moveable between (a) a first position wherein the filament circumferentially constricts the lumen to create a seal around the clot treatment device and (b) a second position wherein the filament is moved to at least partially open the lumen.

16. The clot treatment system of claim 1 wherein the filter has a generally tubular shape.

17. The clot treatment system of claim 1 wherein the hemostasis valve is fluidly coupled to a proximal end portion of the aspiration catheter, and wherein the clot canister is fluidly coupled to lumen of the aspiration catheter via a tube branching from the aspiration catheter distal to the proximal end portion of the aspiration catheter.

18. A clot treatment system, comprising:

an aspiration catheter defining a lumen, wherein the aspiration catheter is flexible and shaped to be intravascularly positioned within a blood vessel of a patient;

a hemostasis valve fluidly coupled to the aspiration catheter, wherein the hemostasis valve is actuatable by a user to selectively provide fluid access to the lumen;

a clot canister selectively fluidly coupled to the lumen of the aspiration catheter and having a first volume;

a filter positioned within the clot canister and configured to filter blood from clot material;

an aspiration source fluidly coupled to the clot canister and having a second volume greater than the first volume;

a flow path extending from the lumen of the aspiration catheter, through the clot canister, and to the aspiration source, wherein the clot canister is proximal to the aspiration catheter along the flow path, and wherein the aspiration source is proximal to the clot canister along the flow path; and

a user-actuatable valve between the aspiration catheter and the clot canister along the flow path, wherein the valve is movable by user actuation between (a) a closed position in which fluid is prevented from flowing along the flow path from the aspiration catheter to the clot canister and (b) an open position in which fluid is allowed to flow from the aspiration catheter to the clot canister,

wherein the aspiration source is configured to generate vacuum pressure within the clot canister when the valve is in the closed position, and

wherein, upon user actuation to move the valve to the open position with the vacuum pressure having been generated in the clot canister, the clot canister is positioned to apply the vacuum pressure to the lumen of the aspiration catheter to aspirate the blood and the clot material into the clot canister.

19. The clot treatment system of claim 18 wherein:

the hemostasis valve is fluidly coupled to a proximal end portion of the aspiration catheter,

the clot canister is fluidly coupled to lumen of the aspiration catheter via a tube branching from the aspiration catheter distal to the proximal end portion of the aspiration catheter,

the clot canister includes a fluid outlet,

the filter includes a mouth positioned around the fluid outlet, and

the fluid outlet is configured to direct the filtered blood through the fluid outlet.

20. A clot treatment system, comprising:

an aspiration catheter defining a lumen, wherein the aspiration catheter is flexible and shaped to be intravascularly positioned within a blood vessel of a patient;

a hemostasis valve fluidly coupled to the aspiration catheter, wherein the hemostasis valve is actuatable by a user to selectively provide fluid access to the lumen;

a clot canister selectively fluidly coupled to the lumen of the aspiration catheter and having a first volume;

a filter positioned within the clot canister and configured to filter blood from clot material;

an aspiration source fluidly coupled to the clot canister and having a second volume greater than the first volume, wherein the aspiration source is configured to generate vacuum pressure in the clot canister;

a flow path extending from the lumen of the aspiration catheter, through the clot canister, and to the aspiration source, wherein the clot canister is proximal to the aspiration catheter along the flow path, and wherein the aspiration source is proximal to the clot canister along the flow path; and

a user-actuatable valve between the aspiration catheter and the clot canister along the flow path, wherein the valve is movable by user actuation between (a) a closed position in which fluid is prevented from flowing along the flow path from the aspiration catheter to the clot canister and (b) an open position in which fluid is allowed to flow from the aspiration catheter to the clot canister,

wherein, upon user actuation to move the valve to the open position, the clot canister is positioned to apply the vacuum pressure to the lumen of the aspiration catheter to aspirate the blood and the clot material into the clot canister.

21. A clot treatment system, comprising:

an aspiration catheter defining a lumen, wherein the aspiration catheter is flexible and shaped to be intravascularly positioned within a blood vessel of a patient;

a hemostasis valve fluidly coupled to the aspiration catheter, wherein the hemostasis valve is actuatable by a user to selectively provide fluid access to the lumen;

a clot canister selectively fluidly coupled to the lumen of the aspiration catheter;

a filter positioned within the clot canister and configured to filter blood from clot material;

an aspiration source fluidly coupled to the clot canister;

a flow path extending from the lumen of the aspiration catheter, through the clot canister, and to the aspiration source; and

a user-actuatable valve between the aspiration catheter and the clot canister along the flow path, wherein the valve is movable by user actuation between (a) a first position in which fluid flow along the flow path from the aspiration catheter to the clot canister has a first rate and (b) a second position in which the fluid is flow along the flow path from the aspiration catheter to the clot canister has a second rate,

wherein the aspiration source is configured to generate vacuum pressure within the clot canister when the valve is in the first position, and

wherein, upon user actuation to move the valve to the second position with the vacuum pressure having been generated in the clot canister, the clot canister is positioned to apply the vacuum pressure to the lumen of the aspiration catheter to aspirate the blood and the clot material into the clot canister.

22. The clot treatment system of claim 21 wherein the second rate is greater than the first rate, and wherein the first rate is zero such that the fluid is prevented from flowing the along the flow path from the aspiration catheter to the clot canister when the valve is in the first position.

ABSTRACT OF THE DISCLOSURE

Systems and methods for the intravascular treatment of clot material within a blood vessel of a human patient are disclosed herein. A method in accordance with embodiments of the present technology can include, for example, positioning a distal portion of a catheter proximate to the clot material within the blood vessel. The method can further include coupling a pressure source to the catheter via a tubing subsystem including a valve or other fluid control device and, while the valve is closed, activating the pressure source to charge a vacuum. The valve can then be opened to apply the vacuum to the catheter to thereby aspirate at least a portion of the clot material from the blood vessel and into the catheter.

UNITED STATES
PATENT AND TRADEMARK OFFICE

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Alexandria, VA 22313 - 1450
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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	**06/05/2023 07:23:35 PM ET**	**111552.8018.US08**

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	62212479	FILING DATE	-
CUSTOMER #	25096	FIRST NAMED INVENTOR	Ben Merritt
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 9

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
Track One Request - 111552-8018US8.PDF	2	Track One Request	856 KB
ADS-111552-8018US8.PDF	10	Application Data Sheet	1781 KB
General Fee Autho - 111552-8018US8.PDF	2	Authorization for Extension of Time all replies	94 KB
Signed_Declaration-parent-111552-8018US8.PDF	4	Oath or Declaration filed	141 KB
POA_Trans-111552-8018US8.PDF	1	Power of Attorney	610 KB

US_POA-signed_2021-Inari.PDF	1	Power of Attorney	106 KB
Track One CON Application - 111552-8018.US08-APP.TEXT.DOCX	58	Application body structured text document	105 KB

Warning: Bookmarks were found and have been removed.

CON Application Track One - 111552-8018US8.PDF	58	Auxiliary PDF of Application	237 KB
111552.8018.US08-Drawings-uspto.PDF	38	Drawings-only black and white line drawings	9090 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
Track One Request - 111552-8018US8.PDF	0D0C5384664F6A2A60E28D2C5747E232D0BF160A0BCDC0A5C49F43BAEC127C32F965222675FE5F8168F3E807C0B0DB21FEEB3F6104E9FCD151660C3F34858518
ADS-111552-8018US8.PDF	30B9D23614F3C06800187BDA2E20C81BEF6B85B8F2FC07F4A2D54144502A8970A3D7541FFBEC8F3F741F370937E93E75E37C3839D59A99261476F964F8267E8A
General Fee Autho - 111552-8018US8.PDF	2F177B2A60B4CA19F81221565B1A319256EF2D7ADDEEE795DB0985DE9E4FBD76D58EE55687C447135F6933F3A272C45385F08F0D9A1F9796729DD8903CE152F5
Signed_Declaration-parent-111552-8018US8.PDF	872BD5DA0E92D68E306BE5D249FEEC2894AF1852801E1BCED0AF9C82767A0E9721484CF35673AF7AD594B2780E69C52AC5C8B0CBE7883CAEDFEFCFC08CCC5611
POA_Trans-111552-8018US8.PDF	8E2264981458ACE963BFE89D78D32A125B2AA92BD3E590CECF20634463FEF1C9488521BEBEFF424D8119DD0ADAAA5B08CE02021173EDB879C96BE92C4D472B6F

US_POA-signed_2021-Inari.PDF	3E41A25D6AE5AA5C420DCDF61DEC6623BF09B001635962F9B62CA905552C41A768DA4A95A80BB1F15975CBDC9350C70526105B775C762F739AFD7BF8EADB57E5
Track One CON Application - 111552-8018.US08-APP.TEXT.DOCX	459784B1A81E66819AC493A7A35AFE58FDF2420C419E6E0695DBAB9B36AEA766757A85F0BCF1CCAD196DAA3EEF45F8B0B9C874CE66D747DCCEE152B15CF753D8
CON Application Track One - 111552-8018US8.PDF	86DAC489D64A1A59B831CF0C751F6D5A97D81021266F35E7C15CF31374940FCCFF53BB948CB5177E15A8C1DB403E2441BADB7F2FD5D07B383DE68F49D8605E09
111552.8018.US08-Drawings-uspto.PDF	FC662766480B2BB92A5E3EFC8EC0F37D25890C8BE9F430F4E02AAC947CE1FAA93BF5D50192CA3F3082EC5F66D6B2A4BC38CEA9072561DF76034E672E974C0A76

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 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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ELECTRONIC PAYMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/329,450	06/05/2023 07:23:35 PM ET	111552.8018.US08

Title of Invention

SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1035	FILED BY	JiYoung Anderson
PATENT CENTER #	62212479	AUTHORIZED BY	Matthew Williams
CUSTOMER #	25096	FILING DATE	-
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Ben Merritt

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 3369	E202365J29216874	JiYoung Anderson

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1830	PROCESSING FEE, EXCEPT IN PROVISIONAL APPLICATIONS	140.00	1	140.00
1817	REQUEST FOR PRIORITIZED EXAMINATION	4200.00	1	4200.00
1111	UTILITY PATENT APPL. SEARCH FEE	700.00	1	700.00
1011	BASIC FILING FEE - UTILITY (PAPER FILING ALSO REQUIRES NON-ELECTRONIC FILING FEE UNDER 1.16(T))	320.00	1	320.00
1311	PATENT APPL. EXAMINATION FEE	800.00	1	800.00

1202	EACH CLAIM IN EXCESS OF 20	100.00	2	200.00
			TOTAL AMOUNT:	**$6,360.00**

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 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.

Docket No.: 111552-8018.US08
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Ben Merritt et al.

Application No.: Not Yet Assigned	Confirmation No.: N/A
Filed: Concurrently Herewith	Art Unit: Not Yet Assigned
For: SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	Examiner: Not Yet Assigned

AUTHORIZATION FOR: EXTENSIONS OF TIME UNDER 37 C.F.R. § 1.136(a)(3) AND PAYMENT OF FEES UNDER 37 C.F.R. § 1.17

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

Dear Commissioner:

With respect to the above-identified application, the Commissioner is authorized to treat any concurrent or future reply requiring a petition for an extension of time under 37 C.F.R. § 1.136(a)(3) for its timely submission as incorporating a petition therefor for the appropriate length of time.

The Commissioner is also authorized to charge any extension of time fees or other fees that may be required under 37 C.F.R. § 1.17 for any paper filed concurrently herewith or in the future, or credit any overpayment, to Deposit Account No. 50-0665.

Dated: June 5, 2023

Respectfully submitted,

By /Matthew S. Williams/
Matthew S. Williams
Registration No.: 77,516

161759237.1

Perkins Coie LLP
P.O. Box 1247
Seattle, WA 98111-1247
Phone: (206) 359-3343
Fax: (206) 359-7198

Attorney for Applicant

Doc Code: TRACK1.REQ
Document Description: TrackOne Request

PTO/AIA/424 (04-14)

CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION UNDER 37 CFR 1.102(e) (Page 1 of 1)

First Named Inventor:	Ben Merritt	Nonprovisional Application Number (if known):	
Title of Invention:	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently $0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.
2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.
3. The applicable box is checked below:

I. ☑ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via EFS-Web.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, **or** the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

i. A request for continued examination has been filed with, or prior to, this form.
ii. If the application is a utility application, this certification and request is being filed via EFS-Web.
iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /Matthew S. Williams/	Date 2023-06-05
Name (Print/Typed) Matthew S. Williams	Practitioner Registration Number 77,516

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.**

☑ *Total of 1 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.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. 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	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

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
	Ben		Merritt	

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

City	State/Province	Country of Residence
San Clemente	CA	US

Mailing Address of Inventor:

Address 1	c/o Inari Medical, Inc.
Address 2	6001 Oak Canyon, Suite #100

City	State/Province	Postal Code	Country
Irvine	CA	92618	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Jacqueline		Macias	

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

City	State/Province	Country of Residence
Fullerton	CA	US

Mailing Address of Inventor:

Address 1	c/o Inari Medical, Inc.
Address 2	6001 Oak Canyon, Suite #100

City	State/Province	Postal Code	Country
Irvine	CA	92618	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Brian	Michael	Strauss	

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

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
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	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

City	San Clemente	State/Province	CA	Country of Residence	US

Mailing Address of Inventor:

Address 1	c/o Inari Medical, Inc.		
Address 2	6001 Oak Canyon, Suite #100		
City	Irvine	State/Province	CA
Postal Code	92618	Country	US

Inventor 4 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Thomas		Tu	

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

City	Louisville	State/Province	KY	Country of Residence	US

Mailing Address of Inventor:

Address 1	c/o Inari Medical, Inc.		
Address 2	6001 Oak Canyon, Suite #100		
City	Irvine	State/Province	CA
Postal Code	92618	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).

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

Customer Number	25096		
Email Address	patentprocurement@perkinscoie.com	Add Email	Remove Email

Application Information:

Title of the Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS		
Attorney Docket Number	111552.8018.US08	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	38	Suggested Figure for Publication (if any)	2

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
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	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

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	25096		

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	18/167757	2023-02-10

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
18/167757	Continuation of	17/976711	2022-10-28
Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
17/976711	Continuation of	17/865315	2022-07-14
Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
17/865315	Continuation of	16/536185	2019-08-08	11559382	2023-01-24

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16/536185	Claims benefit of provisional	62/718269	2018-08-13
Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16/536185	Claims benefit of provisional	62/718248	2018-08-13

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

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. 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	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

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.

PTO/AIA/14 (11-15)
Approved for use through 04/30/2017. OMB 0651-0032
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	111552.8018.US08
	Application Number	
Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS	

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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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	Inari Medical, Inc.		
Mailing Address Information For Applicant:			
Address 1	6001 Oak Canyon, Suite #100		
Address 2			
City	Irvine	**State/Province**	CA
Country	US	Postal Code	92618
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.

PTO/AIA/14 (11-15)
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	111552.8018.US08
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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	/Matthew S. Williams/			Date (YYYY-MM-DD)	2023-06-05
First Name	Matthew S.	Last Name	Williams	Registration Number	77,516

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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	111552.8018.US08
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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.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	SYSTEM FOR TREATING EMBOLISM AND ASSOCIATED DEVICES AND METHODS

As the below named inventor, I hereby declare that:

This declaration is directed to:

- [ ] The attached application, or
- [x] United States application or PCT international application number 16/536,185 filed on August 8, 2019 .

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.

I hereby state that I have reviewed and understand the contents of the above identified application, including the claims, as amended by any amendment.

I acknowledge the duty to disclose information material to patentability as defined in 37 C.F.R. 1.56 including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

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: Thomas Tu Date: Mar 23, 2020

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.

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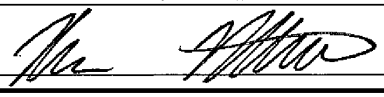
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LEGAL NAME OF INVENTOR

Inventor: Ben Merritt Date: 2/5/2020

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.

145197071.1

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

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LEGAL NAME OF INVENTOR

Inventor: Jacqueline Macias Date: 02/06/2020

Signature: Jacqueline Macias

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.

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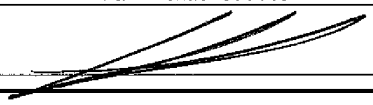
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LEGAL NAME OF INVENTOR

Inventor: Brian Michael Strauss Date: 06Feb2020

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.