UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	03/25/2022	Benjamin E. Merritt	111552.8016.US03	9367

25096 7590 07/11/2023

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

EXAMINER	
VU, QUYNH-NHU HOANG	

ART UNIT	PAPER NUMBER
3783	

NOTIFICATION DATE	DELIVERY MODE
07/11/2023	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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	ISSUE DATE	PATENT NO.
17/705,189	11-Jul-2023	11697011

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	07/11/2023	11697011	111552.8016.US03	9367

25096 7590 06/21/2023

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 Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PAIR WEB site http://pair.uspto.gov for additional inventors):

Benjamin E. Merritt, San Clemente, CA;
John C. Thress, Capistrano Beach, CA;
Paul Lubock, Monarch Beach, CA;

APPLICANT(s) (Please see PAIR WEB site http://pair.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.

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

Change(s) applied to document,
/P.H./
12/22/2022

	227.	20160206344	07-21-2016	Bruzzi et al.	
	228.	20160228134	08-11-2016	Martin et al.	
	229.	20160262790	09-15-2016	Rosenbluth et al.	
	230.	20160287276	10-06-2016	Cox et al.	
	231.	20160367285	~~03-10-2016~~	Sos 12/2016	
	232.	20170014560	01-19-2017	Minskoff et al.	
	233.	20170037548	02-09-2017	Lee	
	234.	20170042571	02-16-2017	Levi	
	235.	20170058623	03-02-2017	Jaffrey et al.	
	236.	20170079672	03-23-2017	Quick	
	237.	20170086864	03-30-2017	Greenhalgh et al.	
	238.	20170100142	04-13-2017	Look et al.	
	239.	20170105743	04-20-2017	Vale et al.	
	240.	20170105745	04-20-2017	Rosenbluth et al.	
	241.	20170112513	07-11-2017	Marchand et al.	
	242.	20170112514	04-27-2017	Marchand et al.	
	243.	20170189041	07-06-2017	Cox et al.	
	244.	20170233908	08-17-2017	Kroczynski et al.	
	245.	20170265878	09-21-2017	Marchand et al.	
	246.	20170303939	10-26-2017	Greenhalgh et al.	
	247.	20170303942	10-26-2017	Greenhalgh et al.	
	248.	20170303947	10-26-2017	Greenhalgh et al.	
	249.	20170303948	10-26-2017	Wallace et al.	
	250.	20170325839	11-16-2017	Rosenbluth et al.	
	251.	20170348014	12-07-2017	Wallace et al.	
	252.	20180042624	02-15-2018	Greenhalgh et al.	
	253.	20180042626	02-15-2018	Greenhalgh et al.	
	254.	20180064453	03-08-2018	Garrison et al.	
	255.	20180064454	03-08-2018	Losordo et al.	
	256.	20180070968	03-15-2018	Wallace et al.	
	257.	20180092652	04-05-2018	Marchand et al.	
	258.	20180105963	04-19-2018	Quick	
	259.	20180125512	05-10-2018	Nguyen et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	194.	20150032144	01-29-2015	Holloway	
	195.	20150059908	03-05-2015	Mollen	
	196.	20150088190	03-26-2015	Jensen	
	197.	20150127035	05-07-2015	Trapp et al.	
	198.	20150133990	05-14-2015	Davidson	
	199.	20150150672	~~08-07-2017~~	Ma 06/2015	
	200.	20150164523	06-18-2015	Brady et al.	
	201.	20150164666	06-18-2015	Johnson et al.	
	202.	20150190155	07-09-2015	Ulm III	
	203.	20150190156	07-09-2015	Ulm III	
	204.	20150196380	07-16-2015	Berrada et al.	
	205.	20150196744	~~04-03-2018~~	Aboytes 07/2015	
	206.	20150209058	07-30-2015	Ferrera et al.	
	207.	20150209165	07-30-2015	Grandfield et al.	
	208.	20150238207	08-27-2015	Cox et al.	
	209.	20150250578	09-10-2015	Cook et al.	
	210.	20150265299	09-24-2015	Cooper et al.	
	211.	20150305756	10-29-2015	Rosenbluth	
	212.	20150305859	10-29-2015	Eller	
	213.	20150352325	12-10-2015	Quick	
	214.	20150360001	12-17-2015	Quick	
	215.	20150374391	12-31-2015	Quick	
	216.	20160008014	08-09-2016	Rosenbluth	
	217.	20160022293	01-28-2016	Dubrul et al.	
	218.	20160058540	03-03-2016	Don Michael	
	219.	20160074627	03-17-2016	Cottone	
	220.	20160106448	04-21-2016	Brady et al.	
	221.	20160106449	04-21-2016	Brady et al.	
	222.	20160113663	04-28-2016	Brady et al.	
	223.	20160113664	04-28-2016	Brady et al.	
	224.	20160113665	04-28-2016	Brady et al.	
	225.	20160113666	04-28-2016	Quick	
	226.	20160143721	05-26-2016	Rosenbluth	

Change(s) applied to document,
/P.H./
12/22/2022

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	161.	20130317589	11-28-2013	Martin et al.	
	162.	20130345739	12-26-2013	Brady et al.	
	163.	20140005712	01-02-2014	Martin	
	164.	20140005713	01-02-2014	Bowman	
	165.	20140005715	03-31-2015	Castella et al.	
	166.	20140005717	01-02-2014	Martin et al.	
	167.	20140025048	01-23-2014	Ward	
	168.	20140031856	01-30-2014	Martin	
	169.	20140046133	02-13-2014	Nakamura et al.	
	170.	20140046243	02-13-2014	Ray et al.	
	171.	20140121672	05-01-2014	Folk	
	172.	20140155830	06-05-2014	Bonnette et al.	
	173.	20140155908	07-22-2014	Rosenbluth et al.	
	174.	20140155980	06-05-2014	Turjman	
	175.	20140180397	~~06-05-2013~~	Gerberding et al. 06/2014	
	176.	20140188143	~~04-03-2018~~	Martin et al. 07/2014	
	177.	20140236219	08-21-2014	Dubrul et al.	
	178.	20140243882	08-28-2014	Ma	
	179.	20140257253	09-11-2014	Jemison	
	180.	20140276403	09-18-2014	Follmer et al.	
	181.	20140318354	10-30-2014	Thompson et al.	
	182.	20140324091	~~06-03-2015~~	Rosenbluth 10/2014	
	183.	20140330286	11-06-2014	Wallace et al.	
	184.	20140336691	11-13-2014	Jones et al.	
	185.	20140343593	11-20-2014	Chin et al.	
	186.	20140364896	12-11-2014	Consigny	
	187.	20140371779	12-18-2014	Vale et al.	
	188.	20150005781	01-01-2015	Lund-Clausen et al.	
	189.	20150005792	01-01-2015	Ahn	
	190.	20150018859	~~02-16-2016~~	Quick 01/2015	
	191.	20150018860	01-15-2015	Quick	
	192.	20150018929	01-15-2015	Martin et al.	
	193.	20150025555	01-22-2015	SOS	

Change(s) applied to document;
/P.H./
12/22/2022

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	128.	20110288529	11-24-2011	Fulton	
	129.	20110288572	11-24-2011	Martin	
	130.	20110319917	12-29-2011	Ferrera et al.	
	131.	20120059309	03-08-2012	di Palma et al.	
	132.	20120059356	03-08-2012	di Palma et al.	
	133.	20120083824	04-05-2012	Berrada et al.	
	134.	20120083868	04-05-2012	Shrivastava	
	135.	20120089216	04-12-2012	Rapaport et al.	
	136.	20120101480	04-26-2012	Ingle et al.	
	137.	20120101510	04-26-2012	Lenker et al.	
	138.	20120138832	06-07-2012	Townsend	
	139.	20120143239	06-07-2012	Aklog et al.	
	140.	20120165919	06-28-2012	Cox et al.	
	141.	20120179181	07-12-2012	Straub et al.	
	142.	20120197277	08-02-2012	Stinis	
	143.	20120232655	09-13-2012	Lorrison et al.	
	144.	20120271105	10-25-2012	Nakamura et al.	
	145.	20120271231	10-25-2012	Agrawal	
	146.	20120277788	11-01-2012	Cattaneo	
	147.	20120310166	12-06-2012	Huff	
Change(s) applied to document, /P.H./ 12/22/2022	148.	20130030460	01-31-2013	Marks et al.	
	149.	20130046332	02-21-2013	Jones et al.	
	150.	20130066348	03-14-2013	Fiorella et al.	
	151.	20130092012	04-18-2013	Marchand et al.	
	152.	20130096571	04-18-2013	Massicotte et al.	
	153.	20130102996	04-25-2013	Strauss	
	154.	20130116721	05-09-2013	Takagi et al.	
	155.	20130144326	~~08-02-2010~~ 06/2013	Brady et al.	
	156.	20130165871	06-27-2013	Fiorella et al.	
	157.	20130184703	07-18-2013	Shireman et al.	
	158.	20130197567	08-01-2013	Brady et al.	
	159.	20130226196	08-29-2013	Smith	
	160.	20130289608	10-31-2013	Tanaka et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Benjamin E. Merritt et al.	
Application No.: 17/705,189	Confirmation No.: 9367
Filed: March 25, 2022	Art Unit: 3783
For: HEMOSTASIS VALVES AND METHODS OF USE	Examiner: Quynh-Nhu H. Vu

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 on December 14, 2022 and on April 14, 2023, the Examiner allowed claims 1-9. 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 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: __May 25, 2023_____

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

Attorney for Applicant

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 including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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

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)
2023-05-25	(Date)

APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
17/705,189	March 25, 2022	Benjamin E. Merritt	111552-8016.US03	9367

TITLE OF INVENTION: HEMOSTASIS VALVES AND METHODS OF USE

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	2023-07-14

EXAMINER	ART UNIT	CLASS-SUBCLASS
Quynh-Nhu Vu	OPAP	-

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363)

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1. 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) ☐ Advance Order - # of Copies _____

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

☑ Electronic Payment via EFS-Web ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. 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 2023-05-25

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.

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 #
17/705,189	**05/25/2023 02:26:32 PM ET**	**111552.8016.US03**

Title of Invention

HEMOSTASIS VALVES AND METHODS OF USE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	9367	FILED BY	JiYoung Anderson
PATENT CENTER #	62155578	FILING DATE	03/25/2022
CUSTOMER #	25096	FIRST NAMED INVENTOR	Benjamin E. Merritt
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2023-5-25 Issue Fee Trans - 111552-8016US3.PDF	2	Issue Fee Payment (PTO-85B)	252 KB
22023-5-25 Comments - 111552-8016US3.PDF	2	Miscellaneous Incoming Letter	88 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
2023-5-25 Issue Fee Trans - 111552-8016US3.PDF	CFC2608DA0B061C8C556CA8824C8D851301ADCCE01895DED A9F51565FF5D99C8127B3C100C051D8707BEECBD5D51FA5D

Imperative EX1002

	942F8DED2B0DD4CD2C387F46FC0232AD
22023-5-25 Comments - 111552-8016US3.PDF	0FE3B8318E4ABEA4708245C16AC1D63F2F2FE6CA8EE87172E C28842460CF522BEF66190BFF3D1DD68022090BB2FD29E81 E13B5037FB6A2E256C6913E3B8A80B

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 #
17/705,189	05/25/2023 02:26:32 PM ET	111552.8016.US03

Title of Invention

HEMOSTASIS VALVES AND METHODS OF USE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	9367	FILED BY	JiYoung Anderson
PATENT CENTER #	62155578	AUTHORIZED BY	Matthew Williams
CUSTOMER #	25096	FILING DATE	03/25/2022
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Benjamin E. Merritt

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 3369	E20235OE27386554	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

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 04/14/2023

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

EXAMINER
VU, QUYNH-NHU HOANG

ART UNIT	PAPER NUMBER
3783	

DATE MAILED: 04/14/2023

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	03/25/2022	Benjamin E. Merritt	111552.8016.US03	9367

TITLE OF INVENTION: HEMOSTASIS VALVES AND METHODS OF USE

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	07/14/2023

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 EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence 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 04/14/2023
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 EFS-Web or by facsimile to (571) 273-2885, on the date below.

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	03/25/2022	Benjamin E. Merritt	111552.8016.US03	9367

TITLE OF INVENTION: HEMOSTASIS VALVES AND METHODS OF USE

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	07/14/2023

EXAMINER	ART UNIT	CLASS-SUBCLASS
VU, QUYNH-NHU HOANG	3783	604-167030

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 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. _____

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	03/25/2022	Benjamin E. Merritt	111552.8016.US03	9367

25096 7590 04/14/2023

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

EXAMINER	
VU, QUYNH-NHU HOANG	
ART UNIT	**PAPER NUMBER**
3783	

DATE MAILED: 04/14/2023

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Notice of Allowability	**Application No.** 17/705,189	**Applicant(s)** Merritt et al.	
	Examiner QUYNH-NHU H VU	**Art Unit** 3783	**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 IDS 01/31/23 & 02/21/23.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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

3. ☑ The allowed claim(s) is/are 1-9 . 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 _____.

/QUYNH-NHU H. VU/
Primary Examiner, Art Unit 3783

Notice of Pre-AIA or AIA Status

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

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Claim 3 (previously withdrawn- now rejoined and allowed, see Election/Restriction below)

Claims 10-15 (previously withdrawn, now cancelled- see Election/Restriction below)

Election/Restrictions

Claims 1-2, 4-9 allowable. The restriction requirement in between Species I-II & sub-Species in Figs. 1-12, as set forth in the Office action mailed on 05/27/22, has been reconsidered in view of the allowability of claims to the elected invention pursuant to MPEP § 821.04(a). **The restriction requirement is hereby withdrawn as to any claim that requires all the limitations of an allowable claim.** Specifically, the restriction requirement of partially is withdrawn. Claim 3, is directed to sub-species in Figs. 6-8 no longer withdrawn from consideration because the claim(s) requires all the limitations of an allowable claim. However, claims 10-15, directed to Species II remain withdrawn from consideration because they do not require all the limitations of an allowable claim. Therefore, claims 10-15 are cancelled.

In view of the above noted withdrawal of the restriction requirement, applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See In re Ziegler, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Allowable Subject Matter

Claims 1-9 are allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to QUYNH-NHU HOANG VU whose telephone number is (571)272-3228. The examiner can normally be reached on M-F 7:30 am-4:00 pm.

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, Bhisma Mehta can be reached on 571-272-3383. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

/Quynh-Nhu H. Vu/
Quynh-Nhu H Vu
Primary Examiner, Art Unit 3783

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/705,189	Merritt et al.
	Examiner	Art Unit
	QUYNH-NHU H VU	3783

CPC - Searched*		
Symbol	**Date**	**Examiner**
A61M2039/062 OR A61M2039/0673 OR A61M39/0613	08/08/2022	QNV
F16K7/02 OR F16K7/08 OR F16K7/04	08/08/2022	QNV

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**
PE2E, IDS, Inventor, forward/backward search	08/08/2022	QNV
updated search, IDS search	11/28/2022	QNV
updated search & IDS search	04/10/2023	QNV

Interference Search			
US Class/CPC Symbol	**US Subclass/CPC Group**	**Date**	**Examiner**
	all the above	11/28/2022	QNV

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/705,189	Merritt et al.
	Examiner	**Art Unit**
	QUYNH-NHU H VU	3783

✓	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	05/22/2022	08/08/2022	11/28/2022	04/10/2023					
1	1	÷	✓	=	=					
2	2	÷	✓	=	=					
3	3	÷	N	=	=					
4	4	÷	✓	=	=					
5	5	÷	✓	=	=					
6	6	÷	✓	=	=					
7	7	÷	✓	=	=					
8	8	÷	✓	=	=					
9	9	÷	✓	=	=					
	10	÷	N	-	-					
	11	÷	N	-	-					
	12	÷	N	-	-					
	13	÷	N	-	-					
	14	÷	N	-	-					
	15	÷	N	-	-					

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.	20220142638	05-12-2022	Enright et al.	
	2.	20220151647	05-19-2022	Dolendo et al.	
	3.	20220152355	05-19-2022	Dolendo et al.	
	4.	5653684	08-05-1997	Laptewicz et al.	
	5.	5908435	06-01-1999	Samuels	
	6.	4611594	09-16-1986	Grayhack et al.	
	7.	9827084	11-28-2017	Bonnette et al.	
	8.	20210137667	05-13-2021	Sonnette et al.	
	9.	20180256177	09-13-2018	Cooper et al.	
	10.	11013523	05-25-2021	Arad Hadar	
	11.	11406801	08-09-2022	Fojtik et al.	
	12.	11554005	01-17-2023	Merritt et al.	
	13.	11559382	01-24-2023	Merritt et al.	
	14.	6818006	11-16-2004	Douk et al.	
	15.	9078682	07-14-2015	Lenker et al.	
	16.	20140052161	02-20-2014	Cully et al.	
	17.	20180042623	02-15-2018	Batiste	
	18.				

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.					
	6.					

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.		
	2.		
	3.		
	4.		
	5.		
	6.		
	7.		

EXAMINER SIGNATURE

Examiner Signature	/QUYNH-NHU H. VU/	Date Considered	04/10/2023

*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).

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

☐ 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)	2023-01-31
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. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.	20180184912	07-05-2018	Al-Ali	
	2.	20160262774	09-15-2016	HONDA	
	3.	20120172918	07-05-2012	Fifer et al.	
	4.	20050054995	03-10-2005	Barzell et al.	
	5.	5421824	06-06-1995	Clement et al.	
	6.	20210236148	08-05-2021	Marchand et al.	
	7.	5158533	10-27-1992	Strauss et al.	
	8.	20230046775	02-16-2023	Quick	
	9.	20140188127	07-03-2014	Dubrul et al.	
	10.	20140074144	03-13-2014	Shrivastava et al.	
	11.	8535283	09-17-2013	Heaton et al.	
	12.	8753322	06-17-2014	Hu et al.	
	13.	8808259	08-19-2014	Walton et al.	
	14.				
	15.				
	16.				
	17.				
	18.				

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.	WO2006124307	11-23-2006	KERBEROS PROXIMAL SOLUTIONS, INC.		
	2.					
	3.					
	4.					
	5.					
	6.					

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.		
	2.		
	3.		
	4.		
	5.		
	6.		
	7.		

EXAMINER SIGNATURE

Examiner Signature	/QUYNH-NHU H. VU/	Date Considered	04/10/2023

*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).

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

☐ 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)	2023-02-21
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.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.	20180184912	07-05-2018	Al-Ali	
	2.	20160262774	09-15-2016	HONDA	
	3.	20120172918	07-05-2012	Fifer et al.	
	4.	20050054995	03-10-2005	Barzell et al.	
	5.	5421824	06-06-1995	Clement et al.	
	6.	20210236148	08-05-2021	Marchand et al.	
	7.	5158533	10-27-1992	Strauss et al.	
	8.	20230046775	02-16-2023	Quick	
	9.	20140188127	07-03-2014	Dubrul et al.	
	10.	20140074144	03-13-2014	Shrivastava et al.	
	11.	8535283	09-17-2013	Heaton et al.	
	12.	8753322	06-17-2014	Hu et al.	
	13.	8808259	08-19-2014	Walton et al.	
	14.				
	15.				
	16.				
	17.				
	18.				

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.	WO2006124307	11-23-2006	KERBEROS PROXIMAL SOLUTIONS, INC.		
	2.					
	3.					
	4.					
	5.					
	6.					

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.		
	2.		
	3.		
	4.		
	5.		
	6.		
	7.		

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 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).

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

☐ 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)	2023-02-21
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.**

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 #
17/705,189	**02/21/2023 05:25:04 PM ET**	**111552.8016.US03**

Title of Invention

HEMOSTASIS VALVES AND METHODS OF USE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	9367	FILED BY	JiYoung Anderson
PATENT CENTER #	61628173	FILING DATE	03/25/2022
CUSTOMER #	25096	FIRST NAMED INVENTOR	Benjamin E. Merritt
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2023-2-21 IDS SB08 - 111552-8016US3.PDF	3	Information Disclosure Statement (IDS) Form (SB08)	127 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
FOR-WO2006124307.PDF	19	Foreign Reference	2080 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)

Imperative EX1002

2023-2-21 IDS SB08 - 111552-8016US3.PDF	97F93208A142301049A2C128A57020B78DF15EC0EB38582536 1216B257B577B6488E3F360E6889D4328894953FEC737D3BC6 B4AFA50C5112C3D535CEB648635C
FOR-WO2006124307.PDF	4CA9E275B28C639DF92082C698747D391EB4FEFEEA1BB6C9 B742A1F4DE7964B77944A82E842650ED0069421D200988267A 5E6CE83FEC33F777AC3CCFF6120555

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.

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (01-22)
Approved for use through 05/31/2024. 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.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	17/705,189	Filing Date	2022-03-25	Docket Number (if applicable)	111552-8016.US03	Art Unit	3783
First Named Inventor	Benjamin E. Merritt			Examiner Name	Quynh-Nhu Hoang Vu		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☐ Amendment/Reply
- ☒ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☐ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No _____

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

Applicant Signature

PTO/SB/30EFS (01-22)
Approved for use through 05/31/2024. 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.

Signature of Registered U.S. Patent Practitioner			
Signature	/Matthew S. Williams/	Date (YYYY-MM-DD)	2023-01-31
Name	Matthew S. Williams	Registration Number	77,516

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Privacy Act Statement

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

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

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

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

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

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

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

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

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

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

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

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.	20220142638	05-12-2022	Enright et al.	
	2.	20220151647	05-19-2022	Dolendo et al.	
	3.	20220152355	05-19-2022	Dolendo et al.	
	4.	5653684	08-05-1997	Laptewicz et al.	
	5.	5908435	06-01-1999	Samuels	
	6.	4611594	09-16-1986	Grayhack et al.	
	7.	9827084	11-28-2017	Bonnette et al.	
	8.	20210137667	05-13-2021	Sonnette et al.	
	9.	20180256177	09-13-2018	Cooper et al.	
	10.	11013523	05-25-2021	Arad Hadar	
	11.	11406801	08-09-2022	Fojtik et al.	
	12.	11554005	01-17-2023	Merritt et al.	
	13.	11559382	01-24-2023	Merritt et al.	
	14.	6818006	11-16-2004	Douk et al.	
	15.	9078682	07-14-2015	Lenker et al.	
	16.	20140052161	02-20-2014	Cully et al.	
	17.	20180042623	02-15-2018	Batiste	
	18.				

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.					
	6.					

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.		
	2.		
	3.		
	4.		
	5.		
	6.		
	7.		

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 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).

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

☐ 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)	2023-01-31
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
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
17/705,189	**01/31/2023 06:45:12 PM ET**	**111552.8016.US03**

Title of Invention

HEMOSTASIS VALVES AND METHODS OF USE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	9367	FILED BY	JiYoung Anderson
PATENT CENTER #	61523748	FILING DATE	03/25/2022
CUSTOMER #	25096	FIRST NAMED INVENTOR	Benjamin E. Merritt
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Matthew Williams

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2023-1-31 IDS SB08 - 111552-8016US3.PDF	3	Information Disclosure Statement (IDS) Form (SB08)	128 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
RCE - 111552-8016US3.PDF	3	Request for Continued Examination (RCE)	1628 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)

2023-1-31 IDS SB08 - 111552-8016US3.PDF	E2744AFD30A328A51B35A092DD0E05DB4812B02AA29FEE5079DD185E7A82FDBB51ACD995726E6C352EDBA10ACA0DEA37280521998B04D50FB21FA44CE0857F4F
RCE - 111552-8016US3.PDF	8D2D0CB94894798024603487 2DF3361EC91657A6A8D652D7F7067B003EB6A9E96237D3139C87A45CB554B0686B7E60C3ABA9200C1C7776993F43EFFFA5D80C37

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 #
17/705,189	01/31/2023 06:45:12 PM ET	111552.8016.US03

Title of Invention

HEMOSTASIS VALVES AND METHODS OF USE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	9367	FILED BY	JiYoung Anderson
PATENT CENTER #	61523748	AUTHORIZED BY	Matthew Williams
CUSTOMER #	25096	FILING DATE	03/25/2022
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Benjamin E. Merritt

Payment Information

PAYMENT METHOD	PAYMENT TRANSACTION ID	PAYMENT AUTHORIZED BY
CARD / 3369	E20231UI46193643	JiYoung Anderson

FEE CODE	DESCRIPTION	ITEM PRICE($)	QUANTITY	ITEM TOTAL($)
1801	REQUEST FOR CONTINUED EXAMINATION (RCE) - 1ST REQUEST (SEE 37 CFR 1.114)	1360.00	1	1360.00
			TOTAL AMOUNT:	$1,360.00

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.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	03/25/2022	Benjamin E. Merritt	111552-8016.US03	9367

25096 7590 12/21/2022

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

EXAMINER	
VU, QUYNH-NHU HOANG	

ART UNIT	PAPER NUMBER
3783	

NOTIFICATION DATE	DELIVERY MODE
12/21/2022	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

Corrected ***Notice of Allowability***	**Application No.** 17/705,189	**Applicant(s)** Merritt et al.	
	Examiner QUYNH-NHU H VU	**Art Unit** 3783	**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 IDS 12/08/22.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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

3. ☑ The allowed claim(s) is/are 1-9 . 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 12/08/22.
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 _____.

/QUYNH-NHU H. VU/
Primary Examiner, Art Unit 3783

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.	20220347455	11-03-2022	Merritt et al.	
	2.	20220346800	11-03-2022	Merritt et al.	
	3.	20220346813	11-03-2022	Quick	
	4.	20220346814	11-03-2022	Quick	
	5.	20220346801	11-03-2022	Merritt et al.	
	6.	3675657	07-11-1972	Gauthier	
	7.	9216277	12-22-2015	Myers	
	8.	9980813	05-29-2018	Eller	
	9.	6451036	09-17-2002	Heitzmann et al.	
	10.	20080234715	09-25-2008	Pesce et al.	
	11.	20110034986	02-10-2011	Chou et al.	
	12.	20190336142	11-07-2019	Torrie et al.	
	13.	20190239910	08-08-2019	Brady et al.	
	14.	20060217664	09-28-2006	Hattler et al.	
	15.	20170252057	09-07-2017	Bonnette et al.	
	16.	20170340867	11-30-2017	Accisano, II	
	17.	11457936	10-04-2022	Buck et al.	
	18.	11259821	03-01-2022	Buck et al.	
	19.	11439799	09-13-2022	Buck et al.	
	20.	20210315598	10-14-2021	Buck et al.	
	21.	11529158	12-20-2022	Hauser	
	22.	20220362512	11-17-2022	Quick et al.	
	23.				
	24.				
	25.				

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]

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

	1.					
	2.					
	3.					
	4.					
	5.					
	6.					

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.		
	2.		
	3.		
	4.		
	5.		
	6.		
	7.		

EXAMINER SIGNATURE			
Examiner Signature	/QUYNH-NHU H. VU/	Date Considered	12/16/2022

*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):

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

☐ 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)	2022-12-08
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

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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. /Q.N.V./

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 12/14/2022

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

EXAMINER
VU, QUYNH-NHU HOANG

ART UNIT	PAPER NUMBER
3783	

DATE MAILED: 12/14/2022

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	03/25/2022	Benjamin E. Merritt	111552-8016.US03	9367

TITLE OF INVENTION: HEMOSTASIS VALVES AND METHODS OF USE

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	03/14/2023

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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

25096 7590 12/14/2022
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 EFS-Web or by facsimile to (571) 273-2885, on the date below.

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	03/25/2022	Benjamin E. Merritt	111552-8016.US03	9367

TITLE OF INVENTION: HEMOSTASIS VALVES AND METHODS OF USE

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	03/14/2023

EXAMINER	ART UNIT	CLASS-SUBCLASS
VU, QUYNH-NHU HOANG	3783	604-167030

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) ❑Advance Order - # of Copies _____

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

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	03/25/2022	Benjamin E. Merritt	111552-8016.US03	9367

25096 7590 12/14/2022

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

EXAMINER	
VU, QUYNH-NHU HOANG	
ART UNIT	**PAPER NUMBER**
3783	

DATE MAILED: 12/14/2022

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

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

Notice of Allowability	**Application No.** 17/705,189	**Applicant(s)** Merritt et al.	
	Examiner QUYNH-NHU H VU	**Art Unit** 3783	**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 11/17/22.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

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

3. ☑ The allowed claim(s) is/are 1-9 . 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 _____.

/QUYNH-NHU H. VU/
Primary Examiner, Art Unit 3783

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

1. (Currently Amended) A valve, comprising:

a tubular member defining a lumen configured to slidably receive a catheter;

a constricting mechanism including at least one filament and an actuator coupled to the filament, the filament comprising a first portion extending around at least a portion of the tubular member and a second portion having a first end extending from the first portion in one direction and a second end extending from the first portion in another direction, and the actuator comprises a first member coupled to the first end of the filament and a second member ~~couped~~ coupled to the second end of the filament, wherein the first member and the second member of the actuator are moveable between (a) a first position wherein the filament circumferentially constricts the lumen to create a seal and (b) a second position wherein the filament is moved to at least partially open the lumen; and

a biasing system configured to bias the first member and the second member to the first position.

Election/Restrictions

Claims 1-2, 4-9 allowable. The restriction requirement in between Species I-II & sub-Species in Figs. 1-12, as set forth in the Office action mailed on 05/27/22, has been reconsidered in view of the allowability of claims to the elected invention pursuant to MPEP § 821.04(a). **The restriction requirement is hereby withdrawn as to any claim that requires all the limitations of an allowable**

claim. Specifically, the restriction requirement of partially is withdrawn. Claim 3, is directed to sub-species in Figs. 6-8 no longer withdrawn from consideration because the claim(s) requires all the limitations of an allowable claim. However, claims 10-15, directed to Species II remain withdrawn from consideration because they do not require all the limitations of an allowable claim.

In view of the above noted withdrawal of the restriction requirement, applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Once a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See In re Ziegler, 443 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

Allowable Subject Matter

Claims 1-9 are allowed.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: The claims in this application have been allowed because the prior art of record fails to disclose either single or in combination the claimed medical device/method including: a constricting mechanism including at least one filament and an actuator coupled to the filament, the filament comprising a first portion extending around at least a portion of the tubular member and a second portion having a first end extending from the first portion in one direction and a second end extending from the first portion in another direction, and the actuator comprises a first member coupled to the first end of the filament and a second member coupled to the second end of the filament, wherein the first member and the second member of the actuator are moveable between (a) a first position wherein the filament circumferentially constricts the lumen to create a seal and (b) a second position wherein the filament is moved to at least partially open the lumen; and a biasing system configured to bias the first member and the second member to the first position.

The closet prior art of record is Hartley (US 2003/0116731), Wong et al. (US 2011/0144592), however these references do not disclose the device as claimed or described above.

Hartley discloses a valve 2, comprising:

a tubular member 22 defining a lumen 8configured to slidably receive a catheter;

a constricting mechanism (rotary actuator 12 being rotated) including at least one filament 14 and an actuator 12 coupled to the filament 14, the filament comprising a first portion (a portion wraps around element 8, see Figs. 3-4) extending around at least a portion of the tubular member and a second portion 14 (a portion located inside the actuator 12 and connected to element 16, see Figs. 3-4) having a first end extending from the first portion in one direction and a second end extending from the first portion in another direction, and the actuator 12 comprises a first member 12 coupled to the first end of the filament and a second member coupled to the second end of the filament, wherein the first member and the second member of the actuator are moveable between (a) a first position (Fig. 4) wherein the filament circumferentially constricts the lumen to create a seal and (b) a second position (Fig. 3) wherein the filament is moved to at least partially open the lumen.

Hartley fails to disclose that a biasing system configured to bias the first member and the second member to the first position.

Wong discloses a valve 19 comprising: a tubular member 19; a constricting mechanism 15 & 17; a biasing 20a & 20b. However, Wong fails to disclose a filament as required in the claimed invention. It is noted that one skilled in the art would not use the device of Harley to combine with Wong to produce the claimed invention.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to QUYNH-NHU HOANG VU whose telephone number is (571)272-3228. The examiner can normally be reached on M-F 7:30 am-4:00 pm.

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, Bhisma Mehta can be reached on 571-272-3383. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

/Quynh-Nhu H. Vu/
Quynh-Nhu H Vu
Primary Examiner, Art Unit 3783

Notice of References Cited	Application/Control No. 17/705,189	Applicant(s)/Patent Under Reexamination Merritt et al.	
	Examiner QUYNH-NHU H VU	Art Unit 3783	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-3675657-A	07-1972	Gauthier; Oscar	A61B17/132	606/203
*	B	US-4551862-A	11-1985	Haber; Terry M.	A61F2/0036	600/491
*	C	US-7775501-B2	08-2010	Kees; Ulrich	F16K7/065	251/5
*	D	US-9980813-B2	05-2018	Eller; Derek	F16K7/06	1/1
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/705,189	Merritt et al.
	Examiner	**Art Unit**
	QUYNH-NHU H VU	3783

CPC						
Symbol					**Type**	**Version**
A61M	/	39	/	0613	F	2013-01-01
A61B	/	17	/	3207	A	2013-01-01
A61M	/	2039	/	0673	A	2013-01-01
A61M	/	2039	/	062	A	2013-01-01

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

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	9	
/QUYNH-NHU H. VU/ Primary Examiner, Art Unit 3783	28 November 2022	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

U.S. Patent and Trademark Office — Part of Paper No.: 20221128

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/705,189	Merritt et al.
	Examiner	**Art Unit**
	QUYNH-NHU H VU	3783

INTERNATIONAL CLASSIFICATION				
CLAIMED				
A61M	/	39	/	06

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

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

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 9	
/QUYNH-NHU H. VU/ Primary Examiner, Art Unit 3783 (Primary Examiner)	28 November 2022 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office — Part of Paper No.: 20221128

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/705,189	Merritt et al.
	Examiner	**Art Unit**
	QUYNH-NHU H VU	3783

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

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1		10												
2	2		11												
3	3		12												
4	4		13												
5	5		14												
6	6		15												
7	7														
8	8														
9	9														

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 9	
/QUYNH-NHU H. VU/ Primary Examiner, Art Unit 3783 (Primary Examiner)	28 November 2022 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1

U.S. Patent and Trademark Office Part of Paper No.: 20221128

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/705,189	Merritt et al.
	Examiner	**Art Unit**
	QUYNH-NHU H VU	3783

✓	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	05/22/2022	08/08/2022	11/28/2022						
1	1	÷	✓	=						
2	2	÷	✓	=						
3	3	÷	N	=						
4	4	÷	✓	=						
5	5	÷	✓	=						
6	6	÷	✓	=						
7	7	÷	✓	=						
8	8	÷	✓	=						
9	9	÷	✓	=						
	10	÷	N	-						
	11	÷	N	-						
	12	÷	N	-						
	13	÷	N	-						
	14	÷	N	-						
	15	÷	N	-						

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/705,189	Merritt et al.
	Examiner	Art Unit
	QUYNH-NHU H VU	3783

CPC - Searched*		
Symbol	Date	Examiner
A61M2039/062 OR A61M2039/0673 OR A61M39/0613	08/08/2022	QNV
F16K7/02 OR F16K7/08 OR F16K7/04	08/08/2022	QNV

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
PE2E, IDS, Inventor, forward/backward search	08/08/2022	QNV
updated search, IDS search	11/28/2022	QNV

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
	all the above	11/28/2022	QNV

Receipt date: 11/17/2022

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.	20220125451	04-28-2022	Hauser	
	2.	20220160382	05-26-2022	Hauser	
	3.	20140303658	10-09-2014	Bonnette et al.	
	4.	20050085769	04-21-2005	MacMahon et al.	
	5.	20220160383	05-26-2022	Hauser	
	6.	20220160381	05-26-2022	Hauser	
	7.	20170049942	02-23-2017	Conlan et al.	
	8.	20220240959	08-04-2022	Quick	
	9.	6564828	05-20-2003	Ishida	
	10.	5197485	03-30-1993	Grooters	
	11.	20130035628	02-07-2013	Garrison et al.	
	12.	8057497	11-15-2011	Raju et al.	
	13.	20150173782	06-25-2015	Garrison et al.	
	14.	20130281788	10-24-2013	Garrison	
	15.	20170196576	07-13-2017	Long et al.	
	16.	20070010787	01-11-2007	Hackett et al.	
	17.	20170319221	11-09-2017	CHU	
	18.	20110196309	08-11-2011	Wells	
	19.	20140296868	10-02-2014	Garrison et al.	
	20.	20010049486	12-06-2001	Evans et al.	
	21.	20100217276	08-26-2010	Garrison et al.	
	22.	20140257363	09-11-2014	Lippert	
	23.	20170056032	03-02-2017	Look et al.	
	24.	20160220741	08-04-2016	Garrison et al.	
	25.	20180104404	04-19-2018	Ngo-Chu	
	26.	6719717	04-13-2004	Johnson et al.	
	27.	10478535	11-19-2019	Ogle	
	28.	6960189	11-01-2005	Bates et al.	
	29.	7004931	02-28-2006	Hogendijk	
	30.	7223253	05-29-2007	Hogendijk	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

	31.	20220211400	07-07-2022	Cox et al.	
	32.	11433218	09-06-2022	Quick et al.	
	33.	20040127936	07-01-2004	Salahieh et al.	
	34.	20210022843	01-28-2021	Hauser	
	35.	5158564	10-27-1992	Schnepp-Pesch et al.	
	36.				
	37.				

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.	JPH07323090A	12-12-1995	Heisei		
	2.	WO2022103848	05-19-2022	Inari Medical, Inc.		
	3.	WO2022109021	05-27-2022	Inari Medical, Inc.		
	4.	WO2022109034	05-27-2022	Inari Medical, Inc.		
	5.					
	6.					

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.		
	2.		
	3.		
	4.		
	5.		
	6.		
	7.		
	8.		
	9.		
	10.		
	11.		
	12.		
	13.		

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

	14.		
	15.		
	16.		
	17.		
	18.		
	19.		
	20.		

EXAMINER SIGNATURE			
Examiner Signature	/QUYNH-NHU H. VU/	Date Considered	11/28/2022

*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.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

Receipt date: 11/17/2022

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

☒ 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)	2022-11-17
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. /Q.N.V./

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	1	16/117519 and (pliable) and (reinforcement) and (tensioning adj mechanism)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 09:36 AM
L2	1	("20150305859").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 10:53 AM
L3	2	("4551862").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 11:14 AM
L4	6	(("5360417") or ("20040039412") or ("20170112513")).PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 11:15 AM
L5	6	(("6824553") or ("7905877") or ("2013184703")).PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 11:16 AM
L6	1	("20120310166").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 11:28 AM
L7	2	16/117519 and pressure	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 11:33 AM
L8	237	("10004531"|"10045790"|"10335186"|"10342571"|"10349960"|"20110319917"|"20130184703"|"20180193043"|"20190150959"|"20190231373"|"5490859"|"6824553"|"7094249"|"7905877"|"20030116731"|"20040039412"|"20060247500"|"20080300466"|"20090281525"|"20110144592"|"20120310166"|"20150305859"|"20170058623"|"20170112513"|"2846179"|"4523738"|"4551862"|"4978341"|"5360417"|"10098651"|"20010004699"|"20010041909"|"20010051810"|"20020111648"|"20020120277"|"20020147458"|"20020156457"|"20030114875"|"20030125663"|"20030135230"|"20030153973"|"20040073243"|"20050038468"|"20050119668"|"20050283186"|"20060047286"|"20060100662"|"20060253145"|"20060282111"|"20070112374"|"20070118165"|	(US-PGPUB; USPAT)	OR	ON	ON	2020/06/10 01:13 PM

		"20070161963"|"20070179513"|"20070191866"|"20070198028"|"20070208361"|"20070208367"|"20070213753"|"20070255252"|"20080015541"|"20080157017"|"20080167678"|"20080228209"|"20080234722"|"20080269798"|"20090018566"|"20090054918"|"20090062841"|"20090160112"|"20090163846"|"20090182362"|"20090292307"|"20100087850"|"20100114113"|"20100121312"|"20100204712"|"20100249815"|"20100318178"|"20110054405"|"20110060212"|"20110152993"|"20110190806"|"20110213290"|"20110213403"|"20110224707"|"20110251629"|"20110264133"|"20120089216"|"20120101480"|"20120101510"|"20120143239"|"20120165919"|"20120179181"|"20120232655"|"20120271231"|"20140005713"|"20140025048"|"20150018860"|"20150133990"|"20150196744"|"20150238207"|"20150265299"|"20150305756"|"20150352325"|"20150360001"|"20150374391"|"20160113666"|"20160143721"|"20160262790"|"20160277276"|"20170105745"|"20170112514"|"20170189041"|"20170265878"|"20170325839"|"20180092652"|"20180125512"|"20180256178"|"20180296240"|"20180344339"|"20180361116"|"3088363"|"3435826"|"3923065"|"4030503"|"4393872"|"4650466"|"4873978"|"4883458"|"4890611"|"5011488"|"5059178"|"5102415"|"5129910"|"5192286"|"5192290"|"5370653"|"5476450"|"5591137"|"5746758"|"5749858"|"5766191"|"578					

		2817"|"5827304"|"5868708"|"5873866"|"5873882"|"5876414"|"5882329"|"5972019"|"5974938"|"5993483"|"6066149"|"6221006"|"6228060"|"6238412"|"6254571"|"6258115"|"6306163"|"6350271"|"6364895"|"6368339"|"6383205"|"6413235"|"6423032"|"6440148"|"6454741"|"6454775"|"6458103"|"6458139"|"6511492"|"6514273"|"6530935"|"6530939"|"6544279"|"6551342"|"6589263"|"6596011"|"6602271"|"6605074"|"6605102"|"6623460"|"6635070"|"6645222"|"6660013"|"6663650"|"6685722"|"6692504"|"6699260"|"6755847"|"6767353"|"6800080"|"6939361"|"6960222"|"7004954"|"7036707"|"7041084"|"7052500"|"7056328"|"7069835"|"7179273"|"7220269"|"7232432"|"7244243"|"7285126"|"7306618"|"7320698"|"7323002"|"7331980"|"7534234"|"7578830"|"7621870"|"7674247"|"7691121"|"7695458"|"7763010"|"7766934"|"7905896"|"7938809"|"7938820"|"7967790"|"7976511"|"7993302"|"7993363"|"8043313"|"8052640"|"8066757"|"8070791"|"8075510"|"8088140"|"8100935"|"8109962"|"8118829"|"8197493"|"8246641"|"8261648"|"8267897").PN.					
L9	63	("8298257"|"8317748"|"8337450"|"8357178"|"8361104"|"8409215"|"8486105"|"8491539"|"8512352"|"8535334"|"8545526"|"8568432"|"8574262"|"8579915"|"8585713"|"8696622"|"8771289"|"8777893"|"8784434"|"8784441"|"8795305"|"8795345"|"8801748"|"8814927"|"8820207"|"882	(US-PGPUB; USPAT)	OR	ON	ON	2020/06/10 01:13 PM

		6791"|"8828044"|"8833224"|"8845621"|"8852205"|"8852226"|"8932319"|"8939991"|"8945143"|"8945172"|"8968330"|"8992504"|"9005172"|"9101382"|"9149609"|"9161766"|"9204887"|"9259237"|"9283066"|"9408620"|"9439664"|"9439751"|"9456834"|"9463036"|"9526864"|"9526865"|"9566424"|"9579116"|"9616213"|"9636206"|"9700332"|"9717519"|"9744024"|"9757137"|"9844386"|"9844387"|"9999493"|"RE43902").PN.					
L10	1	"16117519"	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 01:37 PM
L11	3268	(A61B17/3207).CPC. and (@ad<"20170906")	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:05 PM
L12	4894	(A61M39/06 OR A61M2039/062 OR A61M2039/0673 OR A61M39/0613).CPC. and (@ad<"20170906")	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:11 PM
L13	3470	L12 and (seal or valve)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:11 PM
L14	2235	L12 and (seal)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:11 PM
L15	270	L12 and (seal) and (reinforc$5)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:11 PM
L16	2795	L12 and (valve)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:43 PM
L17	0	L12 and (hemostic adj valve)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:43 PM
L18	411	L12 and (hemostatic adj valve)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:43 PM
L19	1	("7172580").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 02:52 PM
L22	115	("20010042927" | "20020026207" | "20020156432" | "20030195541" | "20040059297" | "20040106942" | "20040111060" | "20040162531" | "20040215209" | "20040230161" | "20040260244" | "20050033342" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2020/06/10 05:51 PM

		"20050065543" | "20050070943" | "20050077688" | "20050077689" | "20050107816" | "20050131349" | "20050251191" | "20050288622" | "20050288634" | "20060211992" | "20060217665" | "20060229654" | "20060229655" | "20070088277" | "20070185453" | "20070255218" | "20080249475" | "20090082735" | "3712298" | "3845766" | "4265694" | "4924923" | "4929235" | "5104382" | "5114407" | "5127626" | "5141498" | "5174613" | "5180373" | "5197955" | "5203773" | "5209737" | "5256147" | "5261891" | "5267965" | "5269763" | "5295993" | "5304143" | "5308336" | "5314417" | "5318585" | "5330437" | "5338305" | "5342315" | "5342382" | "5356421" | "5385553" | "5387197" | "5399167" | "5405328" | "5441041" | "5462532" | "5467762" | "5474539" | "5476475" | "5486190" | "5522833" | "5534009" | "5569160" | "5569292" | "5584850" | "5609604" | "5618297" | "5626598" | "5658236" | "5662615" | "5669885" | "5685854" | "5690663" | "5690664" | "5709671" | "5752938" | "5776112" | "5782812" | "5792113" | "5803919" | "5807338" | "5817061" | "5851216" | "5860996" | "5865807" | "5879332" | "5895377" | "5904699" | "5906595" | "5916232" | "5947930" | "5980493" | "5989224" | "5997510" | "6004326" | "6197041" | "6319266" | "6497716" | "6551282" | "6685630" | "6702787" | "7169130" |				

		"7390317" | "7731694").PN. OR ("8137318").URPN.					
L23	255	("0729423" | "3086797" | "3197173" | "3438607" | "3920215" | "3977400" | "4149535" | "4231400" | "4243034" | "4324239" | "4378013" | "4473369" | "4496348" | "4634421" | "4723550" | "4786028" | "4839471" | "4960259" | "4978341" | "5009643").PN. OR ("5127626").URPN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2020/06/10 05:57 PM
L24	2	("20120138832").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 06:00 PM
L25	2	16/117519 and (pressure with different)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 06:25 PM
L26	1	16/117519 and (vacuum adj pressure)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 06:27 PM
L27	2	16/117519 and (vacuum)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 06:27 PM
L28	1	16/117519 and (filament)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 07:46 PM
L29	1	("20150305859").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 07:57 PM
L30	2	16/117519 and vacuum	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 10:02 AM
L31	1	("20120310166").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/11 10:54 AM
L32	1	("7172580").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/11 10:59 AM
L33	14	(compliant adj polymer) with (silicon adj rubber)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 11:13 AM
L34	57	(compliant adj polymer) with (silicone adj rubber)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 11:14 AM
L35	57	L34 not L33	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 11:14 AM
L36	179	((benjamin near Merritt) or (John near Thress) or (Paul near Lubock)).in. and valve	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 02:17 PM
L37	2	L36 and (reinforcement) and (filament)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 02:18 PM
L38	4	L36 and (reinforcement) and (tension$4)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 02:18 PM
L39	1	16/117519 and uniform	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/11/19 01:13 PM
L40	1	("20180193043").PN.	(US-PGPUB; USPAT;	OR	OFF	OFF	2020/11/19

			FPRS; EPO; JPO)				01:16 PM
L41	1114	(hemostatic adj valve) and (filament or thread or string) and (bias or spring)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/11/19 04:38 PM
L42	943	L41 and (@ad<"20170906")	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/11/19 04:38 PM
L43	1305	((pinch adj valve) or (hemestatic with seal)) and (filament or thread or string) and (bias or spring) and (@ad<"20170906")	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/11/19 04:59 PM
L44	1304	L43 not L42	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/11/19 05:00 PM
L45	4	("3830462" | "7168444").PN. OR ("7775501").URPN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2020/11/19 05:12 PM
L46	37	("10098651"|"10238406"|"20010051810"|"20020156457"|"20030116731"|"20040039412"|"20040199202"|"20050283186"|"20060247500"|"20080262528"|"20080300466"|"20090281525"|"20110144592"|"20120059356"|"20130092012"|"20140276403"|"20150133990"|"20150305859"|"20170037548"|"20170058623"|"20170233908"|"20180105963"|"20180296240"|"20180344339"|"20180361116"|"20190046219"|"20190070401"|"2846179"|"3892161"|"4034642"|"4287808"|"4523738"|"4551862"|"4978341"|"5360417"|"8715314"|"9844387").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/19 06:55 PM
L52	2	("20190046219").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2021/02/05 10:36 AM
L53	3	(("20140371779") or ("20180064454")).PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2021/02/05 10:38 AM
L54	2	("11000682").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/05/22 06:33 PM
L55	333	("2846179" | "3088363" | "3197173" | "3435826"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/05/22 06:34 PM

		| "3892161" | "3923065" | "4030503" | "4034642" | "4287808" | "4393872" | "4523738" | "4551862" | "4650466" | "4873978" | "4883458" | "4890611" | "4960259" | "4978341" | "5011488" | "5059178" | "5102415" | "5127626" | "5129910" | "5192286" | "5192290" | "5360417" | "5370653" | "5476450" | "5490859" | "5591137" | "5746758" | "5749858" | "5766191" | "5782817" | "5827229" | "5827304" | "5868708" | "5873866" | "5873882" | "5876414" | "5882329" | "5911710" | "5972019" | "5974938" | "5989233" | "5993483" | "6066149" | "6221006" | "6228060" | "6238412" | "6254571" | "6258115" | "6306163" | "6350271" | "6364895" | "6368339" | "6383205" | "6413235" | "6423032" | "6440148" | "6454741" | "6454775" | "6458103" | "6458139" | "6511492" | "6514273" | "6530935" | "6530939" | "6544279" | "6551342" | "6589263" | "6596011" | "6602271" | "6605074" | "6605102" | "6623460" | "6635070" | "6645222" | "6660013" | "6663650" | "6685722" | "6692504" | "6699260" | "6755847" | "6767353" | "6800080" | "6824553" | "6939361" | "6960222" | "7004954" | "7036707" | "7041084" | "7052500" | "7056328" | "7069835" | "7094249" | "7179273" | "7220269" | "7232432" | "7244243" | "7285126" | "7306618" | "7320698" | "7323002" | "7331980" | "7534234" | "7578830" | "7621870" | "7674247" | "7691121" | "7695458" | "7763010" | "7766934" | "7775501" | "7905877" | "7905896" | "7938809" | "7938820" | "7967790" | "7976511"					

		| "7993302" | "7993363" | "8043313" | "8052640" | "8066757" | "8070791" | "8075510" | "8088140" | "8100935" | "8109962" | "8118829" | "8197493" | "8246641" | "8261648" | "8267897" | "8298257" | "8317748" | "8337450" | "RE43902" | "8357178" | "8361104" | "8409215" | "8486105" | "8491539" | "8512352" | "8535334" | "8545526" | "8568432" | "8574262" | "8579915" | "8585713" | "8696622" | "8715314" | "8771289" | "8777893" | "8784434" | "8784441" | "8795305" | "8795345" | "8801748" | "8814927" | "8820207" | "8826791" | "8828044" | "8833224" | "8845621" | "8852205" | "8852226" | "8932319" | "8939991" | "8945143" | "8945172" | "8968330" | "8992504" | "9005172" | "9101382" | "9149609" | "9161766" | "9204887" | "9259237" | "9283066" | "9408620" | "9439664" | "9439751" | "9456834" | "9463036" | "9526864" | "9526865" | "9566424" | "9579116" | "9616213" | "9636206" | "9700332" | "9717519" | "9744024" | "9757137" | "9844386" | "9844387" | "9999493" | "10004531" | "10045790" | "10098651" | "10238406" | "10335186" | "10342571" | "10349960" | "20010004699" | "20010041909" | "20010051810" | "20020111648" | "20020120277" | "20020147458" | "20020156457" | "20030114875" | "20030116731" | "20030125663" | "20030135230" |					

		"20030153973" | "20040039412" | "20040073243" | "20040199202" | "20050038468" | "20050119668" | "20050283186" | "20060047286" | "20060100662" | "20060247500" | "20060253145" | "20060282111" | "20070038225" | "20070112374" | "20070118165" | "20070161963" | "20070179513" | "20070191866" | "20070198028" | "20070208361" | "20070208367" | "20070213753" | "20070255252" | "20080015541" | "20080088055" | "20080157017" | "20080167678" | "20080228209" | "20080234722" | "20080262528" | "20080269798" | "20080300466" | "20090018566" | "20090054918" | "20090062841" | "20090160112" | "20090163846" | "20090182362" | "20090281525" | "20090292307" | "20100087850" | "20100114113" | "20100121312" | "20100204712" | "20100249815" | "20100318178" | "20110054405" | "20110060212" | "20110144592" | "20110152993" | "20110190806" | "20110213290" | "20110213403" | "20110224707" | "20110245807" | "20110251629" | "20110264133" | "20110319917" |				

		"20120059356" | "20120089216" | "20120101480" | "20120101510" | "20120138832" | "20120143239" | "20120165919" | "20120179181" | "20120232655" | "20120271231" | "20120310166" | "20130092012" | "20130184703" | "20140005713" | "20140025048" | "20140276403" | "20140371779" | "20150018860" | "20150133990" | "20150196744" | "20150238207" | "20150265299" | "20150305756" | "20150305859" | "20150352325" | "20150360001" | "20150374391" | "20160113666" | "20160143721" | "20160262790" | "20160277276" | "20170037548" | "20170058623" | "20170105745" | "20170112513" | "20170112514" | "20170189041" | "20170233908" | "20170265878" | "20170325839" | "20180064454" | "20180092652" | "20180105963" | "20180125512" | "20180193043" | "20180256178" | "20180296240" | "20180344339" | "20180361116" | "20190000492" | "20190046219" | "20190070401" | "20190150959" | "20190231373").pn. AND (PGPB | USPT | USOC).dbnm.					
L56	3	16/117519 AND	(US-PGPUB; USPAT;	OR	ON	ON	2022/05/22

		(constricting ADJ mechanism)	FPRS; EPO; JPO)				07:06 PM
L57	21	("1100682").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/05 04:00 PM
L58	2	("11000682").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/05 04:01 PM
L59	0	("201403717779").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/05 05:26 PM
L60	1	("20140371779").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/05 05:26 PM
L61	333	("2846179" | "3088363" | "3197173" | "3435826" | "3892161" | "3923065" | "4030503" | "4034642" | "4287808" | "4393872" | "4523738" | "4551862" | "4650466" | "4873978" | "4883458" | "4890611" | "4960259" | "4978341" | "5011488" | "5059178" | "5102415" | "5127626" | "5129910" | "5192286" | "5192290" | "5360417" | "5370653" | "5476450" | "5490859" | "5591137" | "5746758" | "5749858" | "5766191" | "5782817" | "5827229" | "5827304" | "5868708" | "5873866" | "5873882" | "5876414" | "5882329" | "5911710" | "5972019" | "5974938" | "5989233" | "5993483" | "6066149" | "6221006" | "6228060" | "6238412" | "6254571" | "6258115" | "6306163" | "6350271" | "6364895" | "6368339" | "6383205" | "6413235" | "6423032" | "6440148"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/08/05 05:28 PM

		| "6454741" | "6454775" | "6458103" | "6458139" | "6511492" | "6514273" | "6530935" | "6530939" | "6544279" | "6551342" | "6589263" | "6596011" | "6602271" | "6605074" | "6605102" | "6623460" | "6635070" | "6645222" | "6660013" | "6663650" | "6685722" | "6692504" | "6699260" | "6755847" | "6767353" | "6800080" | "6824553" | "6939361" | "6960222" | "7004954" | "7036707" | "7041084" | "7052500" | "7056328" | "7069835" | "7094249" | "7179273" | "7220269" | "7232432" | "7244243" | "7285126" | "7306618" | "7320698" | "7323002" | "7331980" | "7534234" | "7578830" | "7621870" | "7674247" | "7691121" | "7695458" | "7763010" | "7766934" | "7775501" | "7905877" | "7905896" | "7938809" | "7938820" | "7967790" | "7976511" | "7993302" | "7993363" | "8043313" | "8052640" | "8066757" | "8070791" | "8075510" | "8088140" | "8100935" | "8109962" | "8118829" | "8197493" | "8246641" | "8261648" | "8267897" | "8298257" | "8317748" | "8337450" | "RE43902" | "8357178" | "8361104" | "8409215" | "8486105" | "8491539" | "8512352" | "8535334" | "8545526" | "8568432" | "8574262" | "8579915" | "8585713" | "8696622" | "8715314" | "8771289" | "8777893" | "8784434" | "8784441" | "8795305" | "8795345" | "8801748" | "8814927" | "8820207" | "8826791" | "8828044" | "8833224" | "8845621" | "8852205" | "8852226" | "8932319" | "8939991" | "8945143" | "8945172" | "8968330" | "8992504" | "9005172" |					

		"9101382" | "9149609" | "9161766" | "9204887" | "9259237" | "9283066" | "9408620" | "9439664" | "9439751" | "9456834" | "9463036" | "9526864" | "9526865" | "9566424" | "9579116" | "9616213" | "9636206" | "9700332" | "9717519" | "9744024" | "9757137" | "9844386" | "9844387" | "9999493" | "10004531" | "10045790" | "10098651" | "10238406" | "10335186" | "10342571" | "10349960" | "20010004699" | "20010041909" | "20010051810" | "20020111648" | "20020120277" | "20020147458" | "20020156457" | "20030114875" | "20030116731" | "20030125663" | "20030135230" | "20030153973" | "20040039412" | "20040073243" | "20040199202" | "20050038468" | "20050119668" | "20050283186" | "20060047286" | "20060100662" | "20060247500" | "20060253145" | "20060282111" | "20070038225" | "20070112374" | "20070118165" | "20070161963" | "20070179513" | "20070191866" | "20070198028" | "20070208361" | "20070208367" | "20070213753" | "20070255252" | "20080015541" | "20080088055" | "20080157017" | "20080167678" | "20080228209" |				

		"20080234722" | "20080262528" | "20080269798" | "20080300466" | "20090018566" | "20090054918" | "20090062841" | "20090160112" | "20090163846" | "20090182362" | "20090281525" | "20090292307" | "20100087850" | "20100114113" | "20100121312" | "20100204712" | "20100249815" | "20100318178" | "20110054405" | "20110060212" | "20110144592" | "20110152993" | "20110190806" | "20110213290" | "20110213403" | "20110224707" | "20110245807" | "20110251629" | "20110264133" | "20110319917" | "20120059356" | "20120089216" | "20120101480" | "20120101510" | "20120138832" | "20120143239" | "20120165919" | "20120179181" | "20120232655" | "20120271231" | "20120310166" | "20130092012" | "20130184703" | "20140005713" | "20140025048" | "20140276403" | "20140371779" | "20150018860" | "20150133990" | "20150196744" | "20150238207" | "20150265299" | "20150305756" | "20150305859" | "20150352325" | "20150360001" | "20150374391" | "20160113666" |				

		"20160143721" | "20160262790" | "20160277276" | "20170037548" | "20170058623" | "20170105745" | "20170112513" | "20170112514" | "20170189041" | "20170233908" | "20170265878" | "20170325839" | "20180064454" | "20180092652" | "20180105963" | "20180125512" | "20180193043" | "20180256178" | "20180296240" | "20180344339" | "20180361116" | "20190000492" | "20190046219" | "20190070401" | "20190150959" | "20190231373").pn. AND (PGPB | USPT | USOC).dbnm.					
L62	105	("1170208" | "1741526" | "2217718" | "2269401" | "3675657" | "4118805" | "4256094" | "4399809" | "4401107").pn. OR ("4551862").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/08/05 05:29 PM
L63	19	("2003/0116731").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/08/05 05:43 PM
L64	1	17/705189	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 11:02 AM
L65	1	("20110144592").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 01:12 PM
L66	12	"7775501"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO);	OR	ON	ON	2022/08/08 01:22 PM

			FPRS; EPO; JPO)				
L67	5183	((A61M2039/062 OR A61M2039/0673 OR A61M39/0613).cpc.) AND (@ad<"20170906")	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 01:55 PM
L68	4288	L67 AND (valve OR seal)	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 01:55 PM
L69	1185	L68 AND (string OR thread OR filament)	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 01:55 PM
L70	474	L69 AND (button OR actuator)	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 01:56 PM
L72	2	10/309485	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 02:04 PM
L73	1594	((F16K7/02 OR F16K7/08 OR F16K7/04).cpc.) AND (@ad<"20170906")	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 02:05 PM
L74	362	L73 AND (button OR actuator)	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 02:05 PM
L75	24	("3383131" | "4094492" | "4540411" | "4570898" | "5112324" | "5211370" | "5582165" | "5814026" | "6270053" | "6450989" | "6475135" | "7914492" | "7981086" | "8079973" | "8132783" | "8900168" | "20040015177" | "20050131344" | "20070118021" | "20070161956" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/08/08 02:08 PM

		"20110022063" | "20140012235" | "20140330309").pn. OR ("10183159").urpn. AND (PGPB | USPT | USOC).dbnm.					
L76	250	("20010004699" OR "20010041909" OR "20010051810" OR "20020022858" OR "20020026211" OR "20020032455" OR "20020095161" OR "20020095171" OR "20020111648" OR "20020120277" OR "20020147458" OR "20020156457" 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 "20040039412" OR "20040068288" OR "20040073243" OR "20040098033" OR "20040133232" OR "20040138692" OR "20040167567" OR "20040199201" OR "20040199202" OR "20050033172" OR "20050038468" OR "20050055047" OR "20050085826" OR "20050085849" OR "20050119668" OR "20050177132" OR "20050187570" OR "20050283165" OR "20050283166" OR "20050283186" OR "20060020286" OR "20060042786" OR "20060047286" OR "20060089533" OR "20060100662" OR "20060155305" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/08 02:18 PM

		"20060173525" OR "20060195137" OR "20060200221" OR "20060224177" OR "20060229645" OR "20060247500" OR "20060253145" OR "20060276874" OR "20060282111" OR "20060293696" OR "20070038225" OR "20070112374" OR "20070118165" OR "20070149996" OR "20070161963" OR "20070179513" OR "20070191866" OR "20070198028" OR "20070208361" OR "20070208367" OR "20070213753" OR "20070213765" OR "20070255252" OR "20070288054" OR "20080015541" OR "20080088055" OR "20080157017" OR "20080167678" OR "20080183136" OR "20080228209" OR "20080234722" OR "20080262528" OR "20080269798" OR "20080300466" OR "20090018566" OR "20090054918" OR "20090062841" OR "20090069828" OR "20090076417" OR "20090160112" OR "20090163846" OR "20090182362" OR "20090281525" OR "20090292307" OR "20090299393" OR "20100030256" OR "20100042136" OR "20100087844" OR "20100087850" OR "20100114113" OR "20100121312" OR "20100137846" OR "20100190156" OR "20100204712" OR "20100249815" OR "20100268264" OR "20100318178" OR "20110034987" OR					

		"20110054405" OR "20110060212" OR "20110118817" OR "20110125181" OR "20110144592" OR "20110152823" OR "20110152993" OR "20110160742" OR "20110160763" OR "20110190806" 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 "20120101480" OR "20120101510" OR "20120138832" OR "20120143239" OR "20120165919" OR "20120179181" OR "20120197277" OR "20120232655" OR "20120271105" OR "20120271231" OR "20120277788" OR "20120310166" OR "20130030460" OR "20130046332" OR "20130066348" OR "20130092012" OR "20130096571" OR "20130102996" OR "20130116721" OR "20130144326" OR "20130165871" OR "20130184703" OR "20130197567" OR "20130226196" OR "20130289608" OR "20130317589" OR "20130345739" OR "20140005712" OR "20140005713" OR "20140005715" OR "20140005717" OR "20140025048" OR					

		"20140031856" OR "20140046133" OR "20140046243" OR "20140121672" OR "20140155830" OR "20140155908" OR "20140155980" OR "20140180397" OR "20140188143" OR "20140236219" OR "20140243882" OR "20140257253" OR "20140276403" 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 "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 "20160058540" OR "20160074627" OR "20160106448" OR "20160106449" OR "20160113663" OR "20160113664" OR "20160113665" OR "20160113666" OR					

		"20160143721" OR "20160206344" OR "20160228134" OR "20160262790" OR "20160287276" OR "20160367285" OR "20170014560" OR "20170037548" OR "20170042571" OR "20170058623" OR "20170079672" OR "20170086864" OR "20170100142" OR "20170105743" OR "20170105745" OR "20170112513" OR "20170112514" OR "20170189041" OR "20170233908" OR "20170265878" OR "20170303939" OR "20170303942" OR "20170303947" OR "20170303948" OR "20170325839").pn.					
L77	32	("20170348014" OR "20180042624" OR "20180042626" OR "20180064453" OR "20180064454" OR "20180070968" OR "20180092652" OR "20180105963" OR "20180125512" OR "20180193043" OR "20180236205" 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 "20190321071" OR "20190336148" OR "20200046368" OR "20210113224" OR "20210186541").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/08 02:18 PM

L78	1263	((Benjamin NEAR Merritt) OR (John NEAR Thress) OR (Paul NEAR Lubock)).in.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 02:19 PM
L79	110	L78 AND (valve AND filament)	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 02:19 PM
L81	5	("10309485").pn.	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/11 12:16 PM
L82	2	("11000682").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/11 12:17 PM
L83	25	("1840967" | "1977504" | "2434835" | "2846179" | "3329396" | "3572627" | "3897039" | "3994472" | "4007904" | "4095805" | "4310139" | "4372026" | "4447037" | "4449719" | "4452421" | "4458876" | "5116017" | "5273108" | "7845648" | "20140174754").pn. OR ("10648268").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/08/11 12:48 PM
L84	1	17/705189	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/11 01:58 PM
L85	0	17/865266 AND (slide OR slidable OR slidably)	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/30 09:42 AM
L86	0	17/865266	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO);	OR	ON	ON	2022/08/30 09:43 AM

			FPRS; EPO; JPO)				
L87	2	("11000682").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/30 10:02 AM
L88	2	17/705189	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 10:32 AM
L89	6	("2016100252").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 10:49 AM
L90	3	("20160100252").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 10:50 AM
L91	7	"20160100252"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 10:51 AM
L92	28	"2016100252"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 10:51 AM
L93	52	(Pattok NEAR Greg).in.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 10:52 AM
L94	92	"2012009675"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 10:54 AM
L95	1524	("10004531"|"10010335"|"10016266"|"10028759"|"10045790"|"10098651"|"10130385"|"10226263"|"10238406"|"1027	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO);	OR	ON	ON	2022/11/07 10:56 AM

		1864"|"10327883"|"103 35186"|"10342571"|"10 349960"|"10383644"|"1 0524811"|"10588655"|" 10695159"|"10709471"| "10799331"|"10912577" |"11000682"|"11058445 "|"11058451"|"1114757 1"|"11154314"|"200100 04699"|"20010041909"| "20010051810"|"20020 022858"|"20020022859 "|"20020026211"|"2002 0032455"|"2002004945 2"|"20020095161"|"200 20095171"|"200201116 48"|"20020120277"|"20 020147458"|"20020151 918"|"20020156457"|"2 0020161392"|"2002016 9474"|"20020173819"|" 20020188276"|"200300 83693"|"20030100919"| "20030114875"|"20030 116731"|"20030125663 "|"20030135230"|"2003 0135258"|"2003015387 3"|"20030153973"|"200 30168068"|"200301768 84"|"20030191516"|"20 030208224"|"20030216 774"|"20040039412"|"2 0040068288"|"2004007 3243"|"20040098033"|" 20040122359"|"200401 33232"|"20040138525"| "20040138692"|"20040 167567"|"20040199201 "|"20040199202"|"2004 0260344"|"2004026727 2"|"20050033172"|"200 50038468"|"200500550 47"|"20050085769"|"20 050085826"|"20050085 846"|"20050085849"|"2 0050119668"|"2005017 7132"|"20050187570"|" 20050283165"|"200502 83166"|"20050283186"| "20060020286"|"20060 042786"|"20060047286 "|"20060074401"|"2006 0089533"|"2006010066 2"|"20060155305"|"200 60173525"|"200601951 37"|"20060200221"|"20 060224177"|"20060229 645"|"20060247500"|"2	FPRS; EPO; JPO)				

		0060253145"|"2006027 6874"|"20060282111"|" 20060293696"|"200700 38225"|"20070093744"| "20070112374"|"20070 118165"|"20070149996 "|"20070161963"|"2007 0179513"|"2007019186 6"|"20070198028"|"200 70208361"|"200702083 67"|"20070213753"|"20 070213765"|"20070255 252"|"20070288054"|"2 0080015541"|"2008008 8055"|"20080157017"|" 20080167678"|"200801 83136"|"20080228209"| "20080234722"|"20080 262528"|"20080269798 "|"20080300466"|"2009 0018566"|"2009005491 8"|"20090062841"|"200 90069828"|"200900764 17"|"20090160112"|"20 090163846"|"20090182 362"|"20090192495"|"2 0090281525"|"2009029 2307"|"20090299393"|" 20100016837"|"201000 30256"|"20100042136"| "20100087844"|"20100 087850"|"20100114113 "|"20100121312"|"2010 0137846"|"2010019015 6"|"20100204712"|"201 00249815"|"201002682 64"|"20100318178"|"20 110034987"|"20110054 405"|"20110060212"|"2 0110118817"|"2011012 5181"|"20110144592"|" 20110152823"|"201101 52993"|"20110160742"| "20110160763"|"20110 190806"|"20110196414 "|"20110213290"|"2011 0213403"|"2011022470 7"|"20110245807"|"201 10251629"|"201102641 33"|"20110265681"|"20 110288529"|"20110288 572"|"20110319917"|"2 0120059309"|"2012005 9356"|"20120083824"|" 20120083868"|"201200 89216"|"20120101480"| "20120101510"|"20120 138832"|"20120143239					

		"|"20120165919"|"2012 0179181"|"2012019727 7"|"20120232655"|"201 20271105"|"201202712 31"|"20120277788"|"20 120310166"|"20130030 460"|"20130046332"|"2 0130066348"|"2013009 2012"|"20130096571"|" 20130102996"|"201301 16708"|"20130116721"| "20130126559"|"20130 144326"|"20130165871 "|"20130184703"|"2013 0197454"|"2013019756 7"|"20130226196"|"201 30289608"|"201303175 89"|"20130345739"|"20 140005712"|"20140005 713"|"20140005715"|"2 0140005717"|"2014002 5048"|"20140031856"|" 20140046133"|"201400 46243"|"20140121672"| "20140155830"|"20140 155908"|"20140155980 "|"20140180397"|"2014 0188143"|"2014023621 9"|"20140243882"|"201 40257253"|"201402764 03"|"20140303658"|"20 140318354"|"20140324 091"|"20140330286"|"2 0140336691"|"2014034 3593"|"20140364896"|" 20140371779"|"201500 05781"|"20150005792"| "20150018859"|"20150 018860"|"20150018929 "|"20150025555"|"2015 0032144"|"2015005990 8"|"20150088190"|"201 50127035"|"201501339 90"|"20150150672"|"20 150164523"|"20150164 666"|"20150190155"|"2 0150190156"|"2015019 6380"|"20150196744"|" 20150209058"|"201502 09165"|"20150238207"| "20150250578"|"20150 265299"|"20150305756 "|"20150305859"|"2015 0352325"|"2015036000 1"|"20150374391"|"201 60008014"|"201600222 93"|"20160058540"|"20 160074627"|"20160106					

		448"|"20160106449"|"2 0160113663"|"2016011 3664"|"20160113665"|" 20160113666"|"201601 43721"|"20160151605"| "20160206344"|"20160 228134"|"20160262790 "|"20160287276"|"2016 0367285"|"2017001456 0"|"20170037548"|"201 70042571"|"201700499 42"|"20170058623"|"20 170079672"|"20170086 864"|"20170100142"|"2 0170105743"|"2017010 5745"|"20170112513"|" 20170112514"|"201701 89041"|"20170233908"| "20170265878"|"20170 303939"|"20170303942 "|"20170303947"|"2017 0303948"|"2017032583 9"|"20170348014"|"201 80042624"|"201800426 26"|"20180064453"|"20 180064454"|"20180070 968"|"20180092652"|"2 0180105963"|"2018012 5512"|"20180193043"|" 20180236205"|"201802 56178"|"20180296240"| "20180344339"|"20180 361116"|"20190000492 "|"20190046219"|"2019 0070401"|"2019011724 4"|"20190133622"|"201 90133623"|"201901336 24"|"20190133625"|"20 190133626"|"20190133 627"|"20190150959"|"2 0190231373"|"2019032 1071"|"20190336148"|" 20200046368"|"202001 13412"|"20210113224"| "20210186541"|"20210 290925"|"20210330344 "|"20210378694"|"2022 0000505"|"2022000050 6"|"20220000507"|"202 20015798"|"202200228 98"|"20220039815"|"20 220125451"|"20220160 381"|"20220160382"|"2 0220160383"|"2022021 1992"|"20220240959"|" 2846179"|"2955592"|"3 088363"|"3197173"|"34 35826"|"3515137"|"389					

		2161"|"3923065"|"4030 503"|"4034642"|"42223 80"|"4243040"|"428780 8"|"4324262"|"4393872" |"4469100"|"4523738"|" 4551862"|"4604094"|"4 643184"|"4646736"|"46 50466"|"4776337"|"479 0812"|"4863440"|"4870 953"|"4883458"|"48860 62"|"4890611"|"489857 5"|"4946440"|"4960259" |"4978341"|"5059178"|" 5100423"|"5127626"|"5 129910"|"5135484"|"51 54724"|"5192274"|"519 2286"|"5192290"|"5329 923"|"5360417"|"53643 45"|"5376101"|"538388 7"|"5389100"|"5419774" |"5443443"|"5456667"|" 5476450"|"5490859"|"5 496365"|"5527326"|"55 49626"|"5591137"|"566 2703"|"5746758"|"5749 858"|"5769816"|"57828 17"|"5800457"|"582722 9"|"5846251"|"5860938" |"5873866"|"5873882"|" 5876414"|"5895406"|"5 911710"|"5911733"|"59 11754"|"5941869"|"594 7985"|"5954737"|"5971 938"|"5972019"|"59749 38"|"5989233"|"599348 3"|"6030397"|"6066158" |"6068645"|"6126635"|" 6142987"|"6146396"|"6 146403"|"6152946"|"61 56055"|"6159230"|"616 5196"|"6168579"|"6179 859"|"6221006"|"62280 60"|"6238412"|"624507 8"|"6245089"|"6254571" |"6258115"|"6264663"|" 6306163"|"6322572"|"6 350271"|"6361545"|"63 64895"|"6368339"|"638 3205"|"6402771"|"6413 235"|"6423032"|"64321 22"|"6458103"|"647523 6"|"6485502"|"6508782" |"6511492"|"6514273"|" 6530923"|"6530935"|"6 544276"|"6544278"|"65 44279"|"6551342"|"656 9181"|"6575995"|"6589 263"|"6596011"|"66022					

		71"|"6605074"|"660510 2"|"6610077"|"6620148" |"6620179"|"6620182"|" 6623460"|"6635068"|"6 645222"|"6660013"|"66 60014"|"6663650"|"669 2504"|"6699260"|"6702 830"|"6755847"|"67673 53"|"6790204"|"680008 0"|"6824545"|"6824550" |"6824553"|"6830561"|" 6846029"|"6902540"|"6 939361"|"6942682"|"69 45977"|"6960222"|"700 4954"|"7036707"|"7041 084"|"7052500"|"70563 28"|"7063707"|"706983 5"|"7094249"|"7179273" |"7232432"|"7244243"|" 7285126"|"7300458"|"7 306618"|"7320698"|"73 23002"|"7331980"|"753 4234"|"7578830"|"7621 870"|"7674247"|"76911 21"|"7695458"|"776301 0"|"7766934"|"7775501" |"7780696"|"7905877"|" 7905896"|"7938809"|"7 938820"|"7967790"|"79 76511"|"7993302"|"799 3363"|"8043313"|"8052 640"|"8057496"|"80667 57"|"8070769"|"807079 1"|"8075510"|"8088140" |"8092486"|"8100935"|" 8109962"|"8118829"|"8 197493"|"8246641"|"82 61648"|"8267897"|"829 8257"|"8317748"|"8337 450"|"8357178"|"83611 04"|"8409215"|"848610 5"|"8491539"|"8512352" |"8535334"|"8545526"|" 8568432"|"8574262"|"8 579915"|"8585713"|"86 08754"|"8657867"|"869 6622"|"8715314"|"8721 714"|"8771289"|"87778 93"|"8784441"|"878444 2"|"8795305"|"8795345" |"8801748"|"8814927"|" 8820207"|"8826791"|"8 828044"|"8833224"|"88 45621"|"8852226"|"893 9991"|"8945143"|"8945 172"|"8956384"|"89925 04"|"9005172"|"902840 1"|"9101382"|"9125683"					

		|"9126016"|"9149609"|"9155552"|"9161766"|"9173668"|"9186487"|"9204887"|"9259237"|"9283066"|"9351747"|"9358037"|"9439664"|"9439751"|"9456834"|"9463035"|"9463036"|"9526864"|"9526865"|"9566424"|"9579116"|"9616213"|"9636206"|"9643035"|"9700332"|"9717514"|"9717519"|"9744024"|"9757137"|"9844386"|"9844387"|"9848975"|"9849014"|"9962178"|"9999493"|"RE43902").PN.				
L96	435	L95 AND (valve OR seal)	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 11:10 AM
L97	1	17/865266	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 11:53 AM
L98	5994	((A61M2039/0673 OR A61M39/0613 OR A61M2039/062 OR A61M2039/0626).cpc.) AND (@ad<"20170906")	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 11:55 AM
L99	5031	L98 AND (valve OR seal OR elastic)	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 11:55 AM
L100	596	L99 AND (collapse OR collapsible)	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 11:56 AM
L101	1464	L99 AND (bias OR spring)	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 11:56 AM
L102	295	L100 NOT L101	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA,	OR	ON	ON	2022/11/07 01:48 PM

			CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)				
L103	2	("11000682").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 02:18 PM
L104	4	("5376101").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 02:42 PM
L105	4	"2019246240"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 02:55 PM
L106	10	"110652645"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 02:56 PM
L107	9	("5011488," "5800457").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 02:57 PM
L108	28	"2011213403"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 03:02 PM
L109	4	("2017086864").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 03:07 PM
L110	18	"2017086864"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 03:08 PM
L111	26	"2017086864," "2013226196"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA,	OR	ON	ON	2022/11/07 03:11 PM

			CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)				
L112	7	"20170086864," "20130226196"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 03:11 PM
L113	2	"20140371779"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 03:16 PM
L114	3958	(hemostasis ADJ valve) AND spring AND (@ad<"20170906")	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 03:32 PM
L115	3684	L114 NOT L101 NOT L100	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/07 03:34 PM
L116	2516	L114 AND (filament OR thread OR string)	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/08 10:09 AM
L117	134	L116 NOT L115	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/08 10:10 AM
L118	250	("20010004699" OR "20010041909" OR "20010051810" OR "20020022858" OR "20020026211" OR "20020032455" OR "20020095161" OR "20020095171" OR "20020111648" OR "20020120277" OR "20020147458" OR "20020156457" OR "20030083693" OR "20030100919" OR "20030114875" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/11/28 11:33 AM

		"20030116731" OR "20030125663" OR "20030135230" OR "20030135258" OR "20030153873" OR "20030153973" OR "20030168068" OR "20030176884" OR "20030191516" OR "20030208224" OR "20040039412" OR "20040068288" OR "20040073243" OR "20040098033" OR "20040133232" OR "20040138692" OR "20040167567" OR "20040199201" OR "20040199202" OR "20050033172" OR "20050038468" OR "20050055047" OR "20050085826" OR "20050085849" OR "20050119668" OR "20050177132" OR "20050187570" OR "20050283165" OR "20050283166" OR "20050283186" OR "20060020286" OR "20060042786" OR "20060047286" OR "20060089533" OR "20060100662" OR "20060155305" OR "20060173525" OR "20060195137" OR "20060200221" OR "20060224177" OR "20060229645" OR "20060247500" OR "20060253145" OR "20060276874" OR "20060282111" OR "20060293696" OR "20070038225" OR "20070112374" OR "20070118165" OR "20070149996" OR "20070161963" OR "20070179513" OR "20070191866" OR "20070198028" OR "20070208361" OR "20070208367" OR "20070213753" OR "20070213765" OR					

		"20070255252" OR "20070288054" OR "20080015541" OR "20080088055" OR "20080157017" OR "20080167678" OR "20080183136" OR "20080228209" OR "20080234722" OR "20080262528" OR "20080269798" OR "20080300466" OR "20090018566" OR "20090054918" OR "20090062841" OR "20090069828" OR "20090076417" OR "20090160112" OR "20090163846" OR "20090182362" OR "20090281525" OR "20090292307" OR "20090299393" OR "20100030256" OR "20100042136" OR "20100087844" OR "20100087850" OR "20100114113" OR "20100121312" OR "20100137846" OR "20100190156" OR "20100204712" OR "20100249815" OR "20100268264" OR "20100318178" OR "20110034987" OR "20110054405" OR "20110060212" OR "20110118817" OR "20110125181" OR "20110144592" OR "20110152823" OR "20110152993" OR "20110160742" OR "20110160763" OR "20110190806" 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 "20120101480" OR "20120101510" OR "20120138832" OR "20120143239" OR "20120165919" OR "20120179181" OR "20120197277" OR "20120232655" OR "20120271105" OR "20120271231" OR "20120277788" OR "20120310166" OR "20130030460" OR "20130046332" OR "20130066348" OR "20130092012" OR "20130096571" OR "20130102996" OR "20130116721" OR "20130144326" OR "20130165871" OR "20130184703" OR "20130197567" OR "20130226196" OR "20130289608" OR "20130317589" OR "20130345739" OR "20140005712" OR "20140005713" OR "20140005715" OR "20140005717" OR "20140025048" OR "20140031856" OR "20140046133" OR "20140046243" OR "20140121672" OR "20140155830" OR "20140155908" OR "20140155980" OR "20140180397" OR "20140188143" OR "20140236219" OR "20140243882" OR "20140257253" OR "20140276403" 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 "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 "20160058540" OR "20160074627" OR "20160106448" OR "20160106449" OR "20160113663" OR "20160113664" OR "20160113665" OR "20160113666" OR "20160143721" OR "20160206344" OR "20160228134" OR "20160262790" OR "20160287276" OR "20160367285" OR "20170014560" OR "20170037548" OR "20170042571" OR "20170058623" OR "20170079672" OR "20170086864" OR "20170100142" OR "20170105743" OR "20170105745" OR "20170112513" OR "20170112514" OR "20170189041" OR "20170233908" OR "20170265878" OR "20170303939" OR "20170303942" OR					

		"20170303947" OR "20170303948" OR "20170325839").pn.					
L119	32	("20170348014" OR "20180042624" OR "20180042626" OR "20180064453" OR "20180064454" OR "20180070968" OR "20180092652" OR "20180105963" OR "20180125512" OR "20180193043" OR "20180236205" 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 "20190321071" OR "20190336148" OR "20200046368" OR "20210113224" OR "20210186541").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2022/11/28 11:33 AM
L120	250	L118	(US-PGPUB; USPAT)	OR	ON	ON	2022/11/28 11:34 AM
L121	12894	(hemostasis OR twist) ADJ valve	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/28 02:19 PM
L122	1158	L121 AND filament AND (biasing OR spring) AND (@ad<"20170906")	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/11/28 02:19 PM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N47	1423	(A61B17/3207).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 03:05 PM

N48	1681	(A61M39/06 OR A61M2039/062 OR A61M2039/0673 OR A61M39/0613).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 03:05 PM
N49	0	("l1" or N47) and ((hemostatic adj valve) and reinforcement and filament and biasing).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 03:06 PM
N50	2	(N47 or N48) and ((hemostatic adj valve) and reinforcement and filament and biasing).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 03:06 PM
N51	2	((hemostatic adj valve) and reinforcement and filament and biasing).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 03:06 PM
N52	2	(A61M39/06 OR A61M2039/062 OR A61M2039/0673 OR A61M39/0613).CPC. AND ((constricting ADJ mechanism) AND filament AND spring).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/11/08 10:25 AM
N53	3	((hemostasis ADJ valve) AND (constricting ADJ mechanism) AND filament AND spring).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/11/08 10:26 AM
N54	3	((valve) AND (constricting ADJ mechanism) AND (filament) AND (biasing OR spring)).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2022/11/28 03:12 PM

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.	20220347455	11-03-2022	Merritt et al.	
	2.	20220346800	11-03-2022	Merritt et al.	
	3.	20220346813	11-03-2022	Quick	
	4.	20220346814	11-03-2022	Quick	
	5.	20220346801	11-03-2022	Merritt et al.	
	6.	3675657	07-11-1972	Gauthier	
	7.	9216277	12-22-2015	Myers	
	8.	9980813	05-29-2018	Eller	
	9.	6451036	09-17-2002	Heitzmann et al.	
	10.	20080234715	09-25-2008	Pesce et al.	
	11.	20110034986	02-10-2011	Chou et al.	
	12.	20190336142	11-07-2019	Torrie et al.	
	13.	20190239910	08-08-2019	Brady et al.	
	14.	20060217664	09-28-2006	Hattler et al.	
	15.	20170252057	09-07-2017	Bonnette et al.	
	16.	20170340867	11-30-2017	Accisano, II	
	17.	11457936	10-04-2022	Buck et al.	
	18.	11259821	03-01-2022	Buck et al.	
	19.	11439799	09-13-2022	Buck et al.	
	20.	20210315598	10-14-2021	Buck et al.	
	21.	11529158	12-20-2022	Hauser	
	22.	20220362512	11-17-2022	Quick et al.	
	23.				
	24.				
	25.				

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]

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

	1.					
	2.					
	3.					
	4.					
	5.					
	6.					

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.		
	2.		
	3.		
	4.		
	5.		
	6.		
	7.		

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):

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

☐ 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)	2022-12-08
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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.**

Electronic Patent Application Fee Transmittal	
Application Number:	17705189
Filing Date:	25-Mar-2022
Title of Invention:	HEMOSTASIS VALVES AND METHODS OF USE
First Named Inventor/Applicant Name:	Benjamin E. Merritt
Filer:	Matthew S. Williams/JiYoung Anderson
Attorney Docket Number:	111552-8016.US03
Filed as Small Entity	
Filing Fees for Utility under 35 USC 111(a)	

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	130	130
		Total in USD ($)		**130**

Electronic Acknowledgement Receipt	
EFS ID:	47170242
Application Number:	17705189
International Application Number:	
Confirmation Number:	9367
Title of Invention:	HEMOSTASIS VALVES AND METHODS OF USE
First Named Inventor/Applicant Name:	Benjamin E. Merritt
Customer Number:	25096
Filer:	Matthew S. Williams/JiYoung Anderson
Filer Authorized By:	Matthew S. Williams
Attorney Docket Number:	111552-8016.US03
Receipt Date:	08-DEC-2022
Filing Date:	25-MAR-2022
Time Stamp:	14:11:53
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$130
RAM confirmation Number	E2022B8E12224204
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	2022-12-8-IDS-SB08-111552-8016US3.PDF	135113 84404682dc9bc827fd8a4dac7d59506f5374f409	no	4
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
2	Fee Worksheet (SB06)	fee-info.pdf	38022 814848bfe7a8e55e7e57768447f28957374e1fa9	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	173135		

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

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/705,189	Filing Date 03/25/2022	☐ 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	11/17/2022	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 15	Minus	** 20	= 0		x $100 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 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.	LIE
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".	/CRYSTAL QUEEN/
*** 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.

LISTING OF THE CLAIMS

Although they are not being amended herein, following is a complete listing of the claims pending in the application:

1. (Original) A valve, comprising:

a tubular member defining a lumen configured to slidably receive a catheter;

a constricting mechanism including at least one filament and an actuator coupled to the filament, the filament comprising a first portion extending around at least a portion of the tubular member and a second portion having a first end extending from the first portion in one direction and a second end extending from the first portion in another direction, and the actuator comprises a first member coupled to the first end of the filament and a second member couped to the second end of the filament, wherein the first member and the second member of the actuator are moveable between (a) a first position wherein the filament circumferentially constricts the lumen to create a seal and (b) a second position wherein the filament is moved to at least partially open the lumen; and

a biasing system configured to bias the first member and the second member to the first position.

2. (Original) The valve of claim 1 wherein the tubular member is pliable.

3. (Withdrawn The valve of claim 1 wherein the first portion of the filament extends in a loop completely around the tubular member.

4. (Original) The valve of claim 1 wherein the first member of the actuator comprises a first button and the second member of the actuator comprises a second button, wherein the first button and the second button are undepressed in the first position, and wherein the first button and the second button are depressed in the second position.

5. (Original) The valve of claim 1 wherein, when the first member and the second member of the actuator are in the first position, the lumen of the tubular member is configured to remain constricted and sealed when a pressure differential exists between (a) a first volume outside the lumen and adjacent to a first end of the tubular member and (b) a second volume outside the central lumen and adjacent to a second end of the tubular member.

6. (Original) The valve of claim 1 wherein, when the first member and the second member of the actuator are in the first position, the lumen of the tubular member is configured to remain constricted and sealed when vacuum pressure is applied to a volume outside the lumen and adjacent to either a first end or a second end of the tubular member.

7. (Original) The valve of claim 1 wherein the lumen of the tubular member extends a long a first longitudinal axis, wherein the first member and the second member of the actuator are movable between the first and second positions along a second longitudinal axis, and wherein the first longitudinal axis is orthogonal to the second longitudinal axis.

8. (Original) The valve of claim 1 wherein the biasing system comprises a first compression spring coupled to the first member and a second compression spring coupled to the second member.

9. (Original) The valve of claim 1 wherein, in the first position, the first member and the second member of the actuator pull the filament to circumferentially constrict the tubular member such that the lumen is constricted and sealed.

10. (Withdrawn) A hemostasis valve, comprising:

a support;

an actuator having a least a first member movably coupled to the support;

a collapsible tubular sidewall defining a lumen carried by the support;

a filament formed in a loop around the tubular sidewall, the filament having at least a first end portion extending away from the loop to the first member; and

a first spring configured to move the first member in a direction that pulls the first end portion away from the tubular sidewall, reducing a diameter of the lumen in response to reducing a diameter of the loop.

11. (Withdrawn) The hemostasis valve of claim 10, further comprising a second member movably coupled to the support.

12. (Withdrawn) The hemostasis valve of claim 11 wherein the filament further comprises a second end portion extending away from the loop to the second member.

13. (Withdrawn) The hemostasis valve of claim 12 first end portion, the loop, and the second end portion are one continuous filament.

14. (Withdrawn) The hemostasis valve of claim 12 wherein first member and the second member are biased in a direction that places the first end portion and the second end portion under sufficient tension to reduce the diameter of the lumen and provide a seal around a device extending through the lumen.

15. (Withdrawn) The hemostasis valve of claim 12 wherein the first member and the second member are biased in a direction that places the first end portion and the second end portion under sufficient tension to close the lumen.

AMENDMENTS TO THE SPECIFICATION

Please amend paragraph [0061] of the Specification as follows:

[0061] The lack of coupling of the reinforcement structure 320 to the elongate member 132 can facilitate and improve the collapse of the elongate member 132 around a tool 400, also referred to herein as instrument 400 or device 400, inserted through the valve 104 as shown in FIG. 4. The tool 400 can be any device inserted through the valve 104 including, for example, one or several additional catheters, lines, wires, grippers, punches, cutters, or the like. As seen in FIG. 4, the tool 400 is inserted through the valve 104 and specifically through the elongate member 132 of the valve. As shown, the constricting mechanism 141 is in the first configuration and the elongate member 132 and the central lumen 138 of the elongate member 132 is collapsed around the tool 400, and specifically around a shaft 402 of the tool 400 to thereby seal the valve 104 around the tool 400 and specifically around the shaft 402 of the tool 400. The constricting mechanism 141 can seal around tools 400 that fit through the elongate member 132, regardless of the size of the tool 400. Thus, the valve can be used with a wide variety of tools. More specifically, the at least one filament 150 can include (i) a first portion 491 extending around at least a portion of the elongate member 132 and (ii) a second portion 492 having a first end 493-A extending from the first portion 491 in one direction and a second end 493-B extending from the first portion 491 in another direction. The first button 144-A can be coupled to the first end 493-A of the at least one filament 150 and the second button 144-B can be coupled to the second end 493-B of the at least one filament 150. In the illustrated first configuration, the at least one filament 150 circumferentially constricts the elongate member 132 to create a seal between the elongate member 132 and the tool 400. The buttons 144-A, 144-B are moveable to the second configuration wherein the at least one filament 150 is moved to at least partially open the central lumen 138 of the elongate member 132.

REMARKS

Claims 1–15 were pending when the present Office Action was mailed on August 19, 2022, of which claims 3 and 10–15 have been withdrawn from consideration. In this response, no claims have been amended, added, or canceled. Accordingly, claims 1–15 remain pending.

In the Office Action dated August 19, 2022, claims 1, 2, and 4–9 were rejected. More specifically, the status of the application in light of this Office Action is as follows:

(A) The drawings were objected to; and

(B) Claims 1, 2, and 4–9 were rejected under 35 U.S.C. § 112(a) and under 35 U.S.C. § 112(b).

As a preliminary matter, the undersigned attorney wishes to thank the Examiner for engaging in a productive telephone interview on October 31, 2022 to discuss the present Office Action and the pending claims. At that time, the Examiner provisionally agreed that the objection to the drawings and the Section 112(a)/(b) rejections of claims 1, 2, and 4–9 would be withdrawn if the specification and drawings were amended as set forth herein.

The following remarks summarize and expand on the October 31st telephone interview and reflect the agreements reached between the Examiner 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 addressed.

A. Objections to the drawings

The drawings were objected to for informalities. Attached are Replacement Sheets for Figures 2–4. As agreed upon during the October 31, 2022 telephone interview, no new matter

has been added, and the objection to the drawings should be withdrawn in view of the amendments to Figures 2–4. Accordingly, the objection to the drawings should be withdrawn.

B. Response to the Section 112(a)/112(b) Rejection of Claims 1, 2, and 4–9

Claims 1, 2, and 4–9 were rejected under 35 U.S.C. § 112(a) as allegedly lacking enablement and under 35 U.S.C. § 112(b) as allegedly being indefinite. As discussed during the October 31st telephone interview, the Examiner provisionally agreed that the objection to the Section 112(a)/(b) rejections of claims 1, 2, and 4–9 would be withdrawn if the specification and drawings were amended as set forth herein. Accordingly, the Section 112(a)/(b) rejections of claims 1, 2, and 4–9 should be withdrawn.

C. Rejoinder of Claims 3 and 10–15

The Applicant requests that the Examiner rejoin and allow withdrawn claims 3 and 10–15. Withdrawn claim 3 depends from claim 1, and withdrawn claim 10 (and claims 11–15 depending therefrom) include some features similar to those of claim 1. Therefore, in accordance with M.P.E.P. § 821.04, the Applicant respectfully requests that the Examiner rejoin and allow claims 3 and 10–15.

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 cited references; instead, any alteration or characterizations are being made to facilitate expeditious prosecution of this application.

The Applicant reserves the right to later pursue any previously pending or other broader or narrow 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. 111552-8016.US03 from which the undersigned is authorized to draw.

Respectfully submitted,

Dated: November 17, 2022

By: /Matthew S. Williams/
Matthew S. Williams
Registration No.: 77,516
Attorney for Applicant

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

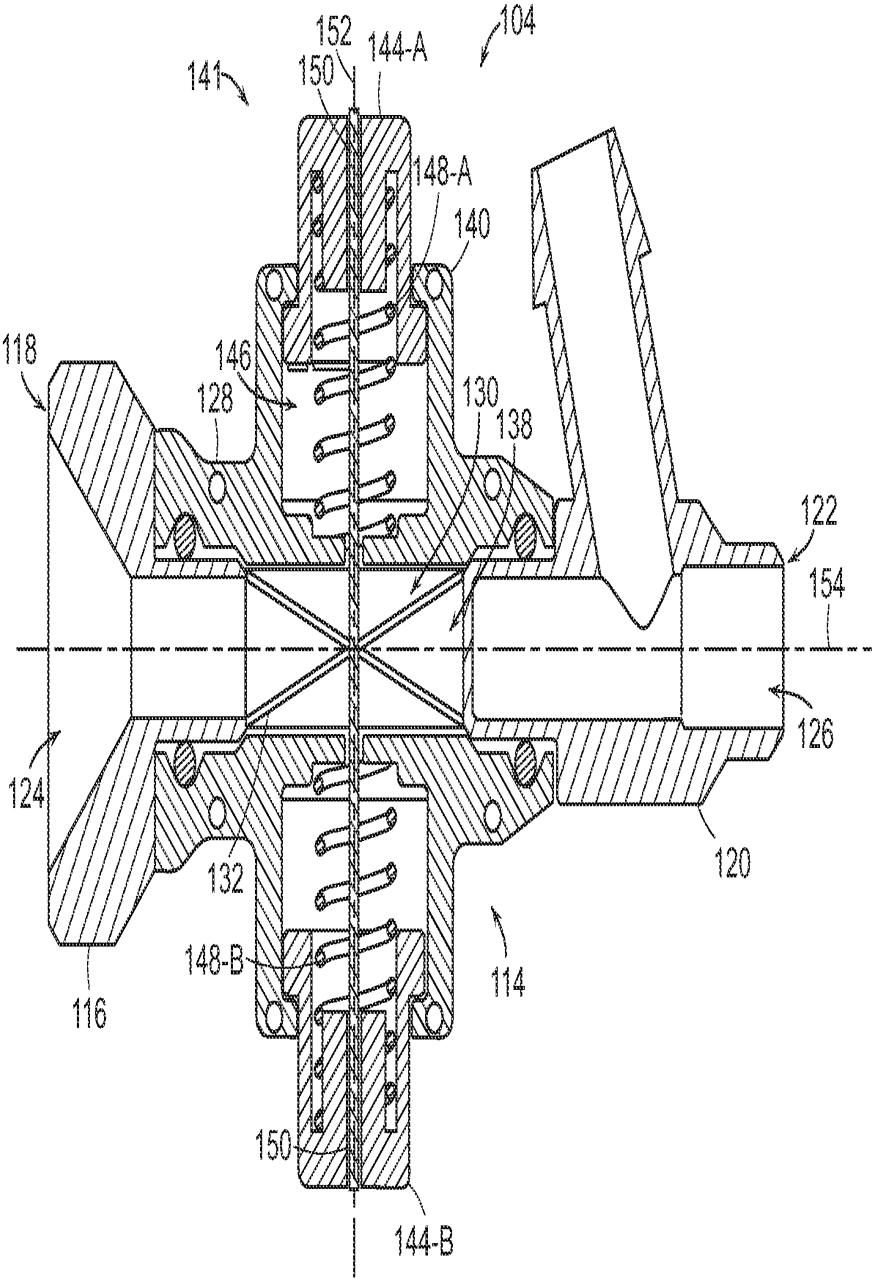

152
144-A
104
141
150
148-A
140
118
146
128
130
138
122
154
126
124
120
132
148-B
114
116
150
144-B

FIG. 2

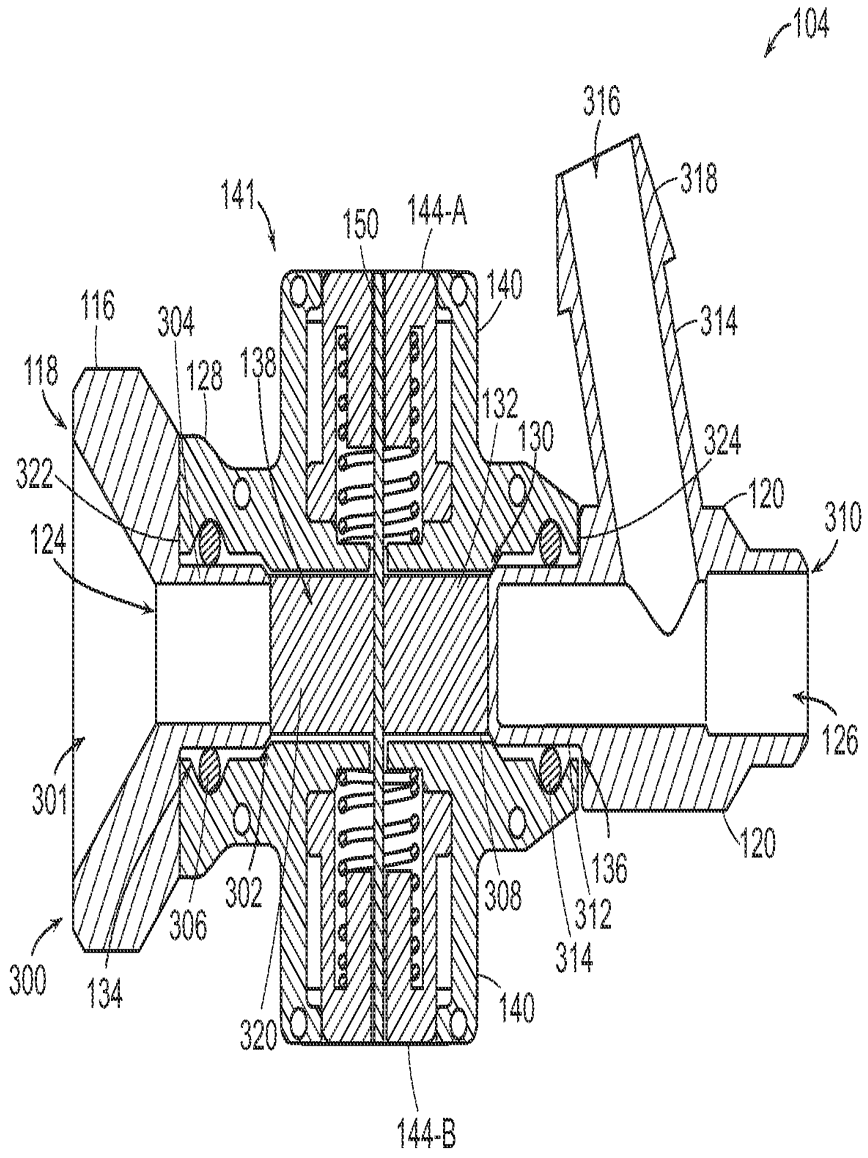

104
316
318
141
150
144-A
140
116
304
314
118
128
138
132
130
324
322
120
310
124
126
301
120
136
302
308
312
306
314
300
134
140
320
144-B

FIG. 3

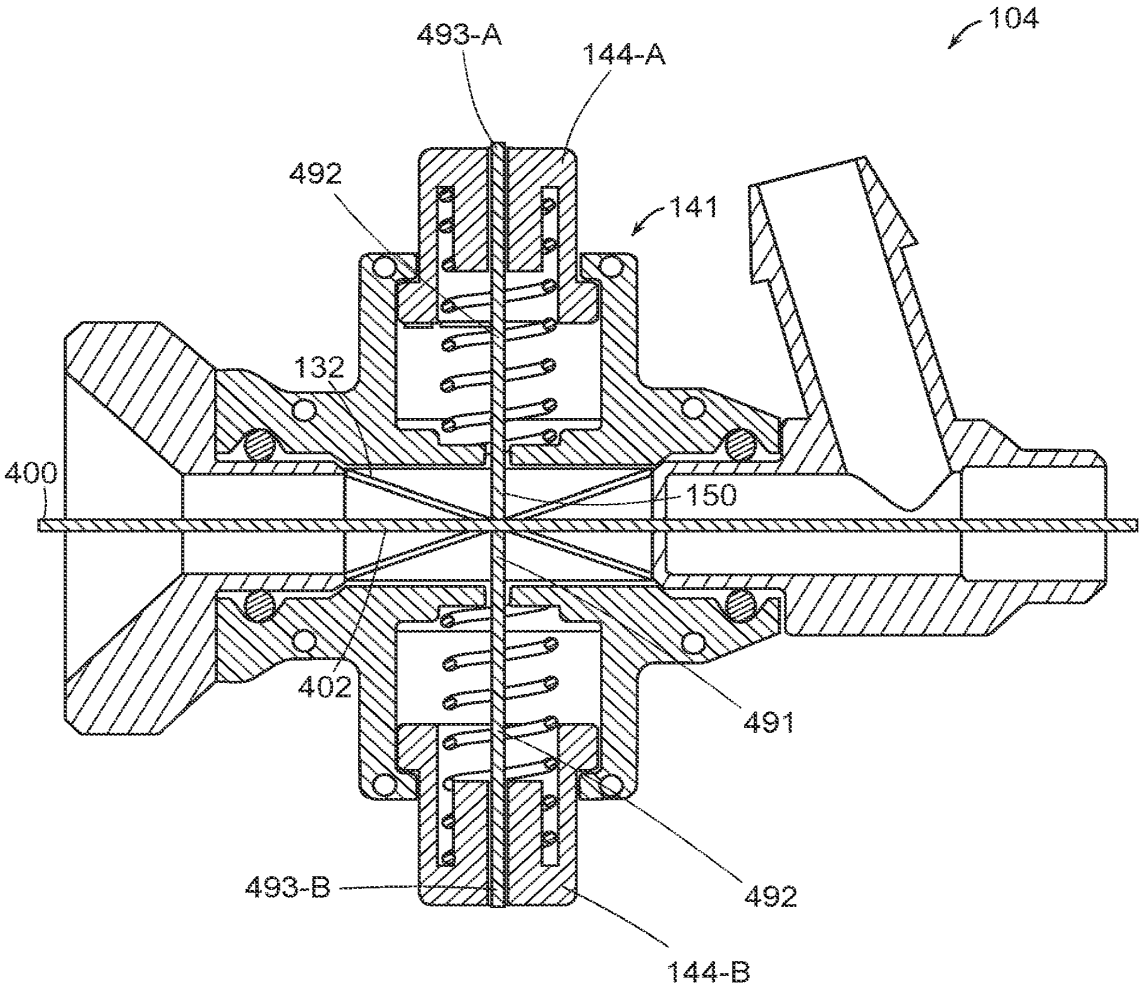


FIG. 4

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

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.	20220125451	04-28-2022	Hauser	
	2.	20220160382	05-26-2022	Hauser	
	3.	20140303658	10-09-2014	Bonnette et al.	
	4.	20050085769	04-21-2005	MacMahon et al.	
	5.	20220160383	05-26-2022	Hauser	
	6.	20220160381	05-26-2022	Hauser	
	7.	20170049942	02-23-2017	Conlan et al.	
	8.	20220240959	08-04-2022	Quick	
	9.	6564828	05-20-2003	Ishida	
	10.	5197485	03-30-1993	Grooters	
	11.	20130035628	02-07-2013	Garrison et al.	
	12.	8057497	11-15-2011	Raju et al.	
	13.	20150173782	06-25-2015	Garrison et al.	
	14.	20130281788	10-24-2013	Garrison	
	15.	20170196576	07-13-2017	Long et al.	
	16.	20070010787	01-11-2007	Hackett et al.	
	17.	20170319221	11-09-2017	CHU	
	18.	20110196309	08-11-2011	Wells	
	19.	20140296868	10-02-2014	Garrison et al.	
	20.	20010049486	12-06-2001	Evans et al.	
	21.	20100217276	08-26-2010	Garrison et al.	
	22.	20140257363	09-11-2014	Lippert	
	23.	20170056032	03-02-2017	Look et al.	
	24.	20160220741	08-04-2016	Garrison et al.	
	25.	20180104404	04-19-2018	Ngo-Chu	
	26.	6719717	04-13-2004	Johnson et al.	
	27.	10478535	11-19-2019	Ogle	
	28.	6960189	11-01-2005	Bates et al.	
	29.	7004931	02-28-2006	Hogendijk	
	30.	7223253	05-29-2007	Hogendijk	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

	31.	20220211400	07-07-2022	Cox et al.	
	32.	11433218	09-06-2022	Quick et al.	
	33.	20040127936	07-01-2004	Salahieh et al.	
	34.	20210022843	01-28-2021	Hauser	
	35.	5158564	10-27-1992	Schnepp-Pesch et al.	
	36.				
	37.				

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.	JPH07323090A	12-12-1995	Heisei		
	2.	WO2022103848	05-19-2022	Inari Medical, Inc.		
	3.	WO2022109021	05-27-2022	Inari Medical, Inc.		
	4.	WO2022109034	05-27-2022	Inari Medical, Inc.		
	5.					
	6.					

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.		
	2.		
	3.		
	4.		
	5.		
	6.		
	7.		
	8.		
	9.		
	10.		
	11.		
	12.		
	13.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

	14.		
	15.		
	16.		
	17.		
	18.		
	19.		
	20.		

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 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.

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	3783
	Examiner Name	QUYNH-NHU HOANG VU
	Attorney Docket Number	111552-8016.US3

☒ 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)	2022-11-17
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.**

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 21/59735

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:
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 examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-7 directed to a proximal ring; a distal ring and a tube portion.

Group II: Claims 8-20 directed to a handle and an actuator.

-*-Continued in Supplemental Box-*-

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.:
1-7

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 21/59735

A. CLASSIFICATION OF SUBJECT MATTER
IPC - A61M 25/00 (2022.01)
CPC - A61M 25/0147; A61M 25/0138

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	WO 2019/246240 A1 (INTUITIVE SURGICAL OPERATIONS, INC.) 26 December 2019 (26.12.2019), entire document, especially Fig 4A, 4C; para [0071]-[0084]	1-3, 6-7
Y		4-5
Y	US2010/0016837 A1 (Howat) 21 January 2010 (21.01.2010), entire document, especially Fig 1-8; para [0034]-[0042]	4-5
A	US 2004/0138525 A1 (Saadat et al.) 15 July 2004 (15.07.2004), entire document	1-7
A	US 2020/0113412 A1 (AMBU A/S) 16 April 2020 (16.04.2020), entire document	1-7
A	US 2009/0192495 A1 (Ostrovsky et al.) 30 July 2009 (30.07.2009), entire document	1-7

☐ 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
20 February 2022	MAR 22 2022
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/210 (second sheet) (July 2019)

Imperative EX1002

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 21/59735

-*-Box No. III - Observations where unity of invention is lacking-*-

The inventions listed as Groups I-II 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 feature of a proximal ring; a distal ring configured to be fixedly attached to a pull wire; and a tube portion extending between the proximal and distal rings, wherein the tube portion includes a plurality of openings extending therethrough to define a plurality of ribs, and wherein the ribs are configured to flex away from each other when the pull wire is pulled proximally, not required by Group II.

The invention of Group II includes the special technical feature of a handle coupled to the proximal region of the aspiration catheter, wherein the handle includes an actuator; and pull wire extending between the actuator and the deflectable member, wherein actuation of the actuator is configured to pull the pull wire, not required by the claims of Group I.

COMMON TECHNICAL FEATURES

Groups I-II share the common technical features of an aspiration catheter including a proximal region and a distal region, wherein the distal region includes a deflectable member; and a pull wire configured to deflect the deflectable member to deflect the distal region of the aspiration catheter relative to the proximal region. However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 2004/0138525 A1 to Saadat et al. (hereinafter "Saadat"), which discloses an aspiration catheter (30; Fig 21A-21B; para [0097]; see analogous Fig 41, para [0125] describing tool arm 30 used for aspiration, wherein the tool arm 30 is interpreted as an aspiration catheter) including a proximal region (proximal half of 30; Fig 21A-21B; para [0097]; the proximal half of 30 being the bottom-most half of the entire tool arm 30 in the orientation shown in Fig 21A) and a distal region (distal half of 30; Fig 21A-21B; para [0097]; the distal half of 30 being the top-most half of the entire tool arm 30 in the orientation shown in Fig 21A), wherein the distal region includes a deflectable member (portion of 30 from bottom slot 132 to the distal-most end of 30; Fig 21A-21B; para [0097]); and a pull wire configured to deflect the deflectable member to deflect the distal region of the aspiration catheter relative to the proximal region (96; Fig 21A-21B; para [0097]; pullwire 96 is shown to be attached to the portion of 30 extending distally from distal-most slot 132 via fixation point 104 wherein pulling the pullwire 96 causes the distal tip of tool arm 30 to deflect relative to the proximal region of tool arm 30).

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-II lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

Electronic Patent Application Fee Transmittal	
Application Number:	17705189
Filing Date:	25-Mar-2022
Title of Invention:	HEMOSTASIS VALVES AND METHODS OF USE
First Named Inventor/Applicant Name:	Benjamin E. Merritt
Filer:	Matthew S. Williams/JiYoung Anderson
Attorney Docket Number:	111552-8016.US03
Filed as Large Entity	
Filing Fees for Utility under 35 USC 111(a)	

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	1806	1	260	260
		Total in USD ($)		**260**

Docket No.: 111552-8016.US03
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Merritt et al.

Application No.: 17/705,189 | Confirmation No.: 9367

Filed: March 25, 2022 | Art Unit: 3783

For: HEMOSTASIS VALVES AND METHODS OF USE | Examiner: QUYNH-NHU HOANG VU

AMENDMENT AND RESPONSE TO NON-FINAL OFFICE ACTION UNDER 37 C.F.R. § 1.111

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

Commissioner:

In response to the Non-Final Office Action mailed on August 19, 2022, please amend and consider the above-identified application as follows:

Amendments to the Drawings begin on page 2.

Amendments to the Drawings begin on page 3.

A **Listing of the Claims** begins on page 4.

Remarks begin on page 7.

Electronic Acknowledgement Receipt	
EFS ID:	47042724
Application Number:	17705189
International Application Number:	
Confirmation Number:	9367
Title of Invention:	HEMOSTASIS VALVES AND METHODS OF USE
First Named Inventor/Applicant Name:	Benjamin E. Merritt
Customer Number:	25096
Filer:	Matthew S. Williams/JiYoung Anderson
Filer Authorized By:	Matthew S. Williams
Attorney Docket Number:	111552-8016.US03
Receipt Date:	17-NOV-2022
Filing Date:	25-MAR-2022
Time Stamp:	11:17:10
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$260
RAM confirmation Number	E2022AGB17402689
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		2022-11-17-ResponseTo_NFOA-111552-8016US3.PDF	135741 a010ab9cf0a5a62877aabca8b9d160c605686c34	yes	9
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Request for Reconsideration-After Non-Final Rejection		1	2	
	Specification		3	3	
	Claims		4	6	
	Amendment/Request for Reconsideration-After Non-Final Rejection		7	9	
Warnings:					
Information:					
2	Drawings-only black and white line drawings	Replacement_Sheet-111552-8016US03.PDF	247167 eda6f2531e303ef840e89c008c0c6932edd19a4a	no	3
Warnings:					
Information:					
3	Information Disclosure Statement (IDS) Form (SB08)	2022-11-17-IDS-SB08-111552-8016US3.PDF	138450 703fe631286a3d6742704010124967 1d5bfd9169	no	4
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
4	Foreign Reference	JP07323090.PDF	193357 2c56e8884e2a297471ff1b90e15afde6a324152c	no	36
Warnings:					
Information:					

5	Foreign Reference	WO2022103848.PDF	1949930 0dfb453ad3d878cb950903d82a282b1d663d8fd0	no	46
Warnings:					
Information:					
6	Foreign Reference	WO2022109021.PDF	1643695 6f9fc08e5f3fd323b5db4fa6a4a77c4eb92af2a8	no	38
Warnings:					
Information:					
7	Foreign Reference	WO2022109034.PDF	2284991 6fa1a1c0dbc84ac7038fc11f663e9212d08ee547	no	44
Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	38200 45f279467d0468acfa340342f768d9e67e3729fd	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	6631531		

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.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
<u>National Stage of an International Application under 35 U.S.C. 371</u>
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.
<u>New International Application Filed with the USPTO as a Receiving Office</u>
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.

AMENDMENTS TO THE DRAWINGS

Attached are Replacement Sheets for Figures 2–4 (3 pages). As agreed upon during the October 31, 2022 telephone interview, the undersigned confirms that no new matter is added by the submission.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	03/25/2022	Benjamin E. Merritt	111552-8016.US03	9367

25096 7590 11/04/2022

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

EXAMINER	
VU, QUYNH-NHU HOANG	

ART UNIT	PAPER NUMBER
3783	

NOTIFICATION DATE	DELIVERY MODE
11/04/2022	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.** 17/705,189	**Applicant(s)** Merritt et al.		
	Examiner QUYNH-NHU H VU	**Art Unit** 3783	**AIA (First Inventor to File) Status** Yes	**Page** 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	**Title**	**Type**
QUYNH-NHU H VU	Primary Examiner	Telephonic
Matthew Williams	Attorney of Record	

Date of Interview: 31 October 2022

Issues Discussed:

35 U.S.C. 112

During the interview, attorney Williams provided the annotated Fig. 4 for claimed limitations. Examiner Vu agreed with the attorney Williams that the 112 rejection should be withdrawn. However, Applicant is requested to amend the figure 4 (same as the annotated figure 4 that provided during the interview). In addition, Applicant should amend the specification for clarification the features that provided in the annotated Fig. 4.

☑ Attachment

/QUYNH-NHU H. VU/ Primary Examiner, Art Unit 3783	

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:	QUYNH-NHU HOANG VU
APPLICATION NO.:	17/705,189	ART UNIT:	3783
FILED:	MARCH 25, 2022	CONF. NO:	9367
FOR:	HEMOSTASIS VALVES AND METHODS OF USE		

Interview Agenda

DO NOT ENTER—FOR DISCUSSION PURPOSES ONLY

* * *

Examiner,

The present paper is an agenda for a telephone interview regarding U.S. Patent Application No. 17/705,189 scheduled for October 31, 2022 at 1:00PM (Eastern). I will call you at 571-272-3228.

The proposed list of participants for the interview is as follows:

- Matthew Williams (Reg. No. 77,516)

Agenda for the Interview:

(1) Discussion of the Section 112(a) and Section 112(b) rejections of claims 1, 2, and 4–9. *See*, e.g., the annotations to Figure 4 of the present application below.

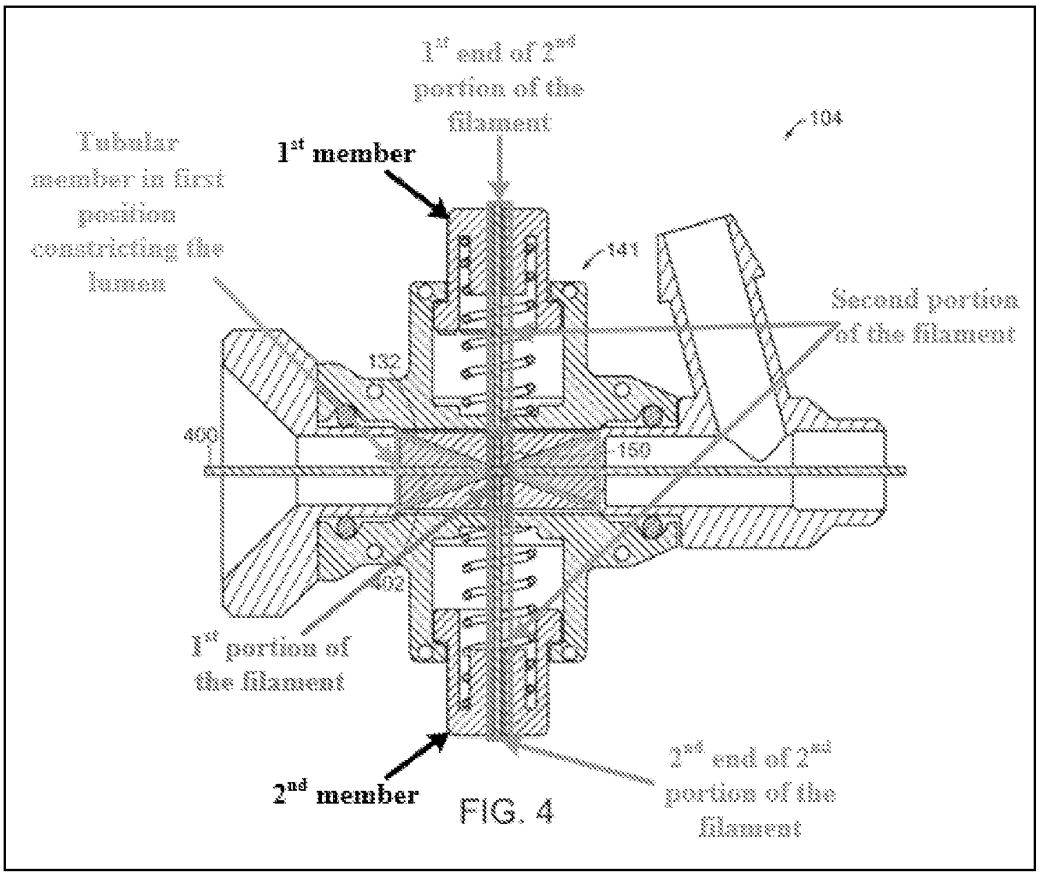


FIG. 4

Present Application, Figure 4 (Annotated by the Applicant).

(2) Discussion of the objections to the drawings. *See*, e.g., the annotations to Figure 4 of the present application above.

UNITED STATES PATENT AND TRADEMARK OFFICE

USPTO Automated Interview Request (AIR)

Oct 24 2022

This paper requesting to schedule and/or conduct an interview is appropriate because:

This submission is requested to be accepted as an authorization for this interview to communicate via the internet. Recognizing that Internet communications are not secure, I hereby authorize the USPTO to communicate with the undersigned concerning scheduling of the interview via video conference, instant messaging, or electronic mail, and to conduct the interview in accordance with office practice including video conferencing.

Name(s):
Matthew Williams

S-signature:
/Matthew Williams/

Registration Number:
77516

U.S. Application Number:
17705189

Confirmation Number:
9367

E-mail Address:
matthewwilliams@perkinscoie.com

Phone Number:
+1 2063593343

Proposed Time of Interview:
10-31-2022 12:00 PM ET

Alternative Proposed Time(s) of Interview:
10-31-2022 1:00 PM ET

Alternative Proposed Time(s) of Interview:
11-1-2022 12:00 PM ET

Prefered Interview Type:
Telephonic

I am the applicant or applicant's representative for this application.

Topic for Discussion:
Will send agenda in advance of interview.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	03/25/2022	Benjamin E. Merritt	111552-8016.US03	9367

25096 7590 08/19/2022

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

EXAMINER
VU, QUYNH-NHU HOANG

ART UNIT	PAPER NUMBER
3783	

NOTIFICATION DATE	DELIVERY MODE
08/19/2022	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. 17/705,189	Applicant(s) Merritt et al.	
	Examiner QUYNH-NHU H VU	Art Unit 3783	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 07/27/22.

☐ 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) 1-15 is/are pending in the application.

5a) Of the above claim(s) 3 and 10-15 is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1-2 and 4-9 is/are rejected.

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

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

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

Application Papers

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

11)☐ The drawing(s) filed on _____ 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 20220808.

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

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

Election/Restrictions

Applicant's election without traverse of Species I (claims 1-9) and Sub-Species IA (Figs. 1-5) in the reply filed on 07/27/22 is acknowledged. Claims 1,2 and 4-9 read on the Species I & sub-Species IA (Figs. 1-5)

Claims 3 and 10-15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Species II and Sub-Species of Figs. 6-9, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 07/27/2022.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitation "**the filament comprising a first portion extending around at least a portion of the tubular member and a second portion having a first end extending from the first portion in one direction and a second end extending from the first portion in another direction, and the actuator comprises a first member coupled to the first end of the filament and a second member coupled to the second end of the filament, wherein the first member and the second member of the actuator are moveable between (a) a first position wherein the filament circumferentially constricts the lumen to create a seal and (b) a second position wherein the filament is moved to at least partially open the lumen**" in the claim 1; the limitation "**a) a first volume outside the lumen and adjacent to a first end of the tubular member and b) a second volume outside the central lumen and adjacent to a second of the tubular member**" in claim 5 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all

of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

> (a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-2, 4-9 are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, because the specification, while being enabling for "***the actuator comprises a first member coupled to the first end of the filament and a second member coupled to the second end of the filament***", does not reasonably provide enablement for "***the filament comprising a first portion extending around at least a portion of the tubular member and a second portion having a first end extending from the first portion in one direction and a second end extending from the first portion in another direction, ... wherein the first member and the second member of the actuator are moveable between (a) a first position wherein the filament circumferentially constricts the lumen to create a seal and (b) a second position wherein the filament is moved to at least partially open the lumen***". The specification does not

enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

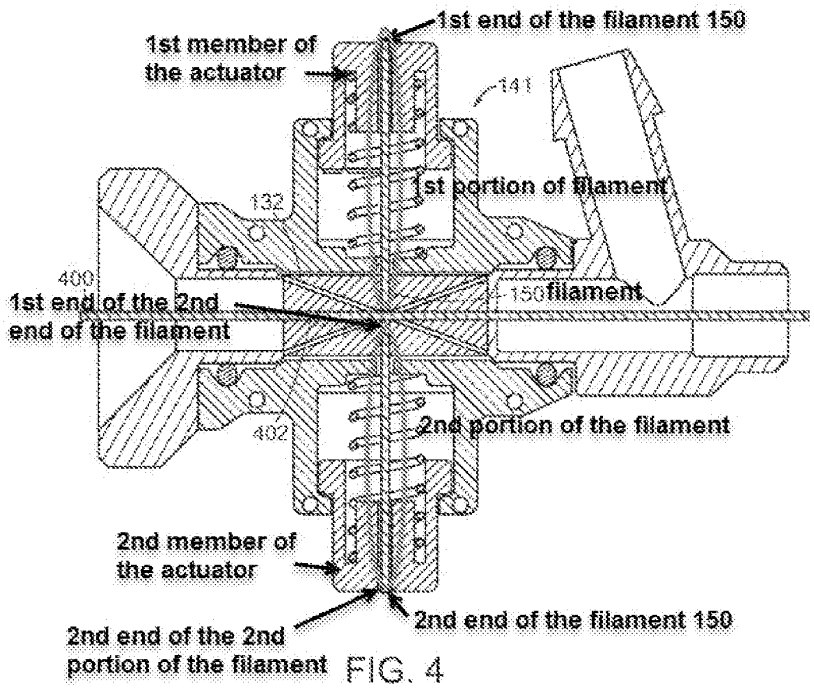


FIG. 4

Based on the marked-up Figure 4 above, Examiner acknowledges that the first member 144A of the actuator 141 coupled to the first end of the filament 150 and a second member 144B of the actuator 141; a tubular member is equivalent to element 132. It appears to Examiner that the tubular member 132 look like a string/filament. In that case, the first portion of the filament **is not** extending around at least a portion of the tubular member, as required in the claimed invention. The marked-up figure shows that the second portion of the filament having a first end and a second end; wherein the first end of the second portion of the filament and the second end of the second portion of the filament are formed in one straight line. Oppositely, the claimed invention requires: a second portion (of the filament) having a first end extending from the first portion in one direction and a second end extending from the first portion in another direction. Applicant is requested to point out the limitation above that shown in the drawing to help Examiner understand better in the claimed invention.

In the next limitation requires that: a) a first position when the filament circumferentially constricts the lumen to create a seal and b) a second position wherein the filament is moved to at least partially open the

lumen. Based on the Fig. 4, it does not show the limitation above. The Fig. 2 shows the tubular member 132 (in shade configuration) is formed as a block member, but not a filament/string as shown in Fig. 4; and being separated in two different part by the filament 15. It is unclear to Examiner that the tubular member 132 in Fig. 2 is under opened or closed configuration and the tubular member 132 is whether in form of string/filament (as shown in Fig. 4) or the block configuration (as shown in Fig. 2). In Fig. 3, it shows that the tubular 132 is same element with a central lumen 138 and being separated by 2 different parts by the filament 150. In that case, it is unclear to Examiner that what is the configuration (i.e. string/filament, block member or another configuration) of the tubular member 132.

> The following is a quotation of 35 U.S.C. 112(b):
> (b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.
>
> The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-2, 4-9 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

In the claim 1, the limitation "**the filament comprising a first portion extending around at least a portion of the tubular member and a second portion having a first end extending from the first portion in one direction and a second end extending from the first portion in another direction, and the actuator comprises a first member coupled to the first end of the filament and a second member coupled to the second end of the filament, wherein the first member and the second member of the actuator are moveable between (a) a first position wherein the filament circumferentially constricts the lumen to create a seal and (b) a second position wherein the filament is moved to at least partially open the lumen**" is very vague. It is unclear to Examiner that which elements defined as a first portion of the filament; a second portion of the filament; a first end of the second portion of the filament. Can Applicant point out somewhere in the figure showing that: a second end having a first end extending from the first

portion in one direction and a second end extending from the first portion in another direction, and the actuator comprises a first member coupled to the first end of the filament and a second member coupled to the second end of the filament?

In the claim 5, it is unclear to Examiner that how is the pressure being different in between a first volume and second volume? Which areas are considered as the first volume and the second volume?

Examiner Notes

Claims 1-2, 4-9 involve 112, 1st and 2nd paragraph above. Because of the confusing claimed limitation, Examiner does not know how to interpret to match with the claimed invention. Therefore, Examiner provides the best prior arts Wong et al. (US 2011/0144592) & Hartley (US 2003/0116731) that can be rejected the claimed invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to QUYNH-NHU HOANG VU whose telephone number is (571)272-3228. The examiner can normally be reached on M-F 7:30 am-4:00 pm.

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, Bhisma Mehta can be reached on 571-272-3383. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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

/Quynh-Nhu H. Vu/
Quynh-Nhu H Vu
Primary Examiner, Art Unit 3783

Examiner-Initiated Interview Summary	**Application No.** 17/705,189	**Applicant(s)** Merritt et al.		
	Examiner QUYNH-NHU H VU	**Art Unit** 3783	**AIA (First Inventor to File) Status** Yes	**Page** 1 of 1

All Participants (applicant, applicants representative, PTO personnel)	**Title**	**Type**
QUYNH-NHU H VU	Primary Examiner	Telephonic
Matthew S. Williams	Attorney of Record	

Date of Interview: 11 August 2022

Issues Discussed:

Other

During the interview, the attorney Williams explained the claimed subject matter and the claimed languages to help examiner Vu understand the point of view from the applicant's side. However, the claims 1-9 involve 112 issue. Please see the non-final office action in the same paper number for more details.

/QUYNH-NHU H. VU/ Primary Examiner, Art Unit 3783	

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: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

Notice of References Cited	Application/Control No. 17/705,189	Applicant(s)/Patent Under Reexamination Merritt et al.	
	Examiner QUYNH-NHU H VU	Art Unit 3783	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-20030116731-A1	06-2003	Hartley, David Ernest	F16K7/06	251/297
*	B	US-20110144592-A1	06-2011	Wong; En Hou Philip	A61M39/0613	604/175
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

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

NON-PATENT DOCUMENTS

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

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

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/705,189	Merritt et al.
	Examiner	**Art Unit**
	QUYNH-NHU H VU	3783

✓	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	05/22/2022	08/08/2022							
	1	÷	✓							
	2	÷	✓							
	3	÷	N							
	4	÷	✓							
	5	÷	✓							
	6	÷	✓							
	7	÷	✓							
	8	÷	✓							
	9	÷	✓							
	10	÷	N							
	11	÷	N							
	12	÷	N							
	13	÷	N							
	14	÷	N							
	15	÷	N							

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/705,189	Merritt et al.
	Examiner	Art Unit
	QUYNH-NHU H VU	3783

CPC - Searched*		
Symbol	Date	Examiner
A61M2039/062 OR A61M2039/0673 OR A61M39/0613	08/08/2022	QNV
F16K7/02 OR F16K7/08 OR F16K7/04	08/08/2022	QNV

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
PE2E, IDS, Inventor, forward/backward search	08/08/2022	QNV

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

Bibliographic Data

Application No: 17/705,189

Foreign Priority claimed: ○ Yes ◉ No

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

Verified and Acknowledged: /QUYNH-NHU H. VU/ Examiner's Signature | Initials

Title: HEMOSTASIS VALVES AND METHODS OF USE

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
03/25/2022	604	3783	111552-8016.US03
RULE			

APPLICANTS

Inari Medical, Inc., Irvine, CA,

INVENTORS

Benjamin E. Merritt, San Clemente, CA, UNITED STATES

John C. Thress, Capistrano Beach, CA, UNITED STATES

Paul Lubock, Monarch Beach, CA, UNITED STATES

CONTINUING DATA

This application is a CON of 17226318 04/09/2021

17226318 is a CON of 16117519 08/30/2018 PAT 11000682

16117519 has PRO of 62554931 09/06/2017

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

03/30/2022

STATE OR COUNTRY

UNITED STATES

ADDRESS

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

FILING FEE RECEIVED

$6,160

Bibliographic Data

Application No: 17/705,189

Foreign Priority claimed: ○ Yes ◉ No

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

Verified and Acknowledged: /QUYNH-NHU H. VU/ Examiner's Signature | Initials

Title: HEMOSTASIS VALVES AND METHODS OF USE

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
03/25/2022	604	3783	111552-8016.US03
RULE			

APPLICANTS

Inari Medical, Inc., Irvine, CA,

INVENTORS

Benjamin E. Merritt, San Clemente, CA, UNITED STATES

John C. Thress, Capistrano Beach, CA, UNITED STATES

Paul Lubock, Monarch Beach, CA, UNITED STATES

CONTINUING DATA

This application is a CON of 17226318 04/09/2021

17226318 is a CON of 16117519 08/30/2018 PAT 11000682

16117519 has PRO of 62554931 09/06/2017

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

03/30/2022

STATE OR COUNTRY

UNITED STATES

ADDRESS

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

FILING FEE RECEIVED

$6,160

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

U.S. PATENTS					
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	
	30.	5127626	07-07-1992	Hilal et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	
	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.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	
	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	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	
	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.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	
	146.	8092486	01-10-2012	Berrada et al.	
	147.	8100935	01-24-2012	Rosenbluth et al.	
	148.	8109962	02-07-2012	Pai	
	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	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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	
	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.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	
	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	Greenhaigh 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	Greenhaigh et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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	
	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. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	
	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	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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	
	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.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	20200113412	04-16-2020	Jensen	
	338.	20090192495	07-30-2009	Ostrovsky et al.	
	339.	11000682	05-11-2021	Merritt et al.	
	340.	10695159	06-30-2020	Hauser	
	341.	10799331	10-13-2020	Hauser	
	342.	20020022859	02-21-2002	Hogendijk	
	343.	20020151918	10-17-2002	Lafontaine et al.	
	344.	11000682	05-11-2021	Merritt et al.	
	345.	5154724	10-13-1992	Andrews	
	346.	20030216774	11-20-2003	Larson	
	347.				
	348.				
	349.				
	350.				
	351.				
	352.				

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

U.S. PATENT APPLICATION PUBLICATIONS					
Examiner Initial*	Cite No	Publication Number	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	20010004699	06-21-2001	Gittings et al.	
	2.	20010041909	11-15-2001	Tsugita et al.	
	3.	20010051810	12-13-2001	Dubrul et al.	
	4.	20020022858	02-21-2002	Demond et al.	
	5.	20020026211	02-28-2002	Khosravi et al.	
	6.	20020032455	03-14-2002	Boock et al.	
	7.	20020095161	07-18-2002	Dhindsa	
	8.	20020095171	07-18-2002	Belef	
	9.	20020111648	08-15-2002	Kusleika et al.	
	10.	20020120277	08-29-2002	Hauschild et al.	
	11.	20020147458	10-10-2002	Hiblar et al.	
	12.	20020156457	10-24-2002	Fisher	
	13.	20030083693	05-01-2003	Daniel et al.	
	14.	20030100919	05-29-2003	Hopkins et al.	
	15.	20030114875	06-19-2003	Sjostrom	
	16.	20030116731	06-26-2003	Hartley	
	17.	20030125663	07-03-2003	Coleman et al.	
	18.	20030135230	07-17-2003	Massey et al.	
	19.	20030135258	07-17-2003	Andreas et al.	
	20.	20030153873	08-14-2003	Luther et al.	
	21.	20030153973	08-14-2003	Soun et al.	
	22.	20030168068	09-11-2003	Poole et al.	
	23.	20030176884	09-18-2003	Berrada et al.	
	24.	20030191516	10-09-2003	Weldon et al.	
	25.	20030208224	11-06-2003	Broome	
	26.	20040039412	02-26-2004	Isshiki et al.	
	27.	20040068288	04-08-2004	Palmer et al.	
	28.	20040073243	04-15-2004	Sepetka et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	29.	20040098033	05-20-2004	Leeflang et al.	
	30.	20040133232	07-08-2004	Rosenbluth et al.	
	31.	20040138692	07-15-2004	Phung et al.	
	32.	20040167567	08-26-2004	Cano et al.	
	33.	20040199201	10-07-2004	Kellett et al.	
	34.	20040199202	10-07-2004	Dubrul et al.	
	35.	20050033172	02-10-2005	Dubrul et al.	
	36.	20050038468	02-17-2005	Panetta et al.	
	37.	20050055047	03-10-2005	Greenhalgh	
	38.	20050085826	04-21-2005	Nair et al.	
	39.	20050085849	04-21-2005	Sepetka et al.	
	40.	20050119668	06-02-2005	Teague et al.	
	41.	20050177132	08-11-2005	Lentz et al.	
	42.	20050187570	08-25-2005	Nguyen et al.	
	43.	20050283165	12-22-2005	Gadberry	
	44.	20050283166	12-22-2005	Greenhalgh et al.	
	45.	20050283186	12-22-2005	Berrada et al.	
	46.	20060020286	01-26-2006	Niermann	
	47.	20060042786	03-02-2006	West	
	48.	20060047286	03-02-2006	West	
	49.	20060089533	04-27-2006	Ziegler et al.	
	50.	20060100662	05-11-2006	Daniel et al.	
	51.	20060155305	07-13-2006	Freudenthal et al.	
	52.	20060173525	08-03-2006	Behl et al.	
	53.	20060195137	08-31-2006	Sepetka et al.	
	54.	20060200221	09-07-2006	Malewicz	
	55.	20060224177	10-05-2006	Finitsis	
	56.	20060229645	10-12-2006	Bonnette et al.	
	57.	20060247500	11-02-2006	Voegele et al.	
	58.	20060253145	11-09-2006	Lucas	
	59.	20060276874	12-07-2006	Wilson et al.	
	60.	20060282111	12-14-2006	Morsi	
	61.	20060293696	12-28-2006	Fahey et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	62.	20070038225	02-15-2007	Osborne	
	63.	20070112374	05-17-2007	Paul, JR. et al.	
	64.	20070118165	05-24-2007	DeMello et al.	
	65.	20070149996	06-28-2007	Coughlin	
	66.	20070161963	07-12-2007	Smalling	
	67.	20070179513	08-02-2007	Deutsch	
	68.	20070191866	08-16-2007	Palmer et al.	
	69.	20070198028	08-23-2007	Miloslavskiet al.	
	70.	20070208361	09-06-2007	Okushi et al.	
	71.	20070208367	09-06-2007	Fiorella et al.	
	72.	20070213753	09-13-2007	Waller	
	73.	20070213765	09-13-2007	Adams et al.	
	74.	20070255252	11-01-2007	Mehta	
	75.	20070288054	12-13-2007	Tanaka et al.	
	76.	20080015541	01-17-2008	Rosenbluth et al.	
	77.	20080088055	04-17-2008	Ross	
	78.	20080157017	07-03-2008	Macatangay et al.	
	79.	20080167678	07-10-2008	Morsi	
	80.	20080183136	07-31-2008	Lenker et al.	
	81.	20080228209	09-18-2008	DeMello et al.	
	82.	20080234722	09-25-2008	Bonnette et al.	
	83.	20080262528	10-23-2008	Martin	
	84.	20080269798	10-30-2008	Ramzipoor et al.	
	85.	20080300466	12-04-2008	Gresham	
	86.	20090018566	01-15-2009	Escudero et al.	
	87.	20090054918	02-26-2009	Henson	
	88.	20090062841	03-05-2009	Amplatz et al.	
	89.	20090069828	03-12-2009	Martin et al.	
	90.	20090076417	03-19-2009	Jones	
	91.	20090160112	06-25-2009	Ostrovsky	
	92.	20090163846	06-25-2009	Aklog et al.	
	93.	20090182362	07-16-2009	Thompson et al.	
	94.	20090281525	11-12-2009	Harding et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	95.	20090292307	11-26-2009	Razack	
	96.	20090299393	12-03-2009	Martin et al.	
	97.	20100030256	02-04-2010	Dubrul et al.	
	98.	20100042136	02-18-2010	Berrada et al.	
	99.	20100087844	04-08-2010	Fischer Jr.	
	100.	20100087850	04-08-2010	Razack	
	101.	20100114113	05-06-2010	Dubrulet al.	
	102.	20100121312	05-13-2010	Gielenz et al.	
	103.	20100137846	06-03-2010	Desaietal	
	104.	20100190156	07-29-2010	Van Wordragen et al.	
	105.	20100204712	08-12-2010	Mallaby	
	106.	20100249815	09-30-2010	Jantzen et al.	
	107.	20100268264	10-21-2010	Bonnette et al.	
	108.	20100318178	12-16-2010	Rapaport et al.	
	109.	20110034987	02-10-2011	Kennedy	
	110.	20110054405	03-03-2011	Whiting et al.	
	111.	20110060212	03-10-2011	Slee et al.	
	112.	20110118817	05-19-2011	Gunderson et al.,	
	113.	20110125181	05-26-2011	Brady et al.	
	114.	20110144592	06-16-2011	Wong et al.	
	115.	20110152823	06-23-2011	Mohiuddin et al.	
	116.	20110152993	06-23-2011	Marchand et al.	
	117.	20110160742	06-30-2011	Ferrera et al.	
	118.	20110160763	06-30-2011	Ferrera et al.	
	119.	20110190806	08-04-2011	Wittens	
	120.	20110196414	08-11-2011	Porter et al.	
	121.	20110213290	09-01-2011	Chin et al.	
	122.	20110213403	09-01-2011	Aboytes	
	123.	20110224707	09-15-2011	Miloslavskiet al.	
	124.	20110245807	10-06-2011	Sakata et al.	
	125.	20110251629	10-13-2011	Galdonik et al.	
	126.	20110264133	10-27-2011	Hanlon et al.	
	127.	20110265681	11-03-2011	Allen et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	128.	20110288529	11-24-2011	Fulton	
	129.	20110288572	11-24-2011	Martin	
	130.	20110319917	12-29-2011	Ferrera et al.	
	131.	20120059309	03-08-2012	di Palma et al.	
	132.	20120059356	03-08-2012	di Palma et al.	
	133.	20120083824	04-05-2012	Berrada et al.	
	134.	20120083868	04-05-2012	Shrivastava	
	135.	20120089216	04-12-2012	Rapaport et al.	
	136.	20120101480	04-26-2012	Ingle et al.	
	137.	20120101510	04-26-2012	Lenker et al.	
	138.	20120138832	06-07-2012	Townsend	
	139.	20120143239	06-07-2012	Aklog et al.	
	140.	20120165919	06-28-2012	Cox et al.	
	141.	20120179181	07-12-2012	Straub et al.	
	142.	20120197277	08-02-2012	Stinis	
	143.	20120232655	09-13-2012	Lorrison et al.	
	144.	20120271105	10-25-2012	Nakamura et al.	
	145.	20120271231	10-25-2012	Agrawal	
	146.	20120277788	11-01-2012	Cattaneo	
	147.	20120310166	12-06-2012	Huff	
	148.	20130030460	01-31-2014	Marks et al.	
	149.	20130046332	02-21-2013	Jones et al.	
	150.	20130066348	03-14-2013	Fiorella et al.	
	151.	20130092012	04-18-2013	Marchand et al.	
	152.	20130096571	04-18-2013	Massicotte et al.	
	153.	20130102996	04-25-2013	Strauss	
	154.	20130116721	05-09-2013	Takagi et al.	
	155.	20130144326	08-02-2016	Brady et al.	
	156.	20130165871	06-27-2013	Fiorella et al.	
	157.	20130184703	07-18-2013	Shireman et al.	
	158.	20130197567	08-01-2013	Brady et al.	
	159.	20130226196	08-29-2013	Smith	
	160.	20130289608	10-31-2013	Tanaka et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	161.	20130317589	11-28-2013	Martin et al.	
	162.	20130345739	12-26-2013	Brady et al.	
	163.	20140005712	01-02-2014	Martin	
	164.	20140005713	01-02-2014	Bowman	
	165.	20140005715	03-31-2015	Castella et al.	
	166.	20140005717	01-02-2014	Martin et al.	
	167.	20140025048	01-23-2014	Ward	
	168.	20140031856	01-30-2014	Martin	
	169.	20140046133	02-13-2014	Nakamura et al.	
	170.	20140046243	02-13-2014	Ray et al.	
	171.	20140121672	05-01-2014	Folk	
	172.	20140155830	06-05-2014	Bonnette et al.	
	173.	20140155908	07-22-2014	Rosenbluth et al.	
	174.	20140155980	06-05-2014	Turjman	
	175.	20140180397	03-05-2019	Gerberding et al.	
	176.	20140188143	04-03-2018	Martin et al.	
	177.	20140236219	08-21-2014	Dubrul et al.	
	178.	20140243882	08-28-2014	Ma	
	179.	20140257253	09-11-2014	Jemison	
	180.	20140276403	09-18-2014	Follmer et al.	
	181.	20140318354	10-30-2014	Thompson et al.	
	182.	20140324091	03-03-2015	Rosenbluth	
	183.	20140330286	11-06-2014	Wallace et al.	
	184.	20140336691	11-13-2014	Jones et al.	
	185.	20140343593	11-20-2014	Chin et al.	
	186.	20140364896	12-11-2014	Consigny	
	187.	20140371779	12-18-2014	Vale et al.	
	188.	20150005781	01-01-2015	Lund-Clausen et al.	
	189.	20150005792	01-01-2015	Ahn	
	190.	20150018859	02-16-2016	Quick	
	191.	20150018860	01-15-2015	Quick	
	192.	20150018929	01-15-2015	Martin et al.	
	193.	20150025555	01-22-2015	SOS	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	194.	20150032144	01-29-2015	Holloway	
	195.	20150059908	03-05-2015	Mollen	
	196.	20150088190	03-26-2015	Jensen	
	197.	20150127035	05-07-2015	Trapp et al.	
	198.	20150133990	05-14-2015	Davidson	
	199.	20150150672	03-07-2017	Ma	
	200.	20150164523	06-18-2015	Brady et al.	
	201.	20150164666	06-18-2015	Johnson et al.	
	202.	20150190155	07-09-2015	Ulm III	
	203.	20150190156	07-09-2015	Ulm III	
	204.	20150196380	07-16-2015	Berrada et al.	
	205.	20150196744	04-03-2018	Aboytes	
	206.	20150209058	07-30-2015	Ferrera et al.	
	207.	20150209165	07-30-2015	Grandfield et al.	
	208.	20150238207	08-27-2015	Cox et al.	
	209.	20150250578	09-10-2015	Cook et al.	
	210.	20150265299	09-24-2015	Cooper et al.	
	211.	20150305756	10-29-2015	Rosenbluth	
	212.	20150305859	10-29-2015	Eller	
	213.	20150352325	12-10-2015	Quick	
	214.	20150360001	12-17-2015	Quick	
	215.	20150374391	12-31-2015	Quick	
	216.	20160008014	08-09-2016	Rosenbluth	
	217.	20160022293	01-28-2016	Dubrul et al.	
	218.	20160058540	03-03-2016	Don Michael	
	219.	20160074627	03-17-2016	Cottone	
	220.	20160106448	04-21-2016	Brady et al.	
	221.	20160106449	04-21-2016	Brady et al.	
	222.	20160113663	04-28-2016	Brady et al.	
	223.	20160113664	04-28-2016	Brady et al.	
	224.	20160113665	04-28-2016	Brady et al.	
	225.	20160113666	04-28-2016	Quick	
	226.	20160143721	05-26-2016	Rosenbluth	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	227.	20160206344	07-21-2016	Bruzzi et al.	
	228.	20160228134	08-11-2016	Martin et al.	
	229.	20160262790	09-15-2016	Rosenbluth et al.	
	230.	20160287276	10-06-2016	Cox et al.	
	231.	20160367285	03-19-2019	Sos	
	232.	20170014560	01-19-2017	Minskoff et al.	
	233.	20170037548	02-09-2017	Lee	
	234.	20170042571	02-16-2017	Levi	
	235.	20170058623	03-02-2017	Jaffrey et al.	
	236.	20170079672	03-23-2017	Quick	
	237.	20170086864	03-30-2017	Greenhalgh et al.	
	238.	20170100142	04-13-2017	Look et al.	
	239.	20170105743	04-20-2017	Vale et al.	
	240.	20170105745	04-20-2017	Rosenbluth et al.	
	241.	20170112513	07-11-2017	Marchand et al.	
	242.	20170112514	04-27-2017	Marchand et al.	
	243.	20170189041	07-06-2017	Cox et al.	
	244.	20170233908	08-17-2017	Kroczynski et al.	
	245.	20170265878	09-21-2017	Marchand et al.	
	246.	20170303939	10-26-2017	Greenhalgh et al.	
	247.	20170303942	10-26-2017	Greenhalgh et al.	
	248.	20170303947	10-26-2017	Greenhalgh et al.	
	249.	20170303948	10-26-2017	Wallace et al.	
	250.	20170325839	11-16-2017	Rosenbluth et al.	
	251.	20170348014	12-07-2017	Wallace et al.	
	252.	20180042624	02-15-2018	Greenhalgh et al.	
	253.	20180042626	02-15-2018	Greenhalgh et al.	
	254.	20180064453	03-08-2018	Garrison et al.	
	255.	20180064454	03-08-2018	Losordo et al.	
	256.	20180070968	03-15-2018	Wallace et al.	
	257.	20180092652	04-05-2018	Marchand et al.	
	258.	20180105963	04-19-2018	Quick	
	259.	20180125512	05-10-2018	Nguyen et al.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	260.	20180193043	07-12-2018	Marchand et al.	
	261.	20180236205	08-23-2018	Krautkremer et al.	
	262.	20180256178	09-13-2018	Cox et al.	
	263.	20180296240	10-18-2018	Rosenbluth et al.	
	264.	20180344339	12-06-2018	Cox et al.	
	265.	20180361116	12-20-2018	Quick et al.	
	266.	20190000492	01-03-2019	Casey et al.	
	267.	20190046219	02-14-2019	Marchand et al.	
	268.	20190070401	03-07-2019	Merritt et al.	
	269.	20190117244	04-25-2019	Wallace et al.	
	270.	20190133622	05-06-2019	Wallace et al.	
	271.	20190133623	05-09-2019	Wallace et al.	
	272.	20190133624	05-09-2019	Wallace et al.	
	273.	20190133625	05-09-2019	Wallace et al.	
	274.	20190133626	05-09-2019	Wallace et al.	
	275.	20190133627	05-09-2019	Wallace et al.	
	276.	20190150959	05-23-2019	Cox et al.	
	277.	20190231373	08-01-2019	Quick	
	278.	20190321071	10-24-2019	Marchand et al.	
	279.	20190336148	11-07-2019	Greenhalgh et al.	
	280.	20200046368	02-13-2020	Merritt et al.	
	281.	20210113224	04-22-2021	Dinh	
	282.	20210186541	06-24-2021	Thress	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

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 Iindo		
	6.	WO1997017889	05-22-1997	Applied Medical Resources Corporation		
	7.	WO2000053120	09-14-2000	Microvena Corporation		
	8.	WO2005046736	05-29-2005	Bonnette		
	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.		

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.		
	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		

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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		
	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.					
	86.					

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

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. **	European Patent Application No. 13838945.7, Extended European Search Report, 9 pages, April 15, 2016.	
	2. **	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.	
	3. **	GUPTA, S. et al., "Acute Pulmonary Embolism Advances in Treatment", JAPI, Association of Physicians India, March 2008, Vol. 56, 185-191.	
	4. **	International Search Report and Written Opinion for International App. No. PCT/US13/61470, mailed January 17, 2014, 7 pages.	
	5. **	International Search Report and Written Opinion for International App. No. PCT/US2014/046567, mailed 11/3/2014, 13 pages	
	6. **	International Search Report and Written Opinion for International App. No. PCT/US2014/061645, mailed 1/23/2015, 15 pages.	
	7. **	International Search Report for International App. No. PCT/US13/71101, mailed March 31, 2014, 4 pages.	
	8. **	KONSTANTINIDES, S. et al., "Pulmonary embolism hotline 2012 - Recent and expected trials", Thrombosis and Haemostasis, January 9, 2013:33; 43-50.	
	9. **	KONSTANTINIDES, S. et al., "Pulmonary embolism: risk assessment and management", European Society of Cardiology; European Heart Journal, September 7, 2012:33, 3014-3022.	
	10. **	KUCHER, N. et al., "Percutaneous Catheter Thrombectomy Device for Acute Pulmonary Embolism: In Vitro and In Vivo Testing", Circulation, September, 2005:112:e28-e32.	
	11. **	KUCHER, N., "Catheter Interventions in Massive Pulmonary Embolism", Cardiology Rounds, March, 2006 Volume 10, Issue 3, 6 pages.	
	12. **	KUCHER, N. et al., "Management of Massive Pulmonary Embolism", Radiology, September 2005:236:3 852-858.	
	13. **	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.	
	14. **	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.	
	15. **	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.	
	16. **	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.	
	17. **	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)	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	18. **	LIU, S. et al, "Massive Pulmonary Embolism: Treatment with the Rotarex Thrombectomy System", Cardiovascular Interventional Radiology; 2011: 34:106-113.	
	19. **	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.	
	20. **	REEKERS, J. et al., "Mechanical Thrombectomy for Early Treatment of Massive Pulmonary Embolism", CardioVascular and Interventional Radiology, 2003: 26:246-250.	
	21. **	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.	
	22. **	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.)	
	23. **	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.	
	24. **	SPIOTTA, A et al., "Evolution of thrombectomy approaches and devices for acute stroke: a technical review." J NeuroInterv Surg 2015, 7, pages 7 pages.	
	25. **	SVILAAS, T. et al., "Thrombus Aspiration During Primary Percutaneous Coronary Intervention." The New England Journal of Medicine, 2008, Vol. 358, No. 6, 11 pages.	
	26. **	TAPSON, V., "Acute Pulmonary Embolism", The New England Journal of Medicine, March 6, 2008:358:2037-52.	
	27. **	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.	
	28. **	TRUONG et al., "Mechanical Thrombectomy of Iliocaval Thrombosis Using a Protective Expandable Sheath," Cardiovasc Intervent Radiol27-254-258, 2004, 5 pgs.	
	29. **	TURK et al., "ADAPT FAST study: a direct aspiration first pass technique for acute stroke thrombectomy." J NeuroIntervent Surg, Vol. 6, 2014, 6 pages.	
	30. **	UFLACKER, R., "Interventional Therapy for Pulmonary Embolism", Journal of Vascular and Interventional Radiology, February 2001: 12:147-164.	
	31. **	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.	
	32. **	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.	
	33. **	English translation of Japanese Office Action received for JP Application No. 2016-564210, Applicant: Inceptus Medical, LLC, Date of Mailing: September 4, 2017, 4 pages.	
	34. **	Australian Exam Report received for AU Application No. 2015274704, Applicant: Inceptus Medical, LLC, Date of Mailing: September 7, 2017, 3 pages.	
	35. **	European Search Report received for EP Application No. 15805810.7, Applicant: Inceptus Medical, LLC, Date of Mailing: September 4, 2017, 6 pages.	
	36. **	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.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	37. **	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.
	38. **	GOLDHABER, S., "Advanced treatment strategies for acute pulmonary embolism, including thrombolysis and embolectomy," Journal of Thrombosis and Haemostasis, 2009: 7 (Suppl. 1): 322-327.
	39. **	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.
	40. **	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.
	41. **	European First Office Action received for EP Application No. 13838945.7, Applicant: Inari Medical, Inc., Date of Mailing: October 26, 2018, 7 pages.
	42. **	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.
	43. **	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.
	44. **	European Search Report for European Application No. 16876941.2, Date of Filing: December 19, 2016, Applicant: Inari Medical, Inc., Date of Mailing: July 18, 2019, 7 pages.
	45. **	Extended European Search Report for European Application No. 16858462.1, Date of Filing: October 24, 2016, Applicant: Inari Medical, Inc., Date of Mailing: June 3, 2019, 10 pages.
	46. **	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.
	47. **	Partial Supplementary European Search Report for European Application No. 17864818.4, Date of Filing: May 21, 2019, Applicant: Inari Medical, Inc., Date of Mailing: April 24, 2020, 11 pages.
	48. **	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.
	49.	Extended European Search Report for European Application No. 20191581.6, Applicant: Inari Medical, Inc., Date of Mailing: March 31, 2021, 11 pages.
	50.	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.
	51.	Extended European Search Report for European Application No. 18853465.5, Applicant: Inari Medical, Inc., Date of Mailing: May 7, 2021, 2021, 7 pages.
	52.	VORWERK, D. MD, et al., "Use of a Temporary Caval Filter to Assist Percutaneous Iliocaval Thrombectomy: Experimental Results." SCVIR, 1995, 4 pages.
	53.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2020/014854, dated October 5, 2020 (13 pages)
	54.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2020/018655, dated December 16, 2020 (22 pages)
	55.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2020/017684, dated November 30, 2020 (19 pages)
	56.	Extended European Search Report for EP Patent Appln. No. 20185092.2 dated September 11, 2020, 6 pages.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	57.	EP Examination Report for EP Patent Appln. No. 18745794.0 dated July 20, 2020, 4 pages.	
	58.	WIKIPEDIA; Embolectomy; retrieved from the internet: https://en.wikipedia.org/wiki/Embolectomy; 4 pgs.; retrieved/printed: 3/24/2016	
	59.	O'SULLIVAN; Thrombolysis versus thrombectomy in acute deep vein thrombosis; Interventional Cardiology; 3(5); pp. 589-596; October 2011	
	60.	CAPTURE VASCULAR SYSTEMS; (company website); retrieved from the internet: http://www.capturevascular.com; 3 pgs.; retrieved/printed: 3/24/2016	
	61.	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	
	62.	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	
	63.	PENUMBRA, INC.; Indigo® System (product information); retrieved from the internet: http://www.penumbrainc.com/peripheralpercutaneous-thromboembolectomy/indigo-system; 7 pgs.; retrieved/printed: 3/24/2016	
	64.	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	
	65.	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	
	66.	PCT International Search Report and Written Opinion for International Patent Appln. No. PCT/US2019/050467, Applicant Stryker Corporation, dated December 18, 2019 (17 pages)	
	67.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2017/029440, Applicant Stryker Corporation, mailed July 7, 2017	
	68.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2017/029472, Applicant Stryker Corporation, mailed July 7, 2017	
	69.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2017/035543, Applicant Stryker Corporation, mailed August 14, 2017.	
	70.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2017/029366, Applicant Stryker Corporation, mailed August 29, 2017.	
	71.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2017/050933, Applicant Stryker Corporation, forms PCT/ISA/210, 220, and 237, dated November 10, 2017 (16 pages)	
	72.	International search report and written opinion mailed February 28, 2018 for PCT/US2017/029345, Applicant Stryker Corporation 26 pages.	
	73.	Extended European Search Report mailed August 22, 2018 for European patent appln no. 16852212.6, 6 pages.	
	74.	Extended European Search Report mailed October 5, 2018 for European patent appln no. 18174891.4, 6 pages.	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	75.	International search report and written opinion mailed November 14, 2018 for PCT/US2018/040937, Applicant Stryker Corporation 16 pages.	
	76.	International Search Report and Written Opinion mailed March 28, 2019 for International Appln. No. PCT /US2018/059607	
	77.	International Search Report and Written Opinion mailed May 6, 2016 for PCT/US2016/017982	
	78.	PCT International Search Report and Written Opinion for International Patent Appln. No. PCT/US2019/032601, Applicant Stryker Corporation, dated July 23, 2019 (12 pages)	
	79.	Extended European Search Report mailed October 8, 2019 for European Patent Application No. 19191925.7	
	80.	International Search Report and Written Opinion for International Patent Appln. No. PCT/US2019/050410 dated October 25, 2019.	
	81.	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.	
	82.	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.	
	83.	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.	
	84.	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.	
	85.	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.	
	86.		
	87.		
	88.		
	89.		
	90.		
	91.		

EXAMINER SIGNATURE			
Examiner Signature	/QUYNH-NHU H. VU/	Date Considered	08/08/2022

*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. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

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).

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 **16/117,519** and filed on **August 30, 2018** and relied upon in this application for an earlier filing date under 35 U.S.C. § 120.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /Q.N.V./

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

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)	2022-04-22
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. /Q.N.V./

PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	1	16/117519 and (pliable) and (reinforcement) and (tensioning adj mechanism)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 09:36 AM
L2	1	("20150305859").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 10:53 AM
L3	2	("4551862").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 11:14 AM
L4	6	(("5360417") or ("20040039412") or ("20170112513")).PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 11:15 AM
L5	6	(("6824553") or ("7905877") or ("2013184703")).PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 11:16 AM
L6	1	("20120310166").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 11:28 AM
L7	2	16/117519 and pressure	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 11:33 AM
L8	237	("10004531"|"10045790"|"10335186"|"10342571"|"10349960"|"20110319917"|"20130184703"|"20180193043"|"20190150959"|"20190231373"|"5490859"|"6824553"|"7094249"|"7905877"|"20030116731"|"20040039412"|"20060247500"|"20080300466"|"20090281525"|"20110144592"|"20120310166"|"20150305859"|"20170058623"|"20170112513"|"2846179"|"4523738"|"4551862"|"4978341"|"5360417"|"10098651"|"20010004699"|"20010041909"|"20010051810"|"20020111648"|"20020120277"|"20020147458"|"20020156457"|"20030114875"|"20030125663"|"20030135230"|"20030153973"|"20040073243"|"20050038468"|"20050119668"|"20050283186"|"20060047286"|"20060100662"|"20060253145"|"20060282111"|"20070112374"|"20070118165"|	(US-PGPUB; USPAT)	OR	ON	ON	2020/06/10 01:13 PM

		"20070161963"|"20070179513"|"20070191866"|"20070198028"|"20070208361"|"20070208367"|"20070213753"|"20070255252"|"20080015541"|"20080157017"|"20080167678"|"20080228209"|"20080234722"|"20080269798"|"20090018566"|"20090054918"|"20090062841"|"20090160112"|"20090163846"|"20090182362"|"20090292307"|"20100087850"|"20100114113"|"20100121312"|"20100204712"|"20100249815"|"20100318178"|"20110054405"|"20110060212"|"20110152993"|"20110190806"|"20110213290"|"20110213403"|"20110224707"|"20110251629"|"20110264133"|"20120089216"|"20120101480"|"20120101510"|"20120143239"|"20120165919"|"20120179181"|"20120232655"|"20120271231"|"20140005713"|"20140025048"|"20150018860"|"20150133990"|"20150196744"|"20150238207"|"20150265299"|"20150305756"|"20150352325"|"20150360001"|"20150374391"|"20160113666"|"20160143721"|"20160262790"|"20160277276"|"20170105745"|"20170112514"|"20170189041"|"20170265878"|"20170325839"|"20180092652"|"20180125512"|"20180256178"|"20180296240"|"20180344339"|"20180361116"|"3088363"|"3435826"|"3923065"|"4030503"|"4393872"|"4650466"|"4873978"|"4883458"|"4890611"|"5011488"|"5059178"|"5102415"|"5129910"|"5192286"|"5192290"|"5370653"|"5476450"|"5591137"|"5746758"|"5749858"|"5766191"|"578					

		2817"|"5827304"|"5868708"|"5873866"|"5873882"|"5876414"|"5882329"|"5972019"|"5974938"|"5993483"|"6066149"|"6221006"|"6228060"|"6238412"|"6254571"|"6258115"|"6306163"|"6350271"|"6364895"|"6368339"|"6383205"|"6413235"|"6423032"|"6440148"|"6454741"|"6454775"|"6458103"|"6458139"|"6511492"|"6514273"|"6530935"|"6530939"|"6544279"|"6551342"|"6589263"|"6596011"|"6602271"|"6605074"|"6605102"|"6623460"|"6635070"|"6645222"|"6660013"|"6663650"|"6685722"|"6692504"|"6699260"|"6755847"|"6767353"|"6800080"|"6939361"|"6960222"|"7004954"|"7036707"|"7041084"|"7052500"|"7056328"|"7069835"|"7179273"|"7220269"|"7232432"|"7244243"|"7285126"|"7306618"|"7320698"|"7323002"|"7331980"|"7534234"|"7578830"|"7621870"|"7674247"|"7691121"|"7695458"|"7763010"|"7766934"|"7905896"|"7938809"|"7938820"|"7967790"|"7976511"|"7993302"|"7993363"|"8043313"|"8052640"|"8066757"|"8070791"|"8075510"|"8088140"|"8100935"|"8109962"|"8118829"|"8197493"|"8246641"|"8261648"|"8267897").PN.					
L9	63	("8298257"|"8317748"|"8337450"|"8357178"|"8361104"|"8409215"|"8486105"|"8491539"|"8512352"|"8535334"|"8545526"|"8568432"|"8574262"|"8579915"|"8585713"|"8696622"|"8771289"|"8777893"|"8784434"|"8784441"|"8795305"|"8795345"|"8801748"|"8814927"|"8820207"|"882	(US-PGPUB; USPAT)	OR	ON	ON	2020/06/10 01:13 PM

		6791"|"8828044"|"8833224"|"8845621"|"8852205"|"8852226"|"8932319"|"8939991"|"8945143"|"8945172"|"8968330"|"8992504"|"9005172"|"9101382"|"9149609"|"9161766"|"9204887"|"9259237"|"9283066"|"9408620"|"9439664"|"9439751"|"9456834"|"9463036"|"9526864"|"9526865"|"9566424"|"9579116"|"9616213"|"9636206"|"9700332"|"9717519"|"9744024"|"9757137"|"9844386"|"9844387"|"9999493"|"RE43902").PN.					
L10	1	"16117519"	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 01:37 PM
L11	3268	(A61B17/3207).CPC. and (@ad<"20170906")	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:05 PM
L12	4894	(A61M39/06 OR A61M2039/062 OR A61M2039/0673 OR A61M39/0613).CPC. and (@ad<"20170906")	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:11 PM
L13	3470	L12 and (seal or valve)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:11 PM
L14	2235	L12 and (seal)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:11 PM
L15	270	L12 and (seal) and (reinforc$5)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:11 PM
L16	2795	L12 and (valve)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:43 PM
L17	0	L12 and (hemostic adj valve)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:43 PM
L18	411	L12 and (hemostatic adj valve)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 02:43 PM
L19	1	("7172580").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 02:52 PM
L22	115	("20010042927" | "20020026207" | "20020156432" | "20030195541" | "20040059297" | "20040106942" | "20040111060" | "20040162531" | "20040215209" | "20040230161" | "20040260244" | "20050033342" |	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2020/06/10 05:51 PM

		"20050065543" | "20050070943" | "20050077688" | "20050077689" | "20050107816" | "20050131349" | "20050251191" | "20050288622" | "20050288634" | "20060211992" | "20060217665" | "20060229654" | "20060229655" | "20070088277" | "20070185453" | "20070255218" | "20080249475" | "20090082735" | "3712298" | "3845766" | "4265694" | "4924923" | "4929235" | "5104382" | "5114407" | "5127626" | "5141498" | "5174613" | "5180373" | "5197955" | "5203773" | "5209737" | "5256147" | "5261891" | "5267965" | "5269763" | "5295993" | "5304143" | "5308336" | "5314417" | "5318585" | "5330437" | "5338305" | "5342315" | "5342382" | "5356421" | "5385553" | "5387197" | "5399167" | "5405328" | "5441041" | "5462532" | "5467762" | "5474539" | "5476475" | "5486190" | "5522833" | "5534009" | "5569160" | "5569292" | "5584850" | "5609604" | "5618297" | "5626598" | "5658236" | "5662615" | "5669885" | "5685854" | "5690663" | "5690664" | "5709671" | "5752938" | "5776112" | "5782812" | "5792113" | "5803919" | "5807338" | "5817061" | "5851216" | "5860996" | "5865807" | "5879332" | "5895377" | "5904699" | "5906595" | "5916232" | "5947930" | "5980493" | "5989224" | "5997510" | "6004326" | "6197041" | "6319266" | "6497716" | "6551282" | "6685630" | "6702787" | "7169130" |					

		"7390317" | "7731694").PN. OR ("8137318").URPN.					
L23	255	("0729423" | "3086797" | "3197173" | "3438607" | "3920215" | "3977400" | "4149535" | "4231400" | "4243034" | "4324239" | "4378013" | "4473369" | "4496348" | "4634421" | "4723550" | "4786028" | "4839471" | "4960259" | "4978341" | "5009643").PN. OR ("5127626").URPN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2020/06/10 05:57 PM
L24	2	("20120138832").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 06:00 PM
L25	2	16/117519 and (pressure with different)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 06:25 PM
L26	1	16/117519 and (vacuum adj pressure)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 06:27 PM
L27	2	16/117519 and (vacuum)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 06:27 PM
L28	1	16/117519 and (filament)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/10 07:46 PM
L29	1	("20150305859").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/10 07:57 PM
L30	2	16/117519 and vacuum	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 10:02 AM
L31	1	("20120310166").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/11 10:54 AM
L32	1	("7172580").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2020/06/11 10:59 AM
L33	14	(compliant adj polymer) with (silicon adj rubber)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 11:13 AM
L34	57	(compliant adj polymer) with (silicone adj rubber)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 11:14 AM
L35	57	L34 not L33	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 11:14 AM
L36	179	((benjamin near Merritt) or (John near Thress) or (Paul near Lubock)).in. and valve	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 02:17 PM
L37	2	L36 and (reinforcement) and (filament)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 02:18 PM
L38	4	L36 and (reinforcement) and (tension$4)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/06/11 02:18 PM
L39	1	16/117519 and uniform	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/11/19 01:13 PM
L40	1	("20180193043").PN.	(US-PGPUB; USPAT;	OR	OFF	OFF	2020/11/19

			FPRS; EPO; JPO)				01:16 PM
L41	1114	(hemostatic adj valve) and (filament or thread or string) and (bias or spring)	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/11/19 04:38 PM
L42	943	L41 and (@ad<"20170906")	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/11/19 04:38 PM
L43	1305	((pinch adj valve) or (hemestatic with seal)) and (filament or thread or string) and (bias or spring) and (@ad<"20170906")	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/11/19 04:59 PM
L44	1304	L43 not L42	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	ON	ON	2020/11/19 05:00 PM
L45	4	("3830462" | "7168444").PN. OR ("7775501").URPN.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2020/11/19 05:12 PM
L46	37	("10098651"|"10238406"|"20010051810"|"20020156457"|"20030116731"|"20040039412"|"20040199202"|"20050283186"|"20060247500"|"20080262528"|"20080300466"|"20090281525"|"20110144592"|"20120059356"|"20130092012"|"20140276403"|"20150133990"|"20150305859"|"20170037548"|"20170058623"|"20170233908"|"20180105963"|"20180296240"|"20180344339"|"20180361116"|"20190046219"|"20190070401"|"2846179"|"3892161"|"4034642"|"4287808"|"4523738"|"4551862"|"4978341"|"5360417"|"8715314"|"9844387").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/19 06:55 PM
L52	2	("20190046219").PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2021/02/05 10:36 AM
L53	3	(("20140371779") or ("20180064454")).PN.	(US-PGPUB; USPAT; FPRS; EPO; JPO)	OR	OFF	OFF	2021/02/05 10:38 AM
L54	2	("11000682").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/05/22 06:33 PM
L55	333	("2846179" | "3088363" | "3197173" | "3435826"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/05/22 06:34 PM

		| "3892161" | "3923065" | "4030503" | "4034642" | "4287808" | "4393872" | "4523738" | "4551862" | "4650466" | "4873978" | "4883458" | "4890611" | "4960259" | "4978341" | "5011488" | "5059178" | "5102415" | "5127626" | "5129910" | "5192286" | "5192290" | "5360417" | "5370653" | "5476450" | "5490859" | "5591137" | "5746758" | "5749858" | "5766191" | "5782817" | "5827229" | "5827304" | "5868708" | "5873866" | "5873882" | "5876414" | "5882329" | "5911710" | "5972019" | "5974938" | "5989233" | "5993483" | "6066149" | "6221006" | "6228060" | "6238412" | "6254571" | "6258115" | "6306163" | "6350271" | "6364895" | "6368339" | "6383205" | "6413235" | "6423032" | "6440148" | "6454741" | "6454775" | "6458103" | "6458139" | "6511492" | "6514273" | "6530935" | "6530939" | "6544279" | "6551342" | "6589263" | "6596011" | "6602271" | "6605074" | "6605102" | "6623460" | "6635070" | "6645222" | "6660013" | "6663650" | "6685722" | "6692504" | "6699260" | "6755847" | "6767353" | "6800080" | "6824553" | "6939361" | "6960222" | "7004954" | "7036707" | "7041084" | "7052500" | "7056328" | "7069835" | "7094249" | "7179273" | "7220269" | "7232432" | "7244243" | "7285126" | "7306618" | "7320698" | "7323002" | "7331980" | "7534234" | "7578830" | "7621870" | "7674247" | "7691121" | "7695458" | "7763010" | "7766934" | "7775501" | "7905877" | "7905896" | "7938809" | "7938820" | "7967790" | "7976511"					

		| "7993302" | "7993363" | "8043313" | "8052640" | "8066757" | "8070791" | "8075510" | "8088140" | "8100935" | "8109962" | "8118829" | "8197493" | "8246641" | "8261648" | "8267897" | "8298257" | "8317748" | "8337450" | "RE43902" | "8357178" | "8361104" | "8409215" | "8486105" | "8491539" | "8512352" | "8535334" | "8545526" | "8568432" | "8574262" | "8579915" | "8585713" | "8696622" | "8715314" | "8771289" | "8777893" | "8784434" | "8784441" | "8795305" | "8795345" | "8801748" | "8814927" | "8820207" | "8826791" | "8828044" | "8833224" | "8845621" | "8852205" | "8852226" | "8932319" | "8939991" | "8945143" | "8945172" | "8968330" | "8992504" | "9005172" | "9101382" | "9149609" | "9161766" | "9204887" | "9259237" | "9283066" | "9408620" | "9439664" | "9439751" | "9456834" | "9463036" | "9526864" | "9526865" | "9566424" | "9579116" | "9616213" | "9636206" | "9700332" | "9717519" | "9744024" | "9757137" | "9844386" | "9844387" | "9999493" | "10004531" | "10045790" | "10098651" | "10238406" | "10335186" | "10342571" | "10349960" | "20010004699" | "20010041909" | "20010051810" | "20020111648" | "20020120277" | "20020147458" | "20020156457" | "20030114875" | "20030116731" | "20030125663" | "20030135230" |					

		"20030153973" | "20040039412" | "20040073243" | "20040199202" | "20050038468" | "20050119668" | "20050283186" | "20060047286" | "20060100662" | "20060247500" | "20060253145" | "20060282111" | "20070038225" | "20070112374" | "20070118165" | "20070161963" | "20070179513" | "20070191866" | "20070198028" | "20070208361" | "20070208367" | "20070213753" | "20070255252" | "20080015541" | "20080088055" | "20080157017" | "20080167678" | "20080228209" | "20080234722" | "20080262528" | "20080269798" | "20080300466" | "20090018566" | "20090054918" | "20090062841" | "20090160112" | "20090163846" | "20090182362" | "20090281525" | "20090292307" | "20100087850" | "20100114113" | "20100121312" | "20100204712" | "20100249815" | "20100318178" | "20110054405" | "20110060212" | "20110144592" | "20110152993" | "20110190806" | "20110213290" | "20110213403" | "20110224707" | "20110245807" | "20110251629" | "20110264133" | "20110319917" |				

		"20120059356" | "20120089216" | "20120101480" | "20120101510" | "20120138832" | "20120143239" | "20120165919" | "20120179181" | "20120232655" | "20120271231" | "20120310166" | "20130092012" | "20130184703" | "20140005713" | "20140025048" | "20140276403" | "20140371779" | "20150018860" | "20150133990" | "20150196744" | "20150238207" | "20150265299" | "20150305756" | "20150305859" | "20150352325" | "20150360001" | "20150374391" | "20160113666" | "20160143721" | "20160262790" | "20160277276" | "20170037548" | "20170058623" | "20170105745" | "20170112513" | "20170112514" | "20170189041" | "20170233908" | "20170265878" | "20170325839" | "20180064454" | "20180092652" | "20180105963" | "20180125512" | "20180193043" | "20180256178" | "20180296240" | "20180344339" | "20180361116" | "20190000492" | "20190046219" | "20190070401" | "20190150959" | "20190231373").pn. AND (PGPB | USPT | USOC).dbnm.					
L56	3	16/117519 AND	(US-PGPUB; USPAT;	OR	ON	ON	2022/05/22

		(constricting ADJ mechanism)	FPRS; EPO; JPO)				07:06 PM
L57	21	("1100682").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/05 04:00 PM
L58	2	("11000682").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/05 04:01 PM
L59	0	("201403717779").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/05 05:26 PM
L60	1	("20140371779").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/05 05:26 PM
L61	333	("2846179" | "3088363" | "3197173" | "3435826" | "3892161" | "3923065" | "4030503" | "4034642" | "4287808" | "4393872" | "4523738" | "4551862" | "4650466" | "4873978" | "4883458" | "4890611" | "4960259" | "4978341" | "5011488" | "5059178" | "5102415" | "5127626" | "5129910" | "5192286" | "5192290" | "5360417" | "5370653" | "5476450" | "5490859" | "5591137" | "5746758" | "5749858" | "5766191" | "5782817" | "5827229" | "5827304" | "5868708" | "5873866" | "5873882" | "5876414" | "5882329" | "5911710" | "5972019" | "5974938" | "5989233" | "5993483" | "6066149" | "6221006" | "6228060" | "6238412" | "6254571" | "6258115" | "6306163" | "6350271" | "6364895" | "6368339" | "6383205" | "6413235" | "6423032" | "6440148"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/08/05 05:28 PM

		| "6454741" | "6454775" | "6458103" | "6458139" | "6511492" | "6514273" | "6530935" | "6530939" | "6544279" | "6551342" | "6589263" | "6596011" | "6602271" | "6605074" | "6605102" | "6623460" | "6635070" | "6645222" | "6660013" | "6663650" | "6685722" | "6692504" | "6699260" | "6755847" | "6767353" | "6800080" | "6824553" | "6939361" | "6960222" | "7004954" | "7036707" | "7041084" | "7052500" | "7056328" | "7069835" | "7094249" | "7179273" | "7220269" | "7232432" | "7244243" | "7285126" | "7306618" | "7320698" | "7323002" | "7331980" | "7534234" | "7578830" | "7621870" | "7674247" | "7691121" | "7695458" | "7763010" | "7766934" | "7775501" | "7905877" | "7905896" | "7938809" | "7938820" | "7967790" | "7976511" | "7993302" | "7993363" | "8043313" | "8052640" | "8066757" | "8070791" | "8075510" | "8088140" | "8100935" | "8109962" | "8118829" | "8197493" | "8246641" | "8261648" | "8267897" | "8298257" | "8317748" | "8337450" | "RE43902" | "8357178" | "8361104" | "8409215" | "8486105" | "8491539" | "8512352" | "8535334" | "8545526" | "8568432" | "8574262" | "8579915" | "8585713" | "8696622" | "8715314" | "8771289" | "8777893" | "8784434" | "8784441" | "8795305" | "8795345" | "8801748" | "8814927" | "8820207" | "8826791" | "8828044" | "8833224" | "8845621" | "8852205" | "8852226" | "8932319" | "8939991" | "8945143" | "8945172" | "8968330" | "8992504" | "9005172" |					

		"9101382" | "9149609" | "9161766" | "9204887" | "9259237" | "9283066" | "9408620" | "9439664" | "9439751" | "9456834" | "9463036" | "9526864" | "9526865" | "9566424" | "9579116" | "9616213" | "9636206" | "9700332" | "9717519" | "9744024" | "9757137" | "9844386" | "9844387" | "9999493" | "10004531" | "10045790" | "10098651" | "10238406" | "10335186" | "10342571" | "10349960" | "20010004699" | "20010041909" | "20010051810" | "20020111648" | "20020120277" | "20020147458" | "20020156457" | "20030114875" | "20030116731" | "20030125663" | "20030135230" | "20030153973" | "20040039412" | "20040073243" | "20040199202" | "20050038468" | "20050119668" | "20050283186" | "20060047286" | "20060100662" | "20060247500" | "20060253145" | "20060282111" | "20070038225" | "20070112374" | "20070118165" | "20070161963" | "20070179513" | "20070191866" | "20070198028" | "20070208361" | "20070208367" | "20070213753" | "20070255252" | "20080015541" | "20080088055" | "20080157017" | "20080167678" | "20080228209" |				

		"20080234722" | "20080262528" | "20080269798" | "20080300466" | "20090018566" | "20090054918" | "20090062841" | "20090160112" | "20090163846" | "20090182362" | "20090281525" | "20090292307" | "20100087850" | "20100114113" | "20100121312" | "20100204712" | "20100249815" | "20100318178" | "20110054405" | "20110060212" | "20110144592" | "20110152993" | "20110190806" | "20110213290" | "20110213403" | "20110224707" | "20110245807" | "20110251629" | "20110264133" | "20110319917" | "20120059356" | "20120089216" | "20120101480" | "20120101510" | "20120138832" | "20120143239" | "20120165919" | "20120179181" | "20120232655" | "20120271231" | "20120310166" | "20130092012" | "20130184703" | "20140005713" | "20140025048" | "20140276403" | "20140371779" | "20150018860" | "20150133990" | "20150196744" | "20150238207" | "20150265299" | "20150305756" | "20150305859" | "20150352325" | "20150360001" | "20150374391" | "20160113666" |				

		"20160143721" | "20160262790" | "20160277276" | "20170037548" | "20170058623" | "20170105745" | "20170112513" | "20170112514" | "20170189041" | "20170233908" | "20170265878" | "20170325839" | "20180064454" | "20180092652" | "20180105963" | "20180125512" | "20180193043" | "20180256178" | "20180296240" | "20180344339" | "20180361116" | "20190000492" | "20190046219" | "20190070401" | "20190150959" | "20190231373").pn. AND (PGPB | USPT | USOC).dbnm.					
L62	105	("1170208" | "1741526" | "2217718" | "2269401" | "3675657" | "4118805" | "4256094" | "4399809" | "4401107").pn. OR ("4551862").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/08/05 05:29 PM
L63	19	("2003/0116731").urpn. AND (PGPB | USPT | USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/08/05 05:43 PM
L64	1	17/705189	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 11:02 AM
L65	1	("20110144592").pn.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 01:12 PM
L66	12	"7775501"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO);	OR	ON	ON	2022/08/08 01:22 PM

			FPRS; EPO; JPO)				
L67	5183	((A61M2039/062 OR A61M2039/0673 OR A61M39/0613).cpc.) AND (@ad<"20170906")	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 01:55 PM
L68	4288	L67 AND (valve OR seal)	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 01:55 PM
L69	1185	L68 AND (string OR thread OR filament)	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 01:55 PM
L70	474	L69 AND (button OR actuator)	(US-PGPUB; USPAT; FIT (AP, AT, AU, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 01:56 PM
L71	21	"10309485"	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 02:03 PM
L72	2	10/309485	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 02:04 PM
L73	1594	((F16K7/02 OR F16K7/08 OR F16K7/04).cpc.) AND (@ad<"20170906")	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 02:05 PM
L74	362	L73 AND (button OR actuator)	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 02:05 PM
L75	24	("3383131" | "4094492" | "4540411" | "4570898" | "5112324" | "5211370" | "5582165" | "5814026" | "6270053" | "6450989"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2022/08/08 02:08 PM

		| "6475135" | "7914492" | "7981086" | "8079973" | "8132783" | "8900168" | "20040015177" | "20050131344" | "20070118021" | "20070161956" | "20110022063" | "20140012235" | "20140330309").pn. OR ("10183159").urpn. AND (PGPB | USPT | USOC).dbnm.					
L76	250	("20010004699" OR "20010041909" OR "20010051810" OR "20020022858" OR "20020026211" OR "20020032455" OR "20020095161" OR "20020095171" OR "20020111648" OR "20020120277" OR "20020147458" OR "20020156457" 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 "20040039412" OR "20040068288" OR "20040073243" OR "20040098033" OR "20040133232" OR "20040138692" OR "20040167567" OR "20040199201" OR "20040199202" OR "20050033172" OR "20050038468" OR "20050055047" OR "20050085826" OR "20050085849" OR "20050119668" OR "20050177132" OR "20050187570" OR "20050283165" OR "20050283166" OR	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/08 02:18 PM

		"20050283186" OR "20060020286" OR "20060042786" OR "20060047286" OR "20060089533" OR "20060100662" OR "20060155305" OR "20060173525" OR "20060195137" OR "20060200221" OR "20060224177" OR "20060229645" OR "20060247500" OR "20060253145" OR "20060276874" OR "20060282111" OR "20060293696" OR "20070038225" OR "20070112374" OR "20070118165" OR "20070149996" OR "20070161963" OR "20070179513" OR "20070191866" OR "20070198028" OR "20070208361" OR "20070208367" OR "20070213753" OR "20070213765" OR "20070255252" OR "20070288054" OR "20080015541" OR "20080088055" OR "20080157017" OR "20080167678" OR "20080183136" OR "20080228209" OR "20080234722" OR "20080262528" OR "20080269798" OR "20080300466" OR "20090018566" OR "20090054918" OR "20090062841" OR "20090069828" OR "20090076417" OR "20090160112" OR "20090163846" OR "20090182362" OR "20090281525" OR "20090292307" OR "20090299393" OR "20100030256" OR "20100042136" OR "20100087844" OR "20100087850" OR "20100114113" OR "20100121312" OR					

		"20100137846" OR "20100190156" OR "20100204712" OR "20100249815" OR "20100268264" OR "20100318178" OR "20110034987" OR "20110054405" OR "20110060212" OR "20110118817" OR "20110125181" OR "20110144592" OR "20110152823" OR "20110152993" OR "20110160742" OR "20110160763" OR "20110190806" 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 "20120101480" OR "20120101510" OR "20120138832" OR "20120143239" OR "20120165919" OR "20120179181" OR "20120197277" OR "20120232655" OR "20120271105" OR "20120271231" OR "20120277788" OR "20120310166" OR "20130030460" OR "20130046332" OR "20130066348" OR "20130092012" OR "20130096571" OR "20130102996" OR "20130116721" OR "20130144326" OR "20130165871" OR "20130184703" OR "20130197567" OR "20130226196" OR "20130289608" OR					

		"20130317589" OR "20130345739" OR "20140005712" OR "20140005713" OR "20140005715" OR "20140005717" OR "20140025048" OR "20140031856" OR "20140046133" OR "20140046243" OR "20140121672" OR "20140155830" OR "20140155908" OR "20140155980" OR "20140180397" OR "20140188143" OR "20140236219" OR "20140243882" OR "20140257253" OR "20140276403" 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 "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 "20160058540" OR					

		"20160074627" OR "20160106448" OR "20160106449" OR "20160113663" OR "20160113664" OR "20160113665" OR "20160113666" OR "20160143721" OR "20160206344" OR "20160228134" OR "20160262790" OR "20160287276" OR "20160367285" OR "20170014560" OR "20170037548" OR "20170042571" OR "20170058623" OR "20170079672" OR "20170086864" OR "20170100142" OR "20170105743" OR "20170105745" OR "20170112513" OR "20170112514" OR "20170189041" OR "20170233908" OR "20170265878" OR "20170303939" OR "20170303942" OR "20170303947" OR "20170303948" OR "20170325839").pn.					
L77	32	("20170348014" OR "20180042624" OR "20180042626" OR "20180064453" OR "20180064454" OR "20180070968" OR "20180092652" OR "20180105963" OR "20180125512" OR "20180193043" OR "20180236205" 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	(US-PGPUB; USPAT)	OR	ON	ON	2022/08/08 02:18 PM

		"20190150959" OR "20190231373" OR "20190321071" OR "20190336148" OR "20200046368" OR "20210113224" OR "20210186541").pn.					
L78	1263	((Benjamin NEAR Merritt) OR (John NEAR Thress) OR (Paul NEAR Lubock)).in.	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 02:19 PM
L79	110	L78 AND (valve AND filament)	(US-PGPUB; USPAT; FIT (AU, AP, AT, CA, CH, CN, DD, DE, EA, EP, ES, FR, GB, JP, KR, OA, RU, SU, WO); FPRS; EPO; JPO)	OR	ON	ON	2022/08/08 02:19 PM

PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N47	1423	(A61B17/3207).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 03:05 PM
N48	1681	(A61M39/06 OR A61M2039/062 OR A61M2039/0673 OR A61M39/0613).CPC.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 03:05 PM
N49	0	("l1" or N47) and ((hemostatic adj valve) and reinforcement and filament and biasing).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 03:06 PM
N50	2	(N47 or N48) and ((hemostatic adj valve) and reinforcement and filament and biasing).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 03:06 PM
N51	2	((hemostatic adj valve) and reinforcement and filament and biasing).clm.	(US-PGPUB; USPAT)	OR	ON	ON	2020/11/24 03:06 PM

Electronic Acknowledgement Receipt	
EFS ID:	46284299
Application Number:	17705189
International Application Number:	
Confirmation Number:	9367
Title of Invention:	HEMOSTASIS VALVES AND METHODS OF USE
First Named Inventor/Applicant Name:	Benjamin E. Merritt
Customer Number:	25096
Filer:	Matthew S. Williams/JiYoung Anderson
Filer Authorized By:	Matthew S. Williams
Attorney Docket Number:	111552-8016.US03
Receipt Date:	27-JUL-2022
Filing Date:	25-MAR-2022
Time Stamp:	14:41:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Response to Election / Restriction Filed	2022-7-27-Responseto_Restriction-Requirement-111552-8016US3.PDF	88397 787fb8358ec0480548519fda343df2005e8f7783	no	6

Warnings:

Imperative EX1002

Information:	
Total Files Size (in bytes):	88397

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

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Benjamin E. Merritt et al.

Application No.: 17/705,189 | Confirmation No.: 9367

Filed: March 25, 2022 | Art Unit: 3783

For: HEMOSTASIS VALVES AND METHODS OF USE | Examiner: Quynh-Nhu Hoang Vu

AMENDMENT AND RESPONSE TO RESTRICTION REQUIREMENT UNDER 37 C.F.R. § 1.142

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

Dear Commissioner:

In response to the Restriction Requirement mailed on May 27, 2022, please amend and consider the above-identified U.S. patent application as follows:

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

Remarks begin on page 5.

AMENDMENTS TO THE CLAIMS

Please withdraw claims 3 and 10–15. Following is a complete listing of the claims pending in the application, as amended:

1. (Original) A valve, comprising:

a tubular member defining a lumen configured to slidably receive a catheter;

a constricting mechanism including at least one filament and an actuator coupled to the filament, the filament comprising a first portion extending around at least a portion of the tubular member and a second portion having a first end extending from the first portion in one direction and a second end extending from the first portion in another direction, and the actuator comprises a first member coupled to the first end of the filament and a second member couped to the second end of the filament, wherein the first member and the second member of the actuator are moveable between (a) a first position wherein the filament circumferentially constricts the lumen to create a seal and (b) a second position wherein the filament is moved to at least partially open the lumen; and

a biasing system configured to bias the first member and the second member to the first position.

2. (Original) The valve of claim 1 wherein the tubular member is pliable.

3. (Withdrawn) The valve of claim 1 wherein the first portion of the filament extends in a loop completely around the tubular member.

4. (Original) The valve of claim 1 wherein the first member of the actuator comprises a first button and the second member of the actuator comprises a second button,

wherein the first button and the second button are undepressed in the first position, and wherein the first button and the second button are depressed in the second position.

5. (Original) The valve of claim 1 wherein, when the first member and the second member of the actuator are in the first position, the lumen of the tubular member is configured to remain constricted and sealed when a pressure differential exists between (a) a first volume outside the lumen and adjacent to a first end of the tubular member and (b) a second volume outside the central lumen and adjacent to a second end of the tubular member.

6. (Original) The valve of claim 1 wherein, when the first member and the second member of the actuator are in the first position, the lumen of the tubular member is configured to remain constricted and sealed when vacuum pressure is applied to a volume outside the lumen and adjacent to either a first end or a second end of the tubular member.

7. (Original) The valve of claim 1 wherein the lumen of the tubular member extends a long a first longitudinal axis, wherein the first member and the second member of the actuator are movable between the first and second positions along a second longitudinal axis, and wherein the first longitudinal axis is orthogonal to the second longitudinal axis.

8. (Original) The valve of claim 1 wherein the biasing system comprises a first compression spring coupled to the first member and a second compression spring coupled to the second member.

9. (Original) The valve of claim 1 wherein, in the first position, the first member and the second member of the actuator pull the filament to circumferentially constrict the tubular member such that the lumen is constricted and sealed.

10. (Withdrawn) A hemostasis valve, comprising:

a support;

an actuator having a least a first member movably coupled to the support;

a collapsible tubular sidewall defining a lumen carried by the support;

a filament formed in a loop around the tubular sidewall, the filament having at least a first end portion extending away from the loop to the first member; and

a first spring configured to move the first member in a direction that pulls the first end portion away from the tubular sidewall, reducing a diameter of the lumen in response to reducing a diameter of the loop.

11. (Withdrawn) The hemostasis valve of claim 10, further comprising a second member movably coupled to the support.

12. (Withdrawn) The hemostasis valve of claim 11 wherein the filament further comprises a second end portion extending away from the loop to the second member.

13. (Withdrawn) The hemostasis valve of claim 12 first end portion, the loop, and the second end portion are one continuous filament.

14. (Withdrawn) The hemostasis valve of claim 12 wherein first member and the second member are biased in a direction that places the first end portion and the second end portion under sufficient tension to reduce the diameter of the lumen and provide a seal around a device extending through the lumen.

15. (Withdrawn) The hemostasis valve of claim 12 wherein the first member and the second member are biased in a direction that places the first end portion and the second end portion under sufficient tension to close the lumen.

REMARKS

In the May 27, 2022 Restriction Requirement, the Examiner required an election of a single species from the following:

Species I**:** Claims 1–9 directed to a filament valve; or

Species II**:** Claims 10–15 directed to a hemostasis valve.

Additionally, if Species I was elected, the Examiner required an election of a single species from the following

Species IA: Figs. 1–5;

Species IB: Fig. 6;

Species IC: Fig. 7;

Species ID: Fig. 8; or

Species IE: Fig. 9.

Additionally, if Species II was elected, the Examiner required an election of a single species from the following

Species IIA: Figs. 1–3;

Species IIB: Fig. 4;

Species IIC: Fig. 5; or

Species IID: Fig. 9.

In response, the Applicant elects Species I (claims 1–9) and Species IIA (Figures 1–5), without traverse. Based on the Applicant's review, claims 1, 2, and 4–9 read on Species I and IIA. Non-elected claims 3 and 10–15 have been withdrawn pending allowance of a corresponding generic claim. The foregoing election is made with the understanding that the Examiner and the U.S. Patent and Trademark Office are bound to the finding of non-obviousness between each of the species. Accordingly, claims 1–15 remain pending.

Please charge any underpayment or credit any overpayment to our Deposit Account No. 50-0665, under Order No. 111552-8016.US03 from which the undersigned is authorized to draw.

Dated: July 27, 2022

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

Attorney for Applicant

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/705,189	03/25/2022	Benjamin E. Merritt	111552-8016.US03

CONFIRMATION NO. 9367

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

PUBLICATION NOTICE

OC000000134994219

Title:HEMOSTASIS VALVES AND METHODS OF USE

Publication No.US-2022-0211992-A1
Publication Date:07/07/2022

NOTICE OF PUBLICATION OF APPLICATION

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

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

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

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

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

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	03/25/2022	Benjamin E. Merritt	111552-8016.US03	9367

25096 7590 05/27/2022

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

EXAMINER	
VU, QUYNH-NHU HOANG	

ART UNIT	PAPER NUMBER
3783	

NOTIFICATION DATE	DELIVERY MODE
05/27/2022	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. 17/705,189	Applicant(s) Merritt et al.	
	Examiner QUYNH-NHU H VU	Art Unit 3783	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 2 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 03/25/22.

☐ 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) 1-15 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) _____ is/are rejected.

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

9) ☑ Claim(s) 1-15 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 _____ 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

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

Election/Restriction

This application contains claims directed to the following patentably distinct species:

Species I) claims 1-9: a filament valve

Species II) claims 10-15: a hemostasis valve

If Species I elected, please elect one of the following for filament valve:

IA) Figs. 1-5 IB) Fig. 6 IC) Fig. 7 ID) Fig. 8 IE) Fig. 9

If Species II elected, please elect one of the following for hemostasis valve:

IIA) Figs. 1-3 IIB) Fig. 4 IIC) Fig. 5 IID) Fig. 12

The species are independent or distinct because these species are not obvious variants of each other based on the current record.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species, or a single grouping of patentably indistinct species, for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claim is generic.

There is a search and/or examination burden for the patentably distinct species as set forth above because at least the following reason(s) apply:

(a) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;

(b) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);

(c) the prior art applicable to one invention would not likely be applicable to another invention.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species to be examined even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected species or grouping of patentably indistinct species**, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

The election may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the election of species requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected species or grouping of patentably indistinct species.

Should applicant traverse on the ground that the species, or groupings of patentably indistinct species from which election is required, are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing them to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the species unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103 or pre-AIA 35 U.S.C. 103(a) of the other species.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141.

A telephone call was made to Mathew S. Williams on 05/24/22 to request an oral election to the above restriction requirement, but did not result in an election being made.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be corrected in compliance with 37 CFR 1.48(a) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. A request to correct inventorship under 37 CFR 1.48(a) must be accompanied by an application data sheet in accordance with

37 CFR 1.76 that identifies each inventor by his or her legal name and by the processing fee required under 37 CFR 1.17(i).

The examiner has required restriction between product or apparatus claims and process claims. Where applicant elects claims directed to the product/apparatus, and all product/apparatus claims are subsequently found allowable, withdrawn process claims that include all the limitations of the allowable product/apparatus claims should be considered for rejoinder. All claims directed to a nonelected process invention must include all the limitations of an allowable product/apparatus claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product/apparatus claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product/apparatus are found allowable, an otherwise proper restriction requirement between product/apparatus claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product/apparatus claim will not be rejoined. See MPEP § 821.04. Additionally, in order for rejoinder to occur, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product/apparatus claims. **Failure to do so may result in no rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to QUYNH-NHU HOANG VU whose telephone number is (571)272-3228. The examiner can normally be reached M-F 7:30 am-4:00 pm.

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, Bhisma Mehta can be reached on 571-272-3383. 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.

/QUYNH-NHU H. VU/
Primary Examiner, Art Unit 3783

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	17/705,189	Merritt et al.
	Examiner	**Art Unit**
	QUYNH-NHU H VU	3783

✓	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	05/22/2022								
	1	÷								
	2	÷								
	3	÷								
	4	÷								
	5	÷								
	6	÷								
	7	÷								
	8	÷								
	9	÷								
	10	÷								
	11	÷								
	12	÷								
	13	÷								
	14	÷								
	15	÷								

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/705,189	03/25/2022	Benjamin E. Merritt	111552-8016.US03	9367

25096 7590 05/10/2022

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

EXAMINER
CENTRAL, DOCKET

ART UNIT	PAPER NUMBER
OPAP	

NOTIFICATION DATE	DELIVERY MODE
05/10/2022	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

Decision Granting Request for Prioritized Examination (Track I)	**Application No.** 17/705,189	**Applicant(s)** Merritt et al.	
	Examiner CHERYL P GIBSON BAYLOR	**Art Unit** OPET	**AIA (FITF) Status** Yes

1. THE REQUEST FILED 25 March 2022 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 CHERYL GIBSON BAYLOR at (571)272-3213. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.

/CHERYL GIBSON BAYLOR/ Paralegal Specialist, OPET	

U.S. Patent and Trademark Office
PTO-2298 (Rev. 02-2012)

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

U.S. PATENTS					
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	
	30.	5127626	07-07-1992	Hilal et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	
	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.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	
	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	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	
	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.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	
	146.	8092486	01-10-2012	Berrada et al.	
	147.	8100935	01-24-2012	Rosenbluth et al.	
	148.	8109962	02-07-2012	Pai	
	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	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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	
	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.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	
	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	Greenhaigh 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	Greenhaigh et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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	
	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	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	
	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	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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	
	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.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.	20200113412	04-16-2020	Jensen	
	338.	20090192495	07-30-2009	Ostrovsky et al.	
	339.	11000682	05-11-2021	Merritt et al.	
	340.	10695159	06-30-2020	Hauser	
	341.	10799331	10-13-2020	Hauser	
	342.	20020022859	02-21-2002	Hogendijk	
	343.	20020151918	10-17-2002	Lafontaine et al.	
	344.	11000682	05-11-2021	Merritt et al.	
	345.	5154724	10-13-1992	Andrews	
	346.	20030216774	11-20-2003	Larson	
	347.				
	348.				
	349.				
	350.				
	351.				
	352.				

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

U.S. PATENT APPLICATION PUBLICATIONS					
Examiner Initial*	Cite No	Publication Number	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	1.	20010004699	06-21-2001	Gittings et al.	
	2.	20010041909	11-15-2001	Tsugita et al.	
	3.	20010051810	12-13-2001	Dubrul et al.	
	4.	20020022858	02-21-2002	Demond et al.	
	5.	20020026211	02-28-2002	Khosravi et al.	
	6.	20020032455	03-14-2002	Boock et al.	
	7.	20020095161	07-18-2002	Dhindsa	
	8.	20020095171	07-18-2002	Belef	
	9.	20020111648	08-15-2002	Kusleika et al.	
	10.	20020120277	08-29-2002	Hauschild et al.	
	11.	20020147458	10-10-2002	Hiblar et al.	
	12.	20020156457	10-24-2002	Fisher	
	13.	20030083693	05-01-2003	Daniel et al.	
	14.	20030100919	05-29-2003	Hopkins et al.	
	15.	20030114875	06-19-2003	Sjostrom	
	16.	20030116731	06-26-2003	Hartley	
	17.	20030125663	07-03-2003	Coleman et al.	
	18.	20030135230	07-17-2003	Massey et al.	
	19.	20030135258	07-17-2003	Andreas et al.	
	20.	20030153873	08-14-2003	Luther et al.	
	21.	20030153973	08-14-2003	Soun et al.	
	22.	20030168068	09-11-2003	Poole et al.	
	23.	20030176884	09-18-2003	Berrada et al.	
	24.	20030191516	10-09-2003	Weldon et al.	
	25.	20030208224	11-06-2003	Broome	
	26.	20040039412	02-26-2004	Isshiki et al.	
	27.	20040068288	04-08-2004	Palmer et al.	
	28.	20040073243	04-15-2004	Sepetka et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	29.	20040098033	05-20-2004	Leeflang et al.	
	30.	20040133232	07-08-2004	Rosenbluth et al.	
	31.	20040138692	07-15-2004	Phung et al.	
	32.	20040167567	08-26-2004	Cano et al.	
	33.	20040199201	10-07-2004	Kellett et al.	
	34.	20040199202	10-07-2004	Dubrul et al.	
	35.	20050033172	02-10-2005	Dubrul et al.	
	36.	20050038468	02-17-2005	Panetta et al.	
	37.	20050055047	03-10-2005	Greenhalgh	
	38.	20050085826	04-21-2005	Nair et al.	
	39.	20050085849	04-21-2005	Sepetka et al.	
	40.	20050119668	06-02-2005	Teague et al.	
	41.	20050177132	08-11-2005	Lentz et al.	
	42.	20050187570	08-25-2005	Nguyen et al.	
	43.	20050283165	12-22-2005	Gadberry	
	44.	20050283166	12-22-2005	Greenhalgh et al.	
	45.	20050283186	12-22-2005	Berrada et al.	
	46.	20060020286	01-26-2006	Niermann	
	47.	20060042786	03-02-2006	West	
	48.	20060047286	03-02-2006	West	
	49.	20060089533	04-27-2006	Ziegler et al.	
	50.	20060100662	05-11-2006	Daniel et al.	
	51.	20060155305	07-13-2006	Freudenthal et al.	
	52.	20060173525	08-03-2006	Behl et al.	
	53.	20060195137	08-31-2006	Sepetka et al.	
	54.	20060200221	09-07-2006	Malewicz	
	55.	20060224177	10-05-2006	Finitsis	
	56.	20060229645	10-12-2006	Bonnette et al.	
	57.	20060247500	11-02-2006	Voegele et al.	
	58.	20060253145	11-09-2006	Lucas	
	59.	20060276874	12-07-2006	Wilson et al.	
	60.	20060282111	12-14-2006	Morsi	
	61.	20060293696	12-28-2006	Fahey et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	62.	20070038225	02-15-2007	Osborne	
	63.	20070112374	05-17-2007	Paul, JR. et al.	
	64.	20070118165	05-24-2007	DeMello et al.	
	65.	20070149996	06-28-2007	Coughlin	
	66.	20070161963	07-12-2007	Smalling	
	67.	20070179513	08-02-2007	Deutsch	
	68.	20070191866	08-16-2007	Palmer et al.	
	69.	20070198028	08-23-2007	Miloslavskiet al.	
	70.	20070208361	09-06-2007	Okushi et al.	
	71.	20070208367	09-06-2007	Fiorella et al.	
	72.	20070213753	09-13-2007	Waller	
	73.	20070213765	09-13-2007	Adams et al.	
	74.	20070255252	11-01-2007	Mehta	
	75.	20070288054	12-13-2007	Tanaka et al.	
	76.	20080015541	01-17-2008	Rosenbluth et al.	
	77.	20080088055	04-17-2008	Ross	
	78.	20080157017	07-03-2008	Macatangay et al.	
	79.	20080167678	07-10-2008	Morsi	
	80.	20080183136	07-31-2008	Lenker et al.	
	81.	20080228209	09-18-2008	DeMello et al.	
	82.	20080234722	09-25-2008	Bonnette et al.	
	83.	20080262528	10-23-2008	Martin	
	84.	20080269798	10-30-2008	Ramzipoor et al.	
	85.	20080300466	12-04-2008	Gresham	
	86.	20090018566	01-15-2009	Escudero et al.	
	87.	20090054918	02-26-2009	Henson	
	88.	20090062841	03-05-2009	Amplatz et al.	
	89.	20090069828	03-12-2009	Martin et al.	
	90.	20090076417	03-19-2009	Jones	
	91.	20090160112	06-25-2009	Ostrovsky	
	92.	20090163846	06-25-2009	Aklog et al.	
	93.	20090182362	07-16-2009	Thompson et al.	
	94.	20090281525	11-12-2009	Harding et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	95.	20090292307	11-26-2009	Razack	
	96.	20090299393	12-03-2009	Martin et al.	
	97.	20100030256	02-04-2010	Dubrul et al.	
	98.	20100042136	02-18-2010	Berrada et al.	
	99.	20100087844	04-08-2010	Fischer Jr.	
	100.	20100087850	04-08-2010	Razack	
	101.	20100114113	05-06-2010	Dubrulet al.	
	102.	20100121312	05-13-2010	Gielenz et al.	
	103.	20100137846	06-03-2010	Desaietal	
	104.	20100190156	07-29-2010	Van Wordragen et al.	
	105.	20100204712	08-12-2010	Mallaby	
	106.	20100249815	09-30-2010	Jantzen et al.	
	107.	20100268264	10-21-2010	Bonnette et al.	
	108.	20100318178	12-16-2010	Rapaport et al.	
	109.	20110034987	02-10-2011	Kennedy	
	110.	20110054405	03-03-2011	Whiting et al.	
	111.	20110060212	03-10-2011	Slee et al.	
	112.	20110118817	05-19-2011	Gunderson et al.,	
	113.	20110125181	05-26-2011	Brady et al.	
	114.	20110144592	06-16-2011	Wong et al.	
	115.	20110152823	06-23-2011	Mohiuddin et al.	
	116.	20110152993	06-23-2011	Marchand et al.	
	117.	20110160742	06-30-2011	Ferrera et al.	
	118.	20110160763	06-30-2011	Ferrera et al.	
	119.	20110190806	08-04-2011	Wittens	
	120.	20110196414	08-11-2011	Porter et al.	
	121.	20110213290	09-01-2011	Chin et al.	
	122.	20110213403	09-01-2011	Aboytes	
	123.	20110224707	09-15-2011	Miloslavskiet al.	
	124.	20110245807	10-06-2011	Sakata et al.	
	125.	20110251629	10-13-2011	Galdonik et al.	
	126.	20110264133	10-27-2011	Hanlon et al.	
	127.	20110265681	11-03-2011	Allen et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	128.	20110288529	11-24-2011	Fulton	
	129.	20110288572	11-24-2011	Martin	
	130.	20110319917	12-29-2011	Ferrera et al.	
	131.	20120059309	03-08-2012	di Palma et al.	
	132.	20120059356	03-08-2012	di Palma et al.	
	133.	20120083824	04-05-2012	Berrada et al.	
	134.	20120083868	04-05-2012	Shrivastava	
	135.	20120089216	04-12-2012	Rapaport et al.	
	136.	20120101480	04-26-2012	Ingle et al.	
	137.	20120101510	04-26-2012	Lenker et al.	
	138.	20120138832	06-07-2012	Townsend	
	139.	20120143239	06-07-2012	Aklog et al.	
	140.	20120165919	06-28-2012	Cox et al.	
	141.	20120179181	07-12-2012	Straub et al.	
	142.	20120197277	08-02-2012	Stinis	
	143.	20120232655	09-13-2012	Lorrison et al.	
	144.	20120271105	10-25-2012	Nakamura et al.	
	145.	20120271231	10-25-2012	Agrawal	
	146.	20120277788	11-01-2012	Cattaneo	
	147.	20120310166	12-06-2012	Huff	
	148.	20130030460	01-31-2014	Marks et al.	
	149.	20130046332	02-21-2013	Jones et al.	
	150.	20130066348	03-14-2013	Fiorella et al.	
	151.	20130092012	04-18-2013	Marchand et al.	
	152.	20130096571	04-18-2013	Massicotte et al.	
	153.	20130102996	04-25-2013	Strauss	
	154.	20130116721	05-09-2013	Takagi et al.	
	155.	20130144326	08-02-2016	Brady et al.	
	156.	20130165871	06-27-2013	Fiorella et al.	
	157.	20130184703	07-18-2013	Shireman et al.	
	158.	20130197567	08-01-2013	Brady et al.	
	159.	20130226196	08-29-2013	Smith	
	160.	20130289608	10-31-2013	Tanaka et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	161.	20130317589	11-28-2013	Martin et al.	
	162.	20130345739	12-26-2013	Brady et al.	
	163.	20140005712	01-02-2014	Martin	
	164.	20140005713	01-02-2014	Bowman	
	165.	20140005715	03-31-2015	Castella et al.	
	166.	20140005717	01-02-2014	Martin et al.	
	167.	20140025048	01-23-2014	Ward	
	168.	20140031856	01-30-2014	Martin	
	169.	20140046133	02-13-2014	Nakamura et al.	
	170.	20140046243	02-13-2014	Ray et al.	
	171.	20140121672	05-01-2014	Folk	
	172.	20140155830	06-05-2014	Bonnette et al.	
	173.	20140155908	07-22-2014	Rosenbluth et al.	
	174.	20140155980	06-05-2014	Turjman	
	175.	20140180397	03-05-2019	Gerberding et al.	
	176.	20140188143	04-03-2018	Martin et al.	
	177.	20140236219	08-21-2014	Dubrul et al.	
	178.	20140243882	08-28-2014	Ma	
	179.	20140257253	09-11-2014	Jemison	
	180.	20140276403	09-18-2014	Follmer et al.	
	181.	20140318354	10-30-2014	Thompson et al.	
	182.	20140324091	03-03-2015	Rosenbluth	
	183.	20140330286	11-06-2014	Wallace et al.	
	184.	20140336691	11-13-2014	Jones et al.	
	185.	20140343593	11-20-2014	Chin et al.	
	186.	20140364896	12-11-2014	Consigny	
	187.	20140371779	12-18-2014	Vale et al.	
	188.	20150005781	01-01-2015	Lund-Clausen et al.	
	189.	20150005792	01-01-2015	Ahn	
	190.	20150018859	02-16-2016	Quick	
	191.	20150018860	01-15-2015	Quick	
	192.	20150018929	01-15-2015	Martin et al.	
	193.	20150025555	01-22-2015	SOS	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	194.	20150032144	01-29-2015	Holloway	
	195.	20150059908	03-05-2015	Mollen	
	196.	20150088190	03-26-2015	Jensen	
	197.	20150127035	05-07-2015	Trapp et al.	
	198.	20150133990	05-14-2015	Davidson	
	199.	20150150672	03-07-2017	Ma	
	200.	20150164523	06-18-2015	Brady et al.	
	201.	20150164666	06-18-2015	Johnson et al.	
	202.	20150190155	07-09-2015	Ulm III	
	203.	20150190156	07-09-2015	Ulm III	
	204.	20150196380	07-16-2015	Berrada et al.	
	205.	20150196744	04-03-2018	Aboytes	
	206.	20150209058	07-30-2015	Ferrera et al.	
	207.	20150209165	07-30-2015	Grandfield et al.	
	208.	20150238207	08-27-2015	Cox et al.	
	209.	20150250578	09-10-2015	Cook et al.	
	210.	20150265299	09-24-2015	Cooper et al.	
	211.	20150305756	10-29-2015	Rosenbluth	
	212.	20150305859	10-29-2015	Eller	
	213.	20150352325	12-10-2015	Quick	
	214.	20150360001	12-17-2015	Quick	
	215.	20150374391	12-31-2015	Quick	
	216.	20160008014	08-09-2016	Rosenbluth	
	217.	20160022293	01-28-2016	Dubrul et al.	
	218.	20160058540	03-03-2016	Don Michael	
	219.	20160074627	03-17-2016	Cottone	
	220.	20160106448	04-21-2016	Brady et al.	
	221.	20160106449	04-21-2016	Brady et al.	
	222.	20160113663	04-28-2016	Brady et al.	
	223.	20160113664	04-28-2016	Brady et al.	
	224.	20160113665	04-28-2016	Brady et al.	
	225.	20160113666	04-28-2016	Quick	
	226.	20160143721	05-26-2016	Rosenbluth	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	227.	20160206344	07-21-2016	Bruzzi et al.	
	228.	20160228134	08-11-2016	Martin et al.	
	229.	20160262790	09-15-2016	Rosenbluth et al.	
	230.	20160287276	10-06-2016	Cox et al.	
	231.	20160367285	03-19-2019	Sos	
	232.	20170014560	01-19-2017	Minskoff et al.	
	233.	20170037548	02-09-2017	Lee	
	234.	20170042571	02-16-2017	Levi	
	235.	20170058623	03-02-2017	Jaffrey et al.	
	236.	20170079672	03-23-2017	Quick	
	237.	20170086864	03-30-2017	Greenhalgh et al.	
	238.	20170100142	04-13-2017	Look et al.	
	239.	20170105743	04-20-2017	Vale et al.	
	240.	20170105745	04-20-2017	Rosenbluth et al.	
	241.	20170112513	07-11-2017	Marchand et al.	
	242.	20170112514	04-27-2017	Marchand et al.	
	243.	20170189041	07-06-2017	Cox et al.	
	244.	20170233908	08-17-2017	Kroczynski et al.	
	245.	20170265878	09-21-2017	Marchand et al.	
	246.	20170303939	10-26-2017	Greenhalgh et al.	
	247.	20170303942	10-26-2017	Greenhalgh et al.	
	248.	20170303947	10-26-2017	Greenhalgh et al.	
	249.	20170303948	10-26-2017	Wallace et al.	
	250.	20170325839	11-16-2017	Rosenbluth et al.	
	251.	20170348014	12-07-2017	Wallace et al.	
	252.	20180042624	02-15-2018	Greenhalgh et al.	
	253.	20180042626	02-15-2018	Greenhalgh et al.	
	254.	20180064453	03-08-2018	Garrison et al.	
	255.	20180064454	03-08-2018	Losordo et al.	
	256.	20180070968	03-15-2018	Wallace et al.	
	257.	20180092652	04-05-2018	Marchand et al.	
	258.	20180105963	04-19-2018	Quick	
	259.	20180125512	05-10-2018	Nguyen et al.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	260.	20180193043	07-12-2018	Marchand et al.	
	261.	20180236205	08-23-2018	Krautkremer et al.	
	262.	20180256178	09-13-2018	Cox et al.	
	263.	20180296240	10-18-2018	Rosenbluth et al.	
	264.	20180344339	12-06-2018	Cox et al.	
	265.	20180361116	12-20-2018	Quick et al.	
	266.	20190000492	01-03-2019	Casey et al.	
	267.	20190046219	02-14-2019	Marchand et al.	
	268.	20190070401	03-07-2019	Merritt et al.	
	269.	20190117244	04-25-2019	Wallace et al.	
	270.	20190133622	05-06-2019	Wallace et al.	
	271.	20190133623	05-09-2019	Wallace et al.	
	272.	20190133624	05-09-2019	Wallace et al.	
	273.	20190133625	05-09-2019	Wallace et al.	
	274.	20190133626	05-09-2019	Wallace et al.	
	275.	20190133627	05-09-2019	Wallace et al.	
	276.	20190150959	05-23-2019	Cox et al.	
	277.	20190231373	08-01-2019	Quick	
	278.	20190321071	10-24-2019	Marchand et al.	
	279.	20190336148	11-07-2019	Greenhalgh et al.	
	280.	20200046368	02-13-2020	Merritt et al.	
	281.	20210113224	04-22-2021	Dinh	
	282.	20210186541	06-24-2021	Thress	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

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 Iindo		
	6.	WO1997017889	05-22-1997	Applied Medical Resources Corporation		
	7.	WO2000053120	09-14-2000	Microvena Corporation		
	8.	WO2005046736	05-29-2005	Bonnette		
	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.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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.		
	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		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	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		
	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.					
	86.					

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

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. **	European Patent Application No. 13838945.7, Extended European Search Report, 9 pages, April 15, 2016.	
	2. **	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.	
	3. **	GUPTA, S. et al., "Acute Pulmonary Embolism Advances in Treatment", JAPI, Association of Physicians India, March 2008, Vol. 56, 185-191.	
	4. **	International Search Report and Written Opinion for International App. No. PCT/US13/61470, mailed January 17, 2014, 7 pages.	
	5. **	International Search Report and Written Opinion for International App. No. PCT/US2014/046567, mailed 11/3/2014, 13 pages	
	6. **	International Search Report and Written Opinion for International App. No. PCT/US2014/061645, mailed 1/23/2015, 15 pages.	
	7. **	International Search Report for International App. No. PCT/US13/71101, mailed March 31, 2014, 4 pages.	
	8. **	KONSTANTINIDES, S. et al., "Pulmonary embolism hotline 2012 - Recent and expected trials", Thrombosis and Haemostasis, January 9, 2013:33; 43-50.	
	9. **	KONSTANTINIDES, S. et al., "Pulmonary embolism: risk assessment and management", European Society of Cardiology; European Heart Journal, September 7, 2012:33, 3014-3022.	
	10. **	KUCHER, N. et al., "Percutaneous Catheter Thrombectomy Device for Acute Pulmonary Embolism: In Vitro and In Vivo Testing", Circulation, September, 2005:112:e28-e32.	
	11. **	KUCHER, N., "Catheter Interventions in Massive Pulmonary Embolism", Cardiology Rounds, March, 2006 Volume 10, Issue 3, 6 pages.	
	12. **	KUCHER, N. et al., "Management of Massive Pulmonary Embolism", Radiology, September 2005:236:3 852-858.	
	13. **	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.	
	14. **	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.	
	15. **	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.	
	16. **	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.	
	17. **	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)	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	18. **	LIU, S. et al, "Massive Pulmonary Embolism: Treatment with the Rotarex Thrombectomy System", Cardiovascular Interventional Radiology; 2011: 34:106-113.	
	19. **	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.	
	20. **	REEKERS, J. et al., "Mechanical Thrombectomy for Early Treatment of Massive Pulmonary Embolism", CardioVascular and Interventional Radiology, 2003: 26:246-250.	
	21. **	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.	
	22. **	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.)	
	23. **	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.	
	24. **	SPIOTTA, A et al., "Evolution of thrombectomy approaches and devices for acute stroke: a technical review." J NeuroInterv Surg 2015, 7, pages 7 pages.	
	25. **	SVILAAS, T. et al., "Thrombus Aspiration During Primary Percutaneous Coronary Intervention." The New England Journal of Medicine, 2008, Vol. 358, No. 6, 11 pages.	
	26. **	TAPSON, V., "Acute Pulmonary Embolism", The New England Journal of Medicine, March 6, 2008:358:2037-52.	
	27. **	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.	
	28. **	TRUONG et al., "Mechanical Thrombectomy of Iliocaval Thrombosis Using a Protective Expandable Sheath," Cardiovasc Intervent Radiol27-254-258, 2004, 5 pgs.	
	29. **	TURK et al., "ADAPT FAST study: a direct aspiration first pass technique for acute stroke thrombectomy." J NeuroIntervent Surg, Vol. 6, 2014, 6 pages.	
	30. **	UFLACKER, R., "Interventional Therapy for Pulmonary Embolism", Journal of Vascular and Interventional Radiology, February 2001: 12:147-164.	
	31. **	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.	
	32. **	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.	
	33. **	English translation of Japanese Office Action received for JP Application No. 2016-564210, Applicant: Inceptus Medical, LLC, Date of Mailing: September 4, 2017, 4 pages.	
	34. **	Australian Exam Report received for AU Application No. 2015274704, Applicant: Inceptus Medical, LLC, Date of Mailing: September 7, 2017, 3 pages.	
	35. **	European Search Report received for EP Application No. 15805810.7, Applicant: Inceptus Medical, LLC, Date of Mailing: September 4, 2017, 6 pages.	
	36. **	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.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	37. **	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.	
	38. **	GOLDHABER, S., "Advanced treatment strategies for acute pulmonary embolism, including thrombolysis and embolectomy," Journal of Thrombosis and Haemostasis, 2009: 7 (Suppl. 1): 322-327.	
	39. **	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.	
	40. **	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.	
	41. **	European First Office Action received for EP Application No. 13838945.7, Applicant: Inari Medical, Inc., Date of Mailing: October 26, 2018, 7 pages.	
	42. **	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.	
	43. **	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.	
	44. **	European Search Report for European Application No. 16876941.2, Date of Filing: December 19, 2016, Applicant: Inari Medical, Inc., Date of Mailing: July 18, 2019, 7 pages.	
	45. **	Extended European Search Report for European Application No. 16858462.1, Date of Filing: October 24, 2016, Applicant: Inari Medical, Inc., Date of Mailing: June 3, 2019, 10 pages.	
	46. **	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.	
	47. **	Partial Supplementary European Search Report for European Application No. 17864818.4, Date of Filing: May 21, 2019, Applicant: Inari Medical, Inc., Date of Mailing: April 24, 2020, 11 pages.	
	48. **	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.	
	49.	Extended European Search Report for European Application No. 20191581.6, Applicant: Inari Medical, Inc., Date of Mailing: March 31, 2021, 11 pages.	
	50.	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.	
	51.	Extended European Search Report for European Application No. 18853465.5, Applicant: Inari Medical, Inc., Date of Mailing: May 7, 2021, 2021, 7 pages.	
	52.	VORWERK, D. MD, et al., "Use of a Temporary Caval Filter to Assist Percutaneous Iliocaval Thrombectomy: Experimental Results." SCVIR, 1995, 4 pages.	
	53.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2020/014854, dated October 5, 2020 (13 pages)	
	54.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2020/018655, dated December 16, 2020 (22 pages)	
	55.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2020/017684, dated November 30, 2020 (19 pages)	
	56.	Extended European Search Report for EP Patent Appln. No. 20185092.2 dated September 11, 2020, 6 pages.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	57.	EP Examination Report for EP Patent Appln. No. 18745794.0 dated July 20, 2020, 4 pages.	
	58.	WIKIPEDIA; Embolectomy; retrieved from the internet: https://en.wikipedia.org/wiki/Embolectomy; 4 pgs.; retrieved/printed: 3/24/2016	
	59.	O'SULLIVAN; Thrombolysis versus thrombectomy in acute deep vein thrombosis; Interventional Cardiology; 3(5); pp. 589-596; October 2011	
	60.	CAPTURE VASCULAR SYSTEMS; (company website); retrieved from the internet: http://www.capturevascular.com; 3 pgs.; retrieved/printed: 3/24/2016	
	61.	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	
	62.	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	
	63.	PENUMBRA, INC.; Indigo® System (product information); retrieved from the internet: http://www.penumbrainc.com/peripheralpercutaneous-thromboembolectomy/indigo-system; 7 pgs.; retrieved/printed: 3/24/2016	
	64.	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	
	65.	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	
	66.	PCT International Search Report and Written Opinion for International Patent Appln. No. PCT/US2019/050467, Applicant Stryker Corporation, dated December 18, 2019 (17 pages)	
	67.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2017/029440, Applicant Stryker Corporation, mailed July 7, 2017	
	68.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2017/029472, Applicant Stryker Corporation, mailed July 7, 2017	
	69.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2017/035543, Applicant Stryker Corporation, mailed August 14, 2017.	
	70.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2017/029366, Applicant Stryker Corporation, mailed August 29, 2017.	
	71.	PCT International Search Report and Written Opinion for International Appln. No. PCT/US2017/050933, Applicant Stryker Corporation, forms PCT/ISA/210, 220, and 237, dated November 10, 2017 (16 pages)	
	72.	International search report and written opinion mailed February 28, 2018 for PCT/US2017/029345, Applicant Stryker Corporation 26 pages.	
	73.	Extended European Search Report mailed August 22, 2018 for European patent appln no. 16852212.6, 6 pages.	
	74.	Extended European Search Report mailed October 5, 2018 for European patent appln no. 18174891.4, 6 pages.	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

	75.	International search report and written opinion mailed November 14, 2018 for PCT/US2018/040937, Applicant Stryker Corporation 16 pages.	
	76.	International Search Report and Written Opinion mailed March 28, 2019 for International Appln. No. PCT /US2018/059607	
	77.	International Search Report and Written Opinion mailed May 6, 2016 for PCT/US2016/017982	
	78.	PCT International Search Report and Written Opinion for International Patent Appln. No. PCT/US2019/032601, Applicant Stryker Corporation, dated July 23, 2019 (12 pages)	
	79.	Extended European Search Report mailed October 8, 2019 for European Patent Application No. 19191925.7	
	80.	International Search Report and Written Opinion for International Patent Appln. No. PCT/US2019/050410 dated October 25, 2019.	
	81.	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.	
	82.	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.	
	83.	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.	
	84.	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.	
	85.	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.	
	86.		
	87.		
	88.		
	89.		
	90.		
	91.		

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.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

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).

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 **16/117,519** and filed on **August 30, 2018** and relied upon in this application for an earlier filing date under 35 U.S.C. § 120.

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	17/705,189 - Conf# 9367
	Filing Date	March 25, 2022
	First Named Inventor	Benjamin E. Merritt
	Art Unit	Not Yet Assigned
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	111552-8016.US03

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)	2022-04-22
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.**

INTERNATIONAL SEARCH REPORT

Int. ..ational Application No
PCT/US 98/10220

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61F2/01 A61M29/02

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 6 A61F A61B

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 95 05209 A (TECH. DEV. CENTER) 23 February 1995 see page 13, line 29 - page 15, line 11 see page 7, line 6 - line 10; figures 1,13-15	1-4,6-8, 36 5,9-35
Y	US 4 723 549 A (WHOLEY ET AL.) 9 February 1988 cited in the application see column 3, line 2 - line 66; figures 1-6	5,9-35

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document 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
21 August 1998	02/09/1998

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Moers, R

1

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 98/10220

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE WPI Week 8122 8 July 1981 Derwent Publications Ltd., London, GB; AN 78-70163A XP002075206 & SU 764 684 A (CHELY MED. INST.) see abstract; figures 1-5	1-3,9,36
X A	US 5 053 008 A (BAJAJ) 1 October 1991 see column 7, line 55 - column 8, line 47; figures 1-4	1,36 3,7,32, 35
A	US 5 470 314 A (WALINSKY PAUL) 28 November 1995 see column 7, line 13 - line 18	7,35

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

Ir. ational Application No
PCT/US 98/10220

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9505209 A	23-02-1995	AU 7567394 A	14-03-1995
US 4723549 A	09-02-1988	NONE	
US 5053008 A	01-10-1991	NONE	
US 5470314 A	28-11-1995	NONE	

Form PCT/ISA/210 (patent family annex) (July 1992)

Electronic Acknowledgement Receipt	
EFS ID:	45543248
Application Number:	17705189
International Application Number:	
Confirmation Number:	9367
Title of Invention:	HEMOSTASIS VALVES AND METHODS OF USE
First Named Inventor/Applicant Name:	Benjamin E. Merritt
Customer Number:	25096
Filer:	Matthew S. Williams/Michelle Burge
Filer Authorized By:	Matthew S. Williams
Attorney Docket Number:	111552-8016.US03
Receipt Date:	22-APR-2022
Filing Date:	25-MAR-2022
Time Stamp:	18:21:13
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	2022_04_22_IDS_1115528016 US03.pdf	401662 a70f0ed2bf7618059a7cb9e5749f4ff0b17df160	no	30

Warnings:

Information:					
This is not an USPTO supplied IDS fillable form					
2	Foreign Reference	AU2015210338B2.PDF	1431572 b994de1e291af8df7e330cb4e79fcf5a1feea09c	no	43
Warnings:					
Information:					
3	Foreign Reference	CN102186427B.PDF	5332864 adc4fbd5b60fd677928f1ea4947dd1342dedf617	no	29
Warnings:					
Information:					
4	Foreign Reference	CN103764049A.PDF	13983015 9acc1c733208867c51fded98e4d346f1e618e05e	no	92
Warnings:					
Information:					
5	Foreign Reference	CN104068910A.PDF	1474062 fbf0df391bd2aa718a2d85371b1b25a1f2bcf743	no	11
Warnings:					
Information:					
6	Foreign Reference	CN108348319B.PDF	2149414 c98c4c7b74db8add8fbdd45d9f4c205e8afd8cfb	no	117
Warnings:					
Information:					
7	Foreign Reference	CN110652645.PDF	12204935 ff43c4892d94a4895514dabbdc602246ad90729f	no	26
Warnings:					
Information:					
8	Foreign Reference	CN111281482A.PDF	2689673 a5f50836870f23180d85f32b16a95f6fedb4244a	no	117
Warnings:					
Information:					

9	Foreign Reference	EP1254634B1.PDF	299324 5440ce1287f280c417ba6559e6975eda8b951c13	no	10
Warnings:					
Information:					
10	Foreign Reference	GB1588072.PDF	2346986 df3133160c5dd4183b69813a7bae691d0a47c688	no	14
Warnings:					
Information:					
11	Foreign Reference	GB2498349.PDF	1699816 b3e71edb718f2bd46627a3c121435bc376467b67	no	17
Warnings:					
Information:					
12	Foreign Reference	JP2001522631_WO9923958.PDF	10520765 ebbf6d9a87725e349332323da00b6fa932878786	no	79
Warnings:					
Information:					
13	Foreign Reference	JP2004097807.PDF	1674226 7397471ffbd98fa5afab7a4e388379395a20788c	no	14
Warnings:					
Information:					
14	Foreign Reference	JP2011526820_WO2010003135-pto.PDF	9326127 9668d2021961ac95fe954f3ba00ddbcee84cd090	no	79
Warnings:					
Information:					
15	Foreign Reference	JP2005230132.PDF	1418039 91f897a35797b7f00b14461b78a9fd40aa662753	no	16
Warnings:					
Information:					

16	Foreign Reference	JP2005323702.PDF	1073889 20a463531da76203e73020da799720784a8aed2f	no	13
Warnings:					
Information:					
17	Foreign Reference	JP2006094876.PDF	1268445 59964441551d62dc65f75cde3a7786f63f6173bf	no	15
Warnings:					
Information:					
18	Foreign Reference	JPH06190049.PDF	514082 e52dffd1046096b0233f2c7d98b884df543669ed	no	7
Warnings:					
Information:					
19	Foreign Reference	WO0032118A1.PDF	996652 70a611e24809d877a2170d6b0aa7c06ec6be8cc4	no	46
Warnings:					
Information:					
20	Foreign Reference	WO0202162A2.PDF	1318708 dc3f48888b7d37566d129abf64f1b2cc000eca2b	no	75
Warnings:					
Information:					
21	Foreign Reference	WO1997017889.PDF	1244042 a6b78d99b21c5385fe46fc0d00c1db70bb079acc	no	32
Warnings:					
Information:					
22	Foreign Reference	WO2000053120A1.PDF	7770822 cfab257dc185907f26bb6f0bb84b0e53d01b4b2d	no	54
Warnings:					
Information:					

23	Foreign Reference	WO2004018916.PDF	1104508 665ef7d83c807ba4e88cf635cc21cecf511d56dd	no	30
Warnings:					
Information:					
24	Foreign Reference	WO2005046736.PDF	2650848 eb8392ff132ca9290c485129b4da7be742a481e8	no	87
Warnings:					
Information:					
25	Foreign Reference	WO2006110186.PDF	2760134 a724144a8ad6821398ffb7ac191adee34fb35e73	no	88
Warnings:					
Information:					
26	Foreign Reference	WO2007092820.PDF	2704277 1fbc1624807a25bd815fd934c2e415d498fd040d	no	76
Warnings:					
Information:					
27	Foreign Reference	WO2009082513.PDF	2380572 2c2f92290f609d5fa5ece942899f028d66fec235	no	51
Warnings:					
Information:					
28	Foreign Reference	WO2009086482.PDF	13723556 b73f2f7e6c560fdbc1e0600fb2e434630f739e8f	no	91
Warnings:					
Information:					
29	Foreign Reference	WO2009155571.PDF	1061273 30f86b4a43f58fc2671a01ebb7808db49d32d1f5	no	29
Warnings:					
Information:					

30	Foreign Reference	WO2010002549.PDF	517264 d441f1be03335183c237246c02d341a962afea05	no	4
Warnings:					
Information:					
31	Foreign Reference	WO2010010545.PDF	10019013 932f1fb2f08d39cf3121d7ab9c621f7494d087df	no	189
Warnings:					
Information:					
32	Foreign Reference	WO2010023671.PDF	5063748 7f2d85db36b76e0b0b755d3147fc8f2f3e4c013e	no	96
Warnings:					
Information:					
33	Foreign Reference	WO2010049121.PDF	1836100 d13298808b1c943428be286fb7f2c61227c5fcc3	no	36
Warnings:					
Information:					
34	Foreign Reference	WO2010102307.PDF	4883420 675a2ff16bec4e2006317034640feda9dd250e9d	no	101
Warnings:					
Information:					
35	Foreign Reference	WO2011054531.PDF	2068444 326c76a0138b750932f287bf6454fb8a570bc5e6	no	42
Warnings:					
Information:					
36	Foreign Reference	WO2011073176.PDF	899792 a97d7278626ccaf61ca62f915cf64fe4f7c7c8af	no	23
Warnings:					
Information:					

37	Foreign Reference	WO2012009675.PDF	9261394 f1c03e1a28f1b91dd777c50706bffee74c10bba8	no	108
Warnings:					
Information:					
38	Foreign Reference	WO2012049652A1.PDF	880736 f974464adda3331654eb291df46f41be8d31d434	no	38
Warnings:					
Information:					
39	Foreign Reference	WO2012065748.PDF	836766 5966cd1889f5635cd0db77aa3b81e619dcb11756	no	17
Warnings:					
Information:					
40	Foreign Reference	WO2012162437.PDF	8288894 542988758150336258a3378e7a3bf0a2c567c972	no	64
Warnings:					
Information:					
41	Foreign Reference	WO2014047650.PDF	1505144 91d81aaefa5e699416b2f26e8b0bb87d8d96b305	no	40
Warnings:					
Information:					
42	Foreign Reference	WO2014081892.PDF	2582813 b90fd5c7304c28cbab2c79b39673ea2d363f567a	no	60
Warnings:					
Information:					
43	Foreign Reference	WO2015006782.PDF	2846400 428a8586d44e0f95afe865731298317d145c3e02	no	69
Warnings:					
Information:					

44	Foreign Reference	WO2015061365.PDF	1771154 b37a30e6f5cf3f6bc0a76001245559c3695b9ede	no	39
Warnings:					
Information:					
45	Foreign Reference	WO2015189354A1.PDF	2551153 af0aa9708960609e352df9eb5cc7c079ae344b9e	no	76
Warnings:					
Information:					
46	Foreign Reference	WO2017058280A1.PDF	3536468 7a89a79e311750b4f8960c88413c5c4d32474578	no	91
Warnings:					
Information:					
47	Foreign Reference	WO2017189535A2.PDF	2787502 8d5595555472a1ac4e2d1b71dd2d963ca006fc9c	no	104
Warnings:					
Information:					
48	Foreign Reference	WO2017189550A1.PDF	1146047 b8a87b38b48c534810edb7e71a0495850c150766	no	61
Warnings:					
Information:					
49	Foreign Reference	WO2017189591A1.PDF	883076 06eb1404c357250b2de7c2568f19e1392fff4832	no	46
Warnings:					
Information:					
50	Foreign Reference	WO2017189615A1.PDF	1045727 ad6efde12f472f577abde4f363cfc97000fb2014	no	54
Warnings:					
Information:					

51	Foreign Reference	WO2017210487A1.PDF	1221005 bf2ac1e5b1fd0339bd086b40ea82dbb4bf78ec5	no	50
Warnings:					
Information:					
52	Foreign Reference	WO2018049317A1.PDF	2915748 159f4513de82358e28b30f067c85c8ca20551351	no	78
Warnings:					
Information:					
53	Foreign Reference	WO2018148174.PDF	12922819 4e048abd77e2d04c55e7e31438c6b9fbd47d3f22	no	239
Warnings:					
Information:					
54	Foreign Reference	WO2019010318A1.PDF	3247965 3c30436cfd75d5eb5655ef4e0394cf8bc8c7c54d	no	83
Warnings:					
Information:					
55	Foreign Reference	WO2019094456A1.PDF	4473296 c0bcbe984bdede5628a317a5cf22852005131b56	no	122
Warnings:					
Information:					
56	Foreign Reference	WO2019222117A1.PDF	2218519 c92dc4c82dbc4ac969eea47a9a6216d88e746c72	no	61
Warnings:					
Information:					
57	Foreign Reference	WO2019246240A1.PDF	2742705 f477fea3cfc03f8188440b640ada0c1ee80a1127	no	49
Warnings:					
Information:					

58	Foreign Reference	WO2021067134.PDF	1594586 b19251b4e1cb413e40001138a0d78d333e05166c	no	36
Warnings:					
Information:					
59	Foreign Reference	WO2021076954.PDF	1739947 5ddab37fbea4e96ca242180b12bcf170765bd2cf	no	39
Warnings:					
Information:					
60	Foreign Reference	WO2020036809-pto.PDF	3767602 81bd7163fa0f51888fcad1ac67773f66c125f93d	no	95
Warnings:					
Information:					
		Total Files Size (in bytes):	209579535		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: MATTHEW S. WILLIAMS
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

APR 21 2021

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 111552-8020WO00	Date of mailing *(day/month/year)* APR 14 2021 **FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US2020/065645	International filing date *(day/month/year)* 17 December 2020
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
   (Facsimile No.: +41 22 338 82 70)

   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, VA 22313-1450 Facsimile No. 571-273-8300	Authorized officer Blaine R. Copenheaver Telephone No. PCT Helpdesk: 571-272-4300

Form PCT/ISA/220 (revised January 2019)

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
111552-8020WO00		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/US2020/065645	17 December 2020	18 December 2019
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. 3A

   ☒ 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.

Form PCT/ISA/210 (first sheet) (July 2019)

Imperative EX1002

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2020/065645

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(s).

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.:
1-10

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/US2020/065645

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61B 17/221; A61B 17/22; A61B 17/3207; A61B 17/34; A61F 2/01; A61F 2/86 (2021.01)
CPC - A61B 17/221; A61B 17/320725; A61B 17/3415; A61B 2017/22041; A61B 2017/22094; A61B 2017/2212; A61B 2017/2215; A61B 2017/320741; A61F 2/011; A61F 2/013; A61F 2002/016; A61F 2002/018; A61F 2230/0069 (2021.02)

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 2014/0371779 A1 (NEURAVI LIMITED) 18 December 2014 (18.12.2014) entire document	1-10
A	US 2011/0160763 A1 (FERRERA et al) 30 June 2011 (30.06.2011) entire document	1-10
A	US 2017/0112513 A1 (INARI MEDICAL) 27 April 2017 (27.04.2017) entire document	1-10
A	US 2018/0092652 A1 (INARI MEDICAL, INC.) 05 April 2018 (05.04.2018) entire document	1-10

☐ 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
25 March 2021	APR 14 2021
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, VA 22313-1450 Facsimile No. 571-273-8300	Authorized officer Blaine R. Copenheaver Telephone No. PCT Helpdesk: 571-272-4300

Form PCT/ISA/210 (second sheet) (July 2019)

Continued from Box No. III Observations where unity of invention is lacking

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 examined, the appropriate additional examination fees must be paid.

Group I, claims 1-10, are drawn to a coring element for coring a vascular thrombus within a blood vessel of a patient.

Group II, claims 11-28, are drawn to a dilator assembly for deploying an expandable funnel coupled to a distal portion of an introducer sheath.

The inventions listed as Groups I-II 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: the special technical feature of the Group I invention: the coring element comprising: a unitary structure having a first region adjacent to a proximal portion of the unitary structure, wherein the first region includes a first mouth configured to core the vascular thrombus; a second region distal of the first region, wherein the second region is generally tubular and includes a first plurality of interconnected struts; a third region distal of the second region, wherein the third region includes a second mouth configured to core the vascular thrombus; and a fourth region distal of the third region, wherein the fourth region is generally tubular and includes a second plurality of interconnected struts as claimed therein is not present in the invention of Group II. The special technical feature of the Group II invention: a dilator assembly for deploying an expandable funnel coupled to a distal portion of an introducer sheath, the dilator assembly comprising: a first shaft defining a lumen; a second shaft slidably positioned within the lumen of the first shaft; a retention sheath coupled to the second shaft and configured to receive and constrain the funnel therein; and a control assembly including an actuator operably coupled to the first and second shafts, wherein movement of the actuator from a first position to a second position advances the first and second shafts together to deploy the funnel from the retention sheath, and wherein movement of the actuator from the second position to a third position advances the first shaft relative to the second shaft as claimed therein is not present in the invention of Group I.

Groups I and II lack unity of invention because even though the inventions of these groups require the technical feature of capturing a vascular thrombus within a blood vessel of a patient, this technical feature is not a special technical feature as it does not make a contribution over the prior art.

Specifically, US 2018/0092652 A1 to Inari Medical, Inc. teaches capturing a vascular thrombus within a blood vessel of a patient (The method includes retracting the thrombus extraction device proximally so that the coring portion cores and separates a portion of the vascular thrombus from the venous vessel wall while the mesh structure captures the vascular thrombus portion. The method includes withdrawing the thrombus extraction device from the patient to remove the vascular thrombus portion from the venous vessel, para. 0008. One aspect of the present disclosure relates to a method for removal of thrombus from a blood vessel in a body of a patient, which blood vessel can be an artery or a vein, para. 0017).

Since none of the special technical features of the Group I or II inventions are found in more than one of the inventions, unity of invention is lacking.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: MATTHEW S. WILLIAMS
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING
APR 21 2021
PERKINS COIE LLP

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	APR 14 2021
Applicant's or agent's file reference 111552-8020WO00	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2020/065645	17 December 2020	18 December 2019

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

IPC(8) - A61B 17/221; A61B 17/22; A61B 17/3207; A61B 17/34; A61F 2/01; A61F 2/86 (2021.01)
CPC - A61B 17/221; A61B 17/320725; A61B 17/3415; A61B 2017/22041; A61B 2017/22094; A61B 2017/2212; A61B 2017/2215; A61B 2017/320741; A61F 2/011; A61F 2/013; A61F 2002/016; A61F 2002/018; A61F 2230/0069 (2021.02)

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, VA 22313-1450 Facsimile No. 571-273-8300	25 March 2021	Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 Telephone No. 571-272-4300

Form PCT/ISA/237 (cover sheet) (revised January 2019)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2020/065645

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2020/065645

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 examined, the appropriate additional examination fees must be paid.

Group I, claims 1-10, are drawn to a coring element for coring a vascular thrombus within a blood vessel of a patient.

Group II, claims 11-28, are drawn to a dilator assembly for deploying an expandable funnel coupled to a distal portion of an introducer sheath.

The inventions listed as Groups I-II 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: the special technical feature of the Group I invention: the coring element comprising: a unitary structure having a first region adjacent to a proximal portion of the unitary structure, wherein the first region includes a first mouth configured to core the vascular thrombus; a second region distal of the first region, wherein the second region is generally tubular and includes a first plurality of interconnected struts; a third region distal of the second region, wherein the third region includes a second mouth configured to core the vascular thrombus; and a fourth region distal of the third region, wherein the fourth region is generally tubular and includes a second plurality of interconnected struts as claimed therein is not present in the invention of Group II. The special technical feature of the Group II invention: a dilator assembly for deploying an expandable funnel coupled to a distal portion of an introducer sheath, the dilator assembly comprising: a first shaft defining a lumen; a second shaft slidably positioned within the lumen of the first shaft; a retention sheath coupled to the second shaft and configured to receive and constrain the funnel therein; and a control assembly including an actuator operably coupled to the first and second shafts, wherein movement of the actuator from a first position to a second position advances the first and second shafts together to deploy the funnel from the retention sheath, and wherein movement of the actuator from the second position to a third position advances the first shaft relative to the second shaft as claimed therein is not present in the invention of Group I.

Groups I and II lack unity of invention because even though the inventions of these groups require the technical feature of capturing a vascular thrombus within a blood vessel of a patient, this technical feature is not a special technical feature as it does not make a contribution over the prior art.

Specifically, US 2018/0092652 A1 to Inari Medical, Inc. teaches capturing a vascular thrombus within a blood vessel of a patient (The method includes retracting the thrombus extraction device proximally so that the coring portion cores and separates a portion of the vascular thrombus from the venous vessel wall while the mesh structure captures the vascular thrombus portion. The method includes withdrawing the thrombus extraction device from the patient to remove the vascular thrombus portion from the venous vessel, para. 0008. One aspect of the present disclosure relates to a method for removal of thrombus from a blood vessel in a body of a patient, which blood vessel can be an artery or a vein, para. 0017).

Since none of the special technical features of the Group I or II inventions are found in more than one of the inventions, unity of invention is lacking.

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. 1-10

Form PCT/ISA/237 (Box No. IV) (revised January 2019)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2020/065645

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	2	YES
	Claims	1, 3-10	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-10	NO
Industrial applicability (IA)	Claims	1-10	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1 and 3-10 lack novelty under PCT Article 33(2) as being anticipated by Neuravi Limited (hereinafter Neuravi).

Regarding claim 1, Neuravi discloses a coring element for coring a vascular thrombus within a blood vessel of a patient (clot retrieval device for removing occlusive clot from a blood vessel, title; clot retrieval device 1, Fig. 1a), the coring element comprising: a unitary structure (outer member 2, Figs. 1a, 1g and 1h) having a first region (expandable member 26, Fig. 1h) adjacent to a proximal portion of the unitary structure (collar 12, Fig. 1g; The proximal end of the outer member may comprise of a collar 12, para. [0196]), wherein the first region includes a first mouth (first opening 22, Fig. 1g) configured to core the vascular thrombus (inlet openings 22 are provided in the outer member 2 these inlets 22 provide the primary movement freedom available to the clot and so the expansion of the outer member 2 urges the clot into the reception space 11. The outer member 2 has multiple inlet mouths 22 to accept the clot, para. [0198]); a second region distal of the first region (expandable member 27, Fig. 1h), wherein the second region is generally tubular (see Fig. 1g) and includes a first plurality of interconnected struts (struts 48 interconnected at junction 41, Fig. 1h); a third region distal of the second region (region between member 27 and member 28, Figs. 1g and 1h), wherein the third region includes a second mouth (second opening 22, Fig. 1g) configured to core the vascular thrombus (inlet openings 22 are provided in the outer member 2 these inlets 22 provide the primary movement freedom available to the clot and so the expansion of the outer member 2 urges the clot into the reception space 11. The outer member 2 has multiple inlet mouths 22 to accept the clot, para. [0198]); and a fourth region distal of the third region (expandable member 28, Fig. 1h), wherein the fourth region is generally tubular (see Fig. 1g) and includes a second plurality of interconnected struts (struts 23 that interconnect at eyelet junctions comprising radiopaque markers 25 as shown in Figs. 1g and 1h).

Regarding claim 3, Neuravi discloses the coring element of claim 1 and further discloses wherein the unitary structure extends along a longitudinal axis (central horizontal axis in Figs. 1g and 1h), and wherein the first region includes a pair of first curved struts that curve in opposite directions around the longitudinal axis and intersect at a pair of first junctions to define the first mouth (see Figs. 1a, 1g and 1h showing the member 26 including a pair of first curved struts 43 extending from member 26 in Fig. 1h towards member 27 in opposite directions, and intersect at a proximal end of struts 43 at junction points 46 to define first mouth 22).

Regarding claim 4, Neuravi discloses the coring element of claim 1 and further discloses wherein the unitary structure extends along a longitudinal axis (central horizontal axis in Figs. 1g and 1h), wherein the third region includes (a) a pair of upper curved struts that curve around the longitudinal axis and intersect each other at an upper junction (see Figs. 1a, 1g and 1h showing the third region including a first upper curved strut extending from member 28 in Fig. 1h towards member 27, a second upper curved strut 43 extending from member 27, the first and second upper curved struts intersecting at upper junction 41) and (b) a pair of lower curved struts that curve around the longitudinal axis and intersect each other at a lower junction, and wherein the lower and upper curved struts define the second mouth (see Figs. 1a, 1g and 1h showing the third region including a first lower curved strut extending from member 28 in Fig. 1h towards member 27, a second lower curved strut 43 extending from member 27, the first and second lower curved struts intersecting at lower junction 41, the lower and upper curved struts defining the second mouth 22).

Regarding claim 5, Neuravi discloses the coring element of claim 4 and further discloses wherein the lower and upper curved struts define (a) a first mouth portion opening in a first direction generally orthogonal to the longitudinal axis (see Fig. 1a showing the lower and upper curved struts of second mouth 22 having a first mouth portion opening in a first upward direction) and (b) a second mouth portion opening in a second direction generally orthogonal to the longitudinal axis, and wherein the first and second mouth portions define the second mouth (see Fig. 1a showing the lower and upper curved struts of second mouth 22 having a second mouth portion opening in a second downward direction, the first and second mouth portions defining second mouth 2).

Regarding claim 6, Neuravi discloses the coring element of claim 5 and further discloses wherein the first direction is generally opposite to the second direction (see Fig. 1a showing the first upward direction opposite to the second downward direction).

Regarding claim 7, Neuravi discloses the coring element of claim 1 and further discloses wherein the coring element is expandable from a compressed delivery configuration to an expanded deployed configuration (The outer member is configured to self-expand upon release from a restraining sheath (such as a microcatheter), para. [0198]).

Regarding claim 8, Neuravi discloses the coring element of claim 7 and further discloses wherein the coring element is configured to self-expand (The outer member is configured to self-expand upon release from a restraining sheath (such as a microcatheter), para. [0198]).

Supplemental Box

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

Regarding claim 9, Neuravi discloses the coring element of claim 8 and further discloses wherein the coring element is made from a shape memory material (Both the inner and outer expandable members are desirably made from a material capable of recovering its shape automatically once released from a highly strained delivery configuration. A superelastic material such as Nitinol or an alloy of similar properties is particularly suitable, para. [0190]).

Regarding claim 10, Neuravi discloses the coring element of claim 1 and further discloses wherein the fourth region of the unitary structure is configured to be connected to a braided filament mesh structure (see Fig. 1a showing member 28 comprising a collar at junction point 9 for connecting to inner member 3; The distal end of the coil 18 on the inner tubular member 3 is bonded to the distal collar of the outer member 2 by adhesive, para. [0206]; the inner member comprises a braided structure, formed from one or more wires. The braided structure comprises a series of opposing spirals, with multiple overlap points where one wire crosses over another, para. [0226]).

Claim 2 lacks an inventive step under PCT Article 33(3) as being obvious over Neuravi Limited (hereinafter Neuravi).

Regarding claim 2, Neuravi discloses the coring element of claim 1 in a first embodiment but does not disclose in the first embodiment wherein the first mouth is radially offset from the second mouth.
However, Neuravi teaches in a second embodiment a coring element (outer expandable member shown in Figs. 21a and 21b; FIGS. 21a and 21b show an alternative embodiment of an outer expandable member such as part 2 of FIG. 1, para. [0245]) comprising a first mouth (large cell 973, Fig. 21a) and a second mouth (large cell 978, Fig. 21a), wherein the first mouth is radially offset from the second mouth (The large inlet window cells facilitate movement of the clot into the outer member and into the reception space between the outer member and inner tubular member, para. [0245]; The distribution of the large inlet windows and smaller cells is key to the performance of the device and in this configuration the large inlet windows and smaller scaffolded cells are generally alternated along the length of the device, para. [0246]).
Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the coring element of the first embodiment of Neuravi to include wherein the first mouth is radially offset from the second mouth, as taught by the second embodiment of Neuravi, for the purpose of providing means for engaging a clot by dislodging it from a patient's vessel with interconnected struts or scaffolds and means for collecting the clot into the coring element with large openings between the scaffolds and offset from each other large opening (Neuravi second embodiment, The large inlet window cells facilitate movement of the clot into the outer member and into the reception space between the outer member and inner tubular member. The smaller highly scaffolded cells engage with the clot and help dislodge the clot from the vessel. They also promote the movement of the clot from the highly scaffolded areas into the inlet windows of the device, para. [0245]).

Claims 1-10 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

Search History:

Limited Classification Search

The Patent Analyst performed a limited classification search within the following US, IPC, CPC, ECLA, or F-Term classification areas:

CPC Class/Subclass(es): A61B 17/221; A61B 17/320725; A61B 17/3415; A61B 2017/22041; A61B 2017/22094; A61B 2017/2212; A61B 2017/2215; A61B 2017/320741; A61F 2/011; A61F 2/013; A61F 2002/016; A61F 2002/018; A61F 2230/0069 (2021.02)

IPC (8) Class/Subclass(es): A61B 17/221; A61B 17/22; A61B 17/3207; A61B 17/34; A61F 2/01; A61F 2/86 (2021.01)

U.S. Class/Subclass(es): 604/104; 604/164.05; 606/127; 606/159; 606/194; 606/198; 606/200

See Global Search Results.

Global Patent Literature Text Search

The Patent Analyst performed the following global text search, which was not limited by classification but may or may not have been limited by other criteria:

Minesoft PatBase: https//www.patbase.com

#	Search query	Results
1	PA=(INARI MEDICAL)	7
2	INV=((THRESS w2 John))	3
3	TAC=(vascular w3 thrombus)	116
4	3 and strut%	2
5	CPC=(A61B17/221 or A61B17/320725 or A61B2017/22094 or A61B2017/2212 or A61B2017/320741 or A61B2017/2215 or A61F2/011 or A61F2/013 or A61F2002/016 or A61B17/3415 or A61B2017/22041 or A61F2002/018 or A61F2230/0069)	8,713
6	5 and mouth*	239
7	6 and strut*	52
8	7 and (tubular* or cylind*)	33
9	8 and (strut* w10 (curv* or taper* or arch* or arc))	5
10	IC=(A61B17/22 or A61B17/221 or A61B17/3207 or A61B17/34 or A61F2/01 or A61F2/86)	46,593
11	10 and (mouth* or ((opening% or aperture% or hole%) w5 strut%))	1,007
12	11 and (strut* w10 (curv* or taper* or arch* or arc))	30
13	12 and (tubular* or cylind*)	20
14	UC=(606/127 or 606/159 or 604/104 or 604/164.05 or 606/194 or 606/198 or 606/200)	7,348
15	14 and (mouth* or ((opening% or aperture% or hole%) w5 strut%))	262

16	15 and (strut* w10 (curv* or taper* or arch* or arc))	22
17	16 and (tubular* or cylind*)	12

Google Patents: https://patents.google.com

#	Search query	Results
1	occlusive clot removing device comprising first and second mouth openings connected by a plurality of struts	1,496
2	mesh device comprising first and second openings for removing a blood vessel clot	40,948
3	a coring element for coring a vascular thrombus within a blood vessel of a patient	11,255
4	devices and methods for treating vascular occlusion	136,839

Computer Accessed Text Databases Searched

The Patent Analyst searched the following computer accessed text databases:

Google: https://www.google.com/

#	Search query	Results
1	devices and methods for treating vascular occlusion	9,200,000
2	a coring element for coring a vascular thrombus within a blood vessel of a patient	2,410,000
3	mesh device comprising first and second openings for removing a blood vessel clot	315,000
4	occlusive clot removing device comprising first and second mouth openings connected by a plurality of struts	36,800

Google Scholar: https://scholar.google.com/

#	Search query	Results
1	devices and methods for treating vascular occlusion	66,700
2	a coring element for coring a vascular thrombus within a blood vessel of a patient	1,950
3	mesh device comprising first and second openings for removing a blood vessel clot	11,700
4	occlusive clot removing device comprising first and second mouth openings connected by a plurality of struts	3

Date search was completed: 25 March 2021

EA/DD

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To MATTHEW S. WILLIAMS
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

OCT 04 2021

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)*	SEP 28 2021
Applicant's or agent's file reference 111552-8026WO00	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US 21/35965	International filing date *(day/month/year)* 04 June 2021 (04.06.2021)
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)

Imperative EX1002

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
111552-8026WO00		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 21/35965	04 June 2021 (04.06.2021)	05 June 2020 (05.06.2020)
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 2 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. 10C

☒ 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.

Form PCT/ISA/210 (first sheet) (July 2019)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US 21/35965

A. CLASSIFICATION OF SUBJECT MATTER

IPC - A61B 17/00, A61B 17/22, A61B 17/3207, A61M 25/10, A61M 1/00 (2021.01)

CPC - A61M 2025/1045, A61B 17/22, A61B 17/221, A61B 2217/005, A61M 2025/109

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 -- Y	US 5,011,488 A (Ginsburg) 30 April 1991 (30.04.1991), entire document	1-10, 13-17, 19-20 ---------- 18
X	US 5,800,457 (Gelbfish) 1 Septemebr 1998 (01.09.1998), entire document	8, 11-12
Y	WO 2009/082513 A1 (Tex Medical) 2 July 2009 (02.07.2009), entire document	18
A	US 2002/0161392 A1 (Dubrul) 31 October 2002 (31.10.2002), entire document	1-20
A	WO 2018/148174 A1 (KP Medcure, Inc) 16 August 2018 (16.08.2018), entire document	1-20

☐ 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
6 August 2021	SEP 28 2021
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/210 (second sheet) (July 2019)

Imperative EX1002

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: MATTHEW S. WILLIAMS
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

OCT 04 2021

PERKINS COIE LLP

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	SEP 28 2021
Applicant's or agent's file reference 111552-8026WO00	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 21/35965	04 June 2021 (04.06.2021)	05 June 2020 (05.06.2020)

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

IPC - A61B 17/00, A61B 17/22, A61B 17/3207, A61M 25/10, A61M 1/00 (2021.01)

CPC - A61M 2025/1045, A61B 17/22, A61B 17/221, A61B 2217/005, A61M 2025/109

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	6 August 2021	Kari Rodriquez PCT Help Desk Telephone No 571-272-4300

Form PCT/ISA/237 (cover sheet) (revised January 2019)

Imperative EX1002

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No
PCT/US 21/35965

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:

☐ in the form of an Annex C/ST.25 text file.

☐ on paper or in the form of an image file

b. ☐ furnished together with the international application under PCT Rule 13*ter* 1(a) for the purposes of international search only in the form of an Annex C/ST 25 text file.

c ☐ furnished subsequent to the international filing date for the purposes of international search only:

☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a))

☐ on paper or in the form of an image file (Rule 13*ter* 1(b) and Administrative Instructions, Section 713).

4 ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished

5. Additional comments:

Form PCT/ISA/237 (Box No. I) (revised January 2019)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/35965

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	11-12, 18	YES
	Claims	1-10, 13-17, 19-20	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-20	NO
Industrial applicability (IA)	Claims	1-20	YES
	Claims	None	NO

2 Citations and explanations.
Claims 1-10, 13-17, 19-20 lack novelty under PCT Article 33(2) as being anticipated by US 5,011,488 A to Ginsburg.

As per claim 1, Ginsburg discloses a funnel catheter assembly, comprising:
an outer shaft defining a lumen (12, Fig. 1 - outer shaft with a lumen);
an inner shaft extending through the lumen and having a proximal portion and a distal portion (14 Fig. 1 - inner shaft extending through 12 lumen having a proximal and distal end);
an expandable funnel coupled to the distal portion of the inner shaft (30, Fig. 1 - expandable funnel 30 coupled to distal portion of inner shaft); and
a control assembly (22, 40, Fig. 1) configured to move the funnel between a first position and a second position, wherein in the first position, the funnel is constrained within the lumen of the outer shaft (Fig. 2A - funnel is constrained within lumen of the outer shaft), and in the second position, the funnel is positioned at least partially outside the lumen of the outer shaft such that the funnel can expand (Fig. 2C - funnel is outside the lumen of the outer shaft such funnel can expand).

As per claim 2, Ginsburg discloses the funnel catheter assembly of claim 1 wherein the control assembly (22, 40, Fig. 1) is coupled to the outer shaft and configured to move the outer shaft relative to the inner shaft (Fig. 1; Col 5, ln 44-46 - see how control assembly is coupled to outer shaft and is capable of being used to move outer shaft relative to inner shaft).

As per claim 3, Ginsburg discloses the funnel catheter assembly of claim 1 wherein the control assembly includes an actuator movable to move the funnel between the first and second positions (24, Fig. 1 - proximal housing movement).

As per claim 4, Ginsburg discloses the funnel catheter assembly of claim 3 wherein the actuator is a slider (Col 5, ln 44-46 - pressure applied to actuator 24 provides axial sliding motion of the outer tube and inner tube).

As per claim 5, Ginsburg discloses the funnel catheter assembly of claim 1 wherein the funnel (30, Fig. 1) includes a proximal portion and a distal portion (Fig. 1 - funnel end connected to inner shaft 14 is proximal and distal is opposite end), and wherein the proximal portion of the funnel is coupled to the distal portion of the inner shaft (Fig. 1 - proximal portion of funnel is coupled to distal portion of inner shaft).

As per claim 6, Ginsburg discloses the funnel catheter of claim 5 wherein the distal portion of the funnel is coupled to the outer shaft (Fig. 1, Fig. 2C - when funnel 30 is retracted, distal portion of funnel is coupled to outer shaft).

As per claim 7, Ginsburg discloses the funnel catheter assembly of claim 1, further comprising a sealable hub (46, Fig. 1 - sealing member used to seal the proximal end tube) and a side port (48, Fig. 1 - aspiration port), wherein the side port (48, Fig. 1 - aspiration port) is rotatably coupled (Col 4, ln 61-66 - inner and outer tube can rotate thus the side port is rotatably coupled) between the control assembly (22, 40 Fig. 1) and the sealable hub (46, Fig. 1 - sealing open proximal end of tube).

-*-Continued in Supplemental Box-*-

Supplemental Box

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

As per claim 8, Ginsburg discloses a funnel catheter assembly, comprising:
an outer shaft defining an outer lumen (12, Fig. 1 - outer shaft with a lumen);
an inner shaft extending through the outer lumen and having a proximal portion and a distal portion (14 Fig. 1 - inner shaft extending through 12 lumen having a proximal and distal end);
an expandable funnel coupled to the distal portion of the inner shaft (30, Fig. 1 - expandable funnel 30 coupled to distal portion of inner shaft); and
a control assembly (22, 40, Fig. 1) operably coupled to the proximal portion of the outer shaft and configured to move the outer shaft between a first position and a second position (22, 40, Fig. 1 - both 22 and 40 are used to move the outer shaft between the first and second position) wherein in the first position, the outer shaft is positioned at least partially over the funnel to radially constrain the funnel (Fig. 2C - outer shaft is position to radially constrain the funnel), and
in the second position, the outer shaft is retracted proximally relative to the funnel such that the funnel can radially expand (Fig. 2A - outer shaft is retracted to allow the funnel to expand).

As per claim 9, Ginsburg discloses the funnel catheter assembly of claim 8 wherein the control assembly includes a housing (22, Fig. 1) and an actuation member (40, Fig. 1), wherein the actuation member is coupled to a proximal portion of the outer shaft (40, Fig. 1 - actuation member is couple to proximal portion of outer shaft), and wherein the actuation member is slidable along the housing to move the outer shaft between the first and second positions (Fig. 1 -

As per claim 10, Ginsburg discloses the funnel catheter assembly of claim 8 wherein the funnel is configured to self expand (Col 6, ln 13-30 - spring elements can be used to allow the funnel to self-expand).

As per claim 13, Ginsburg discloses the funnel catheter assembly of claim 8 wherein the inner shaft defines an inner lumen sized to receive a dilator (70, Fig. 5C - inflatable balloon to come into contact with inside wall of blood vessel).

As per claim 14, Ginsburg discloses a method of operating a funnel catheter assembly during an intravascular procedure on a patient, the method comprising:
at least partially inserting an inner shaft (14 Fig. 1), an outer shaft (12, Fig. 1), and a funnel (30, Fig. 1) of the funnel catheter assembly into the vasculature of the patient (Fig. 5A; Col 6, ln 39-40 - assembly is introduced into vasculature of patient);
advancing the inner shaft (14 Fig. 1), the outer shaft (12, Fig. 1), and the funnel (30, Fig. 1) together to a deployment position within the vasculature of the patient (Col 6, ln 48-50 - system is positioned so it lies just outside region of stenosis), wherein the funnel is sheathed within a lumen of the outer shaft during the advancement (Fig. 5A - funnel is sheathed within a lumen during advancement);
moving the outer shaft relative to the inner shaft to unsheathe the funnel and permit the funnel to expand to an expanded position (Col 6, ln 48-60 - outer shaft is moved relative to inner shaft to unsheathe funnel to allow funnel to expand);
maintaining the funnel in the expanded position during at least a portion of the intravascular procedure (Fig. 5C-5E - funnel is maintained in expanded position during a portion of the procedure);
moving the outer shaft relative to the inner shaft and/or moving the inner shaft relative to the outer shaft to sheath the funnel within the lumen of the outer shaft (Col 7, ln 4-12 - outer shaft is moved relative to inner to sheath the funnel); and
withdrawing the funnel catheter assembly from the patient (Col 7, ln 12-15 - assembly is removed from patient).

As per claim 15, Ginsburg discloses the method of claim 14 wherein the funnel is self-expandable (30, Fig. 1 - expandable funnel 30 coupled to distal portion of inner shaft), and wherein moving the outer shaft relative to the inner shaft to unsheathe the funnel includes permitting the funnel to self-expand to the expanded position (Col 6, ln 49-60 - outer shaft is moved relative to inner shaft to allow funnel to self-expand).

As per claim 16, Ginsburg discloses the method of claim 14 wherein moving the outer shaft relative to the inner shaft to unsheathe the funnel includes moving a slider of a control assembly of the funnel catheter assembly from a first position to a second position, and wherein the slider is coupled to a
proximal portion of the outer shaft (24, Fig. 1; Col 5, ln 44-46 -outer shaft is moved relative to inner shaft to unsheathe the funnel by moving a slider 24 which is coupled to proximal portion of outer shaft).

As per claim 17, Ginsburg discloses the method of claim 14 wherein moving the outer shaft relative to the inner shaft to unsheathe the funnel includes rotating a rotatable element of a control assembly of the funnel catheter assembly from a first position to a second position (Col 4, ln 61-68 - inner and outer shaft are free to rotate in respect to each other).

As per claim 19, Ginsburg discloses the method of claim 14 wherein,
inserting the inner shaft (14 Fig. 1), the outer shaft (12, Fig. 1), and the funnel (30, Fig. 1) into the vasculature of the patient further includes at least partially inserting a dilator positioned within the inner shaft into the vasculature of the patient (Fig. 5A; Col 6, ln 39-40 - assembly is introduced into vasculature of patient); and
advancing the inner shaft (14 Fig. 1), the outer shaft (12, Fig. 1), and the funnel (30, Fig. 1) further includes advancing the inner shaft (14 Fig. 1), the outer shaft (12, Fig. 1), and the funnel (30, Fig. 1), and the dilator (70, Fig. 5C - inflatable balloon to come into contact with inside wall of blood vessel) together to the deployment position (Col 6, ln 48-50 - system is positioned so it lies just outside region of stenosis).

-*-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 per claim 20, Ginsburg discloses the method of claim 14 wherein moving the outer shaft relative to the inner shaft to unsheathe the funnel includes moving the outer shaft in a first direction (Col 6, ln 48-60 - outer shaft is moved relative to inner shaft to unsheathe funnel to allow funnel to expand), and wherein the method further comprises moving the outer shaft relative to the inner shaft to sheath the funnel by moving the outer shaft in a second direction opposite to the first direction (Col 7, ln 4-12 - outer shaft is moved relative to inner to sheath the funnel).

Claims 8, 11-12 lack novelty under PCT Article 33(2) as being anticipated by US 5,800,457 to Gelbfish.

As per claim 8, Gelbfish discloses a funnel catheter assembly, comprising:
an outer shaft defining an outer lumen (26, Fig. 2 - outer shaft with outer lumen);
an inner shaft extending through the outer lumen and having a proximal portion and a distal portion (12, Fig. 3D - inner shaft extending through outer lumen 26 and having a proximal and distal portion);
an expandable funnel coupled to the distal portion of the inner shaft (18, Fig. 3D - expandable funnel coupled to distal portion of inner shaft 12); and
a control assembly operably coupled to the proximal portion of the outer shaft (22, Fig. 2; Col 7, ln 11-15 - control unit 22 includes and is coupled to proximal portion of outer shaft 26) and configured to move the outer shaft between a first position and a second position (Col 7, ln 9-15 - outer member 26 is slide over inner shaft 12),
wherein
in the first position, the outer shaft is positioned at least partially over the funnel to radially constrain the funnel (Fig. 3A - outer shaft is positioned over the funnel to constrain the funnel), and
in the second position, the outer shaft is retracted proximally relative to the funnel such that the funnel can radially expand (Fig. 3B - outer shaft is retracted such the funnel can radially expand).

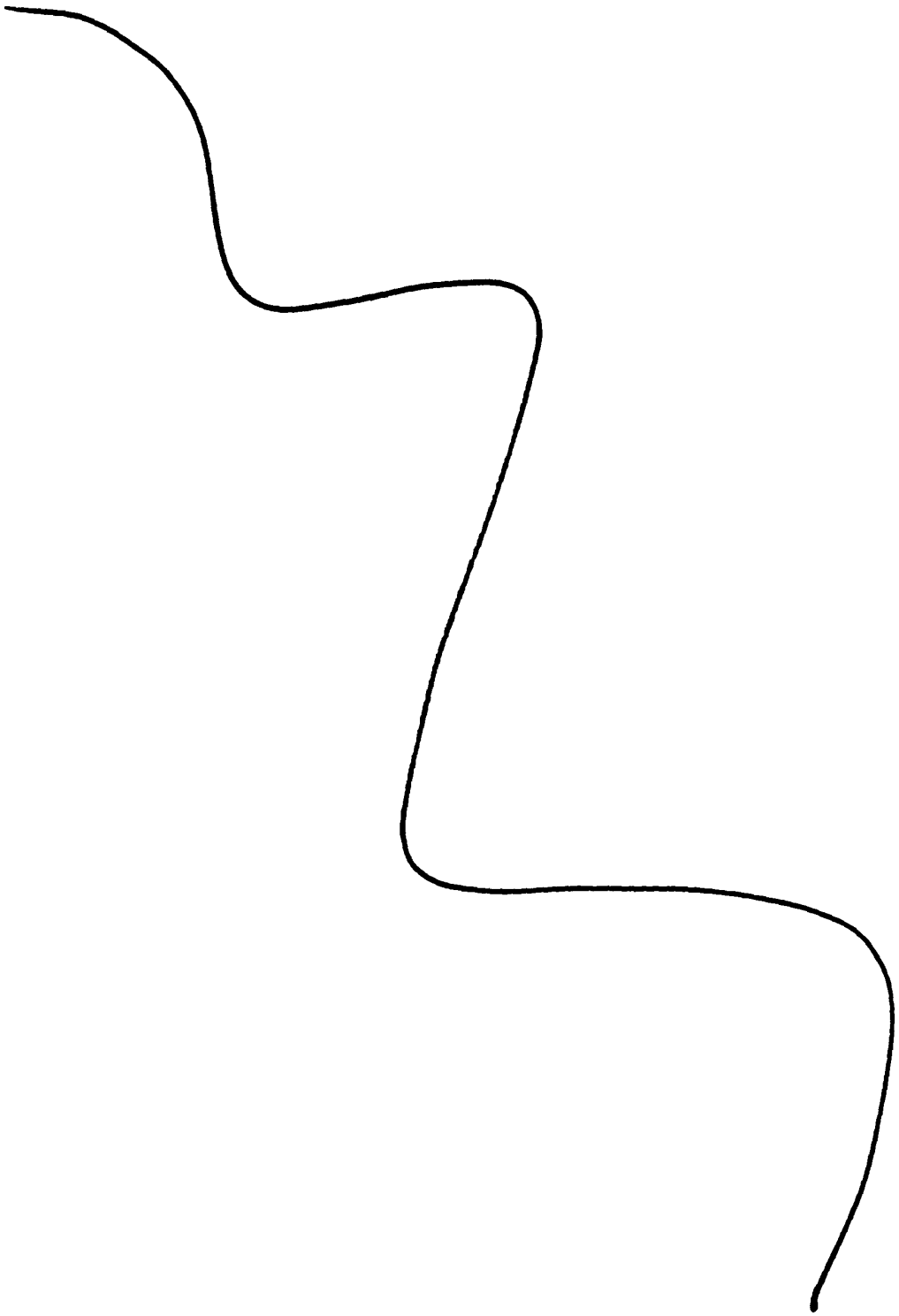
As per claim 11, Gelbfish discloses the funnel catheter assembly of claim 8 wherein the funnel is non-self expanding (Col 7, ln 25-30 - rod 30 is connected to shaft 12 to deploy the funnel), wherein the funnel is further coupled to a distal portion of the outer shaft (Fig. 3A - outer shaft 26 is coupled to funnel when unexpanded), and wherein movement of the outer shaft from the first position to the second position is configured to expand the funnel (Fig. 3B - outer shaft is move to second position to expand the funnel).

As per claim 12, Gelbfish discloses the funnel catheter assembly of claim 11 wherein a distal portion of the funnel is coupled to the distal portion of the outer shaft via one or more tethers (Fig. 3D; Col 8, ln 3-10 - distal portion of funnel is couple to distal portion of outer shaft through tether 42, 44 which traverses an aperture in the outer shaft).

Claims 18 lack an inventive step under PCT Article 33(3) as being obvious over Ginsburg in view of WO 2009/082513 A1 to Tex Medical (hereinafter 'Tex').

As per claim 18, Ginsburg discloses the method of claim 14 but is silent wherein the funnel is non-self-expanding, and wherein the method further comprises actuating the funnel to expand to the expanded position. Tex discloses the method of the funnel (20, Fig. 3A-B) wherein the funnel is coupled to a distal portion of the outer shaft (para [0042] - coupled at one end to distal end 11 of cannula 10) wherein the funnel is non-self expanding (para [0042] - in order to expand funnel 20 cannula 10 may include a balloon 33 position within cannula 10, in addition to an attachment mechanism such as string 34 connecting the balloon to the funnel, wherein when the balloon 33 is inflated it will pull on the string 34 thus deploying the funnel into an open position). Accordingly, it would have been obvious to a person of ordinary skill in the art to utilize Tex's non-self expanding funnel system with Ginsburg's funnel catheter assembly to allow for more control over the funnel deployment through controlled inflation of the balloon.

Claims 1-20 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used by industry.



SEARCH HISTORY

Application Number	PCT/US 21/35965
Search Conducted By	JEF
Search Approved By	SCL

CPC/IPC Classifications Searched	CPC - A61M 2025/1045, A61B 17/22, A61B 17/221, A61B 2217/005, A61M 2025/109 IPC(8) - A61B 17/00, A61B 17/22, A61B 17/3207, A61M 25/10, A61M 1/00 (2021.01)
Date Conducted	06 August 2021 (06.08.2021)

Documentation Searched	CPC - Y10S 55/35, B01D 53/261 IPC(8) - A42B 3/28, A62B 18/00, A62B 23/00, B01D 45/00, A62B 7/00, F24F 1/04 (2021.01)
Search Terms Used	Intra, Intravascular, Treat, Treatment, Funnel, Catheter, Thrombi, Thrombus, Thrombosis, ClotTriver, Invari Medical, Adjustable, Percutaneous, Shaft, Blood, Clot
Date Conducted	06 August 2021 (06.08.2021)

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	06 August 2021 (06.08.2021)

Search Logic:

Search 1: PN=(US5102415 or US10898212) (Results 2)
Search 2: IC=(A61B17/00 or A61B17/22 or A61B17/3207 or A61M25/10 or A61M1/00) (Results 152615)
Search 3: CPC=(A61M2025/1045 or A61B17/22 or A61B17/221 or A61B2217/005 or A61M2025/109) (Results 7069)
Search 4: 2 or 3 (Results 153968)
Search 5: 4 and ft=(funnel) (Results 3521)

Search 6:	5 and ft=(thromb*) (Results 674)
Search 7:	6 and ft=(inner near outer) (Results 400)
Search 8:	7 and ft=(blood) (Results 388)
Search 9:	8 and ft=(inner near shaft) (Results 127)
Search 10:	9 and ft=(expand) (Results 117)
Search 11:	10 and ft=(mov*) (Results 114)
Search 12:	11 and ft=(expand* near funnel) (Results 32)
Search 13:	12 and Ft=(non* near self near expand*) (Results 2)
Search 14:	PN=(WO2004093966) (Results 1)
Search 15:	CTA 14 (Results 1656)
Search 16:	Ft=(funnel near catheter) (Results 750)
Search 17:	16 and ft=(outer or inner) (Results 560)
Search 18:	17 and ft=(expand) (Results 213)
Search 19:	18 and ft=(tether) (Results 27)
Search 20:	18 and ft=(self) (Results 142)
Search 21:	20 and ft=(blood) (Results 124)
Search 22:	21 and ft=(vessel) (Results 106)

Electronic Database Searched	Google
Files Searched	Scholar (Articles excluding patents)
Date Conducted	06 August 2021 (06.08.2021)

Search Logic:

Intravascular Treatment Funnel Catheter
10,000,000

Funnel Catheter Assembly
11,400,000

Thrombi Extraction Catheter
8,820,000

Thrombus Aspiration Catheter
7,160,000

Thrombus Funnel Catheter
7,800,000

Thrombosis Catheter
12,700,000

Thrombosis Funnel Catheter
10,900,000

ClotTriver Inari Medical

5,170

Catheter with Funnel End
13,200,000

Catheter adjustable Funnel Inner Shaft
14,900,000

Catheter Adjustable Funnel Inner Shaft Blood Clot
11,600,000

Percutaneous Funnel Catheter
12,300,000

Electronic Database Searched	Google
Files Searched	Patents (US Patents/Published Applications, EPO publications, International, China, Germany, Canada)
Date Conducted	06 August 2021 (06.08.2021)

Search Logic:

Funnel Catheter Blood Clot
12,760

Percutaneous Funnel Catheter
11,569

Catheter Adjustable Funnel Inner Shaft Blood Clot
1,374

Thrombus Adjustable Funnel Catheter
3,652

Funnel Aspiration Catheters
7,210

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: MATTHEW S. WILLIAMS
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

JAN 25 2022

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 111552-8025WO00	Date of mailing *(day/month/year)* JAN 20 2022 **FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US 21/45072	International filing date *(day/month/year)* 06 August 2021 (06.08.2021)
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
111552-8025WO00		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 21/45072	06 August 2021 (06.08.2021)	06 August 2020 (06.08.2020)
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. 1B

   ☒ 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.

Form PCT/ISA/210 (first sheet) (July 2019)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 21/45072

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:
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 1-15 directed to an automatically-locking syringe.

Group II: Claims 16-20 directed to a clot treatment system.

Group III: Claims 21-28 directed to a syringe having a barrel and a vacuum indicator having a transparent tube and an indicator with a visual characteristic.

-*- See Supplemental Box -*-

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.:
1-15

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 21/45072

A. CLASSIFICATION OF SUBJECT MATTER

IPC - A61M 5/32; A61M 5/315 (2021.01)

CPC - A61M 5/32; A61M 5/502; A61M 5/3243; A61M 5/150641; A61M 5/3234; A61M 5/3232; A61M 5/5013; A61M 2005/5026; A61M 2005/3247; A61M 2005/3223; A61M 5/315

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.
A	US 2013/0126559 A1 (COWAN et al.) 23 May 2013 (23.05.2013); entire document, especially para [0028], and Fig. 1-2.	1-10
A	US 2004/0122359 A1 (WENZ et al.) 24 June 2004 (24.06.2004); entire document, especially para [0063]-[0066], and Fig. 7.	1-15
A	WO 2011/073176 A1 (NOVARTIS AG) 23 June 2011 (23.06.2011); especially pg 6 ln 33 to pg 7 in 2, and Fig. 1-3.	10-15
A, P	WO 2021/067134 A1 (BECTON, DICKINSON AND COMPANY) 8 April 2021 (08.04.2021); entire document.	1-15
A	US 2004/0267272 A1 (HENNIGES et al.) 30 December 2004 (30.12.2004); entire document.	1-15

☐ 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
2 December 2021	JAN 20 2022
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/210 (second sheet) (July 2019)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/US 21/45072

-*- Box III.0 - Explanations where unity of invention is lacking -*-

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 feature of a lock plate, not required by the claims of Groups II-III.

The invention of Group II includes the special technical feature of a catheter, not required by the claims of Groups I or III.

The invention of Group III includes the special technical feature of a transparent tube and an indicator movably positioned within the tube, not required by the claims of Groups I-II.

COMMON TECHNICAL FEATURES

Groups I and III share the common technical feature of a syringe having a barrel and a plunger movable through the barrel.
However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 5,788,463 A (CHAN) (hereinafter Chan), which discloses a syringe (10; Fig. 1-10; col 4 ln 66 to col 5 ln 20) having a barrel (50; Fig. 1-10; col 5 ln 21-23) and a plunger movable through the barrel (60; Fig. 1-10; col 5 ln 21-23).

Groups II-III share the common technical feature of a vacuum indicator.
However, this shared technical feature does not represent a contribution over prior art as being anticipated by Chan, which discloses a vacuum indicator (15; Fig. 1-10; col 8 ln 36-50).

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical features 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: MATTHEW S. WILLIAMS
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

JAN 25 2022

PERKINS COIE LLP

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	JAN 20 2022
Applicant's or agent's file reference 111552-8025WO00	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 21/45072	06 August 2021 (06.08.2021)	06 August 2020 (06.08.2020)

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

IPC - A61M 5/32; A61M 5/315 (2021.01)

CPC - A61M 5/32; A61M 5/502; A61M 5/3243; A61M 5/150641; A61M 5/3234; A61M 5/3232; A61M 5/5013; A61M 2005/5026; A61M 2005/3247; A61M 2005/3223; A61M 5/315

Applicant INARI MEDICAL, INC.

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

- [x] 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
- [x] Box No. IV Lack of unity of invention
- [x] 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	2 December 2021	Kari Rodriquez PCT Help Desk Telephone No. 571-272-4300

Form PCT/ISA/237 (cover sheet) (revised January 2019)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/45072

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:

☐ in the form of an Annex C/ST.25 text file.

☐ on paper or in the form of an image file.

b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/45072

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 1-15 directed to an automatically-locking syringe.

Group II: Claims 16-20 directed to a clot treatment system.

Group III: Claims 21-28 directed to a syringe having a barrel and a vacuum indicator having a transparent tube and an indicator with a visual characteristic.

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 feature of a lock plate, not required by the claims of Groups II-III.

The invention of Group II includes the special technical feature of a catheter, not required by the claims of Groups I or III.

The invention of Group III includes the special technical feature of a transparent tube and an indicator movably positioned within the tube, not required by the claims of Groups I-II.

COMMON TECHNICAL FEATURES

Groups I and III share the common technical feature of a syringe having a barrel and a plunger movable through the barrel.
However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 5,788,463 A (CHAN) (hereinafter Chan), which discloses a syringe (10; Fig. 1-10; col 4 ln 66 to col 5 ln 20) having a barrel (50; Fig. 1-10; col 5 ln 21-23) and a plunger movable through the barrel (60; Fig. 1-10; col 5 ln 21-23).

Groups II-III share the common technical feature of a vacuum indicator.
However, this shared technical feature does not represent a contribution over prior art as being anticipated by Chan, which discloses a vacuum indicator (15; Fig. 1-10; col 8 ln 36-50).

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical features 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.

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. 1-15

Form PCT/ISA/237 (Box No. IV) (revised January 2019)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/45072

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	1-15	YES
	Claims	None	NO
Inventive step (IS)	Claims	1-15	YES
	Claims	None	NO
Industrial applicability (IA)	Claims	1-15	YES
	Claims	None	NO

2. Citations and explanations:
Claims 1-15 meet the criteria of PCT Article 33(2)-(3) because as will be shown, the prior art does not teach nor fairly suggest the claimed limitations.

The prior art is exemplified by (1) US 2013/0126559 A1 (COWAN et al.) (hereinafter Cowan); (2) US 2004/0122359 A1 (WENZ et al.) (hereinafter Wenz); and (3) WO 2011/073176 A1 (NOVARTIS AG) (hereinafter Novartis).

(1) Cowan teaches an automatically-locking syringe (8; Fig. 1-2; para [0028]), comprising:
a barrel (10; Fig. 1-2; para [0028]);
a plunger slidably positioned within the barrel (16; Fig. 1-2; para [0028]),
wherein the plunger is movable between a depressed position and a withdrawn position (depression and withdrawing action of 16 within 10; Fig. 1-2; para [0028]), and
wherein the plunger includes a lock feature (ratchet teeth upon 16; Fig. 1-2; para [0028]); and
a lock plate coupled to the barrel (18; Fig. 1-2; para [0028]),
wherein the lock plate includes a biasing member configured to bias the lock plate to a locking position (30; Fig. 1-2; para [0035]).

(2) Wenz teaches a syringe (Fig. 7; para [0063]-[0066]), comprising:
a barrel (unlabeled barrel through which 5 extends; Fig. 7; para [0064]),
a plunger (5; Fig. 7; para [0064]),
a lock plate (31, 32, 33, 34; Fig. 7; para [0064]-[0066]),
said lock plate having an opening extending therethrough (opening of 31, 32, 33, 34 through which 5 extends; Fig. 7),
wherein the plunger is slidably positioned in the opening (5 extending through opening of 31, 32, 33, 34; Fig. 7).

(3) Novartis teaches a syringe (2; Fig. 1-3; pg 6 ln 33 to pg 7 ln 2), comprising:
a first arm (22; Fig. 1-3; pg 7 ln 20-28),
a second arm (24; Fig. 1-3; pg 7 ln 20-28),
wherein the first arm is configured to be biased at least partially outwardly away from the longitudinal axis of the plunger to a locking position (outward bias of 22 away from 18; Fig. 1-3; pg 8 ln 25 to pg 9 ln 3).

-*- See Supplemental Box -*-

Form PCT/ISA/237 (Box No. V) (revised January 2019)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/45072

Supplemental Box

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

As pertaining to claim 1, Cowan teaches an automatically-locking syringe (8; Fig. 1-2; para [0028]), comprising:
a barrel (10; Fig. 1-2; para [0028]);
a plunger slidably positioned within the barrel (16; Fig. 1-2; para [0028]),
wherein the plunger is movable between a depressed position and a withdrawn position (depression and withdrawing action of 16 within 10; Fig. 1-2; para [0028]), and
wherein the plunger includes a lock feature (ratchet teeth upon 16; Fig. 1-2; para [0028]); and
a lock plate coupled to the barrel (18; Fig. 1-2; para [0028]),
wherein the lock plate includes a biasing member configured to bias the lock plate to a locking position (30; Fig. 1-2; para [0035]);
but is silent wherein comprising:
said lock plate having an opening extending therethrough,
wherein the plunger is slidably positioned in the opening,
wherein-
when the plunger is moved from the depressed position to the withdrawn position, the lock feature is configured to engage the lock plate to drive the lock plate to a position away from the locking position to thereby permit the lock feature to pass through the opening, and
after the lock feature passes through the opening, the biasing member is configured to drive the lock plate to the locking position to inhibit movement of the plunger from the withdrawn position to the depressed position.
Further, Wenz teaches a syringe (Fig. 7; para [0063]-[0066]), comprising:
a barrel (unlabeled barrel through which 5 extends; Fig. 7; para [0064]),
a plunger (5; Fig. 7; para [0064]),
a lock plate (31, 32, 33, 34; Fig. 7; para [0064]-[0066]),
said lock plate having an opening extending therethrough (opening of 31, 32, 33, 34 through which 5 extends; Fig. 7),
wherein the plunger is slidably positioned in the opening (5 extending through opening of 31, 32, 33, 34; Fig. 7),
but the prior art does not teach nor fairly suggest:when the plunger is moved from the depressed position to the withdrawn position, the lock feature is configured to engage the lock plate to drive the lock plate to a position away from the locking position to thereby permit the lock feature to pass through the opening, and
after the lock feature passes through the opening, the biasing member is configured to drive the lock plate to the locking position to inhibit movement of the plunger from the withdrawn position to the depressed position.
The lock plate as claimed by the Applicant is driven away to prevent depression movement of the plunger through the barrel. There exists no motivation without benefit of hindsight for modification of the syringe of Cowan as modified by Wenz such the plunger is inhibited from depression movement as opposed to withdrawing movement, such that the claimed limitations are met.

As pertaining to claims 2-9, the prior art does not teach nor fairly suggest the claimed limitations, because claims 2-9 depend from claim 1.

As pertaining to claim 10, Wenz teaches an automatically-locking syringe (Fig. 7; para [0063]-[0066]), comprising:
a barrel (unlabeled barrel through which 5 extends; Fig. 7; para [0064]) including a flange (14; Fig. 7; para [0064]);
a plunger slidably positioned within the barrel (5; Fig. 7; para [0064]),
wherein the plunger is aligned along a longitudinal axis (longitudinal alignment of 5; Fig. 7), and
wherein the plunger is movable along the longitudinal axis between a depressed position and a withdrawn position (movement of 5 through unlabeled barrel; Fig. 7; para [0064]);
a lock member coupled to the plunger (31, 32, 33, 34; Fig. 7; para [0064]-[0066]),
wherein the lock member includes a body (body of 31; Fig. 7; para [0064]);
but is silent wherein:
the lock member includes a first arm hingedly coupled to the body,
wherein the first arm is configured to be biased at least partially outwardly away from the longitudinal axis of the plunger to a locking position; and
an actuator including a second arm,
wherein the actuator is movable between a first position and a second position, and
wherein the second arm is configured to engage the first arm in the second position to drive the first arm inwardly toward the longitudinal axis away from the locking position.
Further, Novartis teaches a syringe (2; Fig. 1-3; pg 6 ln 33 to pg 7 ln 2), comprising:
a first arm (22; Fig. 1-3; pg 7 ln 20-28),
a second arm (24; Fig. 1-3; pg 7 ln 20-28),
wherein the first arm is configured to be biased at least partially outwardly away from the longitudinal axis of the plunger to a locking position (outward bias of 22 away from 16; Fig. 1-3; pg 8 ln 25 to pg 9 ln 3),
but the prior art does not teach nor fairly suggest employment of the elements of Novartis upon the syringe of Wenz such that the claimed limitations are met.
There exists no motivation without benefit of hindsight for employment of the first arm and second arm of Novartis upon the syringe of Wenz, such that the second arm engages directly with the first arm in order to unlock the plunger for withdrawing.

As pertaining to claims 11-15, the prior art does not teach nor fairly suggest the claimed limitations, because claims 11-15 depend from claim 10.

Claims 1-15 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used by industry.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: MATTHEW S. WILLIAMS
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

MAR 2 2 2022

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)* MAR 16 2022
Applicant's or agent's file reference 111552-8027WO00	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US 21/58793	International filing date *(day/month/year)* 10 November 2021 (10.11.2021)
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
111552-8027WO00		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 21/58793	10 November 2021 (10.11.2021)	10 November 2020 (10.11.2020)
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 3 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. 1C

☒ 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 21/58793

A. CLASSIFICATION OF SUBJECT MATTER

IPC - A61B 17/03; A61B 17/04 (2022.01)

CPC - A61B 17/04; A61B 2017/0496; A61B 17/03; A61B 17/56; A61B 17/0467; A61B 17/8869; A61B 17/0482; A61B 17/0469

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 -- Y	US 5,376,101 A (GREEN et al.) 27 December 1994 (27.12.1994); entire document, especially col 6 ln 56 to col 7 ln 17, and Fig. 15-18.	1, 5-7 -- 2-4
Y	US 5,192,274 A (BIERMAN) 9 March 1993 (09.03.1993); especially col 2 ln 21-54, and Fig. 1-2.	2-3
Y	US 2013/0116708 A1 (ZINITI et al.) 9 May 2013 (09.05.2013); especially para [0090], and Fig. 18A-B.	4
A	US 2004/0260344 A1 (LYONS et al.) 23 December 2004 (23.12.2004); entire document.	1-7

☐ 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
2 March 2022	MAR 16 2022
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

-*- Box III.0 - Explanations where unity of invention is lacking -*-

SPECIAL TECHNICAL FEATURES

The invention of Group I includes the special technical feature of when the first through-hole and the second through-hole receive the suture and the actuator is in the second position, the actuator and the housing cooperate to permit the suture to move relative to the housing, not required by the claims of Group II-III.

The invention of Group II includes the special technical feature of a biasing member operably coupled between the actuator and the housing, not required by the claims of Group I or II.

The invention of Group III includes the special technical feature of adjusting a tension of the suture to a desired tension, not required by the claims of Group I-II.

COMMON TECHNICAL FEATURES

Groups I-III share the common technical feature of a suture tensioning device.
However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 8,888,791 B2 (JARAMILLO et al.) (hereinafter Jaramillo), which discloses a suture tensioning device (100; Fig. 1; col 5 ln 40-62).

Groups I-II share the common technical feature of a device for tensioning a suture, comprising:
a housing having a first through-hole; and
an actuator coupled to the housing and having a second through-hole,
wherein the actuator is movable relative to the housing from a first position to a second position.
However, this shared technical feature does not represent a contribution over prior art as being anticipated by Jaramillo, which discloses a device for tensioning a suture (Fig. 9; col 7 ln 41-51), comprising:
a housing (upper housing of 900; Fig. 9; col 7 ln 41-51) having a first through-hole (902; Fig. 9; col 7 ln 41-51); and
an actuator (903, unlabeled semicircular half adjacent 903; Fig. 9; col 7 ln 41-51) coupled to the housing and having a second through-hole (901; Fig. 9; col 7 ln 41-51),
wherein the actuator is movable relative to the housing from a first position (903 adjacent and flush with housing of 900; Fig. 9; col 7 ln 41-51) to a second position (position of Fig. 9 with 903 deployed rotated outward; Fig. 9; col 7 ln 41-51).

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical features 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: MATTHEW S. WILLIAMS
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

MAR 22 2022

PERKINS COIE LLP

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	MAR 16 2022
Applicant's or agent's file reference 111552-8027WO00	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 21/58793	10 November 2021 (10.11.2021)	10 November 2020 (10.11.2020)

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

IPC - A61B 17/03; A61B 17/04 (2022.01)

CPC - A61B 17/04; A61B 2017/0496; A61B 17/03; A61B 17/56; A61B 17/0467; A61B 17/8869; A61B 17/0482; A61B 17/0469

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	2 March 2022	Kari Rodriquez PCT Help Desk Telephone No. 571-272-4300

Form PCT/ISA/237 (cover sheet) (revised January 2019)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/58793

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/58793

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 1-7 directed to a device for tensioning a suture, having a housing with a first through-hole and an actuator with a second through-hole.

Group II: Claims 8-14 directed to a suture tensioning device, having a housing, an actutator, and a biasing member.

Group III: Claims 15-20 directed to a method of tensioning a suture.

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 feature of when the first through-hole and the second through-hole receive the suture and the actuator is in the second position, the actuator and the housing cooperate to permit the suture to move relative to the housing, not required by the claims of Group II-III.

The invention of Group II includes the special technical feature of a biasing member operably coupled between the actuator and the housing, not required by the claims of Group I or II.

The invention of Group III includes the special technical feature of adjusting a tension of the suture to a desired tension, not required by the claims of Group I-II.

COMMON TECHNICAL FEATURES

Groups I-III share the common technical feature of a suture tensioning device.
However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 8,888,791 B2 (JARAMILLO et al.) (hereinafter Jaramillo), which discloses a suture tensioning device (100; Fig. 1; col 5 ln 40-62).

Groups I-II share the common technical feature of a device for tensioning a suture, comprising:
a housing having a first through-hole; and
an actuator coupled to the housing and having a second through-hole,
wherein the actuator is movable relative to the housing from a first position to a second position.
However, this shared technical feature does not represent a contribution over prior art as being anticipated by Jaramillo, which discloses a device for tensioning a suture (Fig. 9; col 7 ln 41-51), comprising:
a housing (upper housing of 900; Fig. 9; col 7 ln 41-51) having a first through-hole (902; Fig. 9; col 7 ln 41-51); and
an actuator (903, unlabeled semicircular half adjacent 903; Fig. 9; col 7 ln 41-51) coupled to the housing and having a second through-hole (901; Fig. 9; col 7 ln 41-51),
wherein the actuator is movable relative to the housing from a first position (903 adjacent and flush with housing of 900; Fig. 9; col 7 ln 41-51) to a second position (position of Fig. 9 with 903 deployed rotated outward; Fig. 9; col 7 ln 41-51).

-*- See 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. 1-7

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/58793

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	2-4	YES
	Claims	1, 5-7	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-7	NO
Industrial applicability (IA)	Claims	1-7	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1 and 5-7 lack novelty under PCT Article 33(2) as being anticipated by US 5,376,101 A (GREEN et al.) (hereinafter Green).

As pertaining to claim 1, Green teaches a device for tensioning a suture (Fig. 15-18; col 6 ln 56 to col 7 ln 17), comprising:
a housing (510; Fig. 15-18; col 6 ln 56-62) having a first through-hole (511; Fig. 15-18; col 6 ln 56-62); and
an actuator (520; Fig. 15-18; col 6 ln 56-62) coupled to the housing and having a second through-hole (passageway 526; Fig. 15-18; col 6 ln 63 to col 7 ln 13),
wherein the actuator is movable relative to the housing from a first position (position of 520 relative to 510 in Fig. 17; col 7 ln 4-12) to a second position (position of 520 relative to 510 in Fig. 16; col 6 ln 63 to col 7 ln 3),
wherein the first through-hole and the second through-hole are configured to receive a suture therethrough (10; Fig. 15-18; col 7 ln 1-3), and wherein-
when the first through-hole and the second through-hole receive the suture and the actuator is in the first position, the actuator and the housing cooperate to inhibit the suture from moving relative to the housing (receipt of 10 through 511, hole through 520, secured in Fig. 17; col 7 ln 4-17); and
when the first through-hole and the second through-hole receive the suture and the actuator is in the second position, the actuator and the housing cooperate to permit the suture to move relative to the housing (receipt of 10 through 511, hole through 520, adjustable in Fig. 16; col 6 ln 63 to col 7 ln 3).

As pertaining to claim 5, Green teaches the device of claim 1 wherein the first through-hole and the second through-hole are axially offset in the first position (position of 520 and 526 offset relative to 510 and 511 in Fig. 17; col 7 ln 4-12), and wherein the first through-hole and the second through-hole are axially aligned in the second position (position of 520 and 526 aligned relative to 510 and 511 in Fig. 16; col 6 ln 63 to col 7 ln 3).

As pertaining to claim 6, Green teaches the device of claim 5 wherein the housing and actuator engage the suture in the first position to clamp the suture relative to the housing (clamping of 10 with respect to 510 by 520 action; Fig. 16-17; col 6 ln 63 to col 7 ln 17).

As pertaining to claim 7, Green teaches the device of claim 1 wherein the first through-hole and the second through-hole are aligned along an axis in the second position (position of 520 and 526 aligned relative to 510 and 511 in Fig. 16; col 6 ln 63 to col 7 ln 3), and wherein the actuator is movable from the first position to the second position in a direction generally orthogonal to the axis (movement of 520 orthogonal to axis of 511; Fig. 16-17; col 6 ln 63 to col 7 ln 3).

Claims 2-3 lack an inventive step under PCT Article 33(3) as being obvious over Green in view of US 5,192,274 A to BIERMAN (hereinafter Bierman).

As pertaining to claim 2, Green teaches the device of claim 1, but is silent wherein further comprising a flexible pad coupled to the housing.
However, Bierman teaches a device (Fig. 1-2; col 2 ln 21-54), comprising:
a housing (12; Fig. 1-2; 2 ln 29-42); and
a flexible pad coupled to the housing (22; Fig. 1-2; col 2 ln 50-53, col 1 ln 22-24).
Accordingly, it would have been obvious to a person having ordinary skill in the art to have employed the pad of Bierman upon the device of Green, in order to safely and removably secure the device to a patient's skin.

As pertaining to claim 3, Green in view of Bierman teaches the device of claim 2 and Bierman further discloses wherein the flexible pad is configured to be placed against skin of a patient and to conform to the skin of the patient (flexible pad 22 applied upon skin of patient; Fig. 1-2; col 2 ln 50-53, col 1 ln 22-24).

-*- See Supplemental Box -*-

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/58793

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
-*- Box IV.2 - Explanations where unity of invention is lacking -*-

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

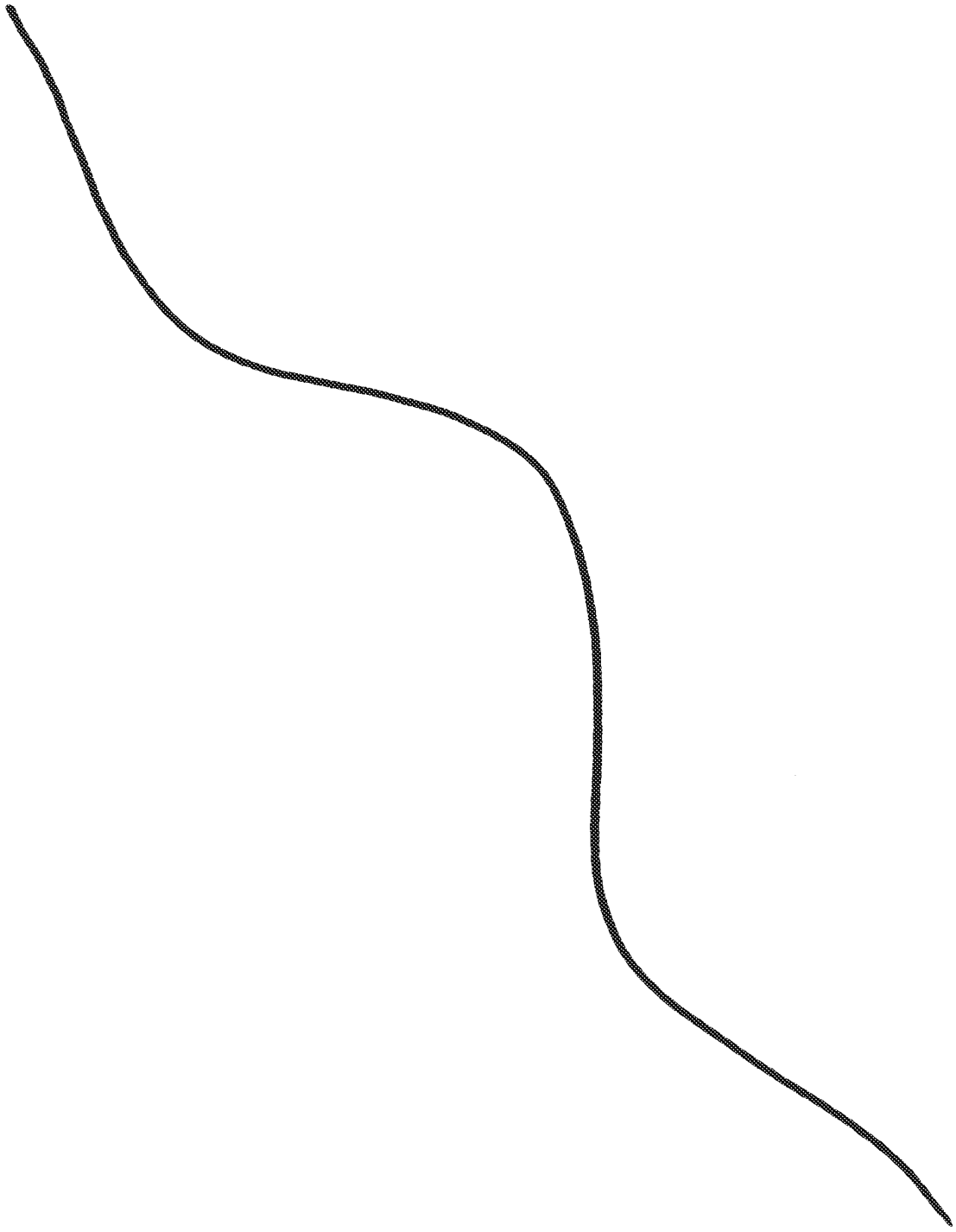
Therefore, Groups I-III lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

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

Claim 4 lacks an inventive step under PCT Article 33(3) as being obvious over Green in view of US 2013/0116708 A1 to ZINITI et al. (hereinafter Ziniti).

As pertaining to claim 4, Green teaches the device of claim 1 but is silent wherein further comprising a biasing member operably coupled between the actuator and the housing, wherein the biasing member is configured to bias the actuator to the first position.
However, Ziniti further discloses a device (Fig. 18A-B; para [0090]), comprising:
a biasing member operably coupled between the actuator and the housing (spring 612; Fig. 18A-B; para [0093]),
wherein the biasing member is configured to bias the actuator to the first position (spring 612 capable of being disposed to bias actuator; Fig. 18A-B; para [0093]).
Accordingly, it would have been obvious to a person having ordinary skill in the art to have employed the biasing member of Ziniti upon the device of Green, in order to aid in user deployment of the device.

Claims 1-7 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used by industry.



Application Number	PCT/US 21/58793
Search Conducted By	SBF
Search Approved By	SCL

CPC/IPC Classifications Searched	IPC(8) A61B 17/03; A61B 17/04 (2022.01) CPC A61B 17/04; A61B 2017/0496; A61B 17/03; A61B 17/56; A61B 17/0467; A61B 17/8869; A61B 17/0482; A61B 17/0469
Date Conducted	25 February-2 March 2022 (25.02.-02.03.2022)

Documentation Searched	IPC(8) A61B 17/03; A61B 17/04 (2022.01) CPC A61B 17/04; A61B 2017/0496; A61B 17/03; A61B 17/56; A61B 17/0467; A61B 17/8869; A61B 17/0482; A61B 17/0469 (keyword limited; terms below)
Search Terms Used	Suture tensioner inari medical flowstasis retention large bore through holes lock retainer misalign tighten adjust gap aperture align line up slot friction clamp clutch thread cable cord increment ratchet button actuator spring load stop restrain
Date Conducted	25 February-2 March 2022 (25.02.-02.03.2022)

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: (European) 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	25 February-2 March 2022 (25.02.-02.03.2022)
Search Logic:	

25 February-
Search 1: pa=(inari medical*) (Results 12)
Search 2: inv=(macias jacqueline* or enright paige* or tu thomas*) (Results 16)
Search 3: 1 or 2 (Results 26)
Search 4: pn=(US8888791) (Results 1)
Search 5: 3 and ft=(suture* near tension*) (Results 0)
Search 6: ctf 4 or ctb 4 (Results 165)
Search 7: 6 and ft=(suture* near (tension* or tighten* or adjust*)) (Results 100)
Search 8: 7 not (4 or 3) (Results 99)
Search 9: cpc=(A61B2017/0496*) (Results 1269)
Search 10: 9 and ft=((hole* or gap* or aperture*) near (align* or (line up*))) (Results 176)
Search 11: 10 not (7 or 4 or 3) (Results 173)

28 February-
Search 12: pn=(US20040260344A1) (Results 1)
Search 13: ctf 12 or ctb 12 (Results 193)
Search 14: 13 and ft=(suture* near (tension* or tighten* or adjust*)) (Results 105)
Search 15: 14 not (12 or 10 or 7 or 4 or 3) (Results 99)
Search 16: pn=(jp2018000843) (Results 1)
Search 17: ctf 16 or ctb 16 (Results 4)
Search 18: cpc=(A61B17/8869*) (Results 409)
Search 19: 18 and ft=((hole* or gap* or aperture* or slot*) near (align* or (line up*) or misalign* or friction*)) (Results 89)
Search 20: 19 not (17 or 16 or 14 or 12 or 10 or 7 or 4 or 3) (Results 79)
Search 21: 13 and ft=((hole* or gap* or aperture*) near (align* or (line up*))) (Results 25)
Search 22: pn=(us5376101) (Results 1)
Search 23: ctf 22 or ctb 22 (Results 308)
Search 24: 23 and ft=((hole* or gap* or aperture* or slot*) near (align* or (line up*) or misalign* or friction*)) (Results 78)
Search 25: 24 not (22 or 21 or 19 or 17 or 16 or 14 or 12 or 10 or 7 or 4 or 3) (Results 57)

2 March-
Search 26: ic=(A61B17/03* OR A61B17/04*) (Results 44372)
Search 27: cpc=(A61B17/03* OR A61B17/04* OR A61B17/56* OR A61B17/0467* OR A61B17/8869* OR A61B17/0482* OR A61B17/0469* OR A61B2017/0496*) (Results 45941)
Search 28: 26 or 27 (Results 76570)
Search 29: 28 and ft=((hole* or gap* or aperture* or slot*) near (align* or (line up*) or misalign* or friction* or clamp* or clutch*)) (Results 9859)
Search 30: 29 and ft=((suture* or thread* or cable* or cord*) near (tension* or tighten* or increment* or ratchet*)) (Results 1998)
Search 31: 30 and ft=(button* or actuator* or (spring* near load*)) (Results 1019)
Search 32: 31 and ft=(spring*) (Results 873)
Search 33: 32 and ft=(suture* near (lock* or stop* or restrain*)) (Results 238)
Search 34: 33 not (24 or 22 or 21 or 19 or 17 or 16 or 14 or 12 or 10 or 7 or 4 or 3) (Results 156)
Search 35: ft=(suture* near (tension* or tighten*)) (Results 6198)
Search 36: 35 and ft=((hole* or gap* or aperture* or slot* or groove*) near (align* or (line up*) or misalign* or friction*)) (Results 1081)
Search 37: 36 and ft=(suture* near (lock* or stop* or restrain*)) (Results 452)
Search 38: 37 and ft=(spring*) (Results 317)
Search 39: 38 and ft=(spring* near (load* or actuat*)) (Results 154)
Search 40: 39 not (33 or 24 or 22 or 21 or 19 or 17 or 16 or 14 or 12 or 10 or 7 or 4 or 3) (Results 20)

Electronic Database Searched	Google
Files Searched	Google Patents
Date Conducted	25 February-2 March 2022 (25.02.-02.03.2022)
Search Logic:	

Suture tensioning through holes
About 12,200 results

Suture tensioning through holes ratchet
About 4,700 results

Suture tensioning through holes lock
About 12,000 results

Suture retainer lock hole misalign
About 6,350 results

Electronic Database Searched	Google
Files Searched	Google Web
Date Conducted	25 February-2 March 2022 (25.02.-02.03.2022)
Search Logic:	

Suture tensioner
About results

Suture tensioner inari medical
About results

Flowstasis suture retention
About results

Large bore suture retention

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: MATTHEW S. WILLIAMS
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

MAR 28 2022

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: 111552-8028WO00	Date of mailing (day/month/year): MAR 22 2022
International application No.: PCT/US 21/59718	FOR FURTHER ACTION: See paragraphs 1 and 4 below
Applicant: INARI MEDICAL, INC.	International filing date (day/month/year): 17 November 2021 (17.11.2021)

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
111552-6028WO00	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 21/59718	17 November 2021 (17.11.2021)	18 November 2020 (18.11.2020)

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. 7C

☒ 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 21/59718

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:
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 examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-14 directed to an aspiration catheter.

Group II: Claims 15-20 directed to a method of removing clot material from a blood vessel.

-*-Continued in Supplemental Box-*-

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.:
1-14

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 21/59716

A. CLASSIFICATION OF SUBJECT MATTER
IPC - A61M 25/00; A61B 17/22 (2022.01)
CPC - A61M 25/0041; A61M 25/0045

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
Y	CN 110652645 A (Shanghai Warbey Medical Technology Co Ltd) 07 January 2020 (07.01.2020), entire document, especially	1-14
Y	US 2006/0074401 A1 (Rose) 06 April 2006 (06.04.2006), entire document, especially	1-14
A	US 2016/0151605 A1 (GMEDIX, INC.) 02 June 2016 (02.06.2016), entire document	1-14
A	US 2013/0197454 A1 (Terumo Kabushiki Kaisha) 01 August 2013 (01.08.2013), entire document	1-14

☐ 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
03 March 2022	MAR 22 2022
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/210 (second sheet) (July 2019)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 21/59716

The inventions listed as Groups I and II 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:

The invention of Group II includes the special technical feature of positioning a distal tip of the aspiration catheter proximate the clot material; activating a pressure source coupled to the aspiration catheter via a fluid control device, while the fluid control device is closed, to generate a vacuum in the pressure source; and opening the fluid control device to apply the vacuum to the aspiration catheter to thereby aspirate at least a portion of the clot material into the aspiration catheter, not required in Group I.

The inventions of Groups I-II share the technical features of an aspiration catheter, comprising: a distal portion and a proximal portion, wherein the distal portion is configured to deflect away from a longitudinal axis of the proximal portion. Specifically, Groups I and II are related as an apparatus (Group I) and methods for using the apparatus (Group II). The apparatus is known in prior art as shown in CN 110652645 A to Shanghai Warbey Medical Technology Co Ltd (hereinafter "Shanghai"). Therefore, Groups I and II lack unity since the shared technical features do not represent a contribution over Shanghai.

Shanghai discloses of an aspiration catheter (Fig 1A-1B; para [0093]-[0099]; para [0115] further teaches wherein the catheter can be used for aspiration), comprising: a distal portion (left half of 10; Fig 1A-1B; para [0093]) and a proximal portion (right half of 10; Fig 1A-1B; para [0093]), wherein the distal portion is configured to deflect away from a longitudinal axis of the proximal portion (Fig 1A-1B; para [0075]). Shanghai teaches wherein the distal region of the aspiration catheter has good flexibility wherein the flexibility of the distal end of the catheter allows for a distal end of the braid of wires within the distal end of the catheter taught by Shanghai to be flexible and deflectable with respect to the longitudinal axis of the proximal portion taught by Shanghai).

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

Therefore, Groups I-II 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: MATTHEW S. WILLIAMS
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	MAR 22 2022
Applicant's or agent's file reference 111552-8028WO00	FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day month year)*	Priority date *(day month year)*
PCT/US 21/59718	17 November 2021 (17.11.2021)	18 November 2020 (18.11.2020)

International Patent Classification (IPC) or both national classification and IPC
IPC - A61M 25/00; A61B 17/22 (2022.01)
CPC - A61M 25/0041; A61M 25/0045

Applicant INARI MEDICAL, INC.

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

- [X] 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
- [X] Box No. IV Lack of unity of invention
- [X] 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
- [X] 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	03 March 2022	Kari Rodriquez PCT Help Desk Telephone No. 571-272-4300

Form PCT/ISA/237 (cover sheet) (revised January 2019)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/59718

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*.3(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:

☐ in the form of an Annex C/ST.25 text file.

☐ on paper or in the form of an image file.

b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/59718

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 examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-14 directed to an aspiration catheter.

Group II: Claims 15-20 directed to a method of removing clot material from a blood vessel.

The inventions listed as Groups I and II 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:

The invention of Group II includes the special technical feature of positioning a distal tip of the aspiration catheter proximate the clot material, activating a pressure source coupled to the aspiration catheter via a fluid control device, while the fluid control device is closed, to generate a vacuum in the pressure source; and opening the fluid control device to apply the vacuum to the aspiration catheter to thereby aspirate at least a portion of the clot material into the aspiration catheter, not required in Group I.

The inventions of Groups I-II share the technical features of an aspiration catheter, comprising: a distal portion and a proximal portion, wherein the distal portion is configured to deflect away from a longitudinal axis of the proximal portion. Specifically, Groups I and II are related as an apparatus (Group I) and methods for using the apparatus (Group II). The apparatus is known in prior art as shown in CN 110652645 A to Shanghai Wartley Medical Technology Co Ltd (hereinafter "Shanghai"). Therefore, Groups I and II lack unity since the shared technical features do not represent a contribution over Shanghai.

Shanghai discloses of an aspiration catheter (Fig 1A-1B; para [0093]-[0099]; para [0115] further teaches wherein the catheter can be used for aspiration), comprising: a distal portion (left half of 10; Fig 1A-1B; para [0083]) and a proximal portion (right half of 10; Fig 1A-1B; para [0083]), wherein the distal portion is configured to deflect away from a longitudinal axis of the proximal portion (Fig 1A-1B; para [0076]; Shanghai teaches wherein the distal region of the aspiration catheter has good flexibility wherein the flexibility of the distal end of the catheter allows for a distal end of the braid of wires within the distal end of the catheter taught by Shanghai to be flexible and deflectable with respect to the longitudinal axis of the proximal portion taught by Shanghai).

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

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

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. 1-14.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No
PCT/US 21/59718

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

1 Statement

Novelty (N)	Claims	1-14	YES
	Claims	None	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-14	NO
Industrial applicability (IA)	Claims	1-14	YES
	Claims	None	NO

2 Citations and explanations

Claims 1-7 lack an inventive step under PCT Article 33(3) as being obvious over CN 110652645 A to Shanghai Wanbey Medical Technology Co Ltd (hereinafter "Shanghai") in view of US 2008/0074401 A1 to Ross.

As per claim 1, Shanghai teaches an aspiration catheter (Fig 1A-1B; para [0003]-[0009]; para [0115] further teaches wherein the catheter can be used for aspiration), comprising:
an inner liner (20; Fig 1A-1B; para [0093]) defining a lumen (21; Fig 1A-1B; para [0093]) and having a proximal region (right half of 20; Fig 1A-1B; para [0093]) and a distal region (left half of 20; Fig 1A-1B; para [0093]);
a braid of wires over the inner liner (40; Fig 1A-1B; para [0093]), [wherein a deflectable portion of the braid of wires (Box VIII) over at least a portion of the distal region of the inner liner is configured to deflect away from a longitudinal axis of the proximal region when the aspiration catheter is unconstrained];
a wire coiled over at least a portion of the distal region of the inner liner (30; Fig 1A-1B; para [0093], [0099]); and
an outer sheath over the braid of wires (Box VIII), the wire, and the inner liner (50; Fig 1A-1B; para [0093]).
While Shanghai teaches wherein the distal region of the aspiration catheter has good flexibility (Fig 1A-1B; para [0076]; the flexibility of the distal end of the catheter allows for a distal end of the braid of wires within the distal end of the catheter taught by Shanghai to be flexible and deflectable), Shanghai does not specifically teach wherein a deflectable portion of the braid of wires (Box VIII) over at least a portion of the distal region of the inner liner is configured to deflect away from a longitudinal axis of the proximal region when the aspiration catheter is unconstrained. However, Ross teaches a similar catheter (Fig 1-2; para [0024]-[0034]) comprising a braid of wires (24, Fig 1-2, para [0027]; reinforcing material 24 is taught to be formed of a braid made of metallic filaments) over an inner liner (22; Fig 1-2; para [0027]) wherein a deflectable portion of the braid of wires (Box VIII) over at least a portion of the distal region of the inner liner is configured to deflect away from a longitudinal axis of the proximal region when the catheter is unconstrained (Fig 1-2; para [0025]-[0026], [0033]; Ross teaches wherein the elongate shaft 16, including the reinforcing material 24 can be bent depending on the desired application - see Fig 6 further showing a configuration of the catheter that is formed to a bent configuration at the distal tip of the catheter). Accordingly, it would have been obvious to one of ordinary skill in the art to have employed deflectable portion taught by Ross with the aspiration catheter taught by Shanghai, in order to allow for improved navigation of tortuous vessels (para [0006]-[0010]).

As per claim 2, Shanghai in view of Ross teach the aspiration catheter of claim 1, and Ross further teaches wherein the wires in the deflectable portion of the braid of wires (Box VIII) is pre-shaped to deflect away from the longitudinal axis (Fig 1-2; para [0032]-[0035]; the catheter is taught to be formed as shown in Fig 6 by constraining the catheter in a desired curvature of position and then heating the shaft to shrink the shrink tubing 28, such that the reinforcing material 24 is pre-shaped in the curved configuration).

As per claim 3, Shanghai in view of Ross teach the aspiration catheter of claim 1, and Ross further teaches wherein the deflectable portion of the braid of wires (Box VIII) is configured to deflect away from the longitudinal axis to have a bend angle of between about 165-195 degrees (Box VIII) when the aspiration catheter is unconstrained (Fig 1-2; para [0032]-[0035]; the catheter is taught to be formed as shown in Fig 6 by constraining the catheter in a desired curvature of position and then heating the shaft to shrink the shrink tubing 28, such that the reinforcing material 24 is pre-shaped in the curved configuration - Fig 6 further shows the bend angle to be almost exactly 180 degrees at the distal end, such that the bend angle is reasonably considered to be between 165-195 degrees).

As per claim 4, Shanghai in view of Ross teach the aspiration catheter of claim 1, and Ross further teaches wherein the deflectable portion of the braid of wires (Box VIII) is configured to deflect away from the longitudinal axis to have a bend angle [of about 270 degrees] when the aspiration catheter is unconstrained (Fig 1-2; para [0032]-[0035]; the catheter is taught to be formed as shown in Fig 6 by constraining the catheter in a desired curvature of position and then heating the shaft to shrink the shrink tubing 28, such that the reinforcing material 24 is pre-shaped in the curved configuration). While Ross teaches wherein the catheter can have a bend shape depending on the desired application (para [0025]), Ross does not specifically teach a bend angle of about 270 degrees. However, it is well known that optimizing size, shape and angle is of the ordinary skill in the art. Accordingly, it would have been obvious to one of ordinary skill in the art to have arrived at a bend angle of about 270 degrees, in order to allow for improved navigation of tortuous vessels.

-*-Continued in Supplemental Box-*-

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/59718

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claims 1-4 and 9-10: The term "the braid" is confusing and lacks proper antecedent basis. The term "the braid" appears to be referring to the braid of wires previously referred to. For purposes of this opinion, the term "the braid" has been interpreted as "the braid of wires."

Claim 3: The recitation "between about between about 165-195 degrees" appears to be a typographical error that is inconsistent with known grammatical standards and has been interpreted to be "between about 165-195 degrees."

Claim 4: The recitation "between about 270 degrees" appears to be a typographical error that is inconsistent with known grammatical standards and has been interpreted to be "about 270 degrees."

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/59718

Supplemental Box

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

As per claim 6, Shanghai in view of Ross teach the aspiration catheter of claim 1. While Shanghai teaches wherein the aspiration catheter can be used as a neurovascular catheter (para [0007]-[0008]), Shanghai does not specifically teach wherein the lumen has a diameter of 20 French or greater. However, it is well known in the art that routine experimentation and various engineering design choices could have been made to have arrived at wherein the lumen has a diameter of 20 French or greater (Note: providing a larger diameter allows for aspiration of larger vessels, such as the aorta, which help provide oxygenated blood to the brain and spinal cord). Accordingly, it would have been obvious to one of ordinary skill in the art to have arrived at wherein the lumen has a diameter of 20 French or greater, in order to allow for use in larger blood vessels.

As per claim 6, Shanghai in view of Ross teach the aspiration catheter of claim 1. While Shanghai teaches wherein the aspiration catheter can be used as a neurovascular catheter (para [0007]-[0008]), Shanghai does not specifically teach wherein the lumen has a diameter of 24 French or greater. However, it is well known in the art that routine experimentation and various engineering design choices could have been made to have arrived at wherein the lumen has a diameter of 24 French or greater (Note: providing a larger diameter allows for aspiration of larger vessels, such as the aorta, which help provide oxygenated blood to the brain and spinal cord). Accordingly, it would have been obvious to one of ordinary skill in the art to have arrived at wherein the lumen has a diameter of 24 French or greater, in order to allow for use in larger blood vessels.

As per claim 7, Shanghai in view of Ross teach the aspiration catheter of claim 1 wherein the inner liner is formed from polytetrafluoroethylene material (Fig 1A-1B; para [0097]), and wherein the outer sheath is formed from a thermoplastic elastomer material (Fig 1A-1B; para [0110]; the outer layer 50 is taught to be made of Pebax).

Claims 1 and 8-14 lack an inventive step under PCT Article 33(3) as being obvious over Shanghai in view of Ross (second treatment).

As per claim 1, Shanghai teaches an aspiration catheter (Fig 1A-1B; para [0093]-[0098]; para [0115] further teaches wherein the catheter can be used for aspiration), comprising:
an inner liner (20; Fig 1A-1B; para [0093]) defining a lumen (21; Fig 1A-1B; para [0093]) and having a proximal region (right half of 20; Fig 1A-1B; para [0093]) and a distal region (left half of 20; Fig 1A-1B; para [0093]);
a braid of wires over the inner liner (40; Fig 1A-1B; para [0093]), [wherein a deflectable portion of the braid of wires (Box VIII) over at least a portion of the distal region of the inner liner is configured to deflect away from a longitudinal axis of the proximal region when the aspiration catheter is unconstrained];
a wire coiled over at least a portion of the distal region of the inner liner (30; Fig 1A-1B; para [0093]; [0099]); and
an outer sheath over the braid of wires (Box VIII), the wire, and the inner liner (50; Fig 4; para [0111]; Shanghai teaches an outer layer 50, which can be reasonably considered to be used with the catheter 10 shown in Fig 1A-1B).
While Shanghai teaches wherein the distal region of the aspiration catheter has good flexibility (Fig 1A-1B; para [0076]; the flexibility of the distal end of the catheter allows for a distal end of the braid of wires within the distal end of the catheter taught by Shanghai to be flexible and deflectable), Shanghai does not specifically teach wherein a deflectable portion of the braid of wires (Box VIII) over at least a portion of the distal region of the inner liner is configured to deflect away from a longitudinal axis of the proximal region when the aspiration catheter is unconstrained. However, Ross teaches a similar catheter (Fig 1-2; para [0024]-[0034]) comprising a braid of wires (24, Fig 1-2; para [0027]; reinforcing material 24 is taught to be formed of a braid made of metallic filaments) over an inner liner (22; Fig 1-2; para [0027]) wherein a deflectable portion of the braid of wires (Box VIII) over at least a portion of the distal region of the inner liner is configured to deflect away from a longitudinal axis of the proximal region when the catheter is unconstrained (Fig 1-2; para [0025]-[0026], [0035]; Ross teaches wherein the elongate shaft 16, including the reinforcing material 24 can be bent depending on the desired application - see Fig 8 further showing a configuration of the catheter that is formed to a bent configuration at the distal tip of the catheter). Accordingly, it would have been obvious to one of ordinary skill in the art to have employed deflectable portion taught by Ross with the aspiration catheter taught by Shanghai, in order to allow for improved navigation of tortuous vessels (para [0008]-[0010]).

As per claim 8, Shanghai in view of Ross teach the aspiration catheter of claim 1 wherein the outer sheath has a first hardness over the proximal region (Fig 4; para [0111]; the proximal region of outer layer 50 is taught to comprise a material with about a 75D shore hardness), and wherein the outer sheath has a second hardness over the distal region of the inner liner that is less than the first hardness (Fig 4; para [0111]; the distal part of the outer layer 50 is taught to comprise an ultra-low hardness material, which has a hardness of about 60A shore hardness).

-*-Continued in next Supplemental Box-*-

Form PCT/ISA/237 (Supplemental Box) (revised January 2019)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/59718

Supplemental Box

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

As per claim 9, Shanghai teaches an aspiration catheter (Fig 1A-1B, 4; para [0093]-[0099], [0111]-[0112]; para [0115] further teaches wherein the catheter can be used for aspiration), comprising:
a proximal region defining a longitudinal axis (region of 10 comprising proximal part of outer layer 50; Fig 1A-1B, 4; para [0093]-[0099], [0111]-[0112]; the outer layer 50 is taught to comprise three parts, including a proximal part, positioned at the proximal end of the catheter body 10);
an intermediate region extending from the proximal region (region of 10 comprising transition section of outer layer 50; Fig 1A-1B, 4; para [0093]-[0099], [0111]-[0112]; the outer layer 50 is taught to comprise three parts, including a transition section extending from the proximal part of the proximal end of the catheter body 10);
a distal region extending from the intermediate region (region of 10 comprising distal part of outer layer 50; Fig 1A-1B, 4; para [0093]-[0099], [0111]-[0112]; the outer layer 50 is taught to comprise three parts, including a distal part, positioned at the distal end of the catheter body 10);
an inner liner (20; Fig 1A-1B; para [0093]) defining a lumen (21; Fig 1A-1B; para [0093]) and extending through the proximal region, the intermediate region and the distal region (Fig 1A-1B; para [0093]-[0099]);
a braid of wires extending over the inner liner and through the proximal region, the intermediate region and the distal region (40; Fig 1A-1B; para [0093]), [wherein a deflectable portion of the braid of wires (Box VIII) over at least a portion of the distal region of the inner liner is configured to deflect away from a longitudinal axis of the proximal region when the aspiration catheter is unconstrained];
a wire coiled in the distal region (30; Fig 1A-1B; para [0093], [0099]); and
an outer sheath extending over the braid of wires (Box VIII), the wire, and the inner liner and through the proximal region, the intermediate region, and the distal region (50; Fig 4; para [0111]-[0112]; Shanghai teaches an outer layer 50, which can be reasonably considered to be used with the catheter 10 shown in Fig 1A-1B).
While Shanghai teaches wherein the distal region of the aspiration catheter has good flexibility (Fig 1A-1B; para [0078]; the flexibility of the distal end of the catheter allows for a distal end of the braid of wires within the distal end of the catheter taught by Shanghai to be flexible and deflectable), Shanghai does not specifically teach wherein a deflectable portion of the braid of wires (Box VIII) over at least a portion of the distal region of the inner liner is configured to deflect away from a longitudinal axis of the proximal region when the aspiration catheter is unconstrained. However, Ross teaches a similar catheter (Fig 1-2; para [0024]-[0034]) comprising a braid of wires (24; Fig 1-2; para [0027]; reinforcing material 24 is taught to be formed of a braid made of metallic filaments) over an inner liner (22; Fig 1-2; para [0027]) wherein a deflectable portion of the braid of wires (Box VIII) over at least a portion of the distal region of the inner liner is configured to deflect away from a longitudinal axis of the proximal region when the catheter is unconstrained (Fig 1-2; para [0025]-[0026], [0035]; Ross teaches wherein the elongate shaft 18, including the reinforcing material 24 can be bent depending on the desired application - see Fig 6 further showing a configuration of the catheter that is formed to a bent configuration at the distal tip of the catheter). Accordingly, it would have been obvious to one of ordinary skill in the art to have employed deflectable portion taught by Ross with the aspiration catheter taught by Shanghai, in order to allow for improved navigation of tortuous vessels (para [0006]-[0010]).

As per claim 10, Shanghai in view of Ross teach the aspiration catheter of claim 1, and Ross further teaches wherein the deflectable portion of the braid of wires (Box VIII) is configured to deflect away from the longitudinal axis to have a bend angle of between about 165-195 degrees (Box VIII) when the aspiration catheter is unconstrained (Fig 1-2; para [0032]-[0035]; the catheter is taught to be formed as shown in Fig 6 by constraining the catheter in a desired curvature of position and then heating the shaft to shrink the shrink tubing 28, such that the reinforcing material 24 is pre-shaped in the curved configuration - Fig 6 further shows the bend angle to be almost exactly 180 degrees at the distal end, such that the bend angle is reasonably considered to be between 165-195 degrees).

As per claim 11, Shanghai in view of Ross teach the aspiration catheter of claim 9 wherein the outer sheath has: (a) a first hardness in the proximal region of between about 65D-75D (Fig 4; para [0111]; Shanghai teaches wherein the proximal part of outer layer 50 has a shore hardness of about 75D), (b) a second hardness in the intermediate region of between about 50D-60D (Fig 4; para [0111]; Shanghai teaches wherein the transition section has a shore hardness of between 60D-63D allowing for a shore hardness of 60D to make up the transition section), and (c) a third hardness in the distal region [of between about 30D-40D] (Fig 4; para [0111]; Shanghai teaches wherein the distal part has a shore hardness of about 60A). While Shanghai teaches wherein a third hardness is less than the first hardness and the second hardness (Fig 4; para [0111]), Shanghai does not specifically teach between about 30D-40D. However, it is well known in the art that routine experimentation and various engineering design choices could have been made to have arrived at between about 30D-40D. Accordingly, it would have been obvious to one of ordinary skill in the art to have arrived at between about 30D-40D, in order to provide improved structural integrity in the distal region of the aspiration catheter.

As per claim 12, Shanghai in view of Ross teach the aspiration catheter of claim 9 wherein the outer sheath (a) has a first hardness in the proximal region (Fig 4; para [0111]; Shanghai teaches wherein the proximal part of outer layer 50 has a shore hardness of about 75D), (b) a second hardness in the intermediate region less than the first hardness (Fig 4; para [0111]; Shanghai teaches wherein the transition section has a shore hardness of between 30D-63D), and (c) a third hardness in the distal region less than the second hardness (Fig 4; para [0111]; Shanghai teaches wherein the distal part has a shore hardness of about 60A).

As per claim 13, Shanghai in view of Ross teach the aspiration catheter of claim 12 wherein (a) the proximal region has a first length (Fig 4; para [0112]; the proximal part is taught to have a length of 1000-1200mm), (b) the intermediate region has a second length less than the first length (Fig 4; para [0112]; the transition section is taught to have a length of 10-30mm), and (c) the distal region has a third length greater than the second length and less than the first length (Fig 4; para [0112]; the distal part is taught to comprise a length of 100-200mm).

-*-Continued in next Supplemental Box-*-

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/59718

Supplemental Box

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

As per claim 14, Shanghai in view of Ross teach the aspiration catheter of claim 13. While Shanghai teaches wherein the overall length of the catheter body can be easily modified to suit specific applications, Shanghai does not specifically teach wherein the first length is between about 20.0- 28.0 inches, the second length is between about 2.0-3.0 inches, and the third length is between about 11.00-15.00 inches. However, it is well known that optimizing size, shape and angle is of the ordinary skill in the art. Accordingly, it would have been obvious to one of ordinary skill in the art to have optimized the size of the first length, the second length and the third length to have arrived at wherein the first length is between about 20.0- 28.0 inches, the second length is between about 2.0-3.0 inches, and the third length is between about 11.00-15.00 inches. Accordingly, it would have been obvious to one of ordinary skill in the art to have arrived at wherein the first length is between about 20.0- 28.0 inches, the second length is between about 2.0-3.0 inches, and the third length is between about 11.00-15.00 inches, in order to improve navigation of the aspiration catheter within blood vessels.

Claims 1-14 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used by industry.

Form PCT/ISA/237 (Supplemental Box) (revised January 2019)

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: MATTHEW S. WILLIAMS
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING
MAR 25 2022
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: 111552-8029WO00	Date of mailing (day/month/year): MAR 22 2022
International application No: PCT/US 21/59735	FOR FURTHER ACTION See paragraphs 1 and 4 below
Applicant: INARI MEDICAL, INC.	International filing date (day/month/year): 17 November 2021 (17.11.2021)

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 9.001 – 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
111552-8029WO00		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 21/59735	17 November 2021 (17.11.2021)	18 November 2020 (18.11.2020)
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. 18

☒ 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 21/59735

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:
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 examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-7 directed to a proximal ring, a distal ring and a tube portion.

Group II: Claims 8-20 directed to a handle and an actuator.

-*Continued in Supplemental Box*-

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.:
1-7

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 21/69735

A. CLASSIFICATION OF SUBJECT MATTER
IPC - A61M 25/00 (2022.01)
CPC - A61M 25/0147; A61M 25/0138

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	WO 2019/246240 A1 (INTUITIVE SURGICAL OPERATIONS, INC.) 26 December 2019 (26.12.2019), entire document, especially Fig 4A, 4C; para [0071]-[0084]	1-3, 5-7
Y		4-6
Y	US2010/0016837 A1 (Rioux) 21 January 2010 (21.01.2010), entire document, especially Fig 1-8; para [0034]-[0042]	4-6
A	US 2004/0138625 A1 (Saadat et al.) 15 July 2004 (15.07.2004), entire document	1-7
A	US 2020/0113412 A1 (AMBU A/S) 16 April 2020 (16.04.2020), entire document	1-7
A	US 2009/0192498 A1 (Ostrovsky et al.) 30 July 2009 (30.07.2009), entire document	1-7

☐ 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
20 February 2022	MAR 29 2022
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/210 (second sheet) (July 2019)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 21/59735

/* Box No. III - Observations where unity of invention is lacking */

The inventions listed as Groups I-II 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 feature of a proximal ring; a distal ring configured to be fixedly attached to a pull wire; and a tube portion extending between the proximal and distal rings, wherein the tube portion includes a plurality of openings extending therethrough to define a plurality of ribs, and wherein the ribs are configured to flex away from each other when the pull wire is pulled proximally, not required by Group II.

The invention of Group II includes the special technical feature of a handle coupled to the proximal region of the aspiration catheter, wherein the handle includes an actuator; and pull wire extending between the actuator and the deflectable member, wherein actuation of the actuator is configured to pull the pull wire, not required by the claims of Group I.

COMMON TECHNICAL FEATURES

Groups I-II share the common technical features of an aspiration catheter including a proximal region and a distal region, wherein the distal region includes a deflectable member; and a pull wire configured to deflect the deflectable member to deflect the distal region of the aspiration catheter relative to the proximal region. However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 2004/0138525 A1 to Saadat et al. (hereinafter "Saadat"), which discloses an aspiration catheter (30; Fig 21A-21B; para [0097]; see analogous Fig 41, para [0125] describing tool arm 30 used for aspiration, wherein the tool arm 30 is interpreted as an aspiration catheter) including a proximal region (proximal half of 30; Fig 21A-21B; para [0097]; the proximal half of 30 being the bottom-most half of the entire tool arm 30 in the orientation shown in Fig 21A) and a distal region (distal half of 30; Fig 21A-21B; para [0097]; the distal half of 30 being the top-most half of the entire tool arm 30 in the orientation shown in Fig 21A), wherein the distal region includes a deflectable member (portion of 30 from bottom slot 132 to the distal-most end of 30; Fig 21A-21B; para [0097]); and a pull wire configured to deflect the deflectable member to deflect the distal region of the aspiration catheter relative to the proximal region (96; Fig 21A-21B; para [0097]; pullwire 96 is shown to be attached to the portion of 30 extending distally from distal-most slot 132 via fixation point 104 wherein pulling the pullwire 96 causes the distal tip of tool arm 30 to deflect relative to the proximal region of tool arm 30).

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-II lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

Form PCT/ISA/210 (extra sheet) (July 2019)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: MATTHEW S. WILLIAMS
PERKINS COIE LLP
P.O. BOX 1247
SEATTLE, WA 98111-1247

RECEIVED
PATENT DOCKETING

MAR 25 2022

PERKINS COIE LLP

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis* 1)

Applicant's or agent's file reference 111552-8029WO00	Date of mailing *(day/month/year)* MAR 22 2022 FOR FURTHER ACTION See paragraph 2 below

International application No.	International filing date *(day month year)*	Priority date *(day month year)*
PCT/US 21/59735	17 November 2021 (17.11.2021)	18 November 2020 (18.11.2020)

International Patent Classification (IPC) or both national classification and IPC
IPC - A61M 25/00 (2022.01)
CPC - A61M 25/0147; A61M 25/0138

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	20 February 2022	Kari Rodriquez PCT Help Desk Telephone No. 571-272-4300

Form PCT/ISA/237 (cover sheet) (revised January 2019)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/59738

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:

☐ in the form of an Annex C/ST.25 text file.

☐ on paper or in the form of an image file.

b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/59735

Box No. IV Lack of unity of invention

1. [X] 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.
   - [X] 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.
   - [X] 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 examined, the appropriate additional examination fees must be paid.

Group I: Claims 1-7 directed to a proximal ring; a distal ring and a tube portion.

Group II: Claims 8-20 directed to a handle and an actuator.

The inventions listed as Groups I-II 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 feature of a proximal ring; a distal ring configured to be fixedly attached to a pull wire; and a tube portion extending between the proximal and distal rings, wherein the tube portion includes a plurality of openings extending therethrough to define a plurality of ribs, and wherein the ribs are configured to flex away from each other when the pull wire is pulled proximally, not required by Group II.

The invention of Group II includes the special technical feature of a handle coupled to the proximal region of the aspiration catheter, wherein the handle includes an actuator; and pull wire extending between the actuator and the deflectable member, wherein actuation of the actuator is configured to pull the pull wire, not required by the claims of Group I.

COMMON TECHNICAL FEATURES

Groups I-II share the common technical features of an aspiration catheter including a proximal region and a distal region, wherein the distal region includes a deflectable member; and a pull wire configured to deflect the deflectable member to deflect the distal region of the aspiration catheter relative to the proximal region. However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 2004/0138525 A1 to Saadat et al. (hereinafter "Saadat"), which discloses an aspiration catheter (30; Fig 21A-21B; para [0097]; see analogous Fig 41, para [0125] describing tool arm 30 used for aspiration, wherein the tool arm 30 is interpreted as an aspiration catheter) including a proximal region (proximal half of 30; Fig 21A-21B; para [0097]; the proximal half of 30 being the bottom-most half of the entire tool arm 30 in the orientation shown in Fig 21A) and a distal region (distal half of 30; Fig 21A-21B; para [0097]; the distal half of 30 being the top-most half of the entire tool arm 30 in the orientation shown in Fig 21A), wherein the distal region includes a deflectable member (portion of 30 from bottom slot 132 to the distal-most end of 30; Fig 21A-21B; para [0097]); and a pull wire configured to deflect the deflectable member to deflect the distal region of the aspiration catheter relative to the proximal region (98; Fig 21A-21B; para [0097]; pullwire 98 is shown to be attached to the portion of 30 extending distally from distal-most slot 132 via fixation point 104 wherein pulling the pullwire 98 causes the distal tip of tool arm 30 to deflect relative to the proximal region of tool arm 30).

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-II lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

4. Consequently, this opinion has been established in respect of the following parts of the international application:
   - [ ] all parts.
   - [X] the parts relating to claims Nos. 1-7

Form PCT/ISA/237 (Box No. IV) (revised January 2019)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/59735

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	3-6, 7	YES
	Claims	1-2, 8	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-7	NO
Industrial applicability (IA)	Claims	1-7	YES
	Claims	None	NO

2. Citations and explanations:
Claims 1-2 and 8 lack novelty under PCT Article 33(2) as being anticipated by WO 2019/246240 A1 to INTUITIVE SURGICAL OPERATIONS, INC. (hereinafter "Intuitive").

As per claim 1, Intuitive teaches an aspiration catheter (Fig 4A, 4C; para [0071]-[0084]; the flexible elongate device 400 is taught to correspond to elongate device 202, which is taught in para [0064] to be used for suction - further, para [0072] teaches wherein flexible elongate device 400 comprises a main lumen 411, which receives medical tools and is considered to be capable of receiving a suction tool or having suction applied therethrough), comprising:
a proximal region (402; Fig 4A; para [0072]); and
a distal region (404, portion of 406 extending distally from 425 collectively; Fig 4A; para [0072]) including a deflectable member (422, 424, 425 collectively; Fig 4A, 4C; para [0072]-[0076]), wherein the deflectable member includes :
a proximal ring (425; Fig 4A; para [0076]);
a distal ring configured to be fixedly attached to a pull wire (422; Fig 4A; para [0073]; control elements 421, taught to be pull wires, are taught to attach to distal mount 422); and
a tube portion extending between between the proximal and distal rings (424; Fig 4A; para [0076]-[0076]; axial support structure 424 is shown to extend between stopper 425 and distal mount 422), wherein the tube portion includes a plurality of openings extending therethrough (openings extending through left portions of 424; Fig 4A; para [0076]-[0078]; the axial support structure 424 is shown to comprise openings extending through every other circular portion of 424 on the left side) to define a plurality of ribs (left sides of 424; Fig 4A; para [0076]-[0078]; the left half of axial support structure 424 includes portions extending between the left openings), and wherein the ribs are configured to flex away from each other when the pull wire is pulled proximally (Fig 4A; para [0076]-[0078]; Intuitive teaches wherein when unequal forces are applied to control elements, the distal section 404, with axial support structure 424, bends in the direction defined by the net actuation forces, such that inherently when a right control element 421 is pulled, the support structure 424 bends right, which causes the left portions of 424 extending between the left openings to flex away from each other).

As per claim 2, Intuitive teaches the aspiration catheter of claim 1 wherein the tube portion includes a spine extending in a direction between the proximal and distal rings (right-most edge of 424; Fig 4A; para [0076]-[0078]; the axial support structure comprises a right most edge extending between the distal mount 422 and stopper 425), wherein the ribs extend away from the spine (Fig 4A; para [0076]-[0078]; the left portions of 424 extend away from the right-most edge of 424), and wherein the spine is configured to extend generally parallel to and over the pull wire (Fig 4A; para [0076]-[0078]; the control elements 421 are taught to extend through control element lumens 412, wherein Fig 4C shows the edges of axial support 424 to extend over the control element lumens 412, wherein the right-most edge of the axial support inherently extends over the right control elements 421 within the control element lumens 412).

As per claim 6, Intuitive teaches the aspiration catheter of claim 1 wherein the tube portion extends along a longitudinal axis in a relaxed state (Fig 4A; para [0072]-[0076]; the control elements 421 are taught to be used to bend the distal section 404 when force is applied to control elements 421, para [0077], wherein Fig 4A is reasonably considered to be a relaxed state such that control elements 421 are not actuated, wherein the axial support structure 424 is shown to extend along the longitudinal axis of the flexible elongate device 400, shown to be the horizontal axis extending through the main lumen 411 in Fig 4A), and wherein the plurality of openings (Box VIII) extend circumferentially about the longitudinal axis and generally parallel to one another in the relaxed state (Fig 4A, para [0072]-[0076]; the left openings of axial support structure 424 are shown to extend circumferentially about the longitudinal axis of the flexible elongate device 400 and further shown to be substantially parallel to one another in Fig 4A).

Claims 3 and 7 lack an inventive step under PCT Article 33(3) as being obvious over Intuitive.

As per claim 3, Intuitive teaches the aspiration catheter of claim 1, wherein the proximal region and the distal region define a lumen (having a diameter of 20 French or greater) (411; Fig 4A, 4C; para [0072]) While Intuitive teaches a similar catheter used to be positioned within an esophagus of a patient (Fig 3A-3B; para [0069]; the medical instrument shown in Fig 3A-3B is shown to be relatively large and inserted into the esophagus of the patient), Intuitive is silent as to the diameter of the lumen. However, it is well known in the art that optimizing size, shape and angle is of the ordinary skill in the art. Accordingly, it would have been obvious to one of ordinary skill in the art to have optimized the size of the lumen to have arrived at the lumen having a diameter of 20 French or greater, in order to allow for the lumen to receive more instrument (para [0072]).

-*-Continued in Supplemental Box-*--

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/58735

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claim 6: The term "the openings" is confusing and lacks proper antecedent basis. The term "the openings" appears to be referring to the plurality of openings previously referred to. For purposes of this opinion, the term "the openings" has been interpreted to be "the plurality of openings."

Form PCT/ISA/237 (Box No. VIII) (revised January 2019)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 21/58735

Supplemental Box

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

As per claim 7, Intuitive teaches the aspiration catheter of claim 1. While Intuitive teaches wherein the proximal ring includes an annular lumen configured to slidably receive the pull wire therethrough (Fig 4A; para [0072]; the control element lumen 412, shown to be annular in Fig 4C, is shown to extend through stopper 425) and an annular member extending through the lumen (423; Fig 4A-4B; para [0073]-[0076]; coil pipe 423 is taught to extend through the control element lumens 412 and terminate at the transition section 406 proximal to the distal section 404), Intuitive does not specifically teach wherein the proximal ring includes an annular member configured to slidably receive the pull wire therethrough. However, it is well known that routine experimentation and various engineering design choices could have been made to have arrived at wherein the proximal ring includes an annular member configured to slidably receive the pull wire therethrough (Note: providing the coil pipe 423 to extend through the control element lumen 412 within stopper 425, allows for the coil pipe 423 to still terminate proximal to distal section 404, as taught in para [0073]). Accordingly, it would have been obvious to one of ordinary skill in the art to have arrived at wherein the proximal ring includes an annular member configured to slidably receive the pull wire therethrough, in order to improve the structural integrity of the lumen within the proximal ring.

Claims 4-5 lack an inventive step under PCT Article 33(3) as being obvious over Intuitive in view of US 2010/0016837 A1 to Howat.

As per claim 4, Intuitive teaches the aspiration catheter of claim 1, further comprising an intermediate region between the proximal and distal regions (portion of 406 extending proximally from 425; Fig 4A; para [0072]). While Intuitive teaches wherein select portions of the aspiration catheter can be stiffened (para [0106]), Intuitive does not specifically teach wherein the proximal region and the intermediate region include a braid of wires extending therethrough. However, Howat teaches a similar catheter (Fig 5-8; para [0034]-[0042]) wherein a proximal region and an intermediate region include a braid of wires extending therethrough (Fig 8; para [0034]-[0037]; Howat teaches wherein an introducer sheath 20 is assembled, in which a braided member 40 is shown to extend along the entire length of the inner tube of the introducer sheath such that the braided member 40 extends through a proximal and intermediate region of the introducer sheath 20). Accordingly, it would have been obvious to one of ordinary skill in the art to have employed the braid of wires taught by Howat with the aspiration catheter taught by Intuitive, in order to improve the structural integrity of the aspiration catheter.

As per claim 5, Intuitive in view of Howat teach the aspiration catheter of claim 4, and Howat further teaches wherein the intermediate region includes a wire coiled around the braid (Fig 7; para [0038]; a coiled member 50, wherein para [0022] further teaches wherein coiled member is a flat wire coil, wherein the coiled member 50 extends along the length of the inner tube 30, such that the coiled member 50 is considered to be included in the intermediate region with the modification as combined).

Claims 1-7 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used by industry.

Form PCT/ISA/237 (Supplemental Box) (revised January 2019)

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**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-08-PCT		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2019/050410	10 September 2019 (10-09-2019)	10 September 2018 (10-09-2018)
Applicant		
STRYKER CORPORATION		

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.

[X] 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:

[X] 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,**

[X] 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,**

[X] 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. 7

[X] 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

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/050410

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/22 A61B17/221 A61B17/3207
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2017/189535 A2 (STRYKER CORP [US]) 2 November 2017 (2017-11-02) abstract paragraphs [0022], [000154] - [000155], [000167] - [000195], [000219]; figures 2-42	1-28
X	WO 2018/049317 A1 (STRYKER CORP [US]) 15 March 2018 (2018-03-15) abstract paragraphs [0082], [000136] - [000149]; figures 1-28	1-28
X	WO 2017/189591 A1 (STRYKER CORP [US]) 2 November 2017 (2017-11-02) abstract paragraphs [00021] - [00024], [00036] - [00066]; figures 1-9	1-4,9-20

-/--

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 October 2019	25/10/2019

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Ioanovici, T

2

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2009/086482 A1 (LAZARUS EFFECT INC [US]; MARTIN BRIAN B [US] ET AL.) 9 July 2009 (2009-07-09) abstract paragraphs [0159] - [0164]; figure 13	1-28

2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2019/050410

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2017189535 A2	02-11-2017	CN 109890304 A	14-06-2019
		EP 3448280 A2	06-03-2019
		JP 2019519341 A	11-07-2019
		US 2017303948 A1	26-10-2017
		US 2019117244 A1	25-04-2019
		US 2019133622 A1	09-05-2019
		WO 2017189535 A2	02-11-2017
WO 2018049317 A1	15-03-2018	CN 109922744 A	21-06-2019
		EP 3509507 A1	17-07-2019
		JP 2019526381 A	19-09-2019
		US 2018070968 A1	15-03-2018
		WO 2018049317 A1	15-03-2018
WO 2017189591 A1	02-11-2017	CN 109414272 A	01-03-2019
		EP 3448278 A1	06-03-2019
		JP 2019514648 A	06-06-2019
		US 2017303939 A1	26-10-2017
		US 2018042624 A1	15-02-2018
		WO 2017189591 A1	02-11-2017
WO 2009086482 A1	09-07-2009	CN 102036611 A	27-04-2011
		EP 2231037 A1	29-09-2010
		JP 5385302 B2	08-01-2014
		JP 5914432 B2	11-05-2016
		JP 2011508635 A	17-03-2011
		JP 2013233454 A	21-11-2013
		JP 2016041275 A	31-03-2016
		US 2009299393 A1	03-12-2009
		US 2014005717 A1	02-01-2014
		US 2017325830 A1	16-11-2017
		WO 2009086482 A1	09-07-2009

Form PCT/ISA/210 (patent family annex) (April 2005)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2019/050410	10.09.2019	10.09.2018

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/22 A61B17/221 A61B17/3207

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Ioanovici, T Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

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

1. Statement

Novelty (N)	Yes:	Claims	10-13, 16-20, 22, 23
	No:	Claims	1-9, 14, 15, 21, 24-28
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-28
Industrial applicability (IA)	Yes:	Claims	1-28
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1 WO 2017/189535 A2 (STRYKER CORP [US]) 2 November 2017 (2017-11-02)

D2 WO 2018/049317 A1 (STRYKER CORP [US]) 15 March 2018 (2018-03-15)

D3 WO 2017/189591 A1 (STRYKER CORP [US]) 2 November 2017 (2017-11-02)

D4 WO 2009/086482 A1 (LAZARUS EFFECT INC [US]; MARTIN BRIAN B [US] ET AL.) 9 July 2009 (2009-07-09)

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1, 14 and 21 is not new in the sense of Article 33(2) PCT.

D1 (abstract; paragraphs [0022], [000154] - [000155], [000167] - [000195], [000219]; figures 2-42) discloses:

An atherectomy device for removing a plaque material from a blood vessel (abstract), the device comprising:
a catheter having a distal edge defining an opening that provides access to a lumen within the catheter (para.[000154]-[000155]); and
a tractor (144,201,311,405,601,1101,1401,1600) comprising a flexible tube that at least partially covers and extends along an outer surface of the catheter and inverts over the catheter distal edge, such that a first end of the flexible tube extends through the opening into the lumen of the catheter (fig.2-17,31-40),
wherein the flexible tube comprises a plurality of engagement features cut at an acute angle into an outer surface of the flexible tube to form a plurality of acute cutting edges (para.[00022],[000171],[000178]-[000182]), and
wherein the flexible tube is configured so that pulling the first end of the flexible tube proximally through the catheter lumen causes the flexible tube to roll and invert over the catheter distal edge, thereby exposing the acute cutting edges distally as the flexible tube rolls into the catheter lumen (para.[000181]-000182],fig.2-17,31-40).

Moreover D1 also discloses the supplementary features of claims 14 and 21, such as the different shapes engagement features (para.[000181]-[000184], fig.30-37), the activatable tractor (the term "activatable" is interpreted as being actuatable manually or by other driving means, para.[000219]), the spaced apart bands of engagement (knit

bands / circumferentially aligned hoops 1105 / interlocking keys 2601 / stiffer regions 2403/3001 in between flexible regions 2401/3003, para.[000181]-[000184], fig. 10,13, 17,18,20,26-37,40).

Furthermore D2 (abstract; paragraphs [0082], [000136] - [000149]; figures 1-28) and D3 (abstract; paragraphs [00021] - [00024], [00036] - [00066]; figures 1-9) also discloses all the features of claims 1 and 14, especially the engagement features (D2 para.[000144], [000150]; D3 para.[0038]).

Dependent claims 2-13, 15-20 and 22-28 do not appear to contain any additional features which, in combination with the features of any claim to which it refers, meet the requirements of the PCT in respect of novelty and/or inventive step. The technical features of these claims are either disclosed in D1-D4 or are minor constructional detail changes. Some examples of the disclosed features can be seen below:

Claims 2-3: D1 para.[000131],[000151],[000155],[000163],[000167],[000181]-[000184], fig.2C,13,17,25.

Claims 5-8, 22-27: D1 knit bands / circumferentially aligned hoops 1105 / interlocking keys 2601 / stiffer regions 2403/3001 in between flexible regions 2401/3003, para. [000181]-[000184], fig. 10,13, 17,18,20,26-37,40.

Claims 9-12, 15-18: D1 para.[000181]-[000184], fig.30-37.

Re Item VII

Certain defects in the international application

The present application does not meet the requirements of Rule 6.3(b) PCT regarding the use of the two-part form in claims, of Rule 6.2(b) PCT regarding reference signs, of Rule 10.1(d) PCT regarding internationally recognized units (see paragraphs [0059], [0064] for example), nor those of Rule 5.1(a)(ii) PCT regarding mentioning relevant prior art in the description.

Re Item VIII

Certain observations on the international application

Although claims 1, 14 and 21 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

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**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-02-PCT1		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2017/029345	25 April 2017 (25-04-2017)	25 April 2016 (25-04-2016)
Applicant		
STRYKER CORPORATION		

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 7 sheets.

[X] 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:
      [X] 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. [X] **Certain claims were found unsearchable** (See Box No. II)

3. [X] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [X] 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,**
   [X] 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. 8a
      [X] 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

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/029345

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. [X] Claims Nos.: 34-42
because they relate to subject matter not required to be searched by this Authority, namely:

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

2. [X] Claims Nos.: 34-42
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:

see FURTHER INFORMATION sheet PCT/ISA/210

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

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

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

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

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

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

4. [X] 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.:

1-33

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.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/029345

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/22 A61B17/221
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	GB 2 498 349 A (COOK MEDICAL TECHNOLOGIES LLC) 17 July 2013 (2013-07-17)	1-3,5, 7-16,19, 21, 23-26, 29-31, 33,62-73
A	abstract; claims; figures page 8, line 12 - page 11, line 16	43-45
Y	US 2010/249815 A1 (JANTZEN ET AL.) 30 September 2010 (2010-09-30)	1-3,5, 7-16,19, 21, 23-26, 29-31,33
	paragraphs [0026], [0027]; figures 1,2	

-/--

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 January 2018	28/02/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Giménez Burgos, R

3

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/029345

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2012/049652 A1 (ENDOGROWTH (PROPRIETARY) LTD) 19 April 2012 (2012-04-19)	7-10
A	page 8, line 32 - page 15, line 26; figures 4-10	1,32,33
A	US 4 863 440 A (CHIN) 5 September 1989 (1989-09-05) abstract; figures	1
A	WO 2012/009675 A2 (LAZARUS EFFECT, INC.) 19 January 2012 (2012-01-19) paragraphs [0152], [0153], [0167] - [0172]; figures 10, 13B, 13G	1,62
Y	US 2007/149996 A1 (COUGHLIN) 28 June 2007 (2007-06-28) abstract; figures 6,7 paragraph [0032]	62-73
Y	US 2007/213765 A1 (ADAMS ET AL.) 13 September 2007 (2007-09-13) paragraphs [0050], [0083]; figures 1B, 13A,13B	66,73
Y	US 2015/190155 A1 (ULM, III) 9 July 2015 (2015-07-09) paragraph [0179]; figures 21-29	69
X,P	WO 2017/058280 A1 (GW MEDICAL LLC) 6 April 2017 (2017-04-06) the whole document	43-46, 48-51, 53-70,73

3

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2017/029345

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2498349 A	17-07-2013	EP 2802275 A1	19-11-2014
		GB 2498349 A	17-07-2013
		US 2015005781 A1	01-01-2015
		WO 2013106146 A1	18-07-2013
US 2010249815 A1	30-09-2010	NONE	
WO 2012049652 A1	19-04-2012	US 2013226196 A1	29-08-2013
		WO 2012049652 A1	19-04-2012
		ZA 201302264 B	30-04-2014
US 4863440 A	05-09-1989	CA 1326198 C	18-01-1994
		DE 3686408 D1	17-09-1992
		DE 3686408 T2	21-01-1993
		EP 0227583 A2	01-07-1987
		JP 2529838 B2	04-09-1996
		JP S62170260 A	27-07-1987
		US 4863440 A	05-09-1989
WO 2012009675 A2	19-01-2012	US 2014005712 A1	02-01-2014
		WO 2012009675 A2	19-01-2012
US 2007149996 A1	28-06-2007	NONE	
US 2007213765 A1	13-09-2007	AT 375131 T	15-10-2007
		AT 469614 T	15-06-2010
		AU 2003247676 A1	02-02-2004
		DE 60316814 T2	17-07-2008
		EP 1534178 A1	01-06-2005
		EP 1854428 A1	14-11-2007
		ES 2291689 T3	01-03-2008
		ES 2344610 T3	01-09-2010
		US 2004010280 A1	15-01-2004
		US 2007213765 A1	13-09-2007
		WO 2004006803 A1	22-01-2004
US 2015190155 A1	09-07-2015	US 2015190155 A1	09-07-2015
		US 2015190156 A1	09-07-2015
WO 2017058280 A1	06-04-2017	US 9463035 B1	11-10-2016
		US 2017086864 A1	30-03-2017
		WO 2017058280 A1	06-04-2017

Form PCT/ISA/210 (patent family annex) (April 2005)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-33

Mechanical thrombectomy apparatus comprising: an elongate inversion support; a tractor; and a plurality of projections that extend from a portion of the tractor.

---

2. claims: 43-61

Mechanical thrombectomy apparatus comprising: an elongate inversion support; a tractor comprising a flexible tube extending longitudinally, wherein the flexible tube comprises longitudinally alternating regions of higher and lower stiffness; and a puller coupled to a first end of the tractor.

---

3. claims: 62-73

Mechanical thrombectomy apparatus comprising: an elongate inversion support; a tractor, wherein the tractor is biased to expand to have an inner diameter that is greater than the outer diameter of the elongate inversion support; in the inverted configuration and is biased to expand to have an inner diameter that is greater than the inner diameter of the elongate inversion support in the un-inverted configuration; and an elongate puller coupled to the first end of the tractor.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 34-42

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

---

Continuation of Box II.2

Claims Nos.: 34-42

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

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2017/029345	25.04.2017	25.04.2016

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/22 A61B17/221

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Giménez Burgos, R Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 34-42

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international search *(specify)*:

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for the whole application or for said claims Nos. 34-42

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☒ See Supplemental Box for further details

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:

   see separate sheet

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

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-73

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

1. Statement

Novelty (N)	Yes:	Claims	1-33, 43-73
	No:	Claims	
Inventive step (IS)	Yes:	Claims	4, 6, 17, 18, 20, 22, 27, 28, 32, 43-61
	No:	Claims	1-3, 5, 7-16, 19, 21, 23-26, 29-31, 33, 62-73
Industrial applicability (IA)	Yes:	Claims	1-33, 43-73
	No:	Claims	

2. Citations and explanations

   see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)

   and / or

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

   see form 210

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The methods according to claims 34- 42 are methods of treatment of the living human or animal body by surgery.

The surgical methods claimed, at least implies the surgical step of positioning a distal end of the thrombectomy apparatus adjacent to a clot within the vessel.

Therefore, no preliminary international examination is required to the subject matter of these method claims (see Article 34(4) and Rule 67.1 (iv) PCT).

Re Item IV

Lack of unity of invention

This Authority considers that the application does not meet the requirements of unity of invention and that there are three inventions covered by the claims indicated as follows:

claims: 1-33

Mechanical thrombectomy apparatus comprising: an elongate inversion support; a tractor; and a plurality of projections that extend from a portion of the tractor.

claims: 43-61

Mechanical thrombectomy apparatus comprising: an elongate inversion support; a tractor comprising a flexible tube extending longitudinally, wherein the flexible tube comprises longitudinally alternating regions of higher and lower stiffness; and a puller coupled to a first end of the tractor.

claims: 62-73

Mechanical thrombectomy apparatus comprising: an elongate inversion support; a tractor, wherein the tractor is biased to expand to have an inner diameter that is greater than the outer diameter of the elongate inversion support; in the inverted configuration and is biased to expand to have an inner diameter that is greater than the inner diameter of the elongate inversion support in the un-inverted configuration; and an elongate puller coupled to the first end of the tractor.

The common technical features of subjects 1- 3 is:

"A mechanical thrombectomy apparatus for removing a clot from a vessel, the apparatus comprising:

an elongate catheter having a proximal end and a distal end and a distal end opening;

a tractor comprising a flexible tube that extends distally in an un-inverted configuration within the catheter, inverts over the distal end opening of the catheter and extends proximally in an inverted configuration along the distal end of the catheter, wherein the tractor comprises a tubular wall, and wherein the tractor is configured to invert by rolling over the distal end opening of the catheter when a first end of the tractor is pulled proximally within the catheter".

These features are known from prior art document GB 2498349 A.

In particular, document GB 2498349 A (Figs.: 1- 3; page 8, line 12- page 11, line 5) discloses a mechanical thrombectomy apparatus for removing a clot from within a vessel, the apparatus comprising:

an elongate catheter (12) having a proximal end and a distal end and a distal end opening;

a tractor (14) comprising a flexible tube that extends distally in an un-inverted configuration within the catheter (12), inverts over the distal end opening of the catheter (12) and extends proximally in an inverted configuration along the distal end of the catheter (12), wherein the tractor (14) comprises a tubular wall, and wherein the tractor is configured to invert by rolling over the distal end opening of the catheter (12) when a first end (16) of the tractor (14) is pulled proximally within the catheter (12).

Therefore, the special technical features, in the sense of Rule 13.2 PCT, of the three subjects are:

for subject 1: that the mechanical thrombectomy apparatus further comprises a plurality of projections that extend from a portion of the tractor; in order to provide an improved clot grabbing and/or maceration.

for subject 2: that the mechanical thrombectomy apparatus tractor comprises a flexible tube extending longitudinally, wherein the flexible tube comprises longitudinally alternating regions of higher and lower stiffness; in order to enhance rolling of the tractor region (inverting) over the distal end

for subject 3: that the mechanical thrombectomy apparatus tractor is biased to expand to have an inner diameter that is greater than the outer diameter of the elongate inversion support; in the inverted configuration and is biased to expand to have an inner diameter that is greater than the inner diameter of the elongate inversion support in the un-inverted configuration; in order to prevent jamming and an increase resistance between the tractor and the outside of the catheter of the elongate inversion support.

It appears that between the different subjects mentioned, no same or corresponding special feature can be found apart from those already known from the prior art.

It is also submitted that the three different subjects clearly intend to solve problems of different nature.

In conclusion, there is not technical relationship between the subjects identified, and thus, the above mentioned set of claims is not so linked by a general inventive concept.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1	GB 2 498 349 A (COOK MEDICAL TECHNOLOGIES LLC)
D2	US 2010/249815 A1 (JANTZEN ET AL.)
D3	WO 2012/049652 A1 (ENDOGROWTH (PROPRIETARY) LTD)
D4	US 4 863 440 A (CHIN)
D5	WO 2012/009675 A2 (LAZARUS EFFECT, INC.)
D6	US 2007/149996 A1 (COUGHLIN)
D7	US 2007/213765 A1 (ADAMS ET AL.)
D8	US 2015/190155 A1 (ULM, III)

Subject 1: Claims 1- 33

2 Independent claim 1, lack of inventive step (Article 33(3) PCT).

The present application does not meet the criteria of Article 33(1) PCT, because the subject matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

2.1 Document **D1** (Figs.: 1- 3; page 8, line 12- page 11, line 5) is regarded as being the prior art closest to the subject matter of claim 1, and discloses a mechanical thrombectomy apparatus for removing a clot from within a vessel, the apparatus comprising:

an elongate catheter (12) having a proximal end and a distal end and a distal end opening;

a tractor (14) comprising a flexible tube that extends distally in an un-inverted configuration within the catheter (12), inverts over the distal end opening of the catheter (12) and extends proximally in an inverted configuration along the distal end of the catheter (12), wherein the tractor (14) comprises a tubular wall, and wherein the tractor is configured to invert by rolling over the distal end opening of the catheter (12) when a first end (16) of the tractor (14) is pulled proximally within the catheter (12).

2.2 The subject-matter of claim 1 therefore differs from this known mechanical thrombectomy apparatus in that it further comprises: a plurality of projections that extend from a portion of the tractor that is inverted over the distal end opening of the catheter as the tractor rolls over the distal end opening of the catheter, wherein the plurality of projections do not extend from the tractor as it extends proximally in the inverted configuration along the distal end of the catheter.

2.3 The problem to be solved by the present invention may be regarded as the need for enhancing clot grabbing and/or maceration.

2.4 However, the outstanding differing features have already been employed for the same purpose in a similar mechanical thrombectomy apparatus for removing a clot from a vessel (see document **D2**: paragraphs [0026] and [0027]; and Figs.: 1 and 2).

In particular, document **D2** discloses a tractor comprising a scraping and thrombus capturing tube (20) of flexible material everted everted upon itself; and a plurality of projections (32, 34, 54) that extend from an internal portion of the eversible tractor (20).

2.5 It would be obvious to the person skilled in the art, namely when the same result is to be achieved, to include a plurality of projections extending from a portion of the tractor, as disclosed in document **D2**, with corresponding effect to the flexible tube tractor of document **D1**, thereby arriving at a mechanical thrombectomy apparatus for removing a clot from a vessel according to claim 1.

Therefore, the subject matter of claim 1 is not inventive (Article 33(3) PCT.

3 Independent claim 33, lack of inventive step (Article 33(3) PCT).

The additional technical feature included in claim 33, wherein the tractor is sufficiently soft such that without support from the catheter, the tractor collapses radially under an axial compression of less than 200g of force when inverting; is considered to come within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen.

Therefore, the same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claim 33, which therefore is also considered not inventive.

4 Dependent claims 2, 3, 5, 7- 16, 19, 21, 23- 26, 29- 31 appear to contain no features which in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect to novelty/ inventive step, since these features are also present in the mechanical thrombectomy apparatuses of documents **D1**- **D3** or are well known alternatives to the skilled man and here applied with no surprising effect.

5 The combination of the features of claims 4, 6, 17, 18, 20, 22, 27, 28 and 32 is neither known from, nor rendered obvious by, the available prior art.

Subject 2: Claims 43-61

6 Independent claims 43, 44 and 45; positive opinion.

6.1 Document **D1** (Figs.: 1- 3; page 8, line 12- page 11, line 5) is regarded as being the prior art closest to the subject-matter of claims 43, 44 and 45, and discloses a mechanical thrombectomy apparatus for removing a clot from within a vessel, the apparatus comprising:

an elongate catheter (12) having a proximal end and a distal end and a distal end opening;

a tractor (14) comprising a flexible tube extending at least partially longitudinally within the catheter (12) to invert and extend over the distal end of the catheter; and

a puller (20) coupled to a first end of the tractor (14) and configured to pull the tractor (14) proximally to invert the tractor (14) over the distal end opening.

6.2 The subject matter of claims 43, 44 and 45 therefore differs from this known mechanical thrombectomy apparatus in that:

the tractor flexible tube comprises longitudinally alternating regions of higher and lower stiffness (3001, 3003, 3001, 3003,...), wherein the regions of higher stiffness (3001) have a stiffness that is greater than the regions of lower stiffness (3003).

6.3 The problem to be solved by the present invention may be regarded as the need for a thrombectomy apparatus that prevents jamming and also helps to grab the clots; due to the ratcheting action obtained by the variable stiffness alternating regions as they invert (roll) at the distal facing end of the elongate inversion support.

6.4 The solution to this problem proposed in claims 43, 44 and 45 of the present application are considered as involving an inventive step (Article 33(3) PCT) because the subject matter of claims 43, 44 or 45 is neither suggested in the relevant prior art, nor detailed hints towards the specific solution claimed can be seen to exist in the prior art.

7 Claims 46- 61 which are dependent claims 43, and/or 44, and/or 45 and likewise meet the requirements of the PCT with respect to novelty and inventive step.

Subject 3: Claims 62- 73

8 Independent claim 62, lack of inventive step (Article 33(3) PCT).

The present application does not meet the criteria of Article 33(1) PCT, because the subject matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

8.1 Document **D1** (Figs.: 1- 3; page 8, line 12- page 11, line 5) is regarded as being the prior art closest to the subject matter of claim 1, and discloses a mechanical thrombectomy apparatus for removing a clot from within a vessel without jamming (Figs.: 1- 3), the apparatus comprising:

an elongate inversion support comprising a catheter (12) having a proximal end and a distal end and a distal end opening;

a tractor (14) comprising a flexible tube that extends distally in an un-inverted configuration (16) within the catheter (12), inverts over the distal end opening of the catheter (12) and extends proximally in an inverted configuration (18) along the distal end of the catheter (12), wherein the tractor (14) comprises a tubular wall, wherein the tractor is configured to invert by rolling over the distal end opening of the catheter (12) when a first end (16) of the tractor (14) is pulled proximally within the catheter (12) (page 10, lines 7- 11), wherein the tractor (14) is biased to expand greater than the outer diameter of the catheter (12) in the inverted configuration and biased to expand greater than the inner diameter of the catheter in the un-inverted configuration (Fig.: 2 and page 9, lines 19- 27); and

a puller (20) coupled to a first end of the tractor (14) and configured to pull the tractor proximally to invert the tractor (14) over the distal end opening page 8, line 26- page 9, line 5).

8.2 The subject matter of claim 1 therefore differs from this known mechanical thrombectomy apparatus in that the apparatus further includes a guidewire lumen extending through the elongate inversion support, puller and tractor that is configured to pass a guide wire; in order to allow the thrombectomy apparatus to more easily be positioned at the target site within the vasculature by tracking the device over a pre-inserted guidewire.

8.3 However, the outstanding differing features have already been employed for the same purpose in a similar mechanical thrombectomy apparatus for removing a clot from a vessel (see document **D6** (Figs.: 6 and 7; and paragraph [0032]) or **D5** (paragraphs [0172]; and Fig.: 13G).

8.3.1 In particular, document **D6** discloses a similar apparatus with an inversion support, puller and tractor that is configured to pass a guidewire.

In the embodiment disclosed in Fig.: 7, the elongate puller (703) has a guidewire lumen (709) such as a guidewire (708) can pass through the inversion support catheter, tractor and elongate puller (paragraph [0032]).

8.3.2 Also document **D5** discloses a similar apparatus with a puller and a tractor that is configured to pass a retrieval device (or suitably a guidewire).

In the embodiment disclosed in Fig.: 13G, the elongate puller (354) has a lumen (709) such as a retrieval device (200) can pass through the tractor and elongate puller (paragraph [0172]).

8.4 It would be obvious to the person skilled in the art, namely when the same result is to be achieved, to include an inversion support, puller and tractor that is configured to pass a guidewire, as disclosed in document **D6**, with corresponding effect to the puller and puller / tractor coupling of document **D1**, thereby arriving at a mechanical thrombectomy apparatus for removing a clot from a vessel according to claim 62.

Therefore, the subject matter of claim 62 is not inventive (Article 33(3) PCT.

9 Independent claim 63, lack of inventive step (Article 33(3) PCT).

The same reasoning applies, mutatis mutandis, to the subject matter of the corresponding independent claim 63, which therefore is also considered not inventive.

10 Dependent claims 64- 73 appear to contain no features which in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect to novelty/ inventive step, since these features are also present in the mechanical thrombectomy apparatuses of documents **D1** and **D6**- **D8** or are well known alternatives to the skilled man and here applied with no surprising effect.

Re Item VI

Certain documents cited

11 Certain published documents:

Application No Patent No	Publication date *(day/month/ year)*	Filing date *(day/month/ year)*	Priority date *(valid claim)* *(day/month/ year)*
WO 2017/058280	06/04/2017	15/02/2016	28/09/2016

Re Item VII

Certain defects in the international application

12 Independent claims 1, 32, 33, 43, 44 45 and 63 are not in the two part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

13 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

14 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in documents **D1**- **D8** is not mentioned in the description, nor are these documents identified therein.

Re Item VIII

Certain observations on the international application

15 Although the two groups of claims: 1, 32 and 33; and 43, 44, and 45 have been drafted as separate independent claims, they appear to relate effectively to the same subject matter and to differ from each other only with regard to the definition of the subject matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter.

The aforementioned groups of claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

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**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-04-PCT		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2018/059607	7 November 2018 (07-11-2018)	9 November 2017 (09-11-2017)
Applicant		
STRYKER CORPORATION		

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 8 sheets.

[X] 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:
      [X] 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. [X] 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. [X] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [X] 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,**
   [X] 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. 9a
      [X] 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

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2018/059607

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 additional sheet

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

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

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

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

Remark on Protest

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

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

☒ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2018/059607

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/221 A61B17/34 A61M1/00
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B A61M

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2017/189550 A1 (STRYKER CORP [US]) 2 November 2017 (2017-11-02)	1-9, 11-15, 29-41
Y	abstract	19-28
A	paragraphs [0033], [0035] - [0036], [0049] - [0109]; figures 1-12	16-18
X	WO 2017/058280 A1 (GW MEDICAL LLC [US]) 6 April 2017 (2017-04-06)	1-18, 29-40
Y	abstract	19-28
	paragraphs [0014], [0015], [0043] - [0071], [0087], [0116] - [0171], [0190]; figures 1-38	

-/--

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 March 2019	28/03/2019

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Ioanovici, T

4

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2017/303948 A1 (WALLACE MICHAEL P [US] ET AL) 26 October 2017 (2017-10-26)	1-15,41
A	abstract paragraphs [0058] - [0064], [0116] - [0148], [0159] - [0217]; figures 1-44	16-40
A	WO 2012/009675 A2 (LAZARUS EFFECT INC [US]; MARTIN BRIAN B [US]) 19 January 2012 (2012-01-19) abstract paragraphs [0167] - [0171]; figures 1-22	1-41
A	US 2005/085849 A1 (SEPETKA IVAN [US] ET AL) 21 April 2005 (2005-04-21) abstract paragraph [0083]; figures 5-46	1-41
X,P	WO 2017/210487 A1 (STRYKER CORP [US]) 7 December 2017 (2017-12-07) abstract paragraphs [0011] - [0017], [0020] - [0031], [0035] - [0088]; figures 1-10	1-4, 8-10, 13-15
X,P	WO 2018/049317 A1 (STRYKER CORP [US]) 15 March 2018 (2018-03-15) abstract paragraphs [0012], [0021] - [0036], [0054] - [0055], [0087] - [0134]; figures 1-28	1,3,4,8, 10,12, 13,15, 29-40
A	US 2011/160763 A1 (FERRERA DAVID A [US] ET AL) 30 June 2011 (2011-06-30) abstract paragraphs [0134], [0244] - [0246]; figures 2-60	1-41
A	US 2012/083868 A1 (SHRIVASTAVA SANJAY [US] ET AL) 5 April 2012 (2012-04-05) abstract paragraph [0052]; figures 1-10	1-41
A	WO 2012/049652 A1 (ENDOGROWTH PROPRIETARY LTD [ZA]; SMITH JAMES [ZA]) 19 April 2012 (2012-04-19) abstract page 9 - page 17; figures 1-14	1-41
A	US 2014/155980 A1 (TURJMAN ALEXIS [US] ET AL) 5 June 2014 (2014-06-05) abstract paragraphs [0257] - [0265]; figure 41	1-41

-/--

4

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2017/189591 A1 (STRYKER CORP [US]) 2 November 2017 (2017-11-02) abstract paragraph [0044]; figures 1-9	1-41

4

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2018/059607

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2017189550 A1	02-11-2017	CN 109310446 A	05-02-2019
		EP 3448276 A1	06-03-2019
		EP 3448277 A1	06-03-2019
		US 2017303942 A1	26-10-2017
		US 2017303947 A1	26-10-2017
		US 2018042626 A1	15-02-2018
		WO 2017189550 A1	02-11-2017
		WO 2017189615 A1	02-11-2017
WO 2017058280 A1	06-04-2017	CN 108348319 A	31-07-2018
		EP 3355829 A1	08-08-2018
		EP 3406208 A1	28-11-2018
		JP 2018529495 A	11-10-2018
		US 9463035 B1	11-10-2016
		US 2017086864 A1	30-03-2017
		WO 2017058280 A1	06-04-2017
US 2017303948 A1	26-10-2017	EP 3448280 A2	06-03-2019
		US 2017303948 A1	26-10-2017
		WO 2017189535 A2	02-11-2017
WO 2012009675 A2	19-01-2012	US 2014005712 A1	02-01-2014
		US 2018206865 A1	26-07-2018
		WO 2012009675 A2	19-01-2012
US 2005085849 A1	21-04-2005	US 2005033348 A1	10-02-2005
		US 2005059995 A1	17-03-2005
		US 2005085849 A1	21-04-2005
		US 2008177296 A1	24-07-2008
		US 2012310251 A1	06-12-2012
		US 2014128894 A1	08-05-2014
WO 2017210487 A1	07-12-2017	EP 3463114 A1	10-04-2019
		US 2017348014 A1	07-12-2017
		WO 2017210487 A1	07-12-2017
WO 2018049317 A1	15-03-2018	US 2018070968 A1	15-03-2018
		WO 2018049317 A1	15-03-2018
US 2011160763 A1	30-06-2011	AU 2010339405 A1	16-08-2012
		EP 2367482 A1	28-09-2011
		EP 3173037 A1	31-05-2017
		JP 5010054 B2	29-08-2012
		JP 5975737 B2	23-08-2016
		JP 2012183366 A	27-09-2012
		JP 2012510352 A	10-05-2012
		JP 2016104212 A	09-06-2016
		US 2011160742 A1	30-06-2011
		US 2011160757 A1	30-06-2011
		US 2011160760 A1	30-06-2011
		US 2011160761 A1	30-06-2011
		US 2011160763 A1	30-06-2011
		US 2011238106 A1	29-09-2011
		US 2012016406 A1	19-01-2012
		US 2012022576 A1	26-01-2012
		US 2012041460 A1	16-02-2012
		US 2012041475 A1	16-02-2012
		US 2012316600 A1	13-12-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 2014121758 A1	01-05-2014
		WO 2011082319 A1	07-07-2011
US 2012083868 A1	05-04-2012	BR 112013007860 A2	21-06-2016
		CN 103153214 A	12-06-2013
		EP 2621375 A1	07-08-2013
		JP 5615979 B2	29-10-2014
		JP 6042372 B2	14-12-2016
		JP 6346221 B2	20-06-2018
		JP 2013542758 A	28-11-2013
		JP 2014193379 A	09-10-2014
		JP 2016172048 A	29-09-2016
		KR 20130076868 A	08-07-2013
		US 2012083868 A1	05-04-2012
		US 2015297375 A1	22-10-2015
		WO 2012044757 A1	05-04-2012
WO 2012049652 A1	19-04-2012	US 2013226196 A1	29-08-2013
		WO 2012049652 A1	19-04-2012
		ZA 201302264 B	30-04-2014
US 2014155980 A1	05-06-2014	EP 2869887 A2	13-05-2015
		JP 2015521922 A	03-08-2015
		US 2014155980 A1	05-06-2014
		US 2015230820 A1	20-08-2015
		US 2016354099 A1	08-12-2016
		WO 2014008460 A2	09-01-2014
WO 2017189591 A1	02-11-2017	CN 109414272 A	01-03-2019
		EP 3448278 A1	06-03-2019
		US 2017303939 A1	26-10-2017
		US 2018042624 A1	15-02-2018
		WO 2017189591 A1	02-11-2017

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-15, 41

Inverting tube aparatus for removing a clot from a vessel comprising an inversion support catheter, a puller and a flexible inverting tube with a cuff at the second end

1.1. claim: 41

Inverting mechanical thrombectomy aparatus for removing a clot from a vessel comprising an inversion support catheter with a plurality of slots or cut-outs for enhancing flexibility, a puller and a flexible knitted inverting tube

---

2. claims: 16, 18

Inverting tube aparatus for removing a clot from a vessel comprising an intermediate catheter, an inversion support catheter, a puller and a knitted inverting tube with filament knitted to form a plurality of interlocking loop stitched having a length between 0,5 and 10 mm

---

3. claims: 17, 19-28

Inverting tube aparatus for removing a clot from a vessel comprising an inversion support catheter, a puller and a knitted inverting tube having a first and a second configuration, the knitted tube having an expanded outer diameter of 0,5-12 mm for the first region adjacent the first end in the first configuration, an inner diameter grater than 30% of an inner diameter of the inversion support catheter in the second configuration, and a second region of the knitted tube adjacent the second end has an expanded outer diameter less than the expanded outer diameter of the knitted tube region adjacent the first end and within 20% of an outer diameter of the inversion support catheter.

---

4. claims: 29-40

Pre-loaded inverting mechanical thrombectomy aparatus for removing a clot from a vessel comprising an intermediate catheter, an inversion support catheter, a puller and a flexible inverting tube extending between the inversion support catheter and the intermediate catheter, wherein the puller and the inversion support catheter are releasabl held together.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2018/059607	07.11.2018	09.11.2017

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/221 A61B17/34 A61M1/00

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Ioanovici, T Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. II Priority

1. ☑ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43*bis*.1 and 64.1) is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

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:

   see separate sheet

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

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-41

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

1. Statement

Novelty (N)	Yes:	Claims	2, 5, 7-9, 12, 15, 17-28, 30-33, 35-40
	No:	Claims	1, 3, 4, 6, 10, 11, 13, 14, 16, 29, 34, 41
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-41
Industrial applicability (IA)	Yes:	Claims	1-41
	No:	Claims	

2. Citations and explanations

   see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)

   and / or

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

   see form 210

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item IV

Lack of unity of invention

This Authority considers that the application does not meet the requirements of unity of invention and that there are 4 inventions covered by the claims indicated as follows:

The common matter linking together the independent claims (1,15,41), 16, 19 and (29,34) is the following: inverting apparatus for removing a clot from a vessel comprising: an inversion support catheter, a puller within the inversion support catheter and a flexible tube extending over the inversion support catheter.

This common matter does not comprise a single general inventive concept, based on same or corresponding technical features, because D3 (US2017/0303948) discloses an inverting apparatus for removing a clot from a vessel (abstract) comprising: an inversion support catheter (4113, fig.41), a puller (4105) within the inversion support catheter (fig.41) and a flexible tube (4103) extending over the inversion support catheter (fig.41).

Moreover independent claims (1,15,41), 16, 19 also have in common the fact that the flexible tube is configured to be pulled proximally by pulling the puller and the flexible tube inverts over the distal end and into the inversion support catheter, and this features are also disclosed in D3 (see para.[0208],fig.4,41)

Hence, the following separate inventions or groups of inventions are not so linked as to form a single general inventive concept:

Group 1. claims 1-15

Inverting tube apparatus for removing a clot from a vessel comprising an inversion support catheter, a puller and a flexible inverting tube with a cuff at the second end

Subgroup 1.1. claim 41

Inverting mechanical thrombectomy apparatus for removing a clot from a vessel comprising an inversion support catheter with a plurality of slots or cut-outs for enhancing flexibility, a puller and a flexible knitted inverting tube

Claim 41 has been grouped together with group 1 because the subject-matter of this claim is disclosed in D1.

Group 2. claims: 16, 18

Inverting tube apparatus for removing a clot from a vessel comprising an intermediate catheter, an inversion support catheter, a puller and a knitted inverting tube with filament knitted to form a plurality of interlocking loop stitched having a length between 0,5 and 10 mm

Group 3. claims: 17, 19-28

Inverting tube apparatus for removing a clot from a vessel comprising an inversion support catheter, a puller and a knitted inverting tube having a first and a second configuration, the knitted tube having an expanded outer diameter of 0,5-12 mm for the first region adjacent the first end in the first configuration, an inner diameter greater than 30% of an inner diameter of the inversion support catheter in the second configuration, and a second region of the knitted tube adjacent the second end has an expanded outer diameter less than the expanded outer diameter of the knitted tube region adjacent the first end and within 20% of an outer diameter of the inversion support catheter.

Claim 17 was grouped together with group 3 because it also refers to the knitted tube inner diameter relative to the inversion support catheter outer diameter.

Group 4. claims: 29-40

Pre-loaded inverting mechanical thrombectomy apparatus for removing a clot from a vessel comprising an intermediate catheter, an inversion support catheter, a puller and a flexible inverting tube extending between the inversion support catheter and the intermediate catheter, wherein the puller and the inversion support catheter are releasably held together.

Remaining technical features of group 1:

An inverting tube apparatus comprising: a flexible tube having a first end coupled at a distal end region of the puller and a second end comprising a cuff that is less flexible that a region of the flexible tube adjacent to the cuff. The cuff is tapered at the proximal facing end.

Problem: The remaining technical features of group 1 solve the problem of how to prevent the flexible tube from rolling completely inside the inversion support catheter

Remaining technical features of group 2:

An inverting tube apparatus comprising: an intermediate catheter; a knitted tube extending over the inversion support catheter, the knitted tube having a first end coupled at a distal end region of the puller and a second end that is free,wherein the knitted tube comprises a filament knitted to form a plurality of interlocking loop stitches, and wherein each loop stitch has a stitch length that is between 0.5mm and 10mm.

Problem: The remaining technical features of group 2 solve the problem of how to improve grabbing and removal of the clot.

Remaining technical features of group 3:

An inverting tube apparatus comprising: a knitted tube extending over the inversion support catheter in a first configuration, the knitted tube having a first end coupled to a distal end region of the puller, and a second end that is free to move relative to the inserting support catheter; wherein the knitted tube in the first configuration has an expanded outer diameter that is between 0.5 mm and 12 mm for a first region of the knitted tube that is adjacent to the first end, and the knitted tube in the second configuration has an inner diameter that is greater than 30% of an inner diameter of the inversion support catheter, and wherein a second region of the knitted tube adjacent to the second end has an expanded outer diameter that is less than the expanded outer diameter of the region of the knitted tube adjacent to the first end and within 20% of an outer diameter of the inversion support catheter.

Problem: The remaining technical features of group 3 solve the problem of how to snuggly fit the knitted tube over the inversion support catheter and provide expansion only at the distal region.

Remaining technical features of group 4:

A pre-loaded inverting mechanical thrombectomy apparatus configured to be delivered through a tortious anatomy, the apparatus comprising: an intermediate catheter having a distal end; an inversion support catheter extending distally from a lumen of the intermediate catheter, the inversion support catheter having a distal end and a distal end opening; a puller extending distally within the inversion support catheter; and a flexible tube extending proximally from a distal end region of the puller and between the intermediate catheter and the inversion support catheter,wherein the puller extends from the distal end of the intermediate catheter and the distal end opening of the inversion support catheter; and wherein the distal end opening of the inversion support is held within the lumen of the intermediate catheter, and wherein the flexible tube extends between the inversion support catheter and the intermediate catheter, and wherein the puller and inversion support catheter are releasably held together so that they move together while advancing distally within a vessel lumen.

Problem: The remaining technical features of group 4 solve the problem of how to prevent vessel wall damage from the flexible tube during tracking and prevent compressive force on the elongate inversion support.

Consequently, the remaining features of Group 1, Group 2, Group 3 and Group 4 are different. As the problems they solve are also different, these features are not corresponding either.

As the claims comprise neither the same, nor corresponding special technical features, the technical relationship between the subject matter of the claims required by Rule 13.1 PCT is lacking and the claims are not so linked as to form a single general inventive concept. The application does not fulfil the requirement for unity of invention in the sense of Rules 13.1 and 13.2 PCT.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1 WO 2017/189550 A1 (STRYKER CORP [US]) 2 November 2017 (2017-11-02)

D2 WO 2017/058280 A1 (GW MEDICAL LLC [US]) 6 April 2017 (2017-04-06)

D3 US 2017/303948 A1 (WALLACE MICHAEL P [US] ET AL) 26 October 2017 (2017-10-26)

D4 WO 2012/009675 A2 (LAZARUS EFFECT INC [US]; MARTIN BRIAN B [US]) 19 January 2012 (2012-01-19)

D5 US 2005/085849 A1 (SEPETKA IVAN [US] ET AL) 21 April 2005 (2005-04-21)

D6 WO 2017/210487 A1 (STRYKER CORP [US]) 7 December 2017 (2017-12-07)

D7 WO 2018/049317 A1 (STRYKER CORP [US]) 15 March 2018 (2018-03-15)

D8 US 2011/160763 A1 (FERRERA DAVID A [US] ET AL) 30 June 2011 (2011-06-30)

D9 US 2012/083868 A1 (SHRIVASTAVA SANJAY [US] ET AL) 5 April 2012 (2012-04-05)

D10 WO 2012/049652 A1 (ENDOGROWTH PROPRIETARY LTD [ZA]; SMITH JAMES [ZA]) 19 April 2012 (2012-04-19)

D11 US 2014/155980 A1 (TURJMAN ALEXIS [US] ET AL) 5 June 2014 (2014-06-05)

D12 WO 2017/189591 A1 (STRYKER CORP [US]) 2 November 2017 (2017-11-02)

GROUP 1

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

D1 (abstract; paragraphs [0033], [0035] - [0036], [0049] - [0109]; figures 1-12) discloses:

An inverting tube apparatus for removing a clot from a vessel (abstract), the apparatus comprising:
an inversion support catheter (409,509,1011,4113, fig.4,10,41);
a puller (407,507,1003,4105) within a lumen of the inversion support catheter (fig. 4,10,41); and
a flexible tube (406,503,1007,4103) extending over a distal end of the inversion support catheter, the flexile tube having a first end coupled at a distal end region of the puller (fig.4,10,41) and a second end comprising a cuff (cuff 404,414,1006, fig. 4,10) that is less flexible (it is implicit that adding a cuff or a polymer material on the flexible tube will make that area less flexible) that a region of the flexible tube adjacent to the cuff (para.[0084.],[0097]), wherein the flexible tube is configure to be pulled proximally into the inversion support catheter by pulling the puller proximally so that the flexible tube rolls and inverts over a distal end of the inversion support catheter (para.[0049]).

Moreover claims 1 is also disclosed in D2 (see cuff in fig.2D,12,16,20A), D6 (intermediate document published on the 07.12.2017 and having the priority of 03.06.2016; see cuff in fig.4A,4B,10A,10B) and D7 (intermediate document published on the 15.03.2018 and having the priority of 12.09.2016; see cuff in fig.3A,8A,15B).

Furthermore D6 and D7 also disclose the subject-matter of claim 15 because both of these intermediate documents disclose a tapered cuff (D6: fig.7A and para.[0081], fig. 8B and para.[0086]; D7: fig.3A and para.[0087], fig.8A and para.[0107]-[0108], fig.15B and para.[0124]). Therefore also claim 15 lacks novelty.

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 41 is not new in the sense of Article 33(2) PCT.

D1 (abstract; paragraphs [0033], [0035] - [0036], [0049] - [0109]; figures 1-12) discloses:

An inverting mechanical thrombectomy apparatus for removing a clot from a vessel configured to be delivered through a tortious anatomy (abstract,para.[0061]), the apparatus comprising:
an inversion support catheter (409,509,700,1011,4113, fig.4,7,10,41) extending distally, the inversion support catheter having a distal end and a distal end opening (411, 707, fig.4,7,10,41), the inversion support catheter comprising a plurality of slots or cut-out regions along its length to enhance flexibility while maintaining column strength such that the inversion support catheter is able to withstand at least about 500g of compressive force (para.[0053]-[0054],[0079]-[0081],fig.7);
a puller (407,507,713,1003,4105) extending distally within the inversion support catheter (fig.4,7,10,41); and
a flexible tube (406,503,711,1007,4103) extending proximally from a distal end region of the puller (fig.4,7,10,41),
wherein the flexible tube comprises a knitted material that is held in compression along an outside region of the inversion support catheter and inverts over the distal end opening of the inversion support catheter and couples to the puller, and
wherein pulling the puller proximally causes the flexible tube to roll from the outside region of the inversion support catheter, over the distal end opening and invert into the inversion support catheter (para.[0049],[0061],[0065],fig.4,7,10,41).

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 15 does not involve an inventive step in the sense of Article 33(3) PCT.

As seen above in relation to claim 1, D1 discloses the inverting tube apparatus of claim 1, but fails to disclose the additional technical feature present in claim 15: the cuff tapered at the proximal facing end. The objective problem to be solved by a proximally tapered cuff could be defined as how to better assemble the different components of an inverting tube apparatus. Even though D1 does not disclose that the cuff may be tapered this modification is a normal design option for the skilled person in the art depending on the geometrical space requirements of the cuff, the cuff tapering proximally inwards facilitates assembly with an outer catheter, and the cuff tapering proximal outwards facilitates assembly with an inner catheter. Moreover stiffer proximal tapering of a flexible tractor tube is also disclosed in D2 (see para. [0146], fig.13) for permitting assembly with a pull wire and a guidewire. Therefore the skilled person would envisage such a tapered cuff for the D1 inverting apparatus without requiring any inventive skill.

Furthermore it is possible to start inventive step objections for claim 15 starting from any of the documents D1-D3, and at the same time also claim 1 lacks an inventive step starting from D3 which fails to disclose the cuff that is an obvious modification as it can be seen from D1 and D2.

Dependent claims 2-14 do not appear to contain any additional features which, in combination with the features of any claim to which it refers, meet the requirements of the PCT in respect of novelty and/or inventive step. The technical features of these claims are either disclosed in D1-D12 (D6 and D7 are only relevant for novelty because they are intermediate documents) or are minor constructional detail changes. Some examples of the disclosed features can be seen below:

Claim 3: D1 para.[0069].

Claim 5: D2 fig.13A.

Claim 6: D1 fig.10.

Claims 10-11: D1 para.[0101].

Claim 13: D1 para.[0049].

Claim 14: D1 para.[0097].

GROUP 2

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 16 is not new in the sense of Article 33(2) PCT.

D2 discloses:

An inverting tube apparatus for removing a clot from a vessel (para.[0014]), the apparatus comprising:
an intermediate catheter (outer catheter, para.[0043],[0055]);
an inversion support catheter (inner catheter, para.[0043],[0055]) within a lumen of the intermediate catheter;
a puller within a lumen of the inversion support catheter (para.[0056],[0057]); and
a knitted (para.[0059]) tube extending over the inversion support catheter (tractor, para.[0055]), the knitted tube having a first end coupled at a distal end region of the puller and a second end that is free (fig.12),
wherein the knitted tube is configured to be pulled proximally into the inversion support catheter by pulling the puller proximally so that the knitted tube rolls and inverts over a distal end of the inversion support catheter (para.[0056]),
wherein the knitted tube comprises a filament knitted to form a plurality of interlocking

loop stitches (para.[0048]), and
wherein each loop stitch has a stitch length that is between 0.5mm and 10mm (woven material pore size in the range of 0.05 and 1 mm, para.[0048]).

Furthermore the claimed value range not disclosed by D2 would still not be inventive in view of D8 (cell length of 2 mm, para.[0134],[0244]-[0246]), D9 (cell size of 3.5x2.5 mm, para.[0052]) or D11 (cell side of 1.8 mm, para.[0264]-[0265], fig.41) which all discloses similar cell sizes for enhancing gripping or macerating of blood clots.

Dependent claims 17-18 do not appear to contain any additional features which, in combination with the features of any claim to which it refers, meets the requirements of the PCT in respect of novelty and/or inventive step. The technical features of these claims are either disclosed in D1-D12 (D6 and D7 are only relevant for novelty because they are intermediate documents) or are minor constructional detail changes.

GROUP 3

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 19 does not involve an inventive step in the sense of Article 33(3) PCT.

D2 discloses:

An inverting tube apparatus for removing a clot from a vessel (para.[0014]), the apparatus comprising:
an inversion support catheter (inner catheter, para.[0043],[0055]);
a puller within a lumen of the inversion support catheter (para.[0056],[0057]); and
a knitted (para.[0059]) tube extending over the inversion support catheter in a first configuration (tractor, para.[0055]), the knitted tube having a first end coupled to a distal end region of the puller, and a second end that is free to move relative to the inserting support catheter (fig.12), wherein the knitted tube is configure to be pulled proximally into the inversion support catheter by pulling the puller proximally so that the knitted tube rolls and inverts over a distal end of the inversion support catheter into a second configuration within the inversion support catheter (para.[0056]);
further wherein the knitted tube in the first configuration has an expanded outer diameter that is between 0.5 mm and 12 mm (3-7mm, para.[0158]; for use in vessels having a 4-8 mm ID para.[0160]; woven tractor expands to an outer diameter 1.5 times greater than the catheter inner diameter when unconstrained, para.[0058]; expanded diameter between 1.3 and 10 times the catheter inner diameter, para. [0120]) for a first region of the knitted tube that is adjacent to the first end (the end coupled to the puller), and the knitted tube in the second configuration (rolled inside

the inversion support catheter) has an inner diameter that is greater than 30% of an inner diameter of the inversion support catheter (para.[0056]), ~~and wherein a second region of the knitted tube adjacent to the second end has an expanded outer diameter that is less than the expanded outer diameter of the region of the knitted tube adjacent to the first end and within 20% of an outer diameter of the inversion support catheter.~~

The technical effect given by the missing technical features is that the second region reduced diameter prevents inversion of the knitted tube during placement of the apparatus before the puller is actuated.

The objective problem to be solved can be therefore formulated as how to increase safety for a clot removing inverting tube apparatus.

D1 from the same technical field discloses a proximal tractor end (414,1006) which is releasably adhered/locked to the outer diameter of the catheter (para.[00070], [00084]) for preventing the tractor from premature deploying and expanding (para. [00061],[00068]-[00072],[00084], fig.4B,10A-10C).

Considering that D1 solves the aforementioned problem it would be obvious for the skilled person in the art to combine the teachings of D1 with D2 and therefore obtaining the claimed apparatus.

Dependent claims 20-28 do not appear to contain any additional features which, in combination with the features of any claim to which it refers, meets the requirements of the PCT in respect of inventive step. The technical features of these claims are either disclosed in D1-D5 or D8-D12 or are minor constructional detail changes. Some examples of the disclosed features can be seen below:

Claim 20: D2 cuff in fig.2D,12,16,20A.

Claim 21: D2 fig.16-17.

Claim 25: D2 woven material pore size in the range of 0.05 and 1 mm, para.[0048].

GROUP 4

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 29 is not new in the sense of Article 33(2) PCT.

D2 discloses:

A pre-loaded (para.[0015],[0050],[0144],[0190]) inverting mechanical thrombectomy apparatus for removing a clot from a vessel (para.[0014]) configured to be delivered through a tortious anatomy (para.[0047]), the apparatus comprising:
an intermediate catheter having a distal end (outer catheter, para.[0043],[0055],[0134]

fig.6,12);
an inversion support catheter (inner catheter, para.[0043],[0055],[0134]) within a lumen of the intermediate catheter (fig.6,12), the inversion support catheter having a distal end and a distal end opening;
a puller (para.[0056],[0057]) extending within the inversion support catheter; and
a flexible tube (tractor, para.[0055]) extending proximally from a distal end region of the puller so that a distal-facing face of the puller extends distally beyond the flexible tube (fig.6),
wherein the puller extends from the distal end of the intermediate catheter and the distal end opening of the inversion support catheter (fig.6,12); and wherein the distal end opening of the inversion support is held within the lumen of the intermediate catheter (the inner catheter with the tractor tube are held within the outer catheter before deployment,para.[0055]), and wherein the flexible tube extends between the inversion support catheter and the intermediate catheter (fig.6-9,12).

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 34 is not new in the sense of Article 33(2) PCT.

The supplementary features (when compared to claim 29) of claim 34 are also disclosed in D2: puller and inversion support catheter are releasably held together during insertion of the apparatus before deployment (para.[0055],[0092],[0149]).

Moreover also D1 discloses a pre-loaded tractor (para.[00093],[000105]) comprising all the features of claims 29 and 34 (fig.8D,11, para.[00043],[00046]-[00047],[00079], [00099]-[000106]).

Dependent claims 30-33 and 35-40 do not appear to contain any additional features which, in combination with the features of any claim to which it refers, meets the requirements of the PCT in respect of novelty and/or inventive step. The technical features of these claims are either disclosed in D1-D12 (D6 and D7 are only relevant for novelty because they are intermediate documents) or are minor constructional detail changes. Some examples of the disclosed features can be seen below:

Claim 30,35: D1 para.[000107].

Claim 31,36: D2 para.[0059]; D1 para.[0036].

Claim 33: D2 para.[0055],[0092],[0149]; D1 fig.8D,11, para.[00043],[00046]-[00047], [00079],[00099]-[000106]

Re Item VI

Certain documents cited

Certain published documents

Application No Patent No	Publication date *(day/month/year)*	Filing date *(day/month/year)*	Priority date *(valid claim)* *(day/month/year)*
WO2017/210487	07/12/2017	01/06/2017	03/06/2016
WO2018/049317	15/03/2018	11/09/2017	12/09/2016

Re Item VII

Certain defects in the international application

Claim 36 send with the request under Article 91 seems to contain an obvious error in the dependency, as it should be dependent on claims 34 or 35 for not creating problems with added subject-matter (Article 19(2)/Article 34(2)(b) PCT).

Claim 37 send with the request under Article 91 seems to contain an obvious error in the dependency, it should be dependent on claim 34 for not creating problems with added subject-matter (Article 19(2)/Article 34(2)(b) PCT).

The present application does not meet the requirements of Rule 6.3(b) PCT regarding the use of the two-part form in claims, of Rule 6.2(b) PCT regarding reference signs, of Rule 10.1(d) PCT regarding internationally recognized units, nor those of Rule 5.1(a)(ii) PCT regarding mentioning relevant prior art in the description.

Re Item VIII

Certain observations on the international application

Although claims 1, 15 and 41 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

Although claims 29 and 34 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

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	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 16/17982	International filing date *(day/month/year)* 15 February 2016 (15.02.2016)	(Earliest) Priority Date *(day/month/year)* 28 September 2015 (28.09.2015)
Applicant GW MEDICAL LLC		

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 3 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. 1

☐ 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.

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 16/17982

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.: 40-73, 78
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:

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.:

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.

Form PCT/ISA/210 (continuation of first sheet (2)) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 16/17982

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A61F 2/01 (2016.01)
CPC - A61B 17/221, A61F 2/01, A61B 2017/22038, A61B 2017/22079, A61B 2017/22081
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) - A61F 2/01 (2016.01)
CPC - A61B 17/221, A61F 2/01, A61B 2017/22038, A61B 2017/22079, A61B 2017/22081

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
(CPC) 606/200, 159, 127; (CPC) A61B 2017/221*; A61F 2/013, 2002/01*
(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: thrombectomy, embolectomy, remov*, captur*, thromb*, clot*, emboli*, plaque*, invert*, inversion, evert*, intussuscept*, mesh, net, basket, smooth*, round*, edge, tip, end, stiff*, reinforc*, snag*, expand*,

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X -- Y -- A	US 2015/0005781 A1 (LUND-CLAUSEN et al.) 01 January 2015 (01.01.2015) Entire document, especially Abstract, para[0003], para[0036]- para0042] and FIGS. 1-3.	1-2 5-20, 23-28, 30-34 --- 3-4, 21-22, 29, 35-39, 74-76, 79-80 --- 77
Y -- A	US 2010/0249815 A1 (JANTZEN et al.) 30 September 2010 (30.09.2010) Entire document, especially Abstract, para[0029] and FIGS. 1-4.	3-4, 21-22, 29, 35-39, 74-76, 79-80 --- 77
Y	US 2006/0293696 A1 (FAHEY et al.) 28 December 2006 (28.12.2006) Entire document, especially Abstract, para[0018], para[0125]- para[0126].	36, 75
A	US 2013/0317589 A1 (MARTIN et al.) 28 November 2013 (28.11.2013) Entire document.	1-39, 74-77, 79-80
A	US 2010/0030256 A1 (DUBRUL et al.) 04 February 2010 (04.02.2010) Entire document.	1-39, 74-77, 79-80
A	US 2003/0083693 A1 (DANIEL et al.) 01 May 2003 (01.05.2003) Entire document.	1-39, 74-77, 79-80
A	US 2007/0149996 A1 (COUGHLIN) 28 June 2007 (28.06.2007) Entire document.	1-39, 74-77, 79-80
A	US 2007/0112374 A1 (PAUL et al.) 17 May 2007 (17.05.2007) Entire document.	1-39, 74-77, 79-80

☐ 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)
"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
26 April 2016	06 MAY 2016
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

Form PCT/ISA/210 (second sheet) (January 2015)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: RICHARD D. SHOOP
SHAY GLENN LLP
2755 CAMPUS DRIVE, SUITE 210
SAN MATEO, CA 94403

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	06 MAY 2016
Applicant's or agent's file reference	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 16/17982	15 February 2016 (15.02.2016)	28 September 2015 (28.09.2015)

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - A61F 2/01 (2016.01)
CPC - A61B 17/221, A61F 2/01, A61B 2017/22038, A61B 2017/22079, A61B 2017/22081

Applicant GW MEDICAL LLC

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 *43bis*.1(a)(i) with regard to novelty, inventive step or 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	26 April 2016	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (January 2015)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 16/17982

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(a)).

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 16/17982

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 40-73, 78

because:

☐ the said international application, or the said claims Nos. _____ relate to the following subject matter which does not require an international search *(specify)*:

☒ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. 40-73, 78 are so unclear that no meaningful opinion could be formed *(specify)*:

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

☐ the claims, or said claims Nos. _____ are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for said claims Nos. 40-73, 78

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.

☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☐ See Supplemental Box for further details.

Form PCT/ISA/237 (Box No. III) (January 2015)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 16/17982

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

1. Statement

Novelty (N)	Claims	1-39, 74-77, 79-80	YES
	Claims	None	NO
Inventive step (IS)	Claims	77	YES
	Claims	1-39, 74-76, 79-80	NO
Industrial applicability (IA)	Claims	1-39, 74-77, 79-80	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-2, 5-20, 23-28, 30-34, lack an inventive step under PCT Article 33(3) as being obvious over US 2015/0005781 A1 to Lund-Clausen et al. (hereinafter: Lund-Clausen).

As per claim 1, Lund-Clausen describes a method of performing a mechanical thrombectomy to remove a clot from a blood vessel (Abstract, para[0003]), the method comprising:
advancing a distal end of a catheter (outer catheter 10, FIG. 1) through the blood vessel (vessel 22, FIG. 1) towards the clot (thrombus FIG. 1; para[0036]-[0037]);
exposing a distal tractor region of a [tube] that is within the catheter from the distal end of the catheter (20/14, FIG. 2; para[0041]), wherein the distal tractor region comprises an expandable first end region (18, FIGS. 1-3) and a less expandable second end region proximal to the expandable first end region (16, FIGS. 1-3; para[0038]: note 18 at least more expandable due to intermediate expandable region between ends 16/18);
allowing the expandable first end region to expand within the blood vessel (FIG. 2; para[0041]);
positioning the distal end of the catheter so that a distal end region of the catheter is between the less expandable second end region and the expandable first end region of the distal tractor region while the expandable first end region is doubled over the less expandable second end region (para[0044]; e.g. see analogous FIG. 2 for small thrombus); and
drawing the clot into the catheter by rolling the expandable first end region over the distal end of the catheter so that the expandable first end region inverts as the expandable first end region is pulled into the catheter (para[0044]; e.g. see analogous FIG. 2-3, para[0042] for small thrombus), but fails to describe specifically tube.
However, it would have been obvious to one skilled in the art to provide the wire as a tube, so as to provide increased flexibility for maneuvering.

As per claim 2, Lund-Clausen describes the method of claim 1, wherein positioning comprises distally advancing the distal end of the catheter so that the distal end region of the catheter is between the less expandable second end region and the expandable first end region of the distal tractor region (para[0044]; e.g. see analogous FIG. 2-3; para[0045]).

As per claim 5, Lund-Clausen describes the method of claim 1, but fails to describe wherein drawing the clot into the catheter comprises withdrawing the tube proximally. However, Lund-Clausen does describe this process for the smaller clots (FIGS. 2-3; para[0042]-[0043]). It would have been obvious to one skilled in the art to perform the capturing in either manner (as described for the smaller clot) so depending on the preference of the operator as one operation might be physically simpler.

As per claim 6, Lund-Clausen describes the method of claim 1, but fails to describe wherein drawing the clot into the catheter comprises withdrawing the tube proximally while advancing the catheter distally. However, Lund-Clausen does describe this process for the smaller clots (para[0046]). It would have been obvious to one skilled in the art to perform the capturing in such a manner (as described for the smaller clot) so as to reduce the push/pull range of motion.

As per claim 7, Lund-Clausen describes the method of claim 1, but fails to describe wherein drawing the clot into the catheter comprises withdrawing the tube proximally while advancing the catheter distally, wherein the tube is withdrawn at a different rate than the catheter is advanced.
However, Lund-Clausen does describe this push/pull process for the smaller clots (para[0046]). It would have been obvious to one skilled in the art to perform the capturing in such a manner (as described for the smaller clot) so as to reduce the push/pull range of motion, as well as poerforming said operation at different rates, because their push/pull forces would be different and making the rates the same would require extra effort.

As per claim 8, Lund-Clausen describes the method of claim 1, wherein allowing the expandable first end region to expand within the blood vessel comprises allowing a biasing element in the expandable first end region to expand so that the distal tractor region makes contact with an intima of the blood vessel (FIG. 2; para[0040]-[0041]: spring steel).

As per claim 9, Lund-Clausen describes the method of claim 1, but fails to describe wherein exposing the distal tractor region of the tube that is within the catheter from the distal end of the catheter comprises pushing the distal tractor region out of the distal end of the catheter.
However, Lund-Clausen describes where the pushing/pulling operations can be switched and/or combined for different aspects of the methods (para[0042]-[0046]). It would have been obvious to one skilled in the art to push the tube (while retracting the outer catheter) so as to reduce the push/pull range of motion.

----------Please See Continuation Sheet----------

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/US 16/17982

Supplemental Box

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

Continuation of:

----------Box V.2. Citations and explanations----------

As per claim 10, Lund-Clausen describes the method of claim I, wherein exposing the distal tractor region of the tube that is within the catheter out of the distal end of the catheter comprises pulling the catheter proximally (para[0041]).

As per claim 11, Lund-Clausen describes the method of claim 1, wherein exposing the distal tractor region of the tube that is within the catheter from the distal end of the catheter comprises [pushing] the distal tractor region out of the distal end of the catheter to expose the expandable first end region already inverted over the less expandable second end region (para[0041]; FIGS. 1-2), but fails to describe pushing.
However, Lund-Clausen describes where the pushing/pulling operations can be switched and/or combined for different aspects of the methods (para[0042]-[0046]). It would have been obvious to one skilled in the art to push the tube (while retracting the outer catheter) so as to reduce the push/pull range of motion.

As per claim 12, Lund-Clausen describes the method of claim 1, but fails to describe wherein exposing the distal tractor region of the tube that is within the catheter from the distal end of the catheter comprises extending the expandable first end region out of the distal end of the catheter so that the expandable first end region inverts over the distal end of the catheter as the expandable first end region is extended.
However, Lund-Clausen describes where the pushing/pulling operations can be switched and/or combined for different aspects of the methods (para[0042]-[0046]) as well as describing that the device can alternatively open from it's shape memory characteristics (para[0048]) and that the device can be very long (para[0042]). It would have been obvious to one skilled in the art to push the tube (while retracting the outer catheter) so as to reduce the push/pull range of motion. Further, it is noted that such an inversion over the distal end of the catheter would happen for long length baskets in sufficiently large diameter vessels (between FIGS. 1-2).

As per claim 13, Lund-Clausen describes the method of claim 1, but fails to describe explicitly wherein exposing the distal tractor region of the tube comprises exposing at least 5 mm of the expandable first end region and at least 5 mm of the less expandable second end region.
However, Lund-Clausen describes that the device can be a range of sizes depending on the size of the thrombus (para[0042]). It would have been obvious to one skilled in the art to provide/expose any desired size, depending on the thrombus to be captured.

As per claim 14, Lund-Clausen describes the method of claim 1, but fails to describe wherein exposing the distal tractor region comprises exposing at least 1 cm of the expandable first end region inverted over at least 1 cm of the less expandable second end region.
However, Lund-Clausen describes that the device can be a range of sizes depending on the size of the thrombus (para[0042]). It would have been obvious to one skilled in the art to provide/expose any desired size, depending on the thrombus to be captured and the size of the vessel.

As per claim 15, Lund-Clausen describes the method of claim 1, wherein the expandable first end region comprises a mesh that is coupled adjacent to the less expandable second end region (para[0040]; FIGS. 1-3).

As per claim 16, Lund-Clausen describes the method of claim 1, wherein the expandable first end region comprises one or more of: a woven material, a mesh braided material, a knitted material, or a film material with multiple openings therethrough (para[0040; FIGS. 1-3).

As per claim 17, Lund-Clausen describes the method of claim 1, wherein advancing comprises advancing the distal end of the catheter through the blood vessel to position the distal end adjacent to the clot.

As per claim 18, Lund-Clausen describes a method of performing a mechanical thrombectomy to remove a clot from a blood vessel (Abstract, para[0003]), the method comprising:
advancing a distal end of a catheter (outer catheter 10, FIG. 1) through the blood vessel (vessel 22, FIG. 1) towards the clot (thrombus FIG. 1; para[0036]-[0037]);
exposing a distal tractor region of a [tube] that is within the catheter from the distal end of the catheter (20/14, FIG. 2; para[0041]), wherein the distal tractor region comprises an expandable first end region (16, FIGS. 1-3) and a less expandable second end region proximal to the expandable first end region (16, FIGS. 1-3; para[0036]; note 18 at least more expandable due to intermediate expandable region between ends 16/18) and configured so that the expandable first end region is inverted over the less expandable second end region (FIG. 1);
allowing the expandable first end region to expand within the blood vessel so that the distal end region of the catheter is between the less expandable second end region and the expandable first end region of the distal tractor region (para[0044]; e.g. see analogous FIG. 2 for small thrombus); and
drawing the clot into the catheter by advancing the catheter distally and [withdrawing the tube proximally] within the catheter so that the expandable first end region rolls over the distal end of the catheter and inverts as the expandable first end region is pulled into the catheter (para[0044]; e.g. see analogous FIG. 2-3, para[0042] for small thrombus), but fails to describe specifically tube or withdrawing the tube proximally.
However, it would have been obvious to one skilled in the art to provide the wire as a tube, so as to provide increased flexibility for maneuvering. Finally, Lund-Clausen does describe this process of withdrawing the tube and extending the catheter for the smaller clots (para[0046]). It would have been obvious to one skilled in the art to perform the capturing in such a manner (as described for the smaller clot) so as to reduce the push/pull range of motion.

As per claim 19, Lund-Clausen describes the method of claim 18, wherein the expandable first end region is inverted over the less expandable second end region before exposing the distal tractor region (FIG. 1).

As per claim 20, Lund-Clausen describes the method of claim 18,wherein the exposing the distal tractor region comprises inverting the expandable distal end region over the less expandable second end region as the distal tractor region is exposed (para[0046],[0042]; note inherent for long length baskets in sufficiently large diameter vessels (between FIGS. 1-2).

----------Please See Continuation Sheet----------

Supplemental Box

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

As per claim 23, Lund-Clausen describes the method of claim 18, but fails to describe wherein exposing the distal tractor region of the tube that is within the catheter from the distal end of the catheter comprises pushing the distal tractor region out of the distal end of the catheter. However, Lund-Clausen describes where the pushing/pulling operations can be switched and/or combined for different aspects of the methods (para[0042]-[0046]). It would have been obvious to one skilled in the art to push the tube (while retracting the outer catheter) so as to reduce the push/pull range of motion.

As per claim 24, Lund-Clausen describes the method of claim 18, wherein exposing the distal tractor region of the tube that is within the catheter out of the distal end of the catheter comprises pulling the catheter proximally (para[0041]).

As per claim 25, Lund-Clausen describes the method of claim 18, but fails to describe explicitly wherein exposing the distal tractor region of the tube comprises exposing at least 5 mm of the expandable first end region and at least 5 mm of the less expandable second end region.
However, Lund-Clausen describes that the device can be a range of sizes depending on the size of the thrombus (para[0042]). It would have been obvious to one skilled in the art to provide/expose any desired size, depending on the thrombus to be captured.

As per claim 26, Lund-Clausen describes the method of claim 18, wherein the expandable first end region of the distal tractor region comprises a mesh that is coupled adjacent to the less expandable second end region (para[0040]; FIGS. 1-3).

As per claim 27, Lund-Clausen describes the method of claim 18, wherein the expandable first end region comprises one or more of: a woven material, a mesh braided material, or a film material with multiple openings therethrough (para[0040; FIGS. 1-3).

As per claim 28, Lund-Clausen describes a method of performing a mechanical thrombectomy to remove a clot from a blood vessel (Abstract, para[0003]), the method comprising:
advancing a distal end of a catheter (outer catheter 10, FIG. 1) through the blood vessel (vessel 22, FIG. 1) towards the clot (thrombus FIG. 1; para[0036]-[0037]);
exposing a distal tractor region of a [tube] that is within the catheter from the distal end of the catheter (20/14, FIG. 2; para[0041]), wherein the distal tractor region comprises an expandable first end region (18, FIGS. 1-3) and a less expandable second end region proximal to the expandable first end region (16, FIGS. 1-3; para[0038]: note 16 at least more expandable due to intermediate expandable region between ends 16/18), wherein exposing comprises extending the expandable first end region out of the distal end of the catheter so that the expandable first end region inverts over the distal end of the catheter as the expandable first end region is extended (para[0046],[0042]: note inherent for long length baskets in sufficiently large diameter vessels (between FIGS. 1-2);
allowing the expandable first end region to expand within the blood vessel as it is extended out of the distal end of the catheter so that a distal end region of the catheter is between the less expandable second end region and the expandable first end region (para[0046],[0042]: note inherent for long length baskets in sufficiently large diameter vessels (between FIGS. 1-2); Also, para[0044]; e.g. see analogous FIG. 2 for small thrombus); and
drawing the clot into the catheter by withdrawing the tube proximally within the catheter so that the expandable distal end region rolls over the distal end of the catheter, collapses, and inverts as the expandable distal end region is pulled into the catheter (para[0044]; e.g. see analogous FIG. 2-3, para[0042] for small thrombus), but fails to describe specifically tube.
However, it would have been obvious to one skilled in the art to provide the wire as a tube, so as to provide increased flexibility for maneuvering.

As per claim 30, Lund-Clausen describes the method of claim 28, but fails to describe wherein exposing the distal tractor region of the tube that is within the catheter from the distal end of the catheter comprises pushing the distal tractor region out of the distal end of the catheter. However, Lund-Clausen describes where the pushing/pulling operations can be switched and/or combined for different aspects of the methods (para[0042]-[0046]). It would have been obvious to one skilled in the art to push the tube (while retracting the outer catheter) so as to reduce the push/pull range of motion.

As per claim 31, Lund-Clausen describes the method of claim 28, wherein exposing the distal tractor region of the tube that is within the catheter out of the distal end of the catheter comprises withdrawing the catheter proximally relative to the distal tractor region of the tube (para[0041]).

As per claim 32, Lund-Clausen describes the method of claim 28, but fails to describe wherein exposing the distal tractor region of the tube comprises exposing at least 5 mm of the expandable first end region and at least 5 mm of the less expandable second end region.
However, Lund-Clausen describes that the device can be a range of sizes depending on the size of the thrombus (para[0042]). It would have been obvious to one skilled in the art to provide/expose any desired size, depending on the thrombus to be captured.

As per claim 33, Lund-Clausen describes the method of claim 28, wherein the expandable first end region comprises a mesh that is coupled adjacent to the less expandable second end region (para[0040]; FIGS. 1-3).

As per claim 34, Lund-Clausen describes the method of claim 28, wherein the expandable first end region comprises one or more of: a woven material, a mesh braided material, or a film material with multiple openings therethrough (para[0040]; FIGS. 1-3).

----------Please See Continuation Sheet----------

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 16/17982

Supplemental Box

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

Claims 3-4, 21-22, 29, 35, 37-39, 74, 76, 79-80 lack an inventive step under PCT Article 33(3) as being obvious over Lund-Clausen in view of US 2010/0249815 A1 to Jantzen et al. (hereinafter: Jantzen).

As per claim 3, Lund-Clausen describes the method of claim 1, but fails to describe further comprising advancing a guidewire within the blood vessel to the clot, wherein advancing the distal end of the catheter comprises advancing the catheter over the guidewire through the blood vessel until the distal end of the catheter is proximate to the clot.
However, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) and further describes advancing a guidewire within the blood vessel to the clot, wherein advancing the distal end of the catheter comprises advancing the catheter over the guidewire through the blood vessel until the distal end of the catheter is proximate to the clot (para[0029]). It would have been obvious to one skilled in the art to utilize the guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).

As per claim 4, Lund-Clausen describes the method of claim 1, but fails to describe further comprising advancing a guidewire within the blood vessel to the clot, wherein advancing the distal end of the catheter comprises advancing the catheter over the guidewire through the blood vessel until the distal end of the catheter is proximate to the clot, further wherein drawing the clot into the catheter comprises advancing the catheter towards the clot over the guidewire while rolling the expandable first end region over the distal end of thecatheter.
However, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) and further describes advancing a guidewire within the blood vessel to the clot, wherein advancing the distal end of the catheter comprises advancing the catheter over the guidewire through the blood vessel until the distal end of the catheter is proximate to the clot, further wherein drawing the clot into the catheter comprises advancing the catheter towards the clot over the guidewire while rolling the expandable first end region over the distal end of thecatheter (para[0029]: note wire removal optional). It would have been obvious to one skilled in the art to utilize the guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).

As per claim 21, Lund-Clausen describes the method of claim 18, but fails to describe further comprising, before exposing the distal tractor region, advancing a guidewire within the blood vessel to the clot and advancing the catheter over the guidewire through the blood vessel until a distal end of the catheter is proximate to the clot.
However, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) and further describes before exposing the distal tractor region, advancing a guidewire within the blood vessel to the clot and advancing the catheter over the guidewire through the blood vessel until a distal end of the catheter is proximate to the clot (para[0029]). It would have been obvious to one skilled in the art to utilize the guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).

As per claim 22, Lund-Clausen describes the method of claim 18, but fails to describe before exposing the distal tractor region, advancing a guidewire within the blood vessel to the clot and advancing the catheter over the guidewire through the blood vessel until a distal end of the catheter is proximate to the clot and leaving the guidewire in place while drawing the clot into the catheter.
However, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) and further describes before exposing the distal tractor region, advancing a guidewire within the blood vessel to the clot and advancing the catheter over the guidewire through the blood vessel until a distal end of the catheter is proximate to the clot and leaving the guidewire in place while drawing the clot into the catheter (para[0029]: note wire removal optional). It would have been obvious to one skilled in the art to utilize the guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).

As per claim 29, Lund-Clausen describes the method of claim 28, but fails to describe further comprising advancing a guidewire within the blood vessel to the clot, wherein advancing the distal end of the catheter comprises advancing the catheter over the guidewire through the blood vessel until a distal end of the catheter is proximate to the clot.
However, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) and further describes advancing a guidewire within the blood vessel to the clot, wherein advancing the distal end of the catheter comprises advancing the catheter over the guidewire through the blood vessel until a distal end of the catheter is proximate to the clot (para[0029]). It would have been obvious to one skilled in the art to utilize the guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).

As per claim 35, Lund-Clausen describes a mechanical thrombectomy apparatus for removing a clot from a vessel (Abstract, para[0003]), the apparatus comprising:
a catheter having a distal end and a distal end opening (12, FIGS. 1-3);
a flexible [tube] extending within the catheter and doubling back over the distal end of the catheter (20/14, FIG. 1), wherein the flexible tube is configured to slide and invert over the distal end opening when a first end of the flexible tube is pulled proximally within the catheter (FIG. 3; para[0042]); and
but fails to describe tube, or a guidewire lumen through the catheter and the flexible tube that is configured to pass a guidewire.
However, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) comprising a tube, and a guidewire lumen through the catheter and the flexible tube that is configured to pass a guidewire (para[0029]). It would have been obvious to one skilled in the art to utilize a hollow tube for the entire flexible tube portion, and utilize a guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).

----------Please See Continuation Sheet----------

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 16/17982

Supplemental Box

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

As per claim 37, Lund-Clausen describes a mechanical thrombectomy apparatus for removing a clot from a vessel (Abstract, para[0003]), the apparatus comprising:
an inner catheter having a distal end and a distal end opening (12, FIGS. 1-3);
a flexible [tube] extending though the catheter and doubling back over the distal end of the inner catheter (20/14, FIG. 1), wherein the flexible tube is configured to invert over the distal end opening when a first end of the flexible tube is pulled proximally within the inner catheter (FIG. 3; para[0042]);
an outer catheter extending over the inner catheter and flexible tube (10, FIG. 1);
but fails to describe a lubricious region of the flexible tube extending between a distal end of the outer catheter and the distal end opening of the inner catheter, wherein the majority of the flexible tube is not lubricious; and
a guidewire lumen through the catheter and the flexible tube configured to pass a guidewire.
However, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) comprising a tube, and a guidewire lumen through the catheter and the flexible tube that is configured to pass a guidewire (para[0029]). Jantzen further describes a proximal lubricious section (see smooth first/inner portion, FIG. 3) that is pulled in first, then and a distal non-lubricious region (outside with scraping device 30, FIG. 3) that is pulled in afterwards during eversion (para[0031],[0029]). It would have been obvious to one skilled in the art to utilize a hollow tube for the entire flexible tube portion, and utilize a guidewire for initial placement, as is well known in the art (Jantzen: para[0029]). It would have further been obvious to provide such lubricious and non-lubricious sections so as to provide scraping of the walls and extremities of the thrombus, but prevent snagging in the internal portion to ease the suction.

As per claim 38, Lund-Clausen describes a mechanical thrombectomy apparatus for removing a clot from a vessel (Abstract, para[0003]), the apparatus comprising:
an inner catheter having a distal end and a distal end opening (32, FIG. 4);
a flexible [tube] extending though the catheter and doubling back over the distal end of the inner catheter (40/34, FIG. 1), wherein the flexible tube is configured to invert over the distal end opening when a first end of the flexible tube is pulled proximally within the inner catheter (para[0047]-[0048]; e.g. see FIG. 3; para[0042]);
a releasable attachment between the flexible tube and an outer surface of the catheter (30, FIG. 4; para[0048]),
configured to release when the flexible tube is pulled with a predetermined force [that is greater than 0.01 N] (para[0048]); and
but fails to describe tube, that is greater than 0.01N, or a guidewire lumen through the catheter and the flexible tube configured to pass a guidewire.
However, it would have been obvious to one skilled int the art, through routine testing, to provide any desired release force, so as to provide a secure but simple release.
Finally, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) comprising a tube, and a guidewire lumen through the catheter and the flexible tube that is configured to pass a guidewire (para[0029]). It would have been obvious to one skilled in the art to utilize a hollow tube for the entire flexible tube portion, and utilize a guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).

As per claim 39, Lund-Clausen describes a mechanical thrombectomy apparatus for removing a clot from a vessel (Abstract, para[0003]), the apparatus comprising:
a catheter having a distal end, a distal end opening and an inner diameter (12, FIGS. 1-3);
a flexible [tube] extending within the catheter and doubling back over the distal end of the catheter (20/14, FIG. 1), wherein the flexible tube is configured to slide and invert over the distal end opening when a first end of the flexible tube is pulled proximally within the catheter (FIG. 3; para[0042]), the
flexible tube having a [low Poisson's ratio], such that the flexible tube has a diameter of greater than half the inner diameter of the catheter when pulled proximally within the catheter with sufficient force to invert over the distal end opening (FIGS. 1-3; para[0042]); and
but fails to explicitly describe low Poisson's ratio or a guidewire lumen through the catheter and the flexible tube configured to pass a guidewire.
However, Lund-Clausen describes such an expansion (FIGS. 1-2). It would have been obvious to one skilled in the art to utilize a low Poisson's ratio material, so as to allow for the use of more types of materials for design flexibility and potential cost savings.
Finally, Jantzen describes an everting clot capturing device (Abstract, FICS. 1-4) comprising a tube, and a guidewire lumen through the catheter and the flexible tube that is configured to pass a guidewire (para[0029]). It would have been obvious to one skilled in the art to utilize a hollow tube for the entire flexible tube portion, and utilize a guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).

As per claim 74, Lund-Clausen describes a method of mechanically removing a thrombectomy (Abstract, para[0003]), the method comprising:
advancing a [guidewire] at least to the proximal end of a clot in a blood vessel (thrombus FIG. 1; para[0036]-[0037]);
advancing a thrombectomy apparatus distally [over the guidewire] (20/14, FIG. 2; para[0041]), wherein the thrombectomy apparatus comprises a catheter having a distal end and a distal end opening (12, FIG. 1) and a flexible tube extending along an outer diameter of the catheter and over the distal end of the catheter (14, FIG. 1), [so that the guidewire passes through a lumen of the catheter and the flexible tube];
pulling the flexible tube proximally from off of the outer diameter of the catheter and into the catheter lumen so that the flexible tube slides and inverts over the distal end opening (FIG. 2-3, para[0042]); and
drawing a clot into the inverted flexible tube as the flexible tube is drawn into the catheter (FIG. 2-3, para[0042]), but fails to describe guidewire, over a guidewire, so that the guidewire passes through a lumen of the catheter and the flexible tube.
However, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) and further describes advancing a guidewire within the blood vessel to the clot, advancing a thrombectomy apparatus distally over the guidewire, so that the guidewire passes through a lumen of the catheter and the flexible tube (para[0029]). It would have been obvious to one skilled in the art to utilize a hollow tube for the entire flexible tube portion, and utilize a guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).

----------Please See Continuation Sheet----------

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 16/17982

Supplemental Box

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

As per claim 76, Lund-Clausen describes a method of mechanically removing a thrombectomy (Abstract, para[0003]), the method comprising:
advancing a {guidewire} adjacent a clot in a blood vessel (thrombus FIG. 1; para[0036]-[0037]);
advancing a thrombectomy apparatus distally {over the guidewire} (20/14, FIG. 2; para[0041]), wherein the thrombectomy apparatus comprises an inner catheter having a distal end and a distal end opening (12, FIG. 1) and a flexible tube extending along an outer diameter of the inner catheter and over the distal end of the catheter (14, FIG. 1), and an outer catheter (10, FIG. 1) securing a distal end region of the flexible tube against the outer diameter of the inner catheter (para[0040]-[0041]), {so that the guidewire passes through a lumen of the catheter and the flexible tube};
pulling the flexible tube proximally from off of the outer diameter of the catheter and into the catheter lumen so that a {lubricious} proximal leader region of the flexible tube slides and inverts over the distal end opening, until {a non-lubricious} distal region of the flexible tube is drawn into the inner catheter (FIG. 2-3, para[0042]); and
drawing a clot into the inverted flexible tube as the flexible tube is drawn into the catheter (FIG. 2-3, para[0042]), but fails to describe guidewire, over a guidewire, so that the guidewire passes through a lumen of the catheter and the flexible tube, lubricious and a non-lubricious.
However, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) and further describes advancing a guidewire within the blood vessel to the clot, advancing a thrombectomy apparatus distally over the guidewire, so that the guidewire passes through a lumen of the catheter and the flexible tube (para[0029]). Jantzen further describes a proximal lubricious section (see smooth first/inner portion, FIG. 3) that is pulled in first, then and a distal non-lubricious region (outside with scraping device 30, FIG. 3) that is pulled in afterwards during eversion (para[0031],[0029]). It would have been obvious to one skilled in the art to utilize a hollow tube for the entire flexible tube portion, and utilize a guidewire for initial placement, as is well known in the art (Jantzen: para[0029]). It would have further been obvious to provide such lubricious and non-lubricious sections so as to provide scraping of the walls and extremities of the thrombus, but prevent snagging in the internal portion to ease the suction.

As per claim 79, Lund-Clausen describes a mechanical thrombectomy device for removing a clot from a vessel (Abstract, para[0003]), the device comprising:
a catheter having a distal end and a distal end opening, wherein the catheter has an inner diameter and an outer diameter (outer catheter 10, FIG. 1; para[0036]);
a distal tractor region of a {tube} within the catheter (20/14, FIG. 2; para[0041]), wherein the distal tractor region (14, FIG. 2) comprises an expandable distal end region (18, FIGS. 1-3) and a less expandable distal end region proximal to the expandable distal end region (16, FIGS. 1-3; para[0038]: note 18 at least more expandable due to intermediate expandable region between ends 16/18), the distal tractor region configured so that the expandable distal end region is inverted over the less expandable distal end region (FIG. 1-2);
{a guidewire lumen through the catheter and the tube, including the distal tractor region, wherein the guidewire lumen is configured to pass a guidewire}, and
{a proximal handle coupled to the tube and} configured to cause relative motion between the catheter and the tube such that the distal tractor region is released from within the inner diameter of the catheter so that the expandable distal end region may expand to a diameter that is greater than the outer diameter so that the catheter may be advanced between the expandable distal end region and the less expandable distal end region and the tube may be drawn proximally to pull the expandable distal end region over the distal end of the catheter so that the expandable distal end region rolls into the distal
end of the catheter, inverts, collapses and is drawn into the catheter (para[0044]; e.g. see analogous FIG. 2-3 for small thrombus; para[0045]),
but fails to describe tube, a guidewire lumen through the catheter and the tube, including the distal tractor region, wherein the guidewire lumen is configured to pass a guidewire, a proximal handle coupled to the tube.
However, though a handle is not described, it would have been obvious to one skilled in the art to provide a handle so as to more easily facilitate the pushing/pulling of the parts.
Finally, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) and further describes a guidewire lumen through the catheter and the tube, including the distal tractor region, wherein the guidewire lumen is configured to pass a guidewire (para[0029]). It would have been obvious to one skilled in the art to utilize a hollow tube for the entire flexible tube portion, and utilize a guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).

----------Please See Continuation Sheet----------

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 16/17982

Supplemental Box

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

As per claim 80, Lund-Clausen describes a mechanical thrombectomy device for removing a clot from a vessel (Abstract, para[0003]), the device comprising:
a catheter having a distal end and a distal end opening, wherein the catheter has an inner diameter and an outer diameter (outer catheter 10, FIG. 1; para[0036]);
a tube having a distal tractor region within the catheter (20/14, FIG. 2; para[0041]), wherein the distal tractor region (14, FIG. 2) comprises an expandable distal end region (18, FIGS. 1-3) and a less expandable distal end region proximal to the expandable distal end region (16, FIGS. 1-3; para[0038]: note 18 at least more expandable due to intermediate expandable region between ends 16/18), further wherein the expandable distal end region is biased to invert over the less expandable distal end region as it is exposed from the distal end of the catheter (para[0042]-[0048]; note inherent for long length baskets in sufficiently large diameter vessels (between FIGS. 1-2));
[a guidewire lumen through the catheter and the tube, including the distal tractor region, wherein the guidewire lumen is configured to pass a guidewire]; and
[a proximal handle coupled to the tube and] configured to cause relative motion between the catheter and the tube such that the distal tractor region is released from within the inner diameter of the catheter so that the expandable distal end region may expand to a diameter that is greater than the outer diameter and the tube may be drawn proximally to pull the expandable distal end region over the distal end of the catheter so that the expandable distal end region rolls into the distal end of the catheter, inverts, collapses and is drawn into the catheter (para[0044]; e.g. see analogous FIG. 2-3 for small thrombus; para[0045]), but fails to describe tube, a guidewire lumen through the catheter and the tube, including the distal tractor region, wherein the guidewire lumen is configured to pass a guidewire, a proximal handle coupled to the tube.
However, though a handle is not described, it would have been obvious to one skilled in the art to provide a handle so as to more easily facilitate the pushing/pulling of the parts.
Finally, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) and further describes a guidewire lumen through the catheter and the tube, including the distal tractor region, wherein the guidewire lumen is configured to pass a guidewire (para[0029]). It would have been obvious to one skilled in the art to utilize a hollow tube for the entire flexible tube portion, and utilize a guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).

Claims 36, 75 lack an inventive step under PCT Article 33(3) as being obvious over Lund-Clausen in view of Jantzen, in further view of US 2006/0293696 A1 to Fahey et al. (hereinafter: Fahey).

As per claim 36, A mechanical thrombectomy apparatus for removing a clot from a vessel (Abstract, para[0003]), the apparatus comprising:
a catheter having a distal end and a distal end opening (12, FIGS. 1-3), [wherein the distal end opening has a durometer that is greater than a durometer of a region immediately proximal to the distal end, further wherein the distal end opening has a rounded lip profile;]
a flexible [tube] extending within the catheter and doubling back over the distal end of the catheter (20/14, FIG. 1), wherein the flexible tube is configured to invert over the distal end opening when a first end of the flexible tube is pulled proximally within the catheter (FIG. 3; para[0042]); and
but fails to describe wherein the distal end opening has a durometer that is greater than a durometer of a region immediately proximal to the distal end, further wherein the distal end opening has a rounded lip profile or a guidewire lumen through the catheter and the flexible tube configured to pass a guidewire.
However, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) comprising a tube, and a guidewire lumen through the catheter and the flexible tube that is configured to pass a guidewire (para[0029]). It would have been obvious to one skilled in the art to utilize a hollow tube for the entire flexible tube portion, and utilize a guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).
Finally, Fahey also describes the design of catheter tips designed to interact with and pull inside, such thrombus removal devices (Abstract, para[0125]), and describes designing the tips to be stiff relative to an adjacent region (para[0126], Abstract) as well as a rounded tip (para[0018]). It would have been obvious to one skilled in the art, through routine testing, to provide a stiffened tip with a rounded edges, so as to prevent snagging and collapse.

As per claim 75, Lund-Clausen describes a method of mechanically removing a thrombectomy, the method comprising:
advancing a [guidewire] adjacent a clot in a blood vessel (thrombus FIG. 1; para[0036]-[0037]);
advancing a thrombectomy apparatus distally [over the guidewire] (20/14, FIG. 2; para[0041]), wherein the thrombectomy apparatus comprises a catheter having a distal end and a distal end opening (12, FIG. 1) and a flexible tube extending along an outer diameter of the catheter and over the distal end of the
catheter (14, FIG. 1), [so that the guidewire passes through a lumen of the catheter and the flexible
tube];
pulling the flexible tube proximally from off of the outer diameter of the catheter and into the catheter lumen over [a rounded lip of] the distal end opening of the catheter so that the flexible tube slides and inverts over the distal end opening (FIG. 2-3, para[0042]), [wherein the distal end opening has a durometer that is greater than a durometer of a region immediately proximal to the distal end]; and
drawing a clot into the inverted flexible tube as the flexible tube is drawn into the catheter (FIG. 2-3, para[0042]), but fails to describe guidewire, over a guidewire, so that the guidewire passes through a lumen of the catheter and the flexible tube, a rounded lip of, wherein the distal end opening has a durometer that is greater than a durometer of a region immediately proximal to the distal end.
However, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) and further describes advancing a guidewire within the blood vessel to the clot, advancing a thrombectomy apparatus distally over the guidewire, so that the guidewire passes through a lumen of the catheter and the flexible tube (para[0029]). It would have been obvious to one skilled in the art to utilize a hollow tube for the entire flexible tube portion, and utilize a guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).
Finally, Fahey also describes the design of catheter tips designed to interact with and pull inside, such thrombus removal devices (Abstract, para[0125]), and describes designing the tips to be stiff relative to an adjacent region (para[0126], Abstract) as well as a rounded tip (para[0018]). It would have been obvious to one skilled in the art, through routine testing, to provide a stiffened tip with a rounded edges, so as to prevent snagging and collapse.
----------Please See Continuation Sheet----------

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 16/17982

Supplemental Box

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

Claim 77 meet the requirements under PCT Articles 33(2) and 33(3) because the prior art does not teach or fairly suggest the method as claimed by the applicant.

The prior art is exemplified by (1) Lund-Clausen and (2) Jantzen

As per claim 77, Lund-Clausen describes a method of mechanically removing a thrombectomy (Abstract, para[0003]), the method comprising:
advancing a [guidewire] adjacent a clot in a blood vessel (thrombus FIG. 1; para[0036]-[0037]);
advancing a thrombectomy apparatus distally [over the guidewire] (20/14, FIG. 2; para[0041]), wherein the thrombectomy apparatus comprises a catheter having a distal end and a distal end opening (12, FIG. 1) and a flexible tube extending along an outer diameter of the catheter and over the distal end of the catheter (14, FIG. 1), [so that the guidewire passes through a lumen of the catheter and the flexible tube];
pulling the flexible tube proximally from off of the outer diameter of the catheter and into the catheter lumen so that the flexible tube slides and inverts over the distal end opening (FIG. 2-3, para[0042]); and
[pulling or pushing the flexible tube distally out of the distal end of the catheter so that the flexible tube slides and inverts over the distal end opening and over the outer diameter of the catheter; and]
drawing a clot into the inverted flexible tube as the flexible tube is drawn into the catheter (FIG. 2-3, para[0042]).
but fails to describe guidewire, over a guidewire, so that the guidewire passes through a lumen of the catheter and the flexible tube, pulling or pushing the flexible tube distally out of the distal end of the catheter so that the flexible tube slides and inverts over the distal end opening and over the outer diameter of the catheter;
However, Jantzen describes an everting clot capturing device (Abstract, FIGS. 1-4) and further describes advancing a guidewire within the blood vessel to the clot, advancing a thrombectomy apparatus distally over the guidewire, so that the guidewire passes through a lumen of the catheter and the flexible tube (para[0029]). It would have been obvious to one skilled in the art to utilize a hollow tube for the entire flexible tube portion, and utilize a guidewire for initial placement, as is well known in the art (Jantzen: para[0029]).
Finally, Lund-Clausen describes an alternate embodiment that allows for the pushing the flexible tube distally out of the distal end of the catheter so that the flexible tube slides and inverts over the distal end opening and over the outer diameter of the catheter (para[0042]-[0046]), but as an alternative means for the expansion. No prior art fairly suggests providing an already everted basket, then straightening it, then again allowing it to every back before capturing the thrombus.

Claims 1-39, 74-77, 79-80 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

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**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-03-PCT		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2018/040937	5 July 2018 (05-07-2018)	6 July 2017 (06-07-2017)
Applicant		
STRYKER CORPORATION		

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 7 sheets.

[X] 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:
      [X] 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. [X] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [X] 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,**
   [X] 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. 5
      [X] 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

Form PCT/ISA/210 (first sheet) (January 2015)

Box No. IV Text of the abstract (Continuation of item 5 of the first sheet)

A mechanical thrombectomy apparatus for removing a clot from a vessel includes an elongate inversion support catheter having a distal end opening, an elongate puller extending within the support catheter, and a knitted tractor tube (501) extending over an outer surface of the support catheter, inverting into the distal end opening of the support catheter, and attached to the elongate puller at a first end within the support catheter, wherein the portion of the knitted tractor tube extending over the support catheter comprises a wire forming a helical spiral of alternating teardrop shaped-links (503) each having a rounded apex, wherein each link is connected to two adjacent links so that the apex of each link is on an outward-facing surface of the tractor tube, wherein the links flare outward from an outer wall of the support catheter when the puller is pulled proximally within the support catheter.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2018/040937

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 additional sheet

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

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

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

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

Remark on Protest

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

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

☒ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2018/040937

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/221
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2017/086864 A1 (GREENHALGH E SKOTT [US] ET AL) 30 March 2017 (2017-03-30) paragraph [0021]; figures 1-6 paragraph [0064] paragraph [0121] - paragraph [0125] paragraph [0164]	1-22
Y	US 2013/226196 A1 (SMITH JAMES [ZA]) 29 August 2013 (2013-08-29) paragraph [0112] - paragraph [0114]; figures 4, 10	1-10
A	US 2010/249815 A1 (JANTZEN ALEXANDRA E [US] ET AL) 30 September 2010 (2010-09-30) abstract; figures 1, 2	1,10

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
25 October 2018	14/11/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Moers, Roelof

2

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2016/074627 A1 (COTTONE ROBERT J [US]) 17 March 2016 (2016-03-17) paragraph [0095] - paragraph [0100]; figures 7A-8D	11-22
A	AU 2015 210 338 A1 (SHIFAMED HOLDINGS LLC) 27 August 2015 (2015-08-27) paragraph [0087] - paragraph [0092]; figures 3-7b	11-22
A	US 2005/177132 A1 (LENTZ DAVID J [US] ET AL) 11 August 2005 (2005-08-11) paragraph [0027]; figures 1-7	11,22

2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2018/040937

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2017086864 A1	30-03-2017	CN 108348319 A	31-07-2018
		EP 3355829 A1	08-08-2018
		JP 2018529495 A	11-10-2018
		US 9463035 B1	11-10-2016
		US 2017086864 A1	30-03-2017
		WO 2017058280 A1	06-04-2017
US 2013226196 A1	29-08-2013	US 2013226196 A1	29-08-2013
		WO 2012049652 A1	19-04-2012
		ZA 201302264 B	30-04-2014
US 2010249815 A1	30-09-2010	NONE	
US 2016074627 A1	17-03-2016	CN 107148289 A	08-09-2017
		EP 3194003 A1	26-07-2017
		JP 2017532104 A	02-11-2017
		US 2016074627 A1	17-03-2016
		WO 2016044211 A1	24-03-2016
AU 2015210338 A1	27-08-2015	AU 2015210338 A1	27-08-2015
		AU 2018203003 A1	17-05-2018
US 2005177132 A1	11-08-2005	EP 1768732 A2	04-04-2007
		US 2005177132 A1	11-08-2005
		US 2010100073 A1	22-04-2010
		WO 2006009588 A2	26-01-2006

Form PCT/ISA/210 (patent family annex) (April 2005)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-10

Thrombectomy apparatus having knitted tractor tube.

---

2. claims: 11-22

Thrombectomy apparatus having slotted inversion support catheter.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2018/040937	05.07.2018	06.07.2017

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/221

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Moers, Roelof Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

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:

   see separate sheet

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

   ☒ all parts.

   ☐ the parts relating to claims Nos.

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

1. Statement

Novelty (N)	Yes:	Claims	1-22
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-22
Industrial applicability (IA)	Yes:	Claims	1-22
	No:	Claims	

2. Citations and explanations

   see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item IV

Lack of unity of invention

This Authority considers that the application does not meet the requirements of unity of invention and that there are 2 inventions.

The reasons, for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

The common subject-matter of independent claims 1 and 10 and independent claims 11 and 22 is:

A mechanical thrombectomy apparatus for removing a clot from a vessel, the apparatus comprising: an elongate inversion support catheter; an elongate puller extending within the elongate inversion support catheter; and a tractor tube extending over an outer surface of the elongate inversion support catheter, inverting into the distal end opening of the elongate inversion support catheter, and attached to the elongate puller at a first end within the elongate inversion support catheter.

This common subject-matter is known in the prior art, see for instance **US 2017/086864 A1 (D1)** (see claims 1, 11; fig. 1).

Therefore, these common features cannot form "special technical features" according to Rule 13(2) PCT.

D1 further discloses that the tractor tube can be knitted. Therefore, the remaining technical features of the first subject (claims 1 and 10) are formed by: the portion of the knitted tractor tube extending over the outer surface of the elongate inversion support catheter comprises a wire forming a helical spiral of alternating teardrop shaped-links each having a rounded apex, wherein each link is connected to two adjacent links so that the apex of each link is on an outward-facing surface of the tractor tube, wherein the links flare outward from an outer wall of the elongate inversion support catheter when the puller is pulled proximally within the elongate inversion support catheter.

The remaining technical features of the second subject (claims 11 and 22) are formed by: the inversion support catheter being slotted comprising a spiral pattern having a plurality of slots arranged approximately transversely to a long axis of the elongate slotted inversion support catheter, wherein the slots have an open diameter of about 0.001 inches or less and wherein there are between 2 and 4 slots per circumferential turn of the spiral pattern.

Since these features are different and they solve different problems (I: how to provide improved retrieval of a clot; II: how to provide a catheter with buckling resistance and sufficient flexibility), there is a case of non-unity.

Hence, the following separate inventions or groups of inventions are not so linked as to form a single general inventive concept:
I claims 1-10: Thrombectomy apparatus having knitted tractor tube.
II claims 11-22: Thrombectomy apparatus having slotted inversion support catheter.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

SUBJECT I

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-10 does not involve an inventive step in the sense of Article 33(3) PCT.

Document **US 2017/086864 A1 (D1)** discloses (see paragraph [0021]; figures 1-6; paragraph [0064]; paragraph [0121] - paragraph [0125]; paragraph [0164]):
A mechanical thrombectomy apparatus for removing a clot from a vessel, the apparatus comprising:
an elongate inversion support catheter having a distal end and a distal end opening;
an elongate puller 146 extending within the elongate inversion support catheter; and
a knitted tractor tube 244' extending over an outer surface of the elongate inversion support catheter, inverting into the distal end opening of the elongate inversion support catheter, and attached to the elongate puller at a first end within the elongate inversion support catheter,
wherein the portion of the knitted tractor tube extending over the outer surface of the elongate inversion support catheter comprises a wire.

The shape of the knitted fibers is not defined further in D1. A knitted pattern normally includes loops. It is furthermore known to the skilled person that a pattern having a helical spiral of alternating teardrop shaped-links having a rounded apex, wherein each link is connected to two adjacent links so that the apex of each link is on an outward-facing surface of a tractor tube, wherein the links flare outward from when a puller is pulled proximally has a beneficial effect on grasping a clot to be removed.
Document **US 2013/226196 A1 (D2)** (see paragraph [0112] - paragraph [0114]; figures 4, 10) discloses a gripping device having an inversible member with such an arrangement.

The skilled person would provide the device of D1 with such a known pattern in order to increase the gripping properties and thus arrive at the subject matter of claim 1 without using any inventive skill.

From fig. 9 of D2 it can be seen that the grab width W of the links flaring outward is between 30-90% of the length L of the links.
Therefore, the subject matter of independent claim 10 also lacks inventive step.

Dependent claims 2-9 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, these features are either known from D1 or D2 or merely relate to minor modifications.

SUBJECT II

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 11-22 does not involve an inventive step in the sense of Article 33(3) PCT.

Document **US 2017/086864 A1 (D1)** discloses (see paragraph [0021]; figures 1-6; paragraph [0064]; paragraph [0121] - paragraph [0125]; paragraph [0164]):
A mechanical thrombectomy apparatus for removing a clot from a vessel, the apparatus comprising:
an elongate inversion support catheter having a distal end and a distal end opening; an elongate puller 146 extending within the elongate inversion support catheter; and a tractor tube 244' extending over an outer surface of the elongate inversion support catheter, inverting into the distal end opening of the elongate inversion support catheter, and attached to the elongate puller at a first end within the elongate inversion support catheter.

In paragraph [0157] it is further mentioned that the catheter may be constructed such that the tip does not buckle under the pull forces.
The skilled person, searching for a suitable non-buckling and flexible catheter would be aware that a plurality of thin slots in a spiral or non spiral pattern provides such flexibility. For instance document **US 2016/074627 A1 (D3)** (see paragraph [0095] - paragraph [0100]; figures 7A-8D) discloses such a slotted catheter, also having different sections for different flexibilities.
The skilled person would provide the apparatus of D1 with such a slotted catheter without using any inventive skill. The term "open diameter" is not clear (see point VIII below) but the dimension of 0.001 inches appears to be a normal value for a slotted

catheter having a size for entry in small blood vessels. See for instance also **US 2005/177132 A1 (D4)** (paragraph [0027]; figures 1-7).
Therefore, the subject matter of independent claims 11 and 22 lacks inventive step.

Dependent claims 12-21 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, these features are either known from D3 or D4 or merely relate to minor modifications.

Re Item VII

Certain defects in the international application

The independent claims are not in the **two part** form and the claims are not provided with **reference numerals**.

The application contains **non-SI** units and citations without also citing the published documents.

Re Item VIII

Certain observations on the international application

Although claims 1 and 10 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

In claims 11, 12 and 22 it is not clear what is meant by slots having an open diameter of about 0.001 inches. It would appear that slots have a width and a length.

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**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-02-PCT2		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2017/029366	25 April 2017 (25-04-2017)	25 April 2016 (25-04-2016)
Applicant		
STRYKER CORPORATION		

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 6 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. 3a

☐ 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

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/029366

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.: 17-25
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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

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

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

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

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

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

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-16

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.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/029366

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/22 A61B17/221
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 498 349 A (COOK MEDICAL TECHNOLOGIES LLC) 17 July 2013 (2013-07-17) abstract; figures page 8, line 12 - page 11, line 16	1,16
A	WO 2012/009675 A2 (LAZARUS EFFECT, INC.) 19 January 2012 (2012-01-19) paragraphs [0152], [0153], [0167] - [0170]; figures 10, 13B	1,16

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

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 June 2017	29/08/2017

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Giménez Burgos, R

1

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2017/029366

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2498349 A	17-07-2013	EP 2802275 A1	19-11-2014
		GB 2498349 A	17-07-2013
		US 2015005781 A1	01-01-2015
		WO 2013106146 A1	18-07-2013
WO 2012009675 A2	19-01-2012	US 2014005712 A1	02-01-2014
		WO 2012009675 A2	19-01-2012

Form PCT/ISA/210 (patent family annex) (April 2005)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-16

A mechanical thrombectomy apparatus comprising: a catheter, a tractor, a puller and a tractor hold to secure an end of the tractor to an outside surface of the catheter until a force greater than a threshold force is applied by pulling the tractor proximally within the catheter.

---

2. claims: 26-31

A mechanical thrombectomy apparatus comprising: a catheter, a tractor, a puller and a guide wire lumen extending through the catheter, the puller and the tractor, and configured to pass a guide wire.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 17-25

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

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2017/029366	25.04.2017	25.04.2016

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/22 A61B17/221

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 17-31

because:

☒ the said international application, or the said claims Nos. 17-31 relate to the following subject matter which does not require an international search *(specify)*:

see separate sheet

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for the whole application or for said claims Nos. 17-31

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☒ See Supplemental Box for further details

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:

   see separate sheet

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

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-16

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

1. Statement

Novelty (N)	Yes:	Claims	1-16
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-16
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-16
	No:	Claims	

2. Citations and explanations

   see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The methods according to claims 17- 25 are methods of treatment of the living human or animal body by surgery.

The surgical methods claimed, at least implies the surgical step of positioning a distal end of the thrombectomy apparatus adjacent to the clot within the vessel.

Therefore, no preliminary international examination is required to the subject matter of these method claims (see Article 34(4) and Rule 67.1 PCT).

Re Item IV

Lack of unity of invention

This Authority considers that the application does not meet the requirements of unity of invention and that there are two inventions covered by the claims indicated as follows:

claims: 1-16

A mechanical thrombectomy apparatus comprising: a catheter, a tractor, a puller and a tractor hold to secure an end of the tractor to an outside surface of the catheter until a force greater than a threshold force is applied by pulling the tractor proximally within the catheter.

claims: 26-31

A mechanical thrombectomy apparatus comprising: a catheter, a tractor, a puller and a guide wire lumen extending through the catheter, the puller and the tractor, and configured to pass a guide wire.

The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

The common technical features of subject 1 and 2 is:

"A mechanical thrombectomy apparatus for removing a clot from a vessel, the apparatus comprising:

a catheter having a proximal end and a distal end and a distal end opening;

a tractor comprising a flexible tube that extends within the catheter, inverts over the distal end opening of the catheter and extends over the distal end of the catheter, wherein the tractor is configured to invert by rolling over the distal end opening of the catheter when a first end of the tractor is pulled proximally within the catheter; and

a puller coupled to the first end of the tractor, wherein the puller extends within the catheter to the proximal end of the catheter".

These features are known from prior art document GB 2498349 A.

In particular, document GB 2498349 A (Figs.: 1- 3; page 8, line 12- page 11, line 5) discloses a mechanical thrombectomy apparatus for removing a clot from within a vessel, the apparatus comprising:

an elongate catheter (12) having a proximal end and a distal end and a distal end opening;

a tractor (14) comprising a flexible tube that extends within the catheter (12), inverts over the distal end opening of the catheter (12) and extends over the distal end of the catheter (12), wherein the tractor (14) is configured to invert by rolling over the distal end opening of the catheter (12) when a first end (16) of the tractor (14) is pulled proximally within the catheter (12); and

a puller (wire; 20) coupled to the first end (16) of the tractor (14), wherein the puller (20) extends within the catheter (12) to the proximal end of the catheter (12).

Therefore, the special technical features, in the sense of Rule 13.2 PCT, of the two subjects are:

for subject 1: that the mechanical thrombectomy apparatus further comprises comprises a tractor hold attached to an outer diameter of the catheter proximal to the distal end of the catheter, wherein the tractor hold secures a second end of the tractor to an outside surface of the catheter until a force greater than a threshold force is applied by pulling the first of the tractor proximally within the catheter, wherein the threshold force is between 50 g of force and 500 g of force; in order to provide a controlled positioning of the elongate catheter within the vessel.

for subject 2: that the mechanical thrombectomy apparatus further comprises comprises a guide wire lumen extending through the catheter, the puller and the tractor, and configured to pass a guide wire; in order to facilitate the navigation of the thrombectomy apparatus through the vessel.

It appears that between the different subjects mentioned, no same or corresponding special feature can be found apart from those already known from the prior art.

It is also submitted that the different subjects clearly intend to solve problems of different nature.

In conclusion, there is not technical relationship between the subjects identified, and thus, the above mentioned set of claims is not so linked by a general inventive concept.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1 GB 2 498 349 A (COOK MEDICAL TECHNOLOGIES LLC)

D2 WO 2012/009675 A2 (LAZARUS EFFECT, INC.)

2 Independent claim 1 and 16, positive opinion.

Document **D1** (Figs.: 1- 4; page 8, line 12- page 11, line 16) is regarded as being the prior art closest to the subject matter of claims 1 and 16, and discloses discloses a mechanical thrombectomy apparatus for removing a clot from within a vessel, the apparatus comprising:

an elongate catheter (12) having a proximal end and a distal end and a distal end opening;

a tractor (14) comprising a flexible tube that extends within the catheter (12), inverts over the distal end opening of the catheter (12) and extends over the distal end of the catheter (12), wherein the tractor (14) is configured to invert by rolling over the distal end opening of the catheter (12) when a first end (16) of the tractor (14) is pulled proximally within the catheter (12);

a puller (wire; 20) coupled to the first end (16) of the tractor (14), wherein the puller (20) extends within the catheter (12) to the proximal end of the catheter (12); and

tractor holding ties (30; Fig.: 4; page 11, lines 11- 16) attached on an outer diameter of the catheter proximal to the distal end of the catheter, wherein the tractor holding ties (30) hold secures a second end of the tractor to an outside surface of the catheter until the are released by the surgeon by a couple of trigger wires.

The subject matter of claims 1 and 16 therefore differs from this known mechanical thrombectomy apparatus in that the tractor hold means is released by a pulling force applied to the tractor, of for example a value greater than between 50 g and 500g of force.

The problem to be solved by the present invention may be regarded as the need for a simpler and improved system of releasing the attachment between the tractor and the catheter.

The solution to the problem proposed in claims 1 and 16 of the present application is considered as involving an inventive step (Article 33(3) PCT) because the subject matter of claims 1 or 16 is neither taught nor suggested in the relevant prior art; nor detailed hints towards the specific combination of features can be seen to exist in the prior art.

3 Claim 2- 15 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Re Item VII

Certain defects in the international application

4 Independent claims 1 and 16 are not in the two part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art **D1** being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

5 The features of claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

6 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in **D1** and **D2** is not mentioned in the description, nor are these documents identified therein.

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**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-02-PCT3		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2017/029440	25 April 2017 (25-04-2017)	25 April 2016 (25-04-2016)
Applicant		
STRYKER CORPORATION		

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 6 sheets.

[X] 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:
      [X] 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. [X] **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,**
   [X] 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,**
   [X] 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. 8A
      [ ] as suggested by the applicant
      [ ] as selected by this Authority, because the applicant failed to suggest a figure
      [X] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/029440

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.: 7-24
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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:

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

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

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

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

Remark on Protest

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

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

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/029440

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/22 A61B17/221
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2012/009675 A2 (LAZARUS EFFECT, INC.) 19 January 2012 (2012-01-19) paragraphs [0152], [0153], [0167] - [0170]; figures 10, 13B	1
A	GB 2 498 349 A (COOK MEDICAL TECHNOLOGIES LLC) 17 July 2013 (2013-07-17) abstract; figures page 8, line 12 - page 11, line 16	1
A	US 2013/096571 A1 (MASSICOTTE ET AL.) 18 April 2013 (2013-04-18) abstract; figures	1
A	US 2006/089533 A1 (ZIEGLER ET AL.) 27 April 2006 (2006-04-27) figures	1

-/--

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 June 2017	07/07/2017

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Giménez Burgos, R

1

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 00/32118 A1 (ATROPOS LIMITED) 8 June 2000 (2000-06-08) figures	1
A,P	WO 2017/058280 A1 (GW MEDICAL LLC) 6 April 2017 (2017-04-06) the whole document	1

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2017/029440

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2012009675 A2	19-01-2012	US 2014005712 A1	02-01-2014
		WO 2012009675 A2	19-01-2012
GB 2498349 A	17-07-2013	EP 2802275 A1	19-11-2014
		GB 2498349 A	17-07-2013
		US 2015005781 A1	01-01-2015
		WO 2013106146 A1	18-07-2013
US 2013096571 A1	18-04-2013	US 2007038227 A1	15-02-2007
		US 2013096571 A1	18-04-2013
		WO 2007022055 A1	22-02-2007
US 2006089533 A1	27-04-2006	BR PI0617790 A2	09-08-2011
		EP 1945091 A2	23-07-2008
		IL 191079 A	31-01-2012
		JP 2009513250 A	02-04-2009
		US 2006089533 A1	27-04-2006
		US 2008045790 A1	21-02-2008
		US 2010198011 A1	05-08-2010
		WO 2007050370 A2	03-05-2007
WO 0032118 A1	08-06-2000	AU 1405400 A	19-06-2000
		AU 1405600 A	19-06-2000
		EP 1135071 A1	26-09-2001
		IE 991011 A1	12-07-2000
		IE 991013 A1	12-07-2000
		US 2002016607 A1	07-02-2002
		WO 0032118 A1	08-06-2000
		WO 0032119 A1	08-06-2000
WO 2017058280 A1	06-04-2017	US 9463035 B1	11-10-2016
		US 2017086864 A1	30-03-2017
		WO 2017058280 A1	06-04-2017

Form PCT/ISA/210 (patent family annex) (April 2005)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 7-24

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

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2017/029440	25.04.2017	25.04.2016

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/22 A61B17/221

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Giménez Burgos, R Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 7-24

because:

☒ the said international application, or the said claims Nos. 7-24 relate to the following subject matter which does not require an international search *(specify)*:

see separate sheet

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for the whole application or for said claims Nos. 7-24

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☒ See Supplemental Box for further details

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

1. Statement

Novelty (N)	Yes:	Claims	1-6
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-6
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-6
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)

and / or

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

see form 210

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The methods according to claims 7- 24 are methods of treatment of the living human or animal body by surgery.

The surgical methods claimed, at least implies the surgical step of positioning a distal end of the thrombectomy apparatus adjacent to the clot within the vessel.

Therefore, no preliminary international examination is required to the subject matter of these method claims (see Article 34(4) and Rule 67.1 PCT).

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1	WO 2012/009675 A2 (LAZARUS EFFECT, INC.)
D2	GB 2 498 349 A (COOK MEDICAL TECHNOLOGIES LLC)
D3	US 2013/096571 A1 (MASSICOTTE ET AL.)
D4	US 2006/089533 A1 (ZIEGLER ET AL.)

2 Independent claim 1, positive assessment.

Document **D1** (Figs.: 13G) is regarded as being the prior art closest to the subject matter of claim 1, and discloses a mechanical thrombectomy system for removing a clot (2) from within a vessel, the apparatus comprising:

a tractor (370) comprising a flexible tube that extends distally in an un-inverted configuration at its proximal end, inverts over at its middle portion and extends proximally in an inverted configuration proximally,

a puller (354) connected to the first end of the tractor (370) extending proximally;

a clot engaging member (200) on the distal end of an elongate manipulator; and

a lumen extending continuously through the puller (354) and the tractor (370) and configured to pass the expandable elongate manipulator.

The subject matter of claim 1 therefore differs from this known mechanical thrombectomy system in that it further comprises:

a flexible catheter having a distal end and a distal end opening;

a tractor comprising a flexible belt that extends within the catheter, inverts over the distal end opening of the catheter and extends along the outer diameter of the catheter, and

a power drive at a proximal end of the flexible catheter configured to drive the tractor around the catheter.

The problem to be solved by the present invention may be regarded as the need to improve the manoeuvrability and positioning of the clot capturing tractor within the vessel.

Document **D2** (Figs.: 1- 3; page 8, line 12- page 11, line 5) discloses a mechanical thrombectomy apparatus for removing a clot from within a vessel, the apparatus comprising:

an elongate catheter (12) having a proximal end and a distal end and a distal end opening;

a tractor (14) comprising a flexible tube that extends within the catheter (12), inverts over the distal end opening of the catheter (12) and extends over the distal end of the catheter (12), wherein the tractor (14) is configured to invert by rolling over the distal end opening of the catheter (12) when a first end (16) of the tractor (14) is pulled proximally within the catheter (12); and

a puller (wire; 20) coupled to the first end (16) of the tractor (14), wherein the puller (20) extends within the catheter (12) to the proximal end of the catheter (12).

Document **D3** (Figs.) discloses a self propelled, endoscopic apparatus formed of a flexible, fluid filled toroid and motorized or powered frame.

The solution proposed in claim 1 of the present application meets the requirements under Articles 33(2) and 33(3) PCT because the prior art does not teach or fairly suggests the mechanical thrombectomy apparatus claimed.

3 Claims 2- 6 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

Re Item VI

Certain documents cited

Certain published documents

Application No Patent No	Publication date *(day/month/ year)*	Filing date *(day/month/ year)*	Priority date *(valid claim)* *(day/month/year)*
WO 2017/058280	06/04/1017	15/02/2016	28/09/2015

Re Item VII

Certain defects in the international application

4 Independent claim 1 is not in the two part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art **D1** being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

5 The features of claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

6 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in **D1**- **D3** is not mentioned in the description, nor are these documents identified therein.

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**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-02-PCT4		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2017/029472	25 April 2017 (25-04-2017)	25 April 2016 (25-04-2016)
Applicant		
STRYKER CORPORATION		

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 6 sheets.

[X] 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:
      [X] 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. [X] **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,**
   [X] 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,**
   [X] 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. 6I
      [X] 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

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/029472

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.: 16-41
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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:

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

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

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

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

Remark on Protest

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

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

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/029472

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/22 A61B17/221
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2012/009675 A2 (LAZARUS EFFECT, INC.) 19 January 2012 (2012-01-19) paragraphs [0152], [0153], [0167] - [0170]; figures 10, 13B	1-15
Y	GB 2 498 349 A (COOK MEDICAL TECHNOLOGIES LLC) 17 July 2013 (2013-07-17) abstract; figures page 8, line 12 - page 11, line 5	1-15
A	US 2006/195137 A1 (SEPETKA ET AL.) 31 August 2006 (2006-08-31) abstract; figures	1,15
A	US 2005/085826 A1 (NAIR ET AL.) 21 April 2005 (2005-04-21) figures	1,15

-/--

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 June 2017	07/07/2017

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Giménez Burgos, R

1

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2012/049652 A1 (ENDOGROWTH (PROPRIETARY) LIMITED) 19 April 2012 (2012-04-19) figures	1,15
A	US 4 243 040 A (BEECHER) 6 January 1981 (1981-01-06) figures	1,15
X,P	WO 2017/058280 A1 (GW MEDICAL LLC) 6 April 2017 (2017-04-06) the whole document	1-15

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2017/029472

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2012009675 A2	19-01-2012	US 2014005712 A1	02-01-2014
		WO 2012009675 A2	19-01-2012
GB 2498349 A	17-07-2013	EP 2802275 A1	19-11-2014
		GB 2498349 A	17-07-2013
		US 2015005781 A1	01-01-2015
		WO 2013106146 A1	18-07-2013
US 2006195137 A1	31-08-2006	US 2006195137 A1	31-08-2006
		US 2014135814 A1	15-05-2014
		US 2016310152 A1	27-10-2016
		WO 2007044995 A2	19-04-2007
US 2005085826 A1	21-04-2005	AT 428358 T	15-05-2009
		CA 2543211 A1	12-05-2005
		EP 1684647 A1	02-08-2006
		ES 2324915 T3	19-08-2009
		JP 2007508903 A	12-04-2007
		US 2005085826 A1	21-04-2005
		US 2007249998 A1	25-10-2007
		WO 2005041788 A1	12-05-2005
WO 2012049652 A1	19-04-2012	US 2013226196 A1	29-08-2013
		WO 2012049652 A1	19-04-2012
		ZA 201302264 B	30-04-2014
US 4243040 A	06-01-1981	NONE	
WO 2017058280 A1	06-04-2017	US 9463035 B1	11-10-2016
		US 2017086864 A1	30-03-2017
		WO 2017058280 A1	06-04-2017

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 16-41

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

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guidelines C-IV, 7.2), should the problems which led to the Article 17(2) declaration be overcome.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2017/029472	25.04.2017	25.04.2016

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/22 A61B17/221

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Giménez Burgos, R Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. II Priority

1. ☑ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43*bis*.1 and 64.1) is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 16-41

because:

☒ the said international application, or the said claims Nos. 16-41 relate to the following subject matter which does not require an international search *(specify)*:

see separate sheet

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for the whole application or for said claims Nos. 16-41

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☒ See Supplemental Box for further details

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

1. Statement

Novelty (N)	Yes:	Claims	1-15
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-15
Industrial applicability (IA)	Yes:	Claims	1-15
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)

and / or

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

see form 210

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The methods according to claims 16- 41 are methods of treatment of the living human or animal body by surgery.

The surgical methods claimed, at least include the surgical step of positioning a distal end of the thrombectomy apparatus adjacent to the clot within the vessel.

Therefore, no preliminary international examination is required to the subject matter of these method claims (see Article 34(4) and Rule 67.1 PCT).

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1	WO 2012/009675 A2 (LAZARUS EFFECT, INC.)
D2	GB 2 498 349 A (COOK MEDICAL TECHNOLOGIES LLC)
D3	US 2006/195137 A1 (SEPETKA ET AL.)
D4	US 2005/085826 A1 (NAIR ET AL.)
D5	WO 2012/049652 A1 (ENDOGROWTH (PROPRIETARY) LIMITED)
D6	US 4 243 040 A (BEECHER)

2 Independent claim 1, lack of inventive step (Article 33(3) PCT).

Document **D1** (Figs.: 13G) is regarded as being the prior art closest to the subject matter of claim 1, and discloses a mechanical thrombectomy system for removing a clot (2) from within a vessel, the apparatus comprising:

a tractor (370) comprising a flexible tube that extends distally in an un-inverted configuration at its proximal end, inverts over at its middle portion and extends proximally in an inverted configuration proximally,

a puller (354) connected to the first end of the tractor (370) extending proximally;

a clot engaging member (200) on the distal end of an elongate manipulator; and

a lumen extending continuously through the puller (354) and the tractor (370) and configured to pass the expandable elongate manipulator.

The subject matter of claim 1 therefore differs from this known mechanical thrombectomy system in that it further comprises:

an elongate inversion support comprising a catheter having a distal end and a distal end opening; wherein the tractor inverts over the distal end opening of the catheter and extends proximally in an inverted configuration along the distal end of the catheter, and

wherein the tractor is configured to invert by rolling over the distal end opening of the catheter when a first end of the tractor is pulled proximally within the catheter.

The problem to be solved by the present invention may be regarded as the need to improve the manoeuvrability and positioning of the clot capturing tractor within the vessel.

However, the above mentioned distinguishing features have already been employed for the same purpose in a similar mechanical thrombectomy system (see document **D2**).

In particular document **D2** (Figs.: 1- 3; page 8, line 12- page 11, line 5) discloses a mechanical thrombectomy system for removing a clot from within a vessel, the apparatus comprising:

an elongate inversion support comprising a catheter (12) having a distal end and a distal end opening;

a tractor (14) comprising a flexible tube that extends distally in an un-inverted configuration within the catheter (12), inverts over the distal end opening of the catheter (12) and extends proximally in an inverted configuration along the distal end of the catheter (12), wherein the tractor (14) is configured to invert by rolling over the distal end opening of the catheter (12) when a first end (16) of the tractor (14) is pulled proximally within the catheter (12); and

a puller (wire; 20) connected to the first end (16) of the tractor (14) extending proximally.

It would be obvious to the person skilled in the art, namely when the same result is to be achieved, to apply these features with corresponding effect to the mechanical thrombectomy system of **D1**, thereby arriving at claim 1.

Hence, no inventive step is present in the subject matter of claim 1.

3 Independent claim 15, lack of inventive step (Article 33(3) PCT).

The same reasoning applies, mutatis mutandis, to the subject matter of the corresponding independent claim 15, which therefore is also considered not inventive.

4 Dependent claim 2- 14 appear to contain no features which in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, since these features are also present in

the mechanical thrombectomy systems of documents **D1** and **D2**, or are well known alternatives to the skilled person and here applied with no surprising effect.

Re Item VI

Certain documents cited

Certain published documents

Application No Patent No	Publication date *(day/month/ year)*	Filing date *(day/month/ year)*	Priority date *(valid claim)* *(day/month/year)*
WO 2017/058280	06/04/1017	15/02/2016	28/09/2015

Re Item VII

Certain defects in the international application

5 Independent claims 1 and 15 are not in the two part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art **D1** or **D2** being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

6 The features of claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

7 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in **D1**- **D6** is not mentioned in the description, nor are these documents identified therein.

Re Item VIII

Certain observations on the international application

8 Although claims 1 and 15 have been drafted as separate independent claims, they appear to relate effectively to the same subject matter and to differ from each other only with regard to the definition of the subject matter for which protection is sought and/or in respect of the terminology used for the features of that subject matter.

The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

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**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-02-PCT5		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2017/035543	1 June 2017 (01-06-2017)	3 June 2016 (03-06-2016)
Applicant		
STRYKER CORPORATION		

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 3 sheets.

[X] 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:
      [X] 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,**
   [X] 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,**
   [X] 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. 6B
      [ ] as suggested by the applicant
      [ ] as selected by this Authority, because the applicant failed to suggest a figure
      [X] as selected by this Authority, because this figure better characterizes the invention
   b. [ ] none of the figures is to be published with the abstract

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/035543

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/22 A61B17/221
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	GB 2 498 349 A (COOK MEDICAL TECHNOLOGIES LLC) 17 July 2013 (2013-07-17) abstract; figures page 8, line 12 - page 11, line 5	1-19
Y	WO 2012/009675 A2 (LAZARUS EFFECT, INC.) 19 January 2012 (2012-01-19) paragraphs [0152], [0153], [0167] - [0170]; figures 10, 13B	1-19
X,P	WO 2017/058280 A1 (GW MEDICAL LLC) 6 April 2017 (2017-04-06) the whole document	1-7,9-19

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
2 August 2017	14/08/2017

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Giménez Burgos, R

1

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2017/035543

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2498349 A	17-07-2013	EP 2802275 A1	19-11-2014
		GB 2498349 A	17-07-2013
		US 2015005781 A1	01-01-2015
		WO 2013106146 A1	18-07-2013
WO 2012009675 A2	19-01-2012	US 2014005712 A1	02-01-2014
		WO 2012009675 A2	19-01-2012
WO 2017058280 A1	06-04-2017	US 9463035 B1	11-10-2016
		US 2017086864 A1	30-03-2017
		WO 2017058280 A1	06-04-2017

Form PCT/ISA/210 (patent family annex) (April 2005)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2017/035543	01.06.2017	03.06.2016

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/22 A61B17/221

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Giménez Burgos, R Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. II Priority

1. ☑ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43*bis*.1 and 64.1) is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

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

1. Statement

Novelty (N)	Yes:	Claims	1-19
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-19
Industrial applicability (IA)	Yes:	Claims	1-19
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)

and / or

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

see form 210

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1 GB 2 498 349 A (COOK MEDICAL TECHNOLOGIES LLC)

D2 WO 2012/009675 A2 (LAZARUS EFFECT, INC.)

2 Independent claim 1, lack of inventive step (Article 33(3) PCT).

The subject matter of claim 1, notwithstanding the lack of clarity objection raised in Item VIII below, does not involve an inventive step in the sense of Article 33(3) PCT and the criteria of Article 33(1) PCT are therefore not met.

2.1 Document **D1** (Figs.: 1- 3; page 8, line 12- page 11, line 5) is regarded as being the prior art closest to the subject matter of claim 1, and discloses

a mechanical thrombectomy apparatus for removing a clot from from a vessel, the apparatus comprising:

an elongate inversion support catheter (12) having a distal end and a distal end opening;

an elongated puller (20) extending within the elongate inversion support catheter (12);

a flexible tractor (14) having a free first end (18) and a second end (16) that is coupled to a distal end region of the elongate puller (20), wherein the flexible tractor (14) is inverted over the elongate puller (20) and is held within the elongate inversion support catheter (12) in a collapsed first configuration (Fig.: 1);

wherein the flexible tractor (14) comprises a braided wire basket made of shape memory material, that bias the flexible tractor free end (18) to expand; and

wherein the end section of the biased flexible tractor (14) has a diameter that is larger than an outer diameter of the elongate inversion support catheter (12) when the flexible tractor (14) is in the expanded second configuration.

2.2 The subject matter of claim 1 therefore differs from this known mechanical thrombectomy system in that the flexible tractor is tubular; such as to configure the apparatus suitable to be used over a guide wire or to allow the passage of a clot engaging member within.

2.3 The problem to be solved by the present invention may be regarded as the need to improve the manoeuvrability and positioning of the clot capturing tractor within the vessel.

2.4 However, the above mentioned distinguishing features have already been employed for the same purpose in a similar mechanical thrombectomy system (see document **D2**).

In particular document **D2** (Fig.: 13G) discloses a mechanical thrombectomy system for removing a clot (2) from within a vessel, the apparatus comprising:

a tractor (370) comprising a flexible tube that extends distally in an un-inverted configuration at its proximal end, inverts over at its middle portion and extends proximally in an inverted configuration proximally,

a puller (354) connected to the first end of the tractor (370) extending proximally;

a clot engaging member (200) on the distal end of an elongate manipulator; and

a lumen extending continuously through the puller (354) and the tractor (370) and configured to pass the expandable elongate manipulator.

2.5 It would be obvious to the person skilled in the art, namely when the same result is to be achieved, to use a tubular flexible tractor with corresponding effect in the mechanical thrombectomy apparatus of **D1**, thereby arriving at claim 1.

3 Independent claim 19, lack of inventive step (Article 33(3) PCT).

The same reasoning applies, mutatis mutandis, to the subject matter of the corresponding independent claim 19, which therefore is also considered not inventive over documents **D1** and **D2**.

4 Dependent claims 2- 18 appear to contain no features which in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, since these features are also present in the mechanical thrombectomy apparatus of documents **D1** and **D2**, or are well known alternatives to the skilled person and here applied with no surprising effect.

Re Item VI

Certain documents cited

Certain published documents

Application No Patent No	Publication date *(day/month/year)*	Filing date *(day/month/year)*	Priority date *(valid claim)* *(day/month/year)*
WO 2017/058280	06/04/2017	15/02/2016	28/09/2016

Re Item VII

Certain defects in the international application

5 The independent claims are not in the two part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art, document **D1**, being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

6 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

7 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in documents **D1** and **D2** is not mentioned in the description, nor are these documents identified therein.

Re Item VIII

Certain observations on the international application

8 The application does not meet the requirements of Article 6 PCT, because claims 1 and 19 are not clear.

The term "annular bias" used in claims 1 and 19 is vague and unclear and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject matter of said claim unclear, Article 6 PCT.

An "annular bias" only defines a characteristic or an effect; and does not infer the inclusion of an additional element capable of creating such characteristic or effect.

It is clear from the description on paragraph [00078] that the annular bias is obtained by coupling an annular bias *element* (525, 625) to the first end of the flexible tractor (544, 644), and consequently the inclusion of this feature is essential to the definition of the invention.

Since independent claims 1 and 19 do not contain "an annular bias *element* (525, 625) coupled to the first end of the flexible tractor (544, 644)", it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.

9 Although claims 1 and 19 have been drafted as separate independent claims, they appear to relate effectively to the same subject matter and to differ from each other only with regard to the definition of the subject matter for which protection is sought and/or in respect of the terminology used for the features of that subject matter.

The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

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**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-02-PCT6		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2017/050933	11 September 2017 (11-09-2017)	12 September 2016 (12-09-2016)
Applicant		
STRYKER CORPORATION		

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 5 sheets.

[X] 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:
      [X] 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. [X] **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,**
   [X] 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,**
   [X] 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. 26A
      [X] 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

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/050933

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. [X] Claims Nos.: 31-41
because they relate to subject matter not required to be searched by this Authority, namely:

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

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:

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

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

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

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

Remark on Protest

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

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

[ ] No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2017/050933

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/22 A61B17/221
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 2012/009675 A2 (LAZARUS EFFECT, INC.) 19 January 2012 (2012-01-19) paragraphs [0008], [0077], [0161], [0167] - [0170], [0172]; figures 10, 13B	1-14, 16-28,30 15,29
Y	US 2010/249815 A1 (JANTZEN ET AL.) 30 September 2010 (2010-09-30) paragraphs [0026], [0027], [0030]; figures 1,2	15,29
A	GB 2 498 349 A (COOK MEDICAL TECHNOLOGIES LLC) 17 July 2013 (2013-07-17) abstract; claims; figures page 8, line 12 - page 11, line 16	1,16,30

-/--

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 October 2017	10/11/2017

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Giménez Burgos, R

1

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2012/049652 A1 (ENDOGROWTH (PROPRIETARY) LTD) 19 April 2012 (2012-04-19) page 8, line 32 - page 15, line 26; figures 4-10	1,16,30
A	US 4 863 440 A (CHIN) 5 September 1989 (1989-09-05) abstract; figures	1,16,30

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2017/050933

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2012009675 A2	19-01-2012	US 2014005712 A1	02-01-2014
		WO 2012009675 A2	19-01-2012
US 2010249815 A1	30-09-2010	NONE	
GB 2498349 A	17-07-2013	EP 2802275 A1	19-11-2014
		GB 2498349 A	17-07-2013
		US 2015005781 A1	01-01-2015
		WO 2013106146 A1	18-07-2013
WO 2012049652 A1	19-04-2012	US 2013226196 A1	29-08-2013
		WO 2012049652 A1	19-04-2012
		ZA 201302264 B	30-04-2014
US 4863440 A	05-09-1989	CA 1326198 C	18-01-1994
		DE 3686408 D1	17-09-1992
		DE 3686408 T2	21-01-1993
		EP 0227583 A2	01-07-1987
		JP 2529838 B2	04-09-1996
		JP S62170260 A	27-07-1987
		US 4863440 A	05-09-1989

Form PCT/ISA/210 (patent family annex) (April 2005)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2017/050933	11.09.2017	12.09.2016

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/22 A61B17/221

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Giménez Burgos, R Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 31-41

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international search *(specify)*:

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for the whole application or for said claims Nos. 31-41

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☒ See Supplemental Box for further details

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

1. Statement

Novelty (N)	Yes:	Claims	3-30
	No:	Claims	1, 2
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-30
Industrial applicability (IA)	Yes:	Claims	1-30
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The methods according to claims 31- 41 are methods of treatment of the living human or animal body by surgery.

The surgical methods of removing a clot from a blood vessel claimed, at least implies the surgical step of advancing a distal end of a self-rolling mechanical atherectomy apparatus through the blood vessel to the clot .

Therefore, no preliminary international examination is required to the subject matter of these method claims (see Article 34(4) and Rule 67.1 PCT).

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

D1 WO 2012/009675 A2 (LAZARUS EFFECT, INC.)

D2 GB 2 498 349 A (COOK MEDICAL TECHNOLOGIES LLC)

D3 US 2010/249815 A1 (JANTZEN ET AL.)

D4 US 4 863 440 A (CHIN)

D5 WO 2012/049652 A1 (ENDOGROWTH (PROPRIETARY) LTD)

2 Independent claim 1, lack of novelty (Article 33(2) PCT).

The present application does not meet the criteria of Article 33(1) PCT, because the subject matter of claim 1 is not new in the sense of Article 33(2) PCT.

Document **D1** (Figs.: 13A, 13B, 13G; paragraphs [0008], [0161], [0167]-[0170] and [0172]) discloses a self-rolling mechanical atherectomy apparatus (350) for removing a clot from a vessel, comprising:

an outer tractor pusher (354) comprising a catheter having a distal end and a distal end opening (Figs.: 13B, 13G);

a tractor tube (370) comprising an outer tractor tube portion that extends distally in an un-inverted configuration and inverts into itself at a distal-facing region to form an inner tractor tube portion (Figs.: 13b, 13G),

wherein the tractor tube (370) is configured such that pulling the inner tractor tube portion proximally (paragraphs [0167]- [0170]):

compresses the outer tractor tube portion into a configuration having a column strength that resists collapsing (Figs.: 13B, 13G), and

causes a region of the outer tractor tube portion at the distal-facing region to roll over itself, unsupported, and invert into the inner tractor tube portion (Figs.: 13B, 13G) ; and

an inner tractor puller (352) coupled to the inner tractor tube portion and extending proximally within the outer tractor pusher (354).

The subject matter of claim 1 is therefore not new (Article 33(2) PCT).

3 Independent claim 16, lack of inventive step (Article 33(3) PCT).

The present application does not meet the criteria of Article 33(1) PCT, because the subject matter of claim 16 does not involve an inventive step in the sense of Article 33(3) PCT.

Document **D1** is regarded as being the prior art closest to the subject matter of claim 16, and discloses self-rolling mechanical atherectomy apparatus (350) for removing a clot from a vessels (see item 2 above), from which the subject matter of claim 16 differs in that the outer tractor is configured so that pulling the inner tractor tube portion proximally compresses into a configuration having a column strength that resists collapsing up to at least 500g of compression and extends inner tractor portion tube portion.

The present authority considers that the outer tractor portion column strength resistance claimed is merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to prevent buckling when the catheter is pulled over the distal annulus (distal end opening).

Hence, no inventive step is present in the subject matter of claim 16.

4 Independent claim 30, lack of inventive step (Article 33(3) PCT).

The present application does not meet the criteria of Article 33(1) PCT, because the subject matter of claim 30 does not involve an inventive step in the sense of Article 33(3) PCT.

Document **D1** is regarded as being the prior art closest to the subject matter of claim 30, and discloses self-rolling mechanical atherectomy apparatus (350) for removing a clot from a vessels (see item 2 above) comprising a tractor tube formed by expandable braided wires, from which the subject matter of claim 30 differs in that the outer tractor tube portion has an expanded configuration with a distal-to-proximal facing braid angle for the expanded configuration of between about 80 and about 170 degrees; and wherein the outer tractor tube portion of the tractor tube is configured to expand to between about +/- 30% of an outer diameter of the outer tractor pusher.

The present authority considers that the outer tube portion expanded configuration claimed is merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to be able to obtain a self-rolling (e.g., unsupported) tractor tube apparatus that will not kink or collapse or otherwise fail.

Hence, no inventive step is present in the subject matter of claim 30.

5 Dependent claims 2- 15 and 17- 29 appear to contain no features which in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect to novelty/ inventive step, since these features are also present in the atherectomy apparatus of documents **D1**- **D3** or are well known alternatives to the skilled man and here applied with no surprising effect.

Re Item VII

Certain defects in the international application

6 Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art **D1** being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

7 The features of claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

8 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in documents **D1**- **D3** is not mentioned in the description, nor are these documents identified therein.

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**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-09-PCT		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2020/014854	23 January 2020 (23-01-2020)	
Applicant		
STRYKER CORPORATION		

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.

[X] 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:
      [X] 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. [X] **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,**
   [X] 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,**
   [X] 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. 3C
      [X] 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

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2020/014854

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. [X] Claims Nos.: 21-27
because they relate to subject matter not required to be searched by this Authority, namely:

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

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:

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

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

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

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

Remark on Protest

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

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

[ ] No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2020/014854

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/22 A61B17/221
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B A61M

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 9 463 035 B1 (GREENHALGH E SKOTT [US] ET AL) 11 October 2016 (2016-10-11) cited in the application column 36, line 40 - column 37, line 3 figures 38A, 38B	1-20
A	US 2017/303948 A1 (WALLACE MICHAEL P [US] ET AL) 26 October 2017 (2017-10-26) paragraph [0218]; figures 38A, 38B, 39A-39C	1-20
A	US 2003/168068 A1 (POOLE ANTHONY GEORGE [GB] ET AL) 11 September 2003 (2003-09-11) paragraphs [0004], [0108] - [0113], [0119] - [0132], [0144]; figures 7, 10	1-20

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

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
25 September 2020	05/10/2020

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Chabus, Hervé

1

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2020/014854

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 9463035 B1	11-10-2016	CN 108348319 A	31-07-2018
		CN 111281482 A	16-06-2020
		EP 3355829 A1	08-08-2018
		EP 3406208 A1	28-11-2018
		JP 2018529495 A	11-10-2018
		JP 2020146487 A	17-09-2020
		US 9463035 B1	11-10-2016
		US 2017086864 A1	30-03-2017
		US 2019336148 A1	07-11-2019
		WO 2017058280 A1	06-04-2017
US 2017303948 A1	26-10-2017	CN 109890304 A	14-06-2019
		EP 3448280 A2	06-03-2019
		EP 3590446 A1	08-01-2020
		JP 2019519341 A	11-07-2019
		US 2017303948 A1	26-10-2017
		US 2019117244 A1	25-04-2019
		US 2019133622 A1	09-05-2019
		WO 2017189535 A2	02-11-2017
US 2003168068 A1	11-09-2003	AT 324827 T	15-06-2006
		AU 8428601 A	22-03-2002
		CA 2421370 A1	14-03-2002
		DE 60119343 T2	07-09-2006
		EP 1315444 A2	04-06-2003
		ES 2260275 T3	01-11-2006
		JP 2004508084 A	18-03-2004
		US 2003168068 A1	11-09-2003
		WO 0219899 A2	14-03-2002

Form PCT/ISA/210 (patent family annex) (April 2005)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2020/014854	23.01.2020	

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/22 A61B17/221

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Chabus, Hervé Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 21-27

because:

☒ the said international application, or the said claims Nos. 21-27 relate to the following subject matter which does not require an international search *(specify)*:

see separate sheet

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for the whole application or for said claims Nos. 21-27

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☒ See Supplemental Box for further details

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

1. Statement

Novelty (N)	Yes:	Claims	1-20
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-20
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-20
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

1 **Re Item III**

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Method claims 21-27 refer to a method of removing a clot from a blood vessel which is a method for treatment of the human or animal body. No opinion is required for such a method (see Rule 67.1(iv) PCT).

2 **Re Item V**

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

2.1 Reference is made to the following documents:

D1	US 9 463 035 B1 (GREENHALGH E SKOTT [US] ET AL) 11 October 2016 (2016-10-11)cited in the application
D2	US 2017/303948 A1 (WALLACE MICHAEL P [US] ET AL) 26 October 2017 (2017-10-26)
D3	US 2003/168068 A1 (POOLE ANTHONY GEORGE [GB] ET AL) 11 September 2003 (2003-09-11)

2.2 D1 (column 36, line 40 - column 37, line 3; figures 38A, 38B) is regarded as being the prior art closest to the subject-matter of claim 1, and discloses an apparatus for removing a material (3805) from a body lumen, the apparatus comprising:
an elongate inversion support catheter (3811) having a proximal end region, a distal end region, and a distal end opening;
an elongate puller (3807) extending within the inversion support catheter;
a flexible tube having a distal first end attached to the puller, wherein the flexible tube extends over an outer surface of the inversion support catheter and is configured to invert into the distal end opening of the inversion support catheter when the puller is pulled proximally; and
a depot (3813) ~~movably~~ coupled to the proximal end region of the inversion support catheter, the depot comprising an inner storage region~~, wherein a~~

~~proximal portion of the flexible tube is held compressed within the inner storage region in a folded configuration that is configured to unfurl out of a distal end opening of the depot when the puller is pulled proximally~~.

The subject-matter of claim 1 therefore differs from this known apparatus in that the depot is movably coupled to the proximal end region of the inversion support catheter, and wherein a proximal portion of the flexible tube is held compressed within the inner storage region in a folded configuration that is configured to unfurl out of a distal end opening of the depot when the puller is pulled proximally.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as to provide an apparatus which can be easily adapted to different lengths of use.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

Document D3 (see paragraphs [0004], [0108] - [0113], [0119] - [0132], [0144]; figures 7, 10) discloses an assembly comprising an endoscope and a body cavity liner which is stored in a compressed state in a housing and which is everted when deployed from the housing. While D3 appears to disclose part of the solution, the skilled person would not consider D3 for solving the above stated problem because it relates to a completely different device.

D2 (see paragraph [0218]; figures 38A, 38B, 39A-39C) does not disclose any depot comprising an inner storage region for the flexible tube.

Therefore, the skilled person does not find, in the prior art, any hint towards the proposed solution when trying to solve the problem mentioned above.

2.3 Claim 20 contains all the features of claim 1. For the same reason, the subject matter of claim 20 involves an inventive step.

2.4 Claims 2-19 are dependent on one or more independent claims whose subject-matter is considered as being new and inventive, as discussed above, and as such said dependent claims also meet the requirements of the PCT with respect to novelty and inventive step.

3 **Re Item VII**

Certain defects in the international application

3.1 Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art D1 being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

3.2 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

4 **Re Item VIII**

Certain observations on the international application

4.1 The application does not meet the requirements of Article 6 PCT, because claim 13 is not clear as it misses a final punctuation point.

4.2 Although claims 1 and 20 have been drafted as separate independent claims, claim 20 consists essentially of the combination of features of claims 1, 2 and 17. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

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	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-10-PCT		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2020/017684	11 February 2020 (11-02-2020)	
Applicant		
STRYKER CORPORATION		

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 6 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. 8b

☒ 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

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2020/017684

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. [X] Claims Nos.: 22-24, 41, 42
because they relate to subject matter not required to be searched by this Authority, namely:

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

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

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

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

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

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

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

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

4. [X] 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.:

1-21

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.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2020/017684

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/221 A61B17/22
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B A61M

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2019/336148 A1 (GREENHALGH E SKOTT [US] ET AL) 7 November 2019 (2019-11-07) cited in the application paragraphs [0049], [0057], [0058], [0150], [0158], [0165], [0171], [0176] - [0177]; claim 2; figures 2, 13, 15A-15D, 19A-21D	1-21
A	WO 2019/010318 A1 (STRYKER CORP [US]) 10 January 2019 (2019-01-10) paragraphs [0011], [0038] - [0040], [0101] - [0105]; figures 5, 7A-8B	1-21
A	US 2017/303948 A1 (WALLACE MICHAEL P [US] ET AL) 26 October 2017 (2017-10-26) paragraphs [0148], [0182] - [0189]; figures 10A-10E, 31A-37C	1-21

-/--

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 September 2020	30/11/2020

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Chabus, Hervé

1

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2019/133624 A1 (WALLACE MICHAEL P [US] ET AL) 9 May 2019 (2019-05-09) paragraphs [0009], [0018], [0034] - [0046]; figures 6, 13A-13C	1-21

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2020/017684

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2019336148 A1	07-11-2019	CN 108348319 A	31-07-2018
		CN 111281482 A	16-06-2020
		EP 3355829 A1	08-08-2018
		EP 3406208 A1	28-11-2018
		EP 3741315 A1	25-11-2020
		ES 2784779 T3	30-09-2020
		JP 2018529495 A	11-10-2018
		JP 2020146487 A	17-09-2020
		US 9463035 B1	11-10-2016
		US 2017086864 A1	30-03-2017
		US 2019336148 A1	07-11-2019
		US 2020315642 A1	08-10-2020
		WO 2017058280 A1	06-04-2017
WO 2019010318 A1	10-01-2019	CN 110913778 A	24-03-2020
		EP 3648686 A1	13-05-2020
		JP 2020526255 A	31-08-2020
		WO 2019010318 A1	10-01-2019
US 2017303948 A1	26-10-2017	CN 109890304 A	14-06-2019
		EP 3448280 A2	06-03-2019
		EP 3590446 A1	08-01-2020
		JP 2019519341 A	11-07-2019
		US 2017303948 A1	26-10-2017
		US 2019117244 A1	25-04-2019
		US 2019133622 A1	09-05-2019
		WO 2017189535 A2	02-11-2017
US 2019133624 A1	09-05-2019	CN 111343932 A	26-06-2020
		EP 3706650 A1	16-09-2020
		US 2019133623 A1	09-05-2019
		US 2019133624 A1	09-05-2019
		US 2019133625 A1	09-05-2019
		US 2019133626 A1	09-05-2019
		US 2019133627 A1	09-05-2019
		WO 2019094456 A1	16-05-2019

Form PCT/ISA/210 (patent family annex) (April 2005)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-21

Apparatus for removing a material from a body lumen with a knitted tube configured to prevent any locking at the distal end of the catheter when pulled

---

2. claims: 25-40

Apparatus for removing a material from a body lumen with a funnel configured to facilitate removal of harder material

---

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2020/017684	11.02.2020	

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/221 A61B17/22

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Chabus, Hervé Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 22-42

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international search *(specify)*:

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for the whole application or for said claims Nos. 22-42

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☒ See Supplemental Box for further details

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:

   see separate sheet

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

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-21

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

1. Statement

Novelty (N)	Yes:	Claims	4, 5, 8, 9, 15-21
	No:	Claims	1-3, 6, 7, 10-14
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-21
Industrial applicability (IA)	Yes:	Claims	1-21
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

1 **Re Item III**

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Method claims 22-24, 41 and 42 relate to methods of removing material from within a body lumen. These methods are methods for treatment of the human body by surgery for which no opinion is required (Rule 67.1(iv) PCT).

2 **Re Item IV**

Lack of unity of invention

2.1 This Authority considers that the application does not meet the requirements of unity of invention and that there are 2 inventions covered by the claims indicated as follows:

Invention 1: claims: 1-21

Apparatus for removing a material from a body lumen with a knitted tube configured to prevent any locking at the distal end of the catheter when pulled

Invention 2: claims: 25-40

Apparatus for removing a material from a body lumen with a funnel configured to facilitate removal of harder material

2.2 The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

The common matter linking together the independent claims 1, 15, 25 and 40 is the following:

an apparatus for removing a material from a body lumen, the apparatus comprising:

an elongate inversion support comprising a catheter having a circumference, a distal end, and a distal end opening; and

a knitted tube that extends distally in an un-inverted configuration along an outer surface of the catheter, inverts into the distal end opening of the catheter, and extends proximally within the catheter in an inverted configuration, wherein the

knitted tube is configured to invert by rolling into the distal end opening of the catheter when a first end of the knitted tube is pulled proximally within the catheter.

This common matter does not comprise a single general inventive concept, based on same or corresponding special technical features within the meaning of Rule 13.2 PCT, because it is known from document D1 (see paragraphs [0049], [0057], [0058], [0150], [0158], [0165], [0171], [0176] - [0177]; claim 2; figures 2, 13, 15A-15D, 19A-21D and item V point 3.2 below).

The differentiating features of the independent claims over the above identified common matter are as follows:

Claim 1: the knitted tube is configured to stretch less than 3 percent when pulled in tension with a force of 2 Newtons so that the knitted tube does not lock onto the outer surface of the catheter.

Claim 15: the knitted tube has a length of 20 cm or greater and has a choke ratio greater than 2.9.

Claim 25: the inversion support further comprises an expandable funnel disposed at a distal end of the catheter body and extending in a proximal to distal axis, wherein a distal end of the funnel defines a distal end opening in communication with an interior of the funnel and the catheter lumen, respectively, and wherein, in an open configuration, an interior wall of the funnel has a wall angle of less than 14 degrees relative to the proximal to distal axis for a majority of a length of the funnel, and includes a first region in which the wall angle is between 14 and 50 degrees with respect to the proximal to distal axis.

Claim 40: an expandable funnel is disposed at a distal end of the catheter body and extending in a proximal to distal axis, wherein a distal end of the funnel defines a distal end opening in communication with an interior of the funnel and the catheter lumen, respectively, and wherein, in an open configuration, an interior wall of the funnel comprises one or more constricted regions in which the interior wall of the funnel constricts from the proximal to distal direction.

The features of claims 1 and 15 are corresponding as they solve the same problem of preventing locking of the knitted tube at the distal end of the catheter.

The features of claims 25 and 40 are also corresponding since they solve the same problem of facilitating the removal of harder material.

However the features of claims 1 and 15 on the one hand and the features of claims 25 and 40 on the other hand are neither the same nor corresponding since they solve different problems.

Therefore, invention 1 and invention 2 as defined above are not so linked by a single general inventive concept (Rule 13.1 PCT) involving same and corresponding special technical features (Rule 13.2 PCT).

Consequently the application does not meet the requirement for unity of invention.

3 **Re Item V**

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

3.1 Reference is made to the following documents:

D1	US 2019/336148 A1 (GREENHALGH E SKOTT [US] ET AL) 7 November 2019 (2019-11-07)cited in the application
D2	WO 2019/010318 A1 (STRYKER CORP [US]) 10 January 2019 (2019-01-10)
D3	US 2017/303948 A1 (WALLACE MICHAEL P [US] ET AL) 26 October 2017 (2017-10-26)
D4	US 2019/133624 A1 (WALLACE MICHAEL P [US] ET AL) 9 May 2019 (2019-05-09)

3.2 The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 1 is not new, as far as it can be understood (see clarity objection in item VIII).

D1 (see paragraphs [0049], [0057], [0058], [0150], [0158], [0165], [0171], [0176] - [0177]; claim 2; figures 2, 13, 15A-15D, 19A-21D) discloses an apparatus for removing a material from a body lumen, the apparatus comprising:
an elongate inversion support comprising a catheter having a circumference, a distal end, and a distal end opening; and
a knitted tube that extends distally in an uninverted configuration along an outer surface of the catheter, inverts into the distal end opening of the catheter, and extends proximally within the catheter in an inverted configuration, wherein the knitted tube is configured to invert by rolling into the distal end opening of the catheter when a first end of the knitted tube is pulled proximally within the catheter.
It is further considered that the knitted tube as disclosed in D1, due to the diameter of the catheter, the diameter of the filament and the number of loops, is configured to stretch less than 3 percent when pulled in tension with a force of 2 Newtons so that the knitted tube does not lock onto the outer surface of the catheter (see paragraphs [0159], [0165], [0171], [0177]).

The subject matter of claim 1 is therefore not new in view of D1.

3.3 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 15 does not involve an inventive step in the sense of Article 33(3) PCT.

Document D1 discloses all the features of claim 15 except the specific ratio linking the number of loops, the diameter of the filament and the circumference of the catheter as defined in the claim. However, the skilled person, starting from D1 and choosing a filament having a diameter of 0.003 inch and a catheter diameter of 0.035 inch as taught in D1 (see paragraph [0165]), he would have no difficulty to choose a number of loops of 10 or greater (see figure 21C) and would arrive at a choke ratio of at least 8.57 which is greater than 2.9.

Therefore, the subject matter of independent claim 15 does not involve an inventive step in view of D1 and the common general knowledge.

3.4 Dependent claims 2-14, 16-21 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step.

The additional features of claims 2-14, 16-21 are either known from D1 (see paragraphs [0049], [0057], [0058], [0150], [0158], [0165], [0171], [0176] - [0177]; claim 2; figures 2, 13, 15A-15D, 19A-21D) or relate to obvious modifications of the known apparatus.

4 **Re Item VII**

Certain defects in the international application

4.1 Independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art D1 being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

4.2 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D2 to D4 is not mentioned in the description, nor are these documents identified therein.

5 **Re Item VIII**

Certain observations on the international application

5.1 The application does not meet the requirements of Article 6 PCT, because claims 1-3 are not clear.

5.1.1 Claim 1 is not clear (Art. 6 PCT) as its subject matter is defined by a result to be achieved and not by clear structural features. The expression "configured to stretch less than 3 percent when pulled in tension with a force of 2 Newtons so that the knitted tube does not lock onto the outer surface of the catheter" merely refers to a result. It is an undue burden for the skilled person to determine the features necessary for achieving the intended result.

According to the description (see paragraphs [00102]-[00108]), this result is achieved by choosing a knitted tube of a 20 cm long and with design parameters such that the choke ratio, as defined in paragraph [00105] is greater than 2.9. This definition should have been introduced into claim 1.

5.1.2 The same remark applies *mutatis mutandis* to claims 2 and 3 which refer also to results to be achieved. Moreover in claim 3, the number loops N and the diameter of the filament are not defined.

5.2 Although claims 1, 15 for the first invention and claims 25 and 40 for the second invention have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

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**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-011-PCT		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2020/018655	18 February 2020 (18-02-2020)	
Applicant		
STRYKER CORPORATION		

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 7 sheets.

[X] 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:
      [X] 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. [X] **Certain claims were found unsearchable** (See Box No. II)

3. [X] **Unity of invention is lacking** (see Box No III)

4. With regard to the **title,**
   [X] 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,**
   [X] 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. 3b
      [X] 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

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2020/018655

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. [X] Claims Nos.: 26-32
because they relate to subject matter not required to be searched by this Authority, namely:

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

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

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

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

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

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

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

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

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

Remark on Protest

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

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

[X] No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2020/018655

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/22 A61B17/221 A61M25/01
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B A61M

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2019/046219 A1 (MARCHAND PHIL [US] ET AL) 14 February 2019 (2019-02-14) paragraphs [0098], [0099], [0200], [0201]; figures 1, 29, 30	1-16
A	US 2014/005717 A1 (MARTIN BRIAN B [US] ET AL) 2 January 2014 (2014-01-02) paragraph [0158]; figures 11A, 13A	1-16
A	US 2018/236205 A1 (KRAUTKREMER DANIEL LEE [US] ET AL) 23 August 2018 (2018-08-23) paragraphs [0063], [0064]; figures 13, 14	1-8
A	US 2016/022293 A1 (DUBRUL WILLIAM R [US] ET AL) 28 January 2016 (2016-01-28) paragraphs [0099] - [0102]; figures 9-16	1

-/--

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
7 December 2020	16/12/2020

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Chabus, Hervé

2

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 254 634 A1 (RADI MEDICAL SYSTEMS [SE]) 6 November 2002 (2002-11-06) paragraph [0022]; figure 2d	1
X	US 2019/133623 A1 (WALLACE MICHAEL P [US] ET AL) 9 May 2019 (2019-05-09)	17-22,24
Y	paragraphs [0138], [0139], [0153]	33-39
A	figures 7A-8C, 14A-14D	23,25
Y	US 2009/076417 A1 (JONES GREGORY ALLEN [US]) 19 March 2009 (2009-03-19) paragraphs [0040], [0041]; claim 1 figures 5, 6	33-39
Y	US 2017/042571 A1 (LEVI TAMIR S [IL]) 16 February 2017 (2017-02-16) paragraph [0037]; figures	33-39
Y	US 3 515 137 A (SANTOMIERI LOUIS S) 2 June 1970 (1970-06-02) figures 6-10	33-39
A	WO 2019/010318 A1 (STRYKER CORP [US]) 10 January 2019 (2019-01-10) paragraphs [0041], [0105], [0106] figures 9A-9C	17-25, 33-39
A	US 2016/228134 A1 (MARTIN BRIAN [US] ET AL) 11 August 2016 (2016-08-11) paragraph [0170] figure 10	33-39

2

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2020/018655

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2019046219 A1	14-02-2019	CN 110312481 A	08-10-2019
		EP 3528717 A1	28-08-2019
		US 2018193043 A1	12-07-2018
		US 2019046219 A1	14-02-2019
		WO 2018080590 A1	03-05-2018
US 2014005717 A1	02-01-2014	CN 102036611 A	27-04-2011
		EP 2231037 A1	29-09-2010
		JP 5385302 B2	08-01-2014
		JP 5914432 B2	11-05-2016
		JP 2011508635 A	17-03-2011
		JP 2013233454 A	21-11-2013
		JP 2016041275 A	31-03-2016
		US 2009299393 A1	03-12-2009
		US 2014005717 A1	02-01-2014
		US 2017325830 A1	16-11-2017
		WO 2009086482 A1	09-07-2009
US 2018236205 A1	23-08-2018	CN 110536713 A	03-12-2019
		EP 3585468 A1	01-01-2020
		JP 2020508153 A	19-03-2020
		US 2018236205 A1	23-08-2018
		WO 2018156819 A1	30-08-2018
US 2016022293 A1	28-01-2016	NONE	
EP 1254634 A1	06-11-2002	AT 245389 T	15-08-2003
		DE 60100507 T2	09-06-2004
		EP 1254634 A1	06-11-2002
		ES 2202269 T3	01-04-2004
US 2019133623 A1	09-05-2019	CN 111343932 A	26-06-2020
		EP 3706650 A1	16-09-2020
		US 2019133623 A1	09-05-2019
		US 2019133624 A1	09-05-2019
		US 2019133625 A1	09-05-2019
		US 2019133626 A1	09-05-2019
		US 2019133627 A1	09-05-2019
		WO 2019094456 A1	16-05-2019
US 2009076417 A1	19-03-2009	NONE	
US 2017042571 A1	16-02-2017	EP 3334487 A1	20-06-2018
		US 2017042571 A1	16-02-2017
		US 2019117395 A1	25-04-2019
		WO 2017030897 A1	23-02-2017
US 3515137 A	02-06-1970	AT 291427 B	12-07-1971
		SE 351128 B	20-11-1972
		US 3515137 A	02-06-1970
WO 2019010318 A1	10-01-2019	CN 110913778 A	24-03-2020
		EP 3648686 A1	13-05-2020
		JP 2020526255 A	31-08-2020
		WO 2019010318 A1	10-01-2019
US 2016228134 A1	11-08-2016	EP 2403583 A1	11-01-2012
		US 2012197285 A1	02-08-2012

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2020/018655

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 2016228134 A1	11-08-2016
		WO 2010102307 A1	10-09-2010

Form PCT/ISA/210 (patent family annex) (April 2005)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-16

Device and associated method for introducing an inversion support catheter into a delivery sheath

---

2. claims: 17-25

System for removing a material from a body vessel and system for reloading an inverting tube apparatus

---

3. claims: 33-39

System for removing a material from a body vessel comprising a compressible grip

---

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2020/018655	18.02.2020	

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/22 A61B17/221 A61M25/01

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Chabus, Hervé Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 26-32

because:

☒ the said international application, or the said claims Nos. 26-32 relate to the following subject matter which does not require an international search *(specify)*:

see separate sheet

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for the whole application or for said claims Nos. 26-32

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☒ See Supplemental Box for further details

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:

   see separate sheet

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

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-39

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

1. Statement

Novelty (N)	Yes:	Claims	1-16, 23, 25, 33-39
	No:	Claims	17-22, 24
Inventive step (IS)	Yes:	Claims	1-16, 23, 25
	No:	Claims	17-22, 24, 33-39
Industrial applicability (IA)	Yes:	Claims	1-25, 33-39
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

1 **Re Item III**

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Method claims 26-32 are directed to methods of removing material from a body vessel. These methods are methods for treatment of the human body by surgery for which no search and no opinion are required (Rules 39.1(iv) and 67.1(iv) PCT).

2 **Re Item IV**

Lack of unity of invention

2.1 This Authority considers that the application does not meet the requirements of unity of invention and that there are three inventions covered by the claims indicated as follows:

Invention 1: claims: 1-16

Device and associated method for introducing an inversion support catheter into a delivery sheath

Invention 2: claims: 17-25

System for removing a material from a body vessel and system for reloading an inverting tube apparatus

Invention 3: claims: 33-39

System for removing a material from a body vessel comprising a compressible grip

2.2 The reasons for which the inventions are not so linked as to form a single general inventive concept, as required by Rule 13.1 PCT, are as follows:

The common matter linking together the independent claims is the following:

an inversion support comprising a catheter and an expandable funnel disposed on a distal end of the catheter, the catheter having an open distal end in communication with an interior region of the funnel.

This common matter does not comprise a single general inventive concept, based on same or corresponding special technical features within the meaning of Rule 13.2 PCT, because it is already known from document D1 (see (paragraphs [0200], [0201]; figures 29, 30).

The technical features, representing the difference over the non-inventive common matter, of independent claims 1, 9 and 11 are a device for introducing an inversion support catheter into a delivery sheath, the device comprising: an elongate body with a lumen, said body being configured to tear along a defined tear line, said lumen having a first diameter at the proximal end region of the body and a second diameter at the distal end region of the body, wherein the second diameter is greater than the first diameter, wherein a sidewall of the body defining the lumen comprises a first flat region and a second flat region spaced apart from the first flat region along a distal to proximal axis of the body.

These features solve the objective technical problem of facilitating the loading of the inversion support catheter into a delivery sheath.

The technical features, representing the difference over the non-inventive common matter, of independent claims 17, 24 and 25 are a system for removing a material from a body vessel comprising a tractor comprising a flexible tube having an un-inverted portion that extends distally along an outer surface of the catheter and a stop on the outer surface of the catheter, wherein the stop prevents the tractor from moving proximally along the outer surface of the catheter without inhibiting the tractor from moving distally along the outer surface of the catheter, wherein the stop maintains the un-inverted portion of the tractor on the outer surface of the catheter in a packed configuration as the tractor is pulled proximally within the catheter lumen.

These features solve the objective technical problem of preventing the tractor from unstacking in the proximal direction.

The technical features, representing the difference over the non-inventive common matter, of independent claim 33 are a system for removing a material from a body vessel comprising a compressible grip slideably coupled to the outer surface of the inversion support catheter.

These features solve the objective technical problem of facilitating the manipulation of the inversion support catheter.

Hence, the independent claims comprise neither the same, nor corresponding special technical features, so the technical relationship between the subject matter of the claims required by Rule 13.2 PCT is lacking and the claims are not so linked as to form a single general inventive concept as required by Rule 13.1 PCT.

Consequently the application does not meet the requirement for unity of invention.

3 Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

3.1 Reference is made to the following documents:

D1 US 2019/046219 A1 (MARCHAND PHIL [US] ET AL) 14 February 2019 (2019-02-14)

D2 US 2014/005717 A1 (MARTIN BRIAN B [US] ET AL) 2 January 2014 (2014-01-02)

D3 US 2018/236205 A1 (KRAUTKREMER DANIEL LEE [US] ET AL) 23 August 2018 (2018-08-23)

D4 US 2016/022293 A1 (DUBRUL WILLIAM R [US] ET AL) 28 January 2016 (2016-01-28)

D5 EP 1 254 634 A1 (RADI MEDICAL SYSTEMS [SE]) 6 November 2002 (2002-11-06)

D6 US 2019/133623 A1 (WALLACE MICHAEL P [US] ET AL) 9 May 2019 (2019-05-09)

D7 US 2009/076417 A1 (JONES GREGORY ALLEN [US]) 19 March 2009 (2009-03-19)

D8 US 2017/042571 A1 (LEVI TAMIR S [IL]) 16 February 2017 (2017-02-16)

D9 US 3 515 137 A (SANTOMIERI LOUIS S) 2 June 1970 (1970-06-02)

D10 WO 2019/010318 A1 (STRYKER CORP [US]) 10 January 2019 (2019-01-10)

D11 US 2016/228134 A1 (MARTIN BRIAN [US] ET AL) 11 August 2016 (2016-08-11)

Invention 1 (claims 1-16)

3.2 D1 (see paragraphs [0098], [0099]; figure 1) is regarded as being the prior art closest to the subject-matter of claim 1, and discloses a device (158) for introducing an inversion support catheter into a delivery sheath, the device comprising:
an elongate body having a lumen extending from a distal end region to a proximal end region, ~~the body configured to tear along a defined tear line extending proximally to distally~~, the lumen having a first diameter at the proximal end region of the body and a second diameter at the distal end region of the body, wherein the second diameter is greater than the first diameter,
~~wherein a sidewall of the body defining the lumen comprises a first flat region and a second flat region spaced apart from the first flat region along a distal to proximal axis of the body~~.

The subject-matter of claim 1 therefore differs from this known device in that the body is configured to tear along a defined tear line extending proximally to distally and in that a sidewall of the body defining the lumen comprises a first flat region and a second flat region spaced apart from the first flat region along a distal to proximal axis of the body .

The subject matter of claim 1 is therefore new (Article 33(2) PCT).

The problems to be solved by the present invention may be regarded as to facilitate the removal of the device and the loading of the inversion support catheter into a delivery sheath.

The solutions to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

Although part of the solution are known from documents D4 (see paragraphs [0099] - [0102]; figures 9-16) and D5 (see paragraph [0022]; figure 2d), the skilled person would have no incentive to consider them because they solve different problems than the ones mentioned above. In D4, the weakened region (76) allows removal of a stopper sleeve (72) during use of the device and not for facilitating the removal of an inversion support catheter introducer. In D5, the pair of flat angled surfaces (64) engage the peripheral rim or collar portions of the closure element, such that they are deflected or bent downwards from the essentially flat initial position.

The rest of the prior art does not hint either at the proposed solutions. Therefore, the subject matter of claim 1 is inventive in view of the prior art at hand.

3.3 For similar reasons, the subject matter of independent claims 9 and 11 involves an inventive step.

3.4 Claims 2-8, 10, 12-16 are dependent on one or more independent claims whose subject-matter is considered as being new and inventive, as discussed above, and as such said dependent claims also meet the requirements of the PCT with respect to novelty and inventive step.

Invention 2 (claims 17-25)

3.5 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent claims 17 and 24 is not new in the sense of Article 33(2) PCT.

3.5.1 Document D6 (see paragraphs [0138], [0139], [0153]; figures 7A-8C, 14A-14D) discloses a system for removing a material from a body vessel, the system comprising:
an inversion support comprising a catheter (707), the catheter having a lumen and a distal end opening in communication with the lumen;
a tractor (715) comprising a flexible tube having an un-inverted portion that extends distally along an outer surface of the catheter, and wherein the flexible

tube inverts over the distal end opening of the catheter, wherein an inverted portion of the flexible tube extends proximally within the catheter lumen in an inverted configuration, wherein the flexible tube is configured to invert by rolling over the distal end opening when a first end of the tractor is pulled proximally within the catheter lumen; and
a stop (1401) on the outer surface of the catheter, wherein the stop prevents the tractor from moving proximally along the outer surface of the catheter without inhibiting the tractor from moving distally along the outer surface of the catheter, wherein the stop maintains the un-inverted portion of the tractor on the outer surface of the catheter in a packed configuration as the tractor is pulled proximally within the catheter lumen.

The subject matter of independent claim 17 is therefore not new over D6.

3.5.2 D6 (see figure 14A and paragraph [0153]) takes also the subject matter of independent claim 24.

3.6 Dependent claims 18-22 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty. Document D6 (paragraph [0153]; figures 14A-14D) discloses a knitted tractor (715) and a stop comprising an annular ring.

3.7 Independent claim 25 and dependent claim 23 (positive opinion)

The prior art does not hint at providing an introducer covering the tractor (715) wherein the introducer comprises an introducer stop within a lumen of the introducer that prevents the tractor from extending proximally beyond the stop without inhibiting the tractor from moving distally, the introducer further comprising a defined tear line extending proximally to distally and configured to tear away to remove the introducer.

The subject matter of independent claim 25 and also of dependent claim 23 is therefore new and inventive in view of D6 and the rest of the found prior art.

Invention 3 (claims 33-39)

3.8 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 33 does not involve an inventive step in the sense of Article 33(3) PCT.

Document D6 (see [0138], [0139], [0153]; figures 7A-8C, 14A-14D) is regarded as being the prior art closest to the subject-matter of claim 33, and discloses a system for removing a material from a body vessel, the system comprising:
an inversion support catheter having a lumen, a distal end region, a proximal end region, and a distal end opening in communication with the lumen;
a puller with the lumen of the inversion support catheter;
a tractor comprising a flexible tube having a first end attached to the puller, wherein the flexible tube extends distally in an un-inverted configuration along an outer surface of the inversion support catheter and is configured to invert by rolling over the distal end opening of the inversion support catheter when the first end of the flexible tube is pulled proximally within the catheter lumen; and
~~a compressible grip slideably coupled to the outer surface of the inversion support catheter~~.

The subject-matter of claim 33 therefore differs from this known system in that it comprises a compressible grip slideably coupled to the outer surface of the inversion support catheter

The problem to be solved by the present invention may therefore be regarded as to facilitate the manipulation of the system.

The solution proposed in claim 33 of the present application cannot be considered to involve an inventive step (Article 33(3) PCT).

The skilled person is already acquainted with the use of compressible grips coupled to the outer surface of a catheter to provide an assistance in its manipulation (see for example D7, paragraphs [0040], [0041]; claim 1; figures 5, 6; D8, paragraph [0037]; figures and D9, figures 6-10).

It would have been obvious at the date of filing of the application to use one the known compressible grips as disclosed in D7 to D9 to facilitate the manipulation of the inversion support catheter known from D6.

No inventive step is therefore present in independent claim 33 (Art. 33(3) PCT).

3.9 Dependent claims 34-39 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step.

The features of claims 34 to 39 are known from D7 to D9 (see their corresponding passages cited in the search report).

4 **Re Item VII**

Certain defects in the international application

4.1 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

4.2 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D1 to D11 is not mentioned in the description, nor are these documents identified therein.

5 **Re Item VIII**

Certain observations on the international application

5.1 The application does not meet the requirements of Article 6 PCT, because claim 10 is not clear as it makes reference to "the" tractor whereas no tractor is defined in any of the preceding claims.

5.2 Although claims 1 and 9 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.

Independent claim 9 contains essentially all the features of claim 1 and should have been drafted as a dependent claim referring to claim 1.

5.3 The independent claims 17, 24 and 25 of the second invention also lacks conciseness and do not meet therefore the requirements of Article 6 PCT.

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**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
100286WO0160246-70		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2019/032601	16 May 2019 (16-05-2019)	1 June 2018 (01-06-2018)

Applicant

CARRIER CORPORATION

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.

[X] 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:

[X] 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,**

[X] 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,**

[X] 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. 2

[ ] as suggested by the applicant

[ ] as selected by this Authority, because the applicant failed to suggest a figure

[X] 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/US2019/032601

A. CLASSIFICATION OF SUBJECT MATTER
INV. G10K9/12
ADD. G08B3/10 G10K9/122

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)
G10K G08B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2016/100252 A1 (PATTOK GREG R [US]) 7 April 2016 (2016-04-07) paragraph [0014] - paragraph [0030] figures 1-4	1-21
A	US 2011/187541 A1 (NOGUCHI TAKAHIRO [JP]) 4 August 2011 (2011-08-04) paragraphs [0002], [0007], [0021] figure 2	17
A	WO 2013/081773 A1 (UTC FIRE & SECURITY CORP [US]; GADONNIEX DENNIS MICHAEL [US] ET AL.) 6 June 2013 (2013-06-06) paragraphs [0009], [0016], [0017] figure 1	3-5,11, 12,18

-/--

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 August 2019	02/09/2019

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Valenzuela, Miriam

1

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 087 811 A (CRAWFORD IAN D [US] ET AL) 11 July 2000 (2000-07-11) column 1, line 5 - line 9 column 3, line 15 - line 17 column 6, line 22 - line 47; figures 2, 3A, 3B	3-5,11, 12,18
A	JP H09 114467 A (MITSUBISHI AUTO ENG; MITSUBISHI MOTORS CORP) 2 May 1997 (1997-05-02) paragraphs [0005], [0011] - paragraph [0015]; figures 1-3	1-21

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2019/032601

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2016100252 A1	07-04-2016	NONE	
US 2011187541 A1	04-08-2011	CA 2728828 A1	29-07-2011
		CN 102157145 A	17-08-2011
		EP 2362379 A1	31-08-2011
		US 2011187541 A1	04-08-2011
WO 2013081773 A1	06-06-2013	EP 2786358 A1	08-10-2014
		ES 2557123 T3	22-01-2016
		US 2013141245 A1	06-06-2013
		WO 2013081773 A1	06-06-2013
US 6087811 A	11-07-2000	NONE	
JP H09114467 A	02-05-1997	NONE	

Form PCT/ISA/210 (patent family annex) (April 2005)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2019/032601	16.05.2019	01.06.2018

International Patent Classification (IPC) or both national classification and IPC
INV. G10K9/12 ADD. G08B3/10 G10K9/122

Applicant
CARRIER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Valenzuela, Miriam Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

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

1. Statement

Novelty (N)	Yes:	Claims	3-5, 8, 11, 12, 16-21
	No:	Claims	1, 2, 6, 7, 9, 10, 13-15
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-21
Industrial applicability (IA)	Yes:	Claims	1-21
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

1 **Prior art**

Reference is made to the following documents:

D1 US 2016/100252 A1 (PATTOK GREG R [US]) 7 April 2016 (2016-04-07)

D2 US 2011/187541 A1 (NOGUCHI TAKAHIRO [JP]) 4 August 2011 (2011-08-04)

D3 WO 2013/081773 A1 (UTC FIRE & SECURITY CORP [US]; GADONNIEX DENNIS MICHAEL [US] ET AL.) 6 June 2013 (2013-06-06)

D4 US 6 087 811 A (CRAWFORD IAN D [US] ET AL) 11 July 2000 (2000-07-11)

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

2 **Independent claim 1**

The present application does not meet the criteria of Article 33(1) PCT because, with respect to document D1, the subject-matter of independent claim 1 is not new in the sense of Article 33(2) PCT.

2.1 Document D1 discloses (references in parenthesis applying to this document):

A method of powering a sounder (paragraph [15] "notification apparatus 10" and Fig.2 showing block diagram of control circuit 12 of the notification apparatus, i.e. sounder) comprising:

- providing a constant input current (Fig.2, item 14; paragraphs [16], [18], and [19]. The constant input current reads on the current draw of the speaker 14. D1 discloses that the notification apparatus 10 maintains the peak efficiency at the resonance frequency by monitoring and maintaining the current draw of the speaker 14, i.e. providing a constant input current.); and

- regulating an input voltage to a phase of a sound engine corresponding with an acoustic signal generated by a sound engine (Fig.2, items 18, 20 14; Fig.3, items 20, 14; Fig.4A to 4C; paragraphs [19], [21], [23], [29] and [30]. Regulating the input voltage reads on the controller 18 increasing or decreasing the driving frequency of the input voltage supplied to the speaker 14 to match the driving frequency of the input voltage when the speaker is operating at the resonance frequency as shown in Fig.4A. The phase of the sound engine corresponding with the acoustic signal generated by a sound engine reads on the speaker operating at the resonance frequency. D1 discloses that the controller 18 monitors the current draw of the speaker 14 to determine if the speaker is driven at the resonance frequency. The controller 18 increases or decreases the driving frequency supplied to the speaker 14 to ensure efficient operation at the resonance frequency.).

2.2 Hence, D1 discloses all the technical features of independent **claim 1**, which subject-matter is therefore not new (Article 33(2) PCT).

3 **Independent claim 9**

The present application does not meet the criteria of Article 33(1) PCT because, with respect to document D1, the subject-matter of independent claim 9 is not new in the sense of Article 33(2) PCT.

3.1 Document D1 discloses (references in parenthesis applying to this document):

A notification appliance (Fig.1, item 10 and paragraph [15] "notification apparatus 10") comprising:

- a sound engine generating a sound according to an acoustic pattern (Fig. 2, items 12 and 14; paragraph [17]. The notification apparatus comprises a control circuit 12 that controls the output of an audible tone from the speaker 14 at a peak level of efficiency by driving the speaker at the resonance frequency. The acoustic pattern reads on the resonance frequency of the speaker as shown in Fig.4A.); and
- a power control regulating input voltage to the sound engine that is matched to the acoustic pattern (Fig.2, items 18, 20 14; Fig.3, items 20, 14; Fig.4A to 4C; paragraphs [19], [21], [23], [29] and [30]. The power control reads on the controller 18. Regulating the input voltage reads on the controller 18 increasing or decreasing the driving frequency of the input voltage supplied to the speaker 14 to match the driving frequency of

the input voltage when the speaker is operating at the resonance frequency as shown in Fig.4A. Thus, when the speaker is operating at a frequency less or greater than the resonance frequency, shown in Fig.4B and 4C, the controller 18 regulates the driving frequency of the input voltage supplied to the speaker 14 to match the resonance frequency of the speaker and thus to ensure efficient operation.).

3.2 Hence, D1 discloses all the technical features of independent **claim 9**, which subject-matter is therefore not new (Article 33(2) PCT).

4 **Independent claim 17**

Independent claim 17 does not meet the criteria of Article 33(1) PCT, because, in view of D1 taken alone, the subject-matter of claim 17 does not involve an inventive step in the sense of Article 33(3) PCT.

4.1 Document D1 is considered to be the closest prior art to the subject-matter of claim 17. The same reasoning as for independent apparatus claim 9 applies, mutatis mutandis, to the features of the corresponding system claim 17 that have an overlap with the features specified in claim 9 (see section 3.1 above). D1 discloses these technical features, which subject-matter is therefore not new (Article 33(2) PCT).

4.2 The additional features of **claim 17** do not add anything of inventive significance. It is common general knowledge in the field of notification systems to connect a plurality of notification appliances by circuit wiring to provide electric power (see i.a. D2: Fig.2, item "to other audible alarm devices" and paragraph [21]. See i.a. D3: Fig.1, items 22 and paragraph [9]). Consequently, the subject-matter of independent claim 17 does not involve an inventive step in the sense of Article 33(2) PCT in view of document D1 taken alone.

5 **Dependent claims 2-8, 10-16, and 18-21**

Dependent claims 2-8, 10-16, and 18-21 do not contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT regarding novelty (Article 33(2) PCT) or inventive step (Article 33(3) PCT).

5.1 **Article 33(2) PCT**

5.1.1 The features added by dependent claims 2, 6, 7, 10, 13-15, and 19-20 are known from D1 which discloses (references in parenthesis applying to this document):

- Claims 2, 13: (Implicit according to Fig.4A: Magnitude of the input voltage is constant, thus volume level of audible tone output from speaker 14 must be constant.)
- Claims 6, 7, 14, 15, 19, 20: (paragraphs [23] and [24]. Plurality of voltage levels to adjust the volume of the audible tone output from the speaker 14.)
- Claim 10: (Implicit according to Fig.4A: When voltage is input to the speaker, the audible tone is generated.)

5.1.2 Therefore, the subject-matter of **claims 2, 6, 7, 10, and 13-15** is not new within the meaning of Article 33(2) PCT, and the subject-matter of **claims 19-20** is not inventive within the meaning of Article 33(3) PCT.

5.2 **Article 33(3) PCT**

5.2.1 The additional features of dependent **claims 3-5, 11, 12, and 18** suggest minor implementation details which come within the scope of the customary practice followed by persons skilled in the art (see i.a. D3: Fig.1, item 22 "notification device" and item 26 "energy storage device"; paragraph [17]. See i.a. D4: Fig.2, item 220 "energy storage device"; column 6, lines 22-47), especially as the advantages thus achieved can be readily contemplated in advance. Therefore, the subject-matter of these claims does not add anything of inventive significance to the subject-matter of independent claim 1 or to any claim to which they refer (Article 33(3) PCT).

5.2.2 The additional features of **claims 8, 16, and 21** are considered obvious implementation details the skilled person would consider whenever appropriate without applying inventive skills. Therefore, the subject-matter of these claims cannot be considered to involve an inventive step (Article 33(3) PCT).

Re Item VIII

Certain observations on the international application

6 **Article 6 PCT**

The application does not meet the requirements of Article 6 PCT, because claims 1-6, 8, 9, 13, 14, 16, 19, and 21 are not clear, and claims lack 1, 9, and 17 essential features which are necessary to define the claimed invention, and claims 9 and 17 lack support.

6.1 **Claim 1** lacks essential features: Reading paragraph [46], it is evident that in order to provide a constant input current, as specified in claim 1, the current 15 flowing from the NAC has to be stored in the energy store 46 when the sound engine 28 is not generating sound. Only by buffering energy in the energy store 46, the input current can be kept constant. Consequently, storing input current in an energy store responsive to time intervals when the sound engine is not generating sound, is an essential feature necessary to define the claimed invention, which is missing in the independent claim 1, contrary to the requirements of Article 6 PCT.

6.2 In **claim 1**, the expression "regulating an input voltage to a phase of a sound engine corresponding with an acoustic signal generated by a sound engine" is not clear for the following reasons:

Which input voltage is regulated, the input voltage to the sounder or the input voltage to the sound engine? How does the sounder differ from the sound engine?

What is a phase of a sound engine, how is it defined? Does the expression "a phase of a sound engine corresponding with an acoustic signal generated by the sound engine" refer to the phase of the acoustic signal, or does it refer to a phase of the sound engine when the sound engine is generating sound versus a phase when the sound engine is not generating sound, i.e. a sound and no sound phase or an on-off phase of the sound engine (see paragraph [43] of the description)?

6.3 **Claim 2** does not meet the requirements of Article 6 PCT because the matter for which protection is sought is not clearly defined. The claim attempts to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem (regulating a sound output of the sound engine to a constant volume), without providing the technical features necessary for achieving this result. Which technical features are used to provide a constant sound output volume, is the regulation of the input voltage defined in claim 1 used or is some other means used?

6.4 In **claim 3**, the expression "the sound engine being between phases" is not clear. What phases are meant? And what is the status of the sound engine between phases? Does a phase of the sound engine refer to a time interval when the sound engine generates sound and the "between phases" a time interval when the sound engine does not generate sound? According to claim 4, it appears that the term "between phases" refers to a time interval when no sound is generated by the sound engine.

6.5 In **claims 2, 4, 5, and 6**, the terms "sound output", "sound", and "sound level" are not clear. Does the word sound in these terms refer to the acoustic signal specified in claim 1, which is generated by the sound engine? Is the word sound in claims 2, 4, and 5 used as synonym for the term "the acoustic signal" defined in claim 1? Or does it refer to another, additional sound signal? And does the term "sound level" in claim 6 refer to the sound level of the acoustic signal in claim 1 that is generated by the sound engine?

6.6 In **claim 8**, the expression "varying a ramp rate of a voltage to correspond with a sound pattern" is not clear for the following reasons:

Which voltage is meant? Is it the input voltage specified in claim 1?

Which sound pattern is meant? Is the sound pattern related to the acoustic signal generated by the sound engine?

6.7 In view of independent method claim 1 the corresponding independent apparatus **claim 9** lacks essential features: According to claim 1, it is evident that the applicant considers the "providing a constant current" as an essential feature necessary to define the claimed invention. These limitations are missing in claim 9, contrary to the requirements of Article 6 PCT.

Furthermore, as outlined for claim 1 in section 6.1 above, **claim 9** lacks a further essential feature, namely storing input current in an energy store responsive to time intervals when the sound engine is not generating sound. This feature is a further essential feature necessary to define the claimed invention, which is missing in the independent claim 9, contrary to the requirements of Article 6 PCT.

These objections for claim 9 may be overcome by including the features of claim 11.

The same objections of lack of essential features for claim 9 apply, mutatis mutandis, to the corresponding system **claim 17**. The objections for claim 17 may be overcome by including the features of claim 18.

6.8 **Claim 9** is not supported by the description as required by Article 6 PCT, as its scope is broader than justified by the description and drawings. Claim 9 specifies that the input voltage is regulated to match the acoustic pattern. The term "acoustic pattern" can be interpreted in many, very broad ways, such as e.g. a melodic pattern, a pitch pattern, a modulation pattern, etc. The description and drawings, however, specify only one type of acoustic pattern according to which the input voltage is regulated, namely a sound and no sound pattern (see paragraph [43] and Fig.3 and Fig.5). There is no basis in the description or drawings for any other type of acoustic pattern. Consequently, claim 9 lacks support.

The same objection applies, mutatis mutandis, to the corresponding system **claim 17**.

6.9 In **claim 13**, the expression " provide a constant volume" is not clear. Does the term "constant volume" refer to a constant volume of the sound generated by the sound engine according to the acoustic pattern, i.e. the sound and no sound pattern, or does it mean that the sound engine is regulated such that it generates continuously sound of constant volume without "no sound" phases?

6.10 In **claim 14**, the expression "adjust a sound level generated by the sound engine" is not clear. Does it refer to the sound level of the sound generated by the sound engine?

The same objection applies, mutatis mutandis, to the corresponding system **claim 19**.

6.11 In **claim 16**, the expression "adjust a voltage ramp rate to match an acoustic pattern" is not clear for the following reasons:

Which voltage is meant? Is it the input voltage specified in claim 9?

Does the term "an acoustic pattern" refer to the acoustic pattern mentioned in claim 9?

The same objection applies, mutatis mutandis, to the corresponding system **claim 21**.

Electronic Acknowledgement Receipt	
EFS ID:	45325436
Application Number:	17705189
International Application Number:	
Confirmation Number:	9367
Title of Invention:	HEMOSTASIS VALVES AND METHODS OF USE
First Named Inventor/Applicant Name:	Benjamin E. Merritt
Customer Number:	25096
Filer:	Paul T Parker/JiYoung Anderson
Filer Authorized By:	Paul T Parker
Attorney Docket Number:	111552-8016.US03
Receipt Date:	25-MAR-2022
Filing Date:	
Time Stamp:	20:05:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$6160
RAM confirmation Number	E20223OK06150908
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	New_App_Transmittal-8016US3.PDF	1408674 37cd4e549a7e93179d9310be0d5d33515ad449ca	no	2
Warnings:					
Information:					
2	Track One Request	Track-One-Request-111552-8016US3.PDF	877333 0b8c6a58a4dd51e97e0e72b1b3c65af870aab51b	no	2
Warnings:					
Information:					
3	Application Data Sheet	ADS-111552-8016US3.PDF	1823409 ea13c2e4e250069465e5fa00d3495d17984a9d53	no	9
Warnings:					
Information:					
4	Authorization for Extension of Time all replies	General_Fee_Authorization-111552-8016US3.PDF	120356 ff964e0703a174e820d8fa6e96513b48766dc116	no	2
Warnings:					
Information:					
5	Power of Attorney	POA_Trans-111552-8016U3.PDF	624184 c29ec579165d58c90502ef53cd6b993cd3391d0e	no	1
Warnings:					
Information:					
6	Power of Attorney	US_POA-signed_2021-Inari.PDF	108448 8899207ebdb0676c00b7c2d622cb7ba46f34795b	no	1
Warnings:					
Information:					

7	Oath or Declaration filed	Declarations-parent-111552-8016US3.PDF	516241 a5c30477acff5dde1d2e6bfb9b455d82d08489e3	no	3
Warnings:					
Information:					
8		CON_Application_Track_One-111552-8016US3-pto.PDF	261180 12d23d650ed014a1af17532a90611126cbf67379	yes	37
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Specification		1	33	
	Claims		34	36	
	Abstract		37	37	
Warnings:					
Information:					
9	Drawings-only black and white line drawings	Drawings-111552-8016US3.PDF	195481 66648bb2049beadbf2c4a6861102107dd980e048	no	10
Warnings:					
Information:					
10	Fee Worksheet (SB06)	fee-info.pdf	48410 ba640f1bb67acad3abe593bfa14374f150eeabdb	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	5983716		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
GWM-07-PCT		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US2019/050467	10 September 2019 (10-09-2019)	10 September 2018 (10-09-2018)
Applicant		
STRYKER CORPORATION		

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 7 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. 24B

☒ 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

Form PCT/ISA/210 (first sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2019/050467

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. [X] Claims Nos.: 20-30
because they relate to subject matter not required to be searched by this Authority, namely:

see FURTHER INFORMATION sheet PCT/ISA/210

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

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

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

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

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

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

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

4. [X] 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, 2, 5-12, 17

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.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2019/050467

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/22 A61B17/221 A61B17/3207
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2017/189535 A2 (STRYKER CORP [US]) 2 November 2017 (2017-11-02) abstract paragraphs [00055], [000122], [000132], [000154] - [000195], [000221] - [000222]; figures 1-44	1,2, 5-12,17
X	US 5 971 938 A (HART CHARLES C [US] ET AL) 26 October 1999 (1999-10-26) abstract column 6, line 66 - column 15, line 61; figures 1-34	1,5-12, 17
A	WO 2012/162437 A1 (LAZARUS EFFECT INC [US]; MARTIN BRIAN B [US]; DIECK MARTIN S [US]) 29 November 2012 (2012-11-29) paragraphs [0062], [0077] - [0093]; figures 2-11	1,2, 5-12,17

-/--

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 October 2019	18/12/2019

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Ioanovici, T

2

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2017/112513 A1 (MARCHAND PHIL [US] ET AL) 27 April 2017 (2017-04-27) abstract paragraphs [0142] - [0183]; figures 15-28	1,2, 5-12,17
A	WO 2009/086482 A1 (LAZARUS EFFECT INC [US]; MARTIN BRIAN B [US] ET AL.) 9 July 2009 (2009-07-09) abstract paragraphs [0158] - [0164]; figures 12-13	1,2, 5-12,17

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2019/050467

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2017189535 A2	02-11-2017	CN 109890304 A	14-06-2019
		EP 3448280 A2	06-03-2019
		EP 3590446 A1	08-01-2020
		JP 2019519341 A	11-07-2019
		US 2017303948 A1	26-10-2017
		US 2019117244 A1	25-04-2019
		US 2019133622 A1	09-05-2019
		WO 2017189535 A2	02-11-2017
US 5971938 A	26-10-1999	NONE	
WO 2012162437 A1	29-11-2012	BR 112013030183 A2	05-12-2017
		CA 2874586 A1	29-11-2012
		CN 103841905 A	04-06-2014
		CN 107126244 A	05-09-2017
		EP 2713909 A1	09-04-2014
		EP 3398539 A1	07-11-2018
		ES 2683178 T3	25-09-2018
		HK 1198415 A1	24-04-2015
		JP 6162689 B2	12-07-2017
		JP 6374577 B2	15-08-2018
		JP 2014522268 A	04-09-2014
		JP 2017176881 A	05-10-2017
		SG 2014013320 A	30-07-2014
		SG 10201500492V A	30-03-2015
		US 2013317589 A1	28-11-2013
		US 2013325051 A1	05-12-2013
		US 2015018929 A1	15-01-2015
		US 2016354098 A1	08-12-2016
		US 2018221037 A1	09-08-2018
		US 2019374239 A1	12-12-2019
		WO 2012162437 A1	29-11-2012
US 2017112513 A1	27-04-2017	US 2017112513 A1	27-04-2017
		US 2017265878 A1	21-09-2017
		US 2018092652 A1	05-04-2018
WO 2009086482 A1	09-07-2009	CN 102036611 A	27-04-2011
		EP 2231037 A1	29-09-2010
		JP 5385302 B2	08-01-2014
		JP 5914432 B2	11-05-2016
		JP 2011508635 A	17-03-2011
		JP 2013233454 A	21-11-2013
		JP 2016041275 A	31-03-2016
		US 2009299393 A1	03-12-2009
		US 2014005717 A1	02-01-2014
		US 2017325830 A1	16-11-2017
		WO 2009086482 A1	09-07-2009

Form PCT/ISA/210 (patent family annex) (April 2005)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1, 2, 5-12, 17

Thrombectomy system comprising an inversion support catheter with an expandable funnel and a flexible tube inverting over the distal end of the funnel within the funnel and into the catheter lumen.

---

2. claims: 3, 4, 13, 14, 18, 19, 31-48

Thrombectomy system comprising an inversion support catheter with an expandable funnel and a flexible knitted tube inverting over the distal end of the funnel within the funnel and into the catheter lumen, wherein the funnel comprises openings to allow fluid to pass therethrough.

---

3. claims: 15, 16, 49-64

Thrombectomy system comprising an inversion support catheter with an expandable funnel and a flexible knitted tube inverting over the distal end of the funnel within the funnel and into the catheter lumen, and a tear-away sleeve over the flexible knitted tube configured to be removed when the catheter is loaded in the delivery catheter.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Claims Nos.: 20-30

Claims 20-30 relate to subject-matter considered by this Authority to be covered by the provisions of Rules 39.1(iv) PCT and 67.1 (iv) PCT, because their subject-matter relates to a method for treatment of the human body by surgery. Consequently, no opinion will be formulated with respect to the subject-matter of this/these claims (Article 34(4)(a)(i) and (b) or 17(2) PCT).

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2019/050467	10.09.2019	10.09.2018

International Patent Classification (IPC) or both national classification and IPC
INV. A61B17/22 A61B17/221 A61B17/3207

Applicant
STRYKER CORPORATION

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 usually 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 notifed 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:	Date of completion of this opinion	Authorized Officer
European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016	see form PCT/ISA/210	Ioanovici, T Telephone No. +31 70 340-0

Form PCT/ISA/237 (Cover Sheet) (January 2015)

Box No. I Basis of the 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(a))

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:

      ☐ in the form of an Annex C/ST.25 text file.

      ☐ on paper or in the form of an image file.

   b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.

   c. ☐ furnished subsequent to the international filing date for the purposes of international search only:

      ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).

      ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 3, 4, 13-16, 18-64

because:

☒ the said international application, or the said claims Nos. 20-30 relate to the following subject matter which does not require an international search *(specify)*:

see separate sheet

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no international search report has been established for the whole application or for said claims Nos. 3, 4, 13-16, 18-64

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

- ☐ furnish a sequence listing in the form of an Annex C/ST.25 text file, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ furnish a sequence listing on paper or in the form of an image file complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in the form and manner acceptable to it; or the sequence listing furnished did not comply with the standard provided for in Annex C of the Administrative Instructions.
- ☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rule 13*ter*.1(a) or (b).

☒ See Supplemental Box for further details

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:

   see separate sheet

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

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1, 2, 5-12, 17

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

1. Statement

Novelty (N)	Yes:	Claims	5
	No:	Claims	1, 2, 6-12, 17
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1, 2, 5-12, 17
Industrial applicability (IA)	Yes:	Claims	1, 2, 5-12, 17
	No:	Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Claims 20-30 relate to subject-matter considered by this Authority to be covered by the provisions of Rules 39.1(iv) PCT and 67.1 (iv) PCT, because their subject-matter relates to a method for treatment of the human body by surgery. Consequently, no opinion will be formulated with respect to the subject-matter of this/these claims (Article 34(4)(a)(i) and (b) or 17(2) PCT).

Re Item IV

Lack of unity of invention

This Authority considers that the application does not meet the requirements of unity of invention and that there are 3 inventions covered by the claims indicated as follows:

The common matter linking together the independent claims 1, (18,19,31,47), (49,57) is the following: thrombectomy apparatus comprising an inversion support catheter with an expandable funnel at the distal end, a flexible tube extending over the funnel and the catheter and inverting over the distal end of the funnel inside the catheter lumen.

This common matter does not comprise a single general inventive concept, based on same or corresponding technical features, because D1 (WO2017/189535) discloses a thrombectomy apparatus (abstract) comprising an inversion support catheter with an expandable funnel at the distal end (para.[000221], fig.44A-C), a flexible tube (4405) extending over the funnel and the catheter and inverting over the distal end of the funnel inside the catheter lumen(para.[000221]-[000222], fig.44A-C).

Hence, the following separate inventions or groups of inventions are not so linked as to form a single general inventive concept:

Group I - claims: 1, 2, 5-12, 17

Thrombectomy system comprising an inversion support catheter with an expandable funnel and a flexible tube inverting over the distal end of the funnel within the funnel and into the catheter lumen.

Group II -claims: 3, 4, 13, 14, 18, 19, 31-48

Thrombectomy system comprising an inversion support catheter with an expandable funnel and a flexible knitted tube inverting over the distal end of the funnel within the funnel and into the catheter lumen, wherein the funnel comprises openings to allow fluid to pass therethrough.

Dependent claims 3, 4, 13 and 14 have been grouped together with group II because they also refer to an expandable funnel with openings which allow fluid to pass therethrough.

Group III - claims: 15, 16, 49-64

Thrombectomy system comprising an inversion support catheter with an expandable funnel and a flexible knitted tube inverting over the distal end of the funnel within the funnel and into the catheter lumen, and a tear-away sleeve over the flexible knitted tube configured to be removed when the catheter is loaded in the delivery catheter.

Dependent claims 15 and 16 have been grouped together with group III because they also refer to an outer sleeve disposed over the inversion support catheter.

Remaining technical features of Group I:

An inverting thrombectomy system comprising a second region of the flexible tube extending partially over the outer surface of the catheter body proximal of the funnel, wherein the inner diameter of this exterior second region is less than a maximum outer diameter of the funnel.

Problem: The remaining technical features of Group I solve the problem of how to provide suitable dimensions for allowing inversion of the flexible tube inside the catheter.

Remaining technical features of Group II:

An inverting thrombectomy system comprising a flexible knitted tube inverting over the distal end of the funnel within the funnel and into the catheter lumen, wherein the funnel comprises openings to allow fluid to pass therethrough.

Problem: The remaining technical features of Group II solve the problem of how to allow better capture the thrombus.

Remaining technical features of Group III:

An inverting thrombectomy system comprising a flexible knitted tube inverting over the distal end of the funnel within the funnel and into the catheter lumen, and a tear-away sleeve over the flexible knitted tube configured to be removed when the catheter is loaded in the delivery catheter.

Problem: The remaining technical features of Group III solve the problem of how to improve loading and delivering an inverting thrombectomy system.

Consequently, the remaining features of Group I, Group II and Group III are different. As the problems they solve are also different, these features are not corresponding either.

As the claims comprise neither the same, nor corresponding special technical features, the technical relationship between the subject matter of the claims required by Rule 13.1 PCT is lacking and the claims are not so linked as to form a single general inventive concept. The application does not fulfil the requirement for unity of invention in the sense of Rules 13.1 and 13.2 PCT.

The application relates to a plurality of inventions, or groups of inventions, in the sense of Rule 13.1 PCT. They have been divided as defined above. If the applicant pays additional fees for one (or more) not yet searched groups of inventions, then the further search(es) may reveal further prior art that gives evidence of a further lack of unity 'a posteriori' within one (or more) of the not yet searched group(s). In such a case only the first invention in this (each of these) group(s) of inventions, which is considered to lack unity of invention, will be the subject of a search. No further invitation to pay further additional fees will be issued. This is because Article 17(3)(a) PCT stipulates that the ISA shall establish the International Search Report on those parts of the international application which relate to the invention first mentioned in the claims ('main invention') and for those parts which relate to inventions in respect of which the additional fees were paid. Neither the PCT nor the PCT guidelines provide a legal basis for further invitations to pay further additional search fees (W17/00, point 11 and W1/97, points 11-16). In such a case the non-searched claims may be the subject of one or more divisional applications after the application has entered the regional phase before the EPO (see W18/07, point 26).

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1 WO 2017/189535 A2 (STRYKER CORP [US]) 2 November 2017 (2017-11-02)

D2 US 5 971 938 A (HART CHARLES C [US] ET AL) 26 October 1999 (1999-10-26)

D3 WO 2012/162437 A1 (LAZARUS EFFECT INC [US]; MARTIN BRIAN B [US]; DIECK MARTIN S [US]) 29 November 2012 (2012-11-29)

D4 US 2017/112513 A1 (MARCHAND PHIL [US] ET AL) 27 April 2017 (2017-04-27)

D5 WO 2009/086482 A1 (LAZARUS EFFECT INC [US]; MARTIN BRIAN B [US] ET AL.) 9 July 2009 (2009-07-09)

The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 1 is not new.

D1 (abstract; paragraphs [00055], [000122], [000132], [000154] - [000195], [000221] - [000222]; figures 1-44) discloses:

A thrombectomy system (abstract), comprising:
an inversion support catheter (para.[000221]) having an elongate and flexible catheter body, a catheter lumen, and an expandable funnel (4401) disposed at a distal end of the catheter body, wherein a distal end of the funnel defines a distal opening in communication with an interior of the funnel and the catheter lumen, respectively (fig. 44A-C); and
a flexible tube (4405) inverting over the distal end of the funnel such that the flexible tube has a first region at least partially disposed within the interior of the funnel and a second region at least partially extending over an exterior of the funnel, wherein the flexible tube is configured to be pulled proximally into the catheter lumen by pulling the first region proximally so that the second region rolls over the distal end of the funnel as the flexible tube is pulled into the catheter lumen (para.[000221]-[000222], fig.44A-C).

Moreover also D2 (abstract; column 6, line 66 - column 15, line 61; figures 1-34) discloses all the features of claim 1, especially the expandable funnel (43, fig.27G-27H, 28E-28F) and the flexible inverting tube (305-307).

Dependent claims 2, 5-12 and 17 do not appear to contain any additional features which, in combination with the features of any claim to which it refers, meet the requirements of the PCT in respect of novelty and/or inventive step. The technical features of these claims are either disclosed in D1-D5 or are minor constructional detail changes. Some examples of the disclosed features can be seen below:

Claim 2: D1 fig.44C.

Claims 8-9: D1 fig.31-37.

Claims 10-12: D1 para.[00055],[000122],[000221]-[000222], fig.44C

Claim 17: D1 para.[000221]-[000222], fig.44A-C.

Re Item VII

Certain defects in the international application

The present application does not meet the requirements of Rule 6.3(b) PCT regarding the use of the two-part form in claims, of Rule 6.2(b) PCT regarding reference signs, of Rule 10.1(d) PCT regarding internationally recognized units (see claims 12 and 26 and paragraphs [00021], [00030], [00086] for example), nor those of Rule 5.1(a)(ii) PCT regarding mentioning relevant prior art in the description.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 17/705,189

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))	15 minus 20 =	*			OR	x 100 =	0.00
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2 minus 3 =	*				x 480 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1820

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($)	ADDITIONAL FEE($)	OR	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.

Imperative EX1002

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
17/705,189	03/25/2022		1820	111552-8016.US03	15	2

CONFIRMATION NO. 9367

FILING RECEIPT

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

OC000000132837416

Date Mailed: 03/31/2022

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)

Benjamin E. Merritt, San Clemente, CA;
John C. 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 17/226,318 04/09/2021
which is a CON of 16/117,519 08/30/2018 PAT 11000682
which claims benefit of 62/554,931 09/06/2017

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: 03/30/2022
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/705,189**
Projected Publication Date: 07/07/2022
Non-Publication Request: No
Early Publication Request: No
Title

HEMOSTASIS VALVES AND METHODS OF USE

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).

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.

PTO/AIA/15 (10-17)
Approved for use through 11/30/2020. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995 no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	111552-8016.US03
First Named Inventor	Benjamin E. Merritt
Title	HEMOSTASIS VALVES AND METHODS OF USE
Priority Mail Express® Label No.	Electronically Filed

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☐ **Fee Transmittal Form** (PTO/SB/17 or equivalent)
2. ☐ **Applicant asserts small entity status.** See 37 CFR 1.27
3. ☐ **Applicant certifies micro entity status.** See 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
4. ☑ **Specification** [*Total Pages* 37] Both the claims and abstract must start on a new page. *(See MPEP § 608.01(a) for information on the preferred arrangement)*
5. ☑ **Drawing(s)** (35 U.S.C. 113) [*Total Sheets* 10]
6. **Inventor's Oath or Declaration** [*Total Pages* 3] *(including substitute statements under 37 CFR 1.64 and assignments serving as an oath or declaration under 37 CFR 1.63(e))*
   a. ☐ Newly executed (original or copy)
   b. ☑ A copy from a prior application (37 CFR 1.63(d))
7. ☑ **Application Data Sheet** ** See note below.* See 37 CFR 1.76 (PTO/AIA/14 or equivalent)
8. **CD-ROM or CD-R** in duplicate, large table, or Computer Program (*Appendix*)
   ☐ Landscape Table on CD
9. **Nucleotide and/or Amino Acid Sequence Submission** (*if applicable, items a. – c. are required*)
   a. ☐ Computer Readable Form (CRF)
   b. ☐ Specification Sequence Listing on:
      i. ☐ CD-ROM or CD-R (2 copies); or
      ii. ☐ Paper
   c. ☐ Statements verifying identity of above copies

ADDRESS TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**

ACCOMPANYING APPLICATION PAPERS

10. ☐ **Assignment Papers** (cover sheet & document(s)) Name of Assignee _____
11. ☐ **37 CFR 3.73(c) Statement** (*when there is an assignee*) ☑ **Power of Attorney**
12. ☐ **English Translation Document** (*if applicable*)
13. ☐ **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    ☐ Copies of citations attached
14. ☐ **Preliminary Amendment**
15. ☐ **Return Receipt Postcard** (*MPEP § 503*) (*Should be specifically itemized*)
16. ☐ **Certified Copy of Priority Document(s)** (*if foreign priority is claimed*)
17. ☐ **Nonpublication Request** Under 35 U.S.C. 122(b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
18. ☑ **Other:** General Fee Authorization
    Track One Request

*Note: (1) Benefit claims under 37 CFR 1.78 and foreign priority claims under 1.55 **must** be included in an Application Data Sheet (ADS).
(2) For applications filed under 35 U.S.C. 111, the application must contain an ADS specifying the applicant if the applicant is an assignee, person to whom the inventor is under an obligation to assign, or person who otherwise shows sufficient proprietary interest in the matter. See 37 CFR 1.46(b).

19. CORRESPONDENCE ADDRESS

☑ The address associated with Customer Number: 25096 **OR** ☐ Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email	

Signature	/Paul T. Parker/	Date	2022-03-25
Name (Print/Type)	Paul T. Parker	Registration No. (Attorney/Agent)	38,264

This collection of information is required by 37 CFR 1.53(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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: 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:	Benjamin E. Merritt	Nonprovisional Application Number (if known):	Not Yet Assigned
Title of Invention:	HEMOSTASIS VALVES AND METHODS OF USE		

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 /Paul T. Parker/	Date 2022-03-25
Name (Print/Typed) Paul T. Parker	Practitioner Registration Number 38,264

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.

Imperative EX1002

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	111552-8016.US03
	Application Number	
Title of Invention	HEMOSTASIS VALVES AND METHODS OF USE	

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
	Benjamin	E.	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	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	John	C.	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	US

Inventor 3 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

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	111552-8016.US03
	Application Number	
Title of Invention	HEMOSTASIS VALVES AND METHODS OF USE	

City	Monarch 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**	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	HEMOSTASIS VALVES AND METHODS OF USE		
Attorney Docket Number	111552-8016.US03	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	10	**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)
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	111552-8016.US03
	Application Number	
Title of Invention	HEMOSTASIS VALVES AND METHODS OF USE	

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	17/226318	2021-04-09
Prior Application Status	Patented		Remove

Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
17/226318	Continuation of	16/117519	2018-08-30	11000682	2021-05-11

Prior Application Status	Expired		Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
16/117519	Claims benefit of provisional	62/554931	2017-09-06

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

Foreign Priority Information:

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	111552-8016.US03
	Application Number	
Title of Invention	HEMOSTASIS VALVES AND METHODS OF USE	

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

Remove

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

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

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

☐ 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
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	111552-8016.US03
	Application Number	
Title of Invention	HEMOSTASIS VALVES AND METHODS OF USE	

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)
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	111552-8016.US03
	Application Number	
Title of Invention	HEMOSTASIS VALVES AND METHODS OF USE	

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)
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	111552-8016.US03
	Application Number	
Title of Invention	HEMOSTASIS VALVES AND METHODS OF USE	

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	/Paul T. Parker/			Date (YYYY-MM-DD)	2022-03-25
First Name	Paul T.	Last Name	Parker	Registration Number	38,264

Additional Signature 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	111552-8016.US03
	Application Number	
Title of Invention	HEMOSTASIS VALVES AND METHODS OF USE	

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.

Docket No.: 111552-8016.US03
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Benjamin E. Merritt et al.

Application No.: Not Yet Assigned	Confirmation No.: NA
Filed: Concurrenlty Herewith	Art Unit: Not Yet Known
For: HEMOSTASIS VALVES AND METHODS OF USE	Examiner: Not Yet Known

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: 2022-March-25

Respectfully submitted,

By __/Paul T. Parker/_____
Paul T. Parker
Registration No.: 38,264

156310241.1

Perkins Coie LLP
P.O. Box 1247
Seattle, WA 98111-1247
Phone: (206) 359-3258
Fax: (206) 359-7198

Attorney for Applicant

Doc Code: PA..
Document Description: Power of Attorney

PTO/AIA/82A (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.

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	Not Yet Assigned
Filing Date	Concurrently Herewith
First Named Inventor	Benjamin E. Merritt
Title	HEMOSTASIS VALVES AND METHODS OF USE
Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned
Attorney Docket Number	111552-8016.US03

SIGNATURE of Applicant or Patent Practitioner

Signature	/Paul T. Parker/	Date (Optional)	2022-03-25
Name	Paul T. Parker	Registration Number	38,264
Title (if Applicant is a juristic entity)	Attorney for Applicant		
Applicant Name (if Applicant is a juristic entity)	Inari Medical, Inc.		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) 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.

Imperative EX1002

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.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☑ The address associated with the above-mentioned Customer Number

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.

Imperative EX1002

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

Title of Invention	HEMOSTASIS VALVES AND METHODS OF USE

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 16/117,519

filed on August 30, 2018.

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: Benjamin E. Merritt Date: 8/31/18

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

141086834.1

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

Title of Invention	HEMOSTASIS VALVES AND METHODS OF USE

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number 16/117,519

filed on August 30, 2018.

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 C. Thress Date: 8/31/18

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

141086834.1

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

Title of Invention	HEMOSTASIS VALVES AND METHODS OF USE

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 16/117,519

filed on August 30, 2018.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Paul Lubock Date: September 11, 2018

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

141086834.1

HEMOSTASIS VALVES AND METHODS OF USE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of U.S. Patent Application No. 17/226,318, filed on April 9, 2021, entitled "HEMOSTASIS VALVES AND METHODS OF USE," which is a continuation of U.S. Patent Application No. 16/117,519, filed on August 30, 2018, now issued as U.S. Patent No. 11,000,682, and entitled "HEMOSTASIS VALVES AND METHODS OF USE," which claims the benefit of U.S. Provisional Patent Application No. 62/554,931, filed on September 6, 2017, and entitled "HEMOSTASIS VALVES AND METHODS OF USE," each of which is herein incorporated by reference in its entirety.

BACKGROUND

[0002] During a surgical procedure, a portion of a patient's body (e.g., vasculature) is accessed to allow for performance of a desired intervention or treatment. During such surgical procedures, it is desired to minimize patient blood loss, prevent delivery of air into the vasculature, and to maintain the sterility of the accessed portions or sites of the patient's body so as to prevent issues such as infection. Further, the desire for improved patient outcomes has led to the development of hemostasis valves that facilitate minimally invasive surgery.

[0003] In minimally invasive surgery, small incisions are created through a blood vessel which one or several catheters are inserted. Each of these one or several catheters can define a lumen extending longitudinally through that catheter. These catheters are moved to a position proximate to tissue, nerves, or other body structures targeted by the surgery, and then tools for performing the procedure are inserted through the lumens of some or all of these catheters.

[0004] To minimize blood loss, prevent delivery of air into the vasculature, and to facilitate maintenance of sterility within the patient's body (e.g., blood vessel), these catheters are equipped with hemostasis valves. These valves seal or selectably seal the lumens of the catheters. In many instances, these valves can seal the lumen of the catheter when a tool extends through the catheter, and specifically through the valve. Additionally the valves can seal the lumen when a tool is removed or does not extend through the catheter.

[0005] While such traditional hemostasis valves are greatly beneficial for intravascular access, they have some drawbacks. For example, some valves may not seal adequately for all interventional applications or tools, and/or the operation of some valves may be complicated for operator use. The drawbacks of such valve designs may in turn increase the complexity of any surgery performed therewith and/or reduce patient safety (e.g., bleeding, infection, and/or other detrimental complications). Accordingly, new and improved hemostasis valves and methods of use are desired.

SUMMARY

[0006] The following relates to valves, medical systems incorporating valves, and methods of using the same. The valve can include a tubular member that can be constricted, collapsed, and/or sealed by one or several tensioning mechanisms. The tensioning mechanism can include at least one filament that extends around at least a portion of the tubular member. The filament can interact with the tubular member to constrict, collapse, and/or seal the tubular member via manipulation of the tensioning mechanism(s). A tool can be inserted through the valve to gain access to a patient's body and specifically to gain access to a blood vessel. Through the use of the tensioning mechanism and filament to constrict, collapse, and/or seal the tubular member, the valve can seal around a wide range of tool sizes and shapes, as well as multiple tools of differing sizes simultaneously. Additionally, such a valve creates a robust seal that maintains its seal when a vacuum is applied such as occurs during aspiration.

[0007] Aspects of the present disclosure relate to a hemostatic valve for sealing a medical device. The hemostatic valve includes an elongate member having a first end, a second end, and a central lumen extending therebetween. In some embodiments, the elongate member is pliable. The hemostatic valve can include a reinforcement structure extending along at least a portion of the elongate member, such that the reinforcement structure is coupled to the elongate member. The hemostatic valve includes an active tensioning mechanism coupled to the elongate member. In some embodiments, the tensioning mechanism is moveable between a first configuration in which the central lumen is constricted and sealed and a second configuration in which the central lumen is open. Optionally, the valve may be manually adjusted by the user to intermediate positions between fully open and fully closed. Additionally, an instrument (e.g. catheter) may provide an intermediate position where the valve creates hemostasis without user adjustment.

[0008] In some embodiments, the elongate member can be a compliant polymer tube. In some embodiments, the tensioning mechanism can include at least one filament extending at least partially around the elongate member. In some embodiments, the reinforcement structure is positioned between the at least one filament and the elongate member. In some embodiments, the reinforcement structure can be a braided mesh. In some embodiments, the reinforcement structure is coupled to the elongate member at a position proximate to the first end of the elongate member and at a position proximate to the second end of the elongate member. In some embodiments, the reinforcement structure is not coupled to the elongate member at a position between the first end of the elongate member and the second end of the elongate member. In some embodiments, the central portion of the compliant polymer tube that is constrained or collapsed by the tensioning mechanism, and at least one filament, is not coupled to the reinforcement structure.

[0009] In some embodiments, the tensioning mechanism can include an actuator coupled to the at least one filament. In some embodiments there are two tensioning mechanisms coupled to the at least one filament that operate in opposite directions. In some embodiments the two tensioning mechanisms are attached to the same filament. In some embodiments the two tensioning mechanisms are attached to opposing filaments. In some embodiments, the actuator can be moveable to control movement of the at least one filament from a first position in which the central lumen is constricted and sealed to a second position in which the central lumen is open. In some embodiments, the at least one filament is in the first position when the tensioning mechanism is in the first configuration. In some embodiments, the actuator is biased towards the first position. In some embodiments, the actuator is biased toward the second position. In some embodiments, the actuator can be a manual actuator.

[0010] In some embodiments, the at least one filament forms a loop around the elongate member. In some embodiments, the at least one filament forms a bight around a portion of the elongate member. In some embodiments, the at least one filament can include a first filament and a second filament. In some embodiments, each of the first filament and the second filament are coupled to the same actuator. In some embodiments, each of the first filament and the second filament are coupled to different actuators. In some embodiments, the first filament and the second filament are moveable from the first position to the second position. In some embodiments, each of the first filament and the second filament form a loop around the elongate member. In some

embodiments, the first filament forms a first bight around a first portion of the elongate member, and the second filament forms a second bight around a second portion of the elongate member. In some embodiments, the first bight extends through the second bight.

[0011] In some embodiments, the hemostatic valve can include a shell defining a first aperture and a second aperture. In some embodiments, the elongate member extends from the first aperture to the second aperture and fluidly couples the first aperture and the second aperture. In some embodiments, the tensioning mechanism is self-adjustable to seal around tools of different sizes extending through the hemostatic valve. In some embodiments, the central lumen can comprise a single lumen, and in some embodiments, the central lumen can comprise a plurality of lumens.

[0012] One aspect of the present disclosure relates to a delivery system for intravascular access of a blood vessel within a patient's body. The delivery system includes a catheter having a first end, a second end, and a catheter lumen extending therebetween and a hemostatic valve coupled to the first end of the catheter. The hemostatic valve includes a tubular member having a first end, a second end, and a central lumen extending therebetween. In some embodiments, the central lumen of the tubular member is fluidly coupled with the catheter lumen. The hemostatic valve includes an active tensioning mechanism coupled to the tubular member, the tensioning mechanism can be moveable between a first configuration in which the tensioning mechanism constricts on the central lumen and the central lumen is sealed and a second configuration in which the central lumen is open.

[0013] In some embodiments, the hemostatic valve further includes a reinforcement structure extending along at least a portion of the tubular member. In some embodiments, the reinforcement structure is located between the tensioning mechanism and the tubular member. In some embodiments, the reinforcement structure can be a braided mesh. In some embodiments, the reinforcement structure is coupled to the tubular member at a position proximate to the first end of the tubular member and at a position proximate to the second end of the tubular member. In some embodiments, the reinforcement structure is adhered to the tubular member at the first end of the tubular member and at the second end of the tubular member. In some embodiments, the reinforcement structure is uncoupled to the tubular member between the first end of the tubular member and the second end of the tubular member.

[0014] In some embodiments, the tensioning mechanism can include at least one filament extending at least partially around the tubular member. In some embodiments, the tensioning mechanism can include an actuator coupled to the at least one filament. In some embodiments, moving the tensioning mechanism from the first configuration to the second configuration can include moving the actuator and the thereto coupled at least one filament from a first position to a second position. In some embodiments, the filament constricts and seals the central lumen of the tubular member when the filament is in the first position.

[0015] In some embodiments, the actuator can be a manual actuator. In some embodiments, the actuator can include a pair of opposing and depressable buttons, which buttons can be biased towards an undepressed position. In some embodiments, the central lumen is sealed when the buttons are in the undepressed position. In some embodiments, the filament can be a monofilament. In some embodiments, the filament can be at least one of: a polymer filament; or a metallic filament. In some embodiments, the catheter can include a thrombus extraction device.

[0016] One aspect of the present disclosure relates to a method of sealing a delivery device accessing a blood vessel of a patient. The method includes inserting the delivery device including a catheter and a hemostatic valve into the blood vessel of the patient. In some embodiments, the catheter can have a first end, a second end, and a catheter lumen extending therethrough. In some embodiments, the hemostatic valve can be coupled to the first end and can have a tubular member defining a central lumen fluidly coupled with the catheter lumen and a tensioning mechanism coupled with the tubular member. In some embodiments, the tensioning mechanism collapses and seals the central lumen in a first configuration and thereby seals access to the blood vessel. The method can include moving the tensioning mechanism of the hemostatic valve to a second configuration. In some embodiments, the central lumen is open and access to the blood vessel is unsealed when the tensioning mechanism is in the second configuration. The method can include advancing a shaft of a tool through the delivery device until a first end of the tool reaches a desired position within the blood vessel of the patient and a portion of the shaft is positioned within the central lumen of the tubular member. The method can include returning the tensioning mechanism of the hemostatic valve to the first configuration such that the tubular member collapses on the shaft of the tool and seals around the shaft of the tool.

[0017] In some embodiments, the method includes retracting the shaft of the tool from the delivery device. In some embodiments, the tensioning mechanism is maintained in the first configuration during and after the retracting of the shaft of the tool from the delivery device. In some embodiments, the tensioning mechanism is moved to the second configuration during the retracting of the shaft of the tool from the delivery device, and the tensioning mechanism is returned to the first configuration after the shaft of the tool is retracted from the delivery device.

[0018] In some embodiments, the tensioning mechanism can include at least one filament extending at least partially around the tubular member. In some embodiments, the at least one filament collapses the tubular member when the tensioning mechanism is in the first configuration. In some embodiments, the at least one filament circumferentially constricts the tubular member to collapse the tubular member when the tensioning mechanism is in the first configuration. In some embodiments, the hemostatic valve can include a reinforcement structure located between the at least one filament and the tubular member.

[0019] In some embodiments, the at least one filament forms a loop around the elongate member, and moving the tensioning mechanism from the second configuration to the first configuration reduces a size of the loop to thereby constrict the tubular member within the loop. In some embodiments, the filament forms at least one bight around a portion of the elongate member. In some embodiments, the filament can include a first filament and a second filament. In some embodiments, the at least one bight can include a first bight oriented in a first direction and formed by the first filament and a second bight oriented in a second direction and formed by the second filament. In some embodiments, the first and second bights overlap to encircle a portion of the tubular member within a constricting area.

[0020] In some embodiments, moving the tensioning mechanism from the second configuration to the first configuration can include moving the first bight in the first direction and the second bight in the direction to reduce the size of the constricting area and collapse and seal the central lumen of the tubular member. In some embodiments, the tensioning mechanism can include an actuator. In some embodiments, moving the tensioning mechanism to the second configuration can include manipulating the actuator. In some embodiments, the method includes applying a vacuum to the delivery device and/or delivery system to aspirate material through the catheter. In

some embodiments, the central lumen remains sealed during the aspiration. In some embodiments, the tool can include a thrombus extraction device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] Figure 1 is a perspective view of one embodiment of a delivery device.

[0022] Figure 2 is a side-section view of one embodiment of a hemostasis valve in a first configuration.

[0023] Figure 3 is a side-section view of one embodiment of the valve in a second configuration.

[0024] Figure 4 is a side-section view of one embodiment of the valve in the first configuration and with a tool extending through the valve.

[0025] Figure 5 is a side-section view of one embodiment of a single-button hemostasis valve in a first configuration.

[0026] Figure 6 is a perspective view of a filament of a valve forming a loop.

[0027] Figure 7 is a perspective view of two filaments of a valve, each of the filaments forming a loop.

[0028] Figure 8 is a perspective view of two overlapping and interlocked bights in an open configuration.

[0029] Figure 9 is a perspective view of two overlapping and interlocked bights in a closed configuration.

[0030] Figure 10 is a flowchart illustrating one embodiment of a method for sealing a valve and/or catheter.

[0031] Figure 11 is a side view of one embodiment of a thrombectomy system including the delivery device.

[0032] Figure 12 is a side-section view of another embodiment of a hemostasis valve having two-piece caps.

DETAILED DESCRIPTION

[0033] The present disclosure relates to a valve that can be used a hemostasis valve. This valve, also referred to herein as a garrote valve can seal with or without a tool extending through the valve. The garrote valve provides convenient, single-handed operation for a wide range of medical devices including catheters, wires, embolectomy systems, or the like. This single-handed operation of the garrote valve allows the user to easily and quickly swap different tools being used through the valve without compromising hemostasis and therefore simplifying the procedure. Combined with single-handed operation, the garrote valve provides robust sealing either with or without a tool extending through the valve. This robust sealing minimizes leakage in applications with a pressure differential on different sides of the valve. This pressure differential can arise, for example, during the application of vacuum aspiration in a procedure. Even under such conditions, as well as under other conditions, the garrote valve maintains seal integrity and prevents leakage in one or both directions.

[0034] The garrote valve includes a tubular member. The tubular member is a flexible member that defines a central lumen, which can, in some embodiments, define a single lumen, and in some embodiments, defines a plurality of lumens. In some embodiments, each of the plurality of lumens can comprise the same size and shape, and in some embodiments, some or all of the plurality of lumens can comprise different sizes and shapes. In some embodiments, for example, the plurality of lumens can comprise a lumen sized and/or shaped to receive a guide wire and a lumen sized and/or shaped to receive a tool. The tubular member extends at least partially through a constricting mechanism. The constricting mechanism can be moved from a first configuration to a second configuration, and the constricting mechanism can collapse and/or seal the central lumen of the tubular member when the constricting mechanism is in the first configuration. The constricting mechanism creates the above-discussed robust seal of the tubular member and thus of the valve.

[0035] With reference now to **Figure 1**, a perspective view of one embodiment of a delivery system 100, also referred to herein as a delivery device 100, is shown. The delivery system 100 can include a catheter 102 and a garrote valve 104, also referred to herein as valve 104. The catheter 102 can comprise a shaft 106, also referred to herein as an elongate sheath 106, having a proximal end 108, also referred to herein as a first end 108, that can connect to the valve 104 and a distal end

110, also referred to herein as a second end 110. The shaft 106 can define a catheter lumen 112 extending from the proximal end 108 of the shaft 106 to the distal end 110 of the shaft 106. The catheter 102 and specifically the shaft 106 can comprise a variety of shapes and sizes and can be made from a variety of materials. In some embodiments, the catheter 102 can be flexible and/or can be made from a biocompatible material. The elongate sheath 106 can have an outer diameter of at least 4 French, at least 6 French, at least 8 French, at least 10 French, at least 12 French, at least 14 French, at least 18 French, at least 20 French, at least 22 French, between 4 French and 30 French, between 8 French and 24 French, between 12 French and 20 French, and/or any other or intermediate size.

[0036] The valve 104 can include an outer shell 114. The outer shell 114 can comprise a variety of shapes and sizes and can be made from a variety of materials. In some embodiments, the outer shell 114 can be made from one or several polymers or composites. The outer shell 114 can include features that allow interaction with and/or control of the valve 104 to move the valve 104 between the first configuration and the second configuration.

[0037] The outer shell 114 can include a proximal cap 116 located at a proximal end 118 of the outer shell 114 and a distal cap 120 located at a distal end 122 of the shell 114. The proximal cap 116 can include and/or house a proximal aperture 124, also referred to herein as a proximal channel 124, a first channel 124, or a first aperture 124, that extends through the proximal cap 116, and the distal cap 120 can include and/or house a distal aperture 126, also referred to herein as a distal channel 126, a second channel 126, or second aperture 126, that extends through the distal cap 120. As seen in Figure 1, the distal cap 120 connects to the shaft 106 of the catheter 102 at the distal end 122 of the valve 104.

[0038] The proximal cap 116 and the distal cap 120 are connected via a housing 128. The housing 128 can be a one-piece housing 128 or a multi-piece housing 128. In the embodiment depicted in Figure 1, the housing comprises a two-piece housing 128. The housing 128 can be configured to receive and couple with each of the proximal cap 116 and the distal cap 120, and as seen in Figure 1, the housing 128 is coupled with each of the proximal cap 116 and the distal cap 120 to secure the relative position of the proximal cap 116 and the distal cap 120 with respect to each other.

[0039] The housing 128 can define an interior channel 130 through which an elongate member 132, also referred to herein as a tubular member 132, a septum 132, or a tubular septum 132, can extend and connect the proximal cap 116 and the distal cap 120. The elongate member 132 can comprise a variety of shapes and sizes and can be made from a variety of materials. In some embodiments, the elongate member 132 can comprise a compliant tubular structure that can be, for example, a thin-walled compliant tubular structure. The thin-walled structure of the elongate member 132 can facilitate the collapse, and specifically the uniform collapse of the elongate member 132 and the sealing of the elongate member 132. In some embodiments, the elongate member 132 is an elastic, resilient material that may comprise a polymer including either a natural or synthetic polymer. In some embodiments, the elongate member can comprise an elastic, resilient material that may comprise silicone, urethane, ethylene-vinyl acetate, natural or synthetic rubber or other elastomers known in the art. In some embodiments, the elongate member 132 can comprise a silicone tube.

[0040] The elongate member 132 can comprise a proximal end 134, also referred to herein as a first end 134, that can couple to the proximal cap 116, and a distal end 136, also referred to herein as a second end 136, that can couple to the distal cap 120. The elongate member 132 can define a central lumen 138 that can extend from the first end 134 to the second end 136 of the elongate member 132. The elongate member 132 can be coupled to the proximal cap 116 such that the central lumen 138 is fluidly coupled with the proximal aperture 124 of the proximal cap 116, and the elongate member 132 can be coupled to the distal cap 120 such that the central lumen 138, as seen in **Figure 2** and in **Figure 3**, is fluidly coupled with the distal aperture 126 of the distal cap 120.

[0041] The central lumen 138 of the elongate member 132 can be defined by a wall of the elongate member 132 that can have a thickness that is uniform along the length of the elongate member 132 between the first end 134 and the second end 136, or that is non-uniform along the length of the elongate member 132 between the first end 134 and the second end 136. In some embodiments, the wall can have a thickness that is approximately between 0.005 inches and 0.05 inches, and/or approximately between 0.010 inches and 0.030 inches. As used anywhere herein, "approximately" refers to a range of +/- 10% of the value and/or range of values for which "approximately" is used.

[0042] In some embodiments, the elongate member 132 can be cylindrically shaped, and specifically can be circular-cylindrically shaped. In some embodiments, the elongate member 132 can be dog-bone shaped to facilitate, for example, connection to each of the proximal cap 116 and the distal cap 120. In some embodiments, the elongate member 132 can include one or several outward-extending protuberances that engage with all or portions of a constricting mechanism 141, also referred to herein as a tensioning mechanism 141, of the valve 104 to secure a position of all or portions of the constricting mechanism 141 with respect to the elongate member 132. In some embodiments, the constricting mechanism 141 can be self-adjusting to seal around tools of different sizes extending through the valve 104.

[0043] The constricting mechanism 141 can, in some embodiments, collapse and seal the elongate member 132 via compression and/or constriction, and specifically via constriction with at least one filament 150. The constricting mechanism 141 can comprise: an actuator 142 which can be a manual actuator such as one or several buttons 144; and the at least one filament 150 that can extend at least partially around the elongate member 132. In some embodiments, the use of the constricting mechanism 141 can facilitate sealing of the valve around tools or instruments of a wide range of sizes and/or diameters, and particularly around tools or instruments that fit through the elongate member 132.

[0044] The housing 128 can further include one or several retention features 140. The one or several retention features 140 of the housing can engage with and retain all or portions of the constricting mechanism 141 of the valve 104. In some embodiments, the one or several retention features 140 of the housing 128 can retain the actuator 142 and/or can couple the actuator 142 to the housing 128. The actuator 142 can comprise any desired type of actuator including, for example, a manual actuator and/or an automated actuator such as, for example, an electromechanical actuator including a solenoid-based actuator. In some embodiments, the actuator can comprise one or several buttons 144, and specifically, as depicted in Figure 1, the actuator 142 can comprise a first button 144-A and a second button 144-B. Alternatively, and as depicted in **Figure 5**, the actuator 142 can comprise a single button 144. In such an embodiment, the filament 150 can be coupled to the single button 144 and to a portion of the housing 128 such as, for example, to grip portion 500 of the housing 128 such that the movement of the single button 144 causes the sealing and/or opening of the elongate member 132 and of the valve 104.

[0045] The actuator 142 can be biased towards a configuration such as, for example, biased towards the first configuration or biased towards the second configuration. As depicted in Figure 2, which shows the constricting mechanism 141 in the first configuration, the actuator 142 can be biased towards the first configuration wherein the elongate member 132 is collapsed and/or sealed by a bias feature 146. In this first configuration, the buttons 144 can be in a first position, also referred to herein as an undepressed position. This bias feature 146 can, as shown in Figure 2, include a first spring 148-A configured to bias the first button 144-A towards the first position corresponding to the first configuration of the constricting mechanism 141, and a second spring 148-B configured to bias the second button 144-B towards a first position corresponding to the first configuration of the constricting mechanism 141. One or both of the first spring 148-A and the second spring 148-B can comprise a tension spring, compression spring, a torsion spring, a coil spring, or any other desired type of spring.

[0046] In some embodiments, one or both of the first spring 148-A and the second spring 148-B can generate sufficient force so as to allow actuation of the actuator 142 with a single hand and so as to collapse and seal the elongate member 132 when the constricting mechanism 141 is in the first configuration. In some embodiments, one or both of the first spring 148-A and the second spring 148-B can generate a force of: at least 0.1 pounds, at least 0.2 pounds, at least 0.3 pounds, at least 0.4 pounds, at least 0.5 pounds, at least 0.6 pounds, at least 0.7 pounds, at least 0.8 pounds, at least 0.9 pounds, at least 1 pound, at least 1.5 pounds, at least 2 pounds, at least 3 pounds, at least 5 pounds, and/or at least 10 pounds and in some embodiments one or both of the first spring 148-A and the second spring 148-B can generate a force approximately between: 0.1 and 10 pounds, 0.1 and 5 pounds, 0.1 and 1.5 pounds, 0.2 and 1 pounds, and/or 0.4 and 0.8 pounds.

[0047] The constricting mechanism 141 can include at least one filament 150 that extends at least partially around the elongate member 132. In some embodiments, the at least one filament 150 can circumferentially constrict the elongate member 132 to collapse and seal the elongate member 132 when the constricting mechanism 141 is in the first configuration. The filament can be made from a variety of materials including, for example, a polymer, a synthetic, and/or a metal. In some embodiments, the filament 150 can be nylon, stainless steel, nitinol, silicone, or the like. In some embodiments, the filament can comprise a single strand such as, for example, a monofilament, and in some embodiments, the filament can comprise a plurality of strands that can be, for example,

twisted, woven, grouped, and/or fused to form the filament. In some embodiments, the filament 150 can comprise one or several threads, lines, cords, rope, ribbon, flat wire, sheet, or tape.

[0048] The filament 150 can be coupled to the actuator 142 such that the filament 150 selectively constricts, collapses, and/or seals the elongate member 132, and specifically the central lumen 138 of the elongate member 132 based on the movement and/or position of the actuator 142. In some embodiments, the filament 150 can be connected to one or both of the buttons 144-A, 144-B such that the filament 150 collapses, constricts, and/or seals the elongate member 132 and specifically the central lumen 138 of the elongate member 132 when the buttons 144-A, 144-B are in the first position, and the filament 150 can be connected to one or both of the buttons 144-A, 144-B such that the elongate member 132 and specifically the central lumen 138 of the elongate member 132 is open and uncollapsed when the buttons 144-A, 144-B are in the second position. In some embodiments in which the actuator 142 comprises a single button 144, as depicted in Figure 5, the filament 150 can be connected to the button 144 and to the housing 128 such that the filament 150 is tightened when the button 144 moves to the first position.

[0049] In some embodiments, the at least one filament 150 can extend along an axis 152 that can be perpendicular to a central axis 154 of the elongate member 132 and/or of the apertures 124, 126. In some embodiments, the axis 152 of the at least one filament 150 can intersect and be perpendicular to the central axis 154 of the elongate member 132 and/or of the apertures 124, 126. In some embodiments, the actuator 142, and specifically the buttons 144-A, 144-B can move along this axis 152 when moved from the first position to the second position.

[0050] In Figure 3, an embodiment of the valve 104 with the constricting mechanism 141 in the second configuration is shown. As specifically shown, both of the first and second buttons 144-A, 144-B are in the second position, depressed into the retention features 140 of the housing 128. In this second position, the filament 150 is loosened, thereby allowing the expansion of the elongate member 132 and the unsealing of the central lumen 138 of the elongate member 132.

[0051] As further seen in Figure 3, the proximal cap 116 has a proximal end 300 and a distal end 302. The proximal cap 116 can include a funnel portion 301 of the proximal aperture 124, which funnel portion 301 can facilitate insertion of a tool into the proximal aperture 124. The distal end 302 of the proximal cap 116 can partially extend into the interior channel 130 of the housing 128. The proximal cap 116 can include a mating feature 304 that can mate with the proximal end

134 of the elongate member 132. In some embodiments, the proximal end 134 of the elongate member 132 can fit over the mating feature 304 of the proximal cap 116. The proximal end 134 of the elongate member 132 can be compressed between the mating feature 304 of the elongate member 132 and a portion of the interior channel 130 of the housing 128 into which the mating feature 304 is inserted to thereby secure the proximal end 134 of the elongate member 132 on the mating feature 304. In some embodiments, the proximal end 134 of the elongate member 132 can be further secured on the mating feature 304 by a proximal O-ring 306 that can be compressed between the housing 128 and the mating feature 304 of the proximal cap 116 to sealingly couple the elongate member 132 to the proximal cap 116.

[0052] The distal cap 120 has a proximal end 308 and a distal end 310. The distal cap can include a mating feature 312 located on the proximal end 308 of the distal cap 120, which mating feature 312 can mate with the distal end 136 of the elongate member 132. In some embodiments, the distal end 136 of the elongate member 132 can fit over the mating feature 312 of the distal cap 123. The distal end 136 of the elongate member 132 can be compressed between the mating feature 312 of the elongate member 132 and a portion of the interior channel 130 of the housing 128 into which the mating feature 312 is inserted to thereby secure the distal end 136 of the elongate member 132 on the mating feature 312. In some embodiments, the distal end 136 of the elongate member 132 can be further secured on the mating feature 312 by a distal O-ring 314 that can be compressed between the housing 128 and the mating feature 312 of the proximal cap 116 to sealingly couple the elongate member 132 to the distal cap 120.

[0053] The distal cap 120 can, in some embodiments, further include a side port barb 314 that can extend laterally away from the distal cap 120 and specifically away from the distal aperture 126 of the distal cap 120. The side port barb 314 can define a side port channel 316 that can extend through the side port barb 314 and fluidly connect to the distal aperture 126. In some embodiments, the side port barb 314 can include a securement feature 318 such as a barb that can secure coupling of a hose or tube to the side port barb 314.

[0054] In some embodiments, the side barb 314 can be used to apply a vacuum to the portions of the delivery device 100, and particularly to portions of the delivery device 100 that are distal of the axis 152 along which the elongate member 132 seals. This vacuum can be applied to aspirate a material through the delivery device 100, and specifically through the catheter 102 of the delivery

device. This aspirated material can be a biological material including, for example, bodily fluids, multi-phase bodily materials that can include, for example, a fluidic portion and at least one solid portion, or the like.

[0055] In some embodiments, due to the narrowing shape of the elongate member 132 when the constricting mechanism 141 is in the first configuration, a vacuum applied to the portions of the delivery device 100 distal to the axis 152 draws the elongate member 132 towards the first configuration and can, in some embodiments, increase the strength, robustness, and/or strength of the seal of the valve 104. This attribute of the valve 104 can provide benefits over other valve designs in which a vacuum can compromise the seal of the valve, and thus the ability to draw a vacuum and aspirate can be limited.

[0056] In some embodiments, the valve 104 can further include a reinforcement structure 320 that can extend along all or portions of the elongate member 132. The reinforcement structure 320 can facilitate the uniform collapse of the elongate member 132, can prevent the at least one filament 150 from cutting through and/or tearing the elongate member 132, and can assist in guiding one or several tools through the elongate member 132. The reinforcement structure 320 can be tubular, can extend along and around the elongate member 132, and can be positioned so as to be between the elongate member 132 and the at least one filament 150.

[0057] The reinforcement structure 320 can include a proximal end 322 and a distal end 324. In some embodiments, the reinforcement structure 320 extends along and around the elongate member 132, and is positioned such that the proximal end 322 of the reinforcement structure 320 is proximate to the first end 134 of the elongate member 132 and the distal end 324 of the reinforcement structure 320 is proximate to the second end 136 of the elongate member 132.

[0058] The reinforcement structure 320 can be coupled to the elongate member 132. In some embodiments, the reinforcement structure 320 is coupled to the elongate member 132 along the length of the reinforcement structure 320, and in some embodiments, the reinforcement structure 320 is coupled to the elongate member 132 and distinct positions along the length of the elongate member 132 and/or the reinforcement structure 320. In one embodiment, for example, the reinforcement structure 320 can be coupled to the elongate member 132 at one or both of the proximal end 322 of the reinforcement structure 320 and the distal end 324 of the reinforcement structure 320 and/or at one or both of the first end 134 and the second end 136 of the elongate

member 132. In some embodiments, the reinforcement structure 320 can be coupled to the elongate member 132 via one or several other components of the valve 104. In some embodiments, the reinforcement structure 320 can be coupled to the elongate member 132 via the compression of the reinforcement structure 320 and the elongate member 132 between the housing 128 and one or both of the proximal 116 and the distal 120.

[0059] In some embodiments, the reinforcement structure 320 can be adhered to the elongate member 132 via, for example, an adhesive such as silicone adhesive. In some embodiments, the adhesive can be circumferentially applied to the reinforcement structure 320 and/or the elongate member 132 in an adhesive ring that can, for example, a have a length approximately between: 0.010 inches and 0.5 inches; 0.02 and 0.4 inches; 0.050 inches and 0.0250 inches, or any other or intermediate range.

[0060] In one embodiment, each of the proximal end 322 and the distal end 324 of the reinforcement structure 320 can be adhered via an adhesive to the elongate member 132. In such an embodiment, the reinforcement structure 320 may be uncoupled to the elongate member 132 at positions other than the coupling at one or both of the proximal end 322 and the distal end 324 of the reinforcement structure 320, and thus the reinforcement structure 320 is uncoupled to the elongate member 132 at a position between the first end 134 and the second end 136 of the elongate member 134 and/or between the proximal end 322 and the distal end 324 of the reinforcement structure 320.

[0061] The lack of coupling of the reinforcement structure 320 to the elongate member 132 can facilitate and improve the collapse of the elongate member 132 around a tool 400, also referred to herein as instrument 400 or device 400, inserted through the valve 104 as shown in **Figure 4**. The tool 400 can be any device inserted through the valve 104 including, for example, one or several additional catheters, lines, wires, grippers, punches, cutters, or the like. As seen in Figure 4, the tool 400 is inserted through the valve 104 and specifically through the elongate member 132 of the valve. As shown, the constricting mechanism 141 is in the first configuration and the elongate member 132 and the central lumen 138 of the elongate member 132 is collapsed around the tool 400, and specifically around a shaft 402 of the tool 400 to thereby seal the valve 104 around the tool 400 and specifically around the shaft 402 of the tool 400. The constricting mechanism 141 can seal

around tools 400 that fit through the elongate member 132, regardless of the size of the tool 400. Thus, the valve can be used with a wide variety of tools.

[0062] The reinforcement structure 320 can comprise a variety of designs, shapes, sizes, and materials. In some embodiments, the reinforcement structure 320 can be sized and shaped so as to receive elongate member 132 and to be positioned between the elongate member 132 and the at least one filament 150. In some embodiments, the reinforcement structure 320 can be made from a material sufficiently strong to prevent the cutting of the at least one filament 150 through the elongate member 132.

[0063] In some embodiments, the reinforcement structure can comprise a coil or a mesh sheath. The mesh sheath can, in some embodiments, comprise a braided mesh. The braided mesh can be made from any desired number of wires in any desired configuration. In some embodiments, the braided mesh can comprise a 4 wire braided mesh, an 8 wire braided mesh, a 12 wire braided mesh, a 16 wire braided mesh, a 20 wire braided mesh, a 24 wire braided mesh, a 32 wire braided mesh, a 48 wire braided mesh, a 64 wire braided mesh, a 72 wire braided mesh, an 80 wire braided mesh, a 96 wire braided mesh, or any other or intermediate braided mesh. In some embodiments, the braided mesh can comprise: a 1x1 configuration. In some embodiments, the wire in the braided mesh can be any desired material including, for example, a metal wire such as a nitinol wire or a stainless steel wire, a polymer wire, or a natural wire. In one embodiment, the braided mesh can comprise a 48 wire mesh in a 1x1 configuration made with a nitinol wire having a diameter of 0.003 inches.

[0064] With reference now to **Figures 6** through **9**, different embodiments and/or configurations of the filament 150 are shown. The filament 150 can comprise a single filament 150 having a first end 600 and a second end 602 as shown in Figure 6. The filament 150, and specifically which first and second ends 600, 602 can be coupled to the actuator 142 to move the filament 150 between the first and second configurations or positions and/or from the first configuration or position to the second configuration or position. In some embodiments, both of the first end 600 and the second end 602 can be coupled to a single button 144, in some embodiments, each of the first end 600 and the second end 602 can be coupled to different buttons 144, and in some embodiments, one of the first end 600 and the second end 602 can be coupled to a button 144

and the other of the first end 600 and the second end 602 can be coupled to the housing 128 or other portion of the valve 104.

[0065] In some embodiments, the filament 150 can comprise multiple filaments, and specifically, as shown in Figures 7 through 9, the filament 150 can comprise a first filament 150-A and a second filament 150-B. In embodiments in which the filament 150 comprises multiple filaments, each of the multiple filaments can have a first end 700 and a second end 702. The first and second filaments 150-A, 150-B can be coupled to the actuator 142. In such embodiments, the first and second ends 700, 702 can be coupled to the actuator 142 to move the filaments 150-A, 150-B between the first and second configurations and/or from the first configuration to the second configuration. In some embodiments, both of the first end 700 and the second end 702 of one or more of the multiple filaments 150 can be coupled to a single button 144, in some embodiments, each of the first end 700 and the second end 702 of one or more of the multiple filaments 150 can be coupled to different buttons 144, and in some embodiments, one of the first end 700 and the second end 702 of one or more of the multiple filaments 150 can be coupled to one button 144 and the other of the first end 700 and the second end 702 of those one or more filaments 150 can be coupled to the housing 128 or other portion of the valve 104.

[0066] The filament 150 can be arranged in a variety of configurations. In some embodiments, the filament 150 can be configured to form a single loop 604 that can extend around the elongate member 132 and/or through which the elongate member 132 can be received as shown in Figure 6, and in some embodiments, the filament 150 can be configured to form multiple loops, and specifically a first loop 704 and a second loop 706 as shown in Figure 7. The first and second loops 704, 706 can each receive the elongate member 132. In some embodiments, a diameter or size of the loop 604, or of the loops 704, 706 can decrease when the constricting mechanism 141 is moved from the second configuration to the first configuration.

[0067] In some embodiments, the filament 150 can be configured to form a bight 800, which bight 800 can be a single bight or multiple bights. As used herein, a "bight" refers to a U-shaped section between the two ends of the filament 150. As depicted in Figures 8 and 9, the bight 800 can comprise multiple bights, and specifically a first bight 800-A and a second bight 800-B. In some embodiments, the first bight 800-A can extend through the second bight 800-B such that the first and second bights 800-A, 800-B interlock, whereas in other embodiments, the first and second

bights 800-A, 800-B can be non-interlocking. Similarly, in embodiments containing the filament 150 having multiple loops, one or several of the multiple loops can be interlocking.

[0068] In some embodiments, the bight 800, and specifically one or both of the first bight 800-A and the second bight 800-B can be formed around a portion of the elongate member 132 and/or can extend around a portion of the elongate member 132. Each bight 800 can define a partially enclosed receiving area 808 wherein the elongate member 132 can be received. Thus, the first bight 800-A can define a first receiving area 808-A and the second bight 800-B can define a second receiving area 808-B.

[0069] As seen in Figures 8 and 9, multiple bights, and specifically the first and the second bights 800-A, 800-B can be positioned and oriented such that the first bight 800-A has a first orientation or first direction as indicated by arrow 810, and the second bight has a second orientation or second direction as indicated by the arrow 812. In some embodiments, the first orientation is different from the second orientation such that the first and second receiving areas 808-A, 808-B overlap and define an encircled area 814, also referred to herein as a constricting area 814. The elongate member 132 can be received within the encircled area 814. In embodiments in which bights 800-A, 800-B overlap to define the encircled area 814, the movement of the constricting mechanism 141 to the first configuration can result in and/or include the first bight 800-A moving in the direction indicated by the arrow 810 and/or the second bight 800-B moving in the direction indicated by the arrow 812, which movement of the bights 800-A, 800-B decreases the size of the encircled area 814 and constricts, collapses, and/or seals the elongate member 132 extending through the encircled area 814.

[0070] The filament(s) 150 forming the bights 800 can each apply an arcuate line or narrow longitudinal zone of pressure to the elongate member 132. If the filament(s) are circular in cross-section, the zone of pressure can be very small, and can, in some embodiments, be less than the diameter or thickness of the filament. In some embodiments, the filaments have a diameter or width less than about 2.5mm, less than about 2mm, less than about 1.5mm, less than about 1.25mm, less than about 1mm, less than about 0.75mm, less than about 0.5mm, and/or less than about 0.25mm. In some embodiments, the filaments can have a diameter or width of between about 0.01mm and 2.5mm, between about 0.05mm and 2mm, between about 0.1mm and 1mm, and/or between about 0.125mm and 0.70mm. In some embodiments, the arcuate line or zone of pressure may form two

opposing arcs and in other embodiments, the arcuate line of pressure may be a singular substantially circular line or zone that encircles the elongate member at least once. The longitudinal length of the of the line or zone of pressure may be very short compared to other valves known in the art. In some embodiments, the longitudinal length of the zone of pressure applied to the elongate member 132 by the filament(s) 150 may be less than about 2.0mm and in some embodiments less than about 0.5mm. In some embodiments, the filament(s) 150 can have any desired cross-sectional shape including, for example, a circular cross-section, a rectangular cross-section, an oval cross-section, a square cross-section, a polygonal cross-section, a triangular cross-section, or any other desired shape of cross-section.

[0071] With reference now to **Figure 10**, a flowchart illustrating one embodiment of a process 1000 for sealing a valve 104 and/or catheter 102 accessing a body of a patient is shown. The process 1000 can be performed using the valve 104 and/or the delivery system 100. The process 1000 begins at block 1002, wherein the delivery device 100, and specifically the catheter 102 of the delivery device 100 is inserted into the body of the patient. In some embodiments, this can include inserting the catheter 102 into a portion of the circulator system of the patient such as, for example, a blood vessel including an artery or a venous vessel. In some embodiments, the delivery device 100 can be inserted into the body of the patient directly through an aperture or incision in the patient, and in some embodiments, the delivery device 100 can be inserted into the body of the patient via another catheter or device. In some embodiments, the constricting mechanism 141 can be in the first configuration while the delivery device 100 and/or the catheter 102 is inserted into the patient's body.

[0072] After the delivery device 100 is inserted into the body of the patient, the process 1000 proceeds to block 1004, wherein the constricting mechanism 141 is moved from the first configuration to the second configuration. As described above, the central lumen 138 of the elongate member 132 is unsealed when the constricting mechanism 141 is in the second configuration. In some embodiments, the moving of the constricting mechanism 141 from the first configuration to the second configuration can include the manipulation of the actuator 142 and/or the control of the actuator 142, and specifically the depressing of the one or several buttons 144 to move the filament 150 from the first position to the second position to allow the expansion and opening of the central lumen 138 of the elongate member 132.

[0073] After the constricting mechanism 141 is moved from the first configuration to the second configuration, the process 1000 proceeds to block 1006, wherein the tool 400, and specifically the shaft 402 of the tool 400 is advanced through the delivery device 100 and specifically through the valve 104 until a first end of the tool reaches a desired position within the body of the patient. In some embodiments, a portion of the shaft 402 can be positioned within the central lumen 138 of the elongate member 132 after the advancing of the tool 400 through the delivery device 100. In some embodiments, after the tool 400 is advanced through the delivery device 100, the desired procedure can be performed with the tool.

[0074] After the tool 400 is advanced through the delivery device 100, or while the tool 400 is being advanced through the delivery device 100, the process 1000 proceeds to block 1008, wherein the constricting mechanism 141 is returned to the first configuration. In some embodiments, the returning of the constricting mechanism 141 to the first configuration can include the release of the one or several buttons 144 and/or the control of the actuator 142 to reconfigure the constricting mechanism 141 to the first configuration. In some embodiments, the return of the constricting mechanism 141 to the first configuration can result in the collapse and/or sealing of the elongate member 132 and specifically the central lumen 138 of the elongate member 132 around the tool 400 and specifically around the shaft 402 of the tool 400. The return of the constricting mechanism 141 to the first configuration, or the movement of the constricting mechanism 141 to the first configuration can include the decreasing of the size and/or diameter of one or several loops formed by the filament 150 and/or the movement of one or several bights 800 such as, for example, the movement of the first bight 800-A in the first direction indicated by arrow 810 and the movement of the second bight 800-B in the second direction indicated by arrow 812 to reduce the size of the constricting area 814. In some embodiments, after the constricting mechanism is returned to the first configuration, the desired procedure can be performed with the tool.

[0075] After the constricting mechanism is returned to the first configuration, the process 1000 proceeds to block 1010, wherein the tool 400, and specifically the shaft 402 of the tool 400 is retracted from the delivery device 100, and more specifically from the valve 104. In some embodiments, the valve 104 can remain sealed during the retracing of the tool 400 and/or the shaft 402 of the tool. In some embodiments, the valve 104 remains sealed during the retracting of the tool 400 and/or the retracting of the shaft 402 of the tool 400 as the constricting mechanism 141 can

remain in the first configuration during the retracing of the tool 400 and/or the shaft 402 of the tool 400.

[0076] In some embodiments, the constricting mechanism 141 can be moved to the second configuration to allow the retraction of the tool 400 and/or the shaft 402 of the tool 400 from the valve 104, and the constricting mechanism 141 can be returned to the first configuration when the tool 400 and/or the shaft 402 of the tool 400 is removed from the valve 104. In some embodiments, the retraction of the tool 400 and/or shaft 402 of the tool 400 from the valve 104 can be performed with the constricting mechanism 141 left in the first configuration. In some embodiments, the constricting mechanism 141 can be moved to the second configuration, and then returned to the first configuration via the manipulation and/or control of the actuator 142, which manipulation and/or control of the actuator 142 can include the depressing of the one or several buttons 144 to move the constricting mechanism 141 to the second configuration, and the release of the one or several buttons 144 to return the constricting mechanism 141 to the first configuration. In some embodiments, if the procedure is complete, the delivery device 100 can then be removed from the body of the patient, and any incision created for the procedure can be closed.

[0077] With reference now to Figure 11, a side view of one embodiment of a thrombectomy system 1100 including the delivery device 100 and a thrombus extraction device 1102 is shown. In some embodiments, the thrombectomy system 1100 can be used to access a blood vessel 1104 to treat and/or extract a thrombus 1106 from the blood vessel 1104. The thrombus extraction device 1102 can include a self-expanding coring element 206 and expandable cylindrical portion 208. In some embodiments, and as shown in Figure 11, the thrombus extraction device 1102 can be the tool 400 that can extend through the valve 104, and in some embodiments, the valve 104 can be a part of the thrombus extraction device 1102. Further details of thrombectomy systems, thrombus extraction devices, and methods of using the same are disclosed in: U.S. Application No. 15/268,296, filed September 16, 2016, and entitled "INTRAVASCULAR TREATMENT OF VASCULAR OCCLUSION AND ASSOCIATED DEVICES, SYSTEMS, AND METHODS"; U.S. Application No. 15/498,320, filed April 26, 2017, and entitled "DEVICES AND METHODS FOR TREATING VASCULAR OCCLUSION"; and U.S. Application No. 15/466,740, filed on March 22, 2017, and entitled "DEVICE AND METHOD FOR TREATING VASCULAR OCCLUSION", the entirety of each of which is hereby incorporated by reference herein.

[0078] With reference now to Figure 12, a side-section view of another embodiment of the hemostasis valve 104 having two piece caps 116, 120 is shown. The valve 104 can include a housing 128 defining an interior channel 130 through which the tubular member 132 can extend. The valve 104 can include the proximal cap 116 and the distal cap 120. In some embodiments, the proximal cap 116 can comprise a two piece cap and can include a proximal exterior member 1200 and a proximal channel member 1202. In some embodiments, the distal cap 120 can comprise a two-piece cap and can include a distal exterior member 1204 and a distal channel member 1206. In some embodiments, this coupling between the proximal exterior member 1200 and the proximal channel member 1202 and/or the coupling between the distal exterior member 1204 and the distal channel member 1206 can be a sealed coupling so as to prevent the leakage of material including fluid or gas between the respective ones of the proximal exterior member 1200 and the proximal channel member 1202 and/or the distal exterior member 1204 and the distal channel member 1206. In some embodiments, this sealing coupling can be achieved and/or maintained via a seal such as an O-ring 1208 that can be positioned between the proximal exterior member 1200 and the proximal channel member 1202 and/or between the distal exterior member 1204 and the distal channel member 1206.

[0079] In some embodiments, the proximal exterior member 1200 can be coupled, and in some embodiments, rotatingly coupled to the proximal channel member 1202 in a manner to allow the rotation of the proximal exterior member 1200 without rotating the proximal channel member 1202. Similarly, in some embodiments, the distal exterior member 1204 can be rotatingly coupled to the distal channel member 1206 in a manner to allow the rotation of the distal exterior member 1204 without the rotating of the distal channel member 1206. In some such embodiments, the channel members 1202, 1206 can be non-rotatable with respect to the housing 128 and/or the tubular member 132, and one or both of the exterior members 1200, 1204 can be rotatable with respect to the housing 128 and/or the tubular member 132. In such an embodiment, the maintaining of the rotational position of the channel members 1202, 1206 with respect to the housing 128 and/or the tubular member 132 can prevent the twisting of the tubular member 132 which can result in the sealing of the tubular member 132 regardless of the configuration of the constructing mechanism 141.

[0080] The exterior members 1200, 1204 can comprise a variety of shapes and sizes and can include a variety of features. In some embodiments, one or both of the exterior members 1200, 1204 can be coupled to, for example, a shaft similar to the shaft 106 shown in figure 1. In some embodiments, for example, the distal exterior member 1204 can be coupled to a shaft 106, including, for example, can be non-detachably coupled to the shaft 106. In some embodiments, one or both of the exterior members can include one or several features configured to facilitate coupling with the valve 104. These one or several features can include, for example, one or several male or female: connectors; couplers; attachment mechanisms; or the like. In some embodiments, these one or several features can facilitate use of the valve with other existing components, instruments, tools, or the like. In some embodiments, for example, one or both of the exterior members 1200, 1204 can comprise either a male or female luer fitting, and specifically as shown in Figure 12, the distal exterior member 1204 can comprise a male luer fitting 1210.

[0081] Several aspects of the present technology are set forth in the following examples.

1. A hemostatic valve for sealing a medical device, the hemostatic valve comprising:

an elongate member having a first end, a second end, and a central lumen extending therebetween, wherein the elongate member is pliable;

a reinforcement structure extending along at least a portion of the elongate member, wherein the reinforcement structure is coupled to the elongate member; and

an active tensioning mechanism coupled to the elongate member, wherein the tensioning mechanism is moveable between a first configuration wherein the central lumen is constricted and sealed and a second configuration wherein the central lumen is open.

2. The hemostatic valve of example 1, wherein the elongate member comprises a compliant polymer tube.

3. The hemostatic valve of example 1 or 2, wherein the tensioning mechanism comprises at least one filament extending at least partially around the elongate member.

4. The hemostatic valve of example 3, wherein the reinforcement structure is positioned between the at least one filament and the elongate member.

5. The hemostatic valve of example 4, wherein the reinforcement structure comprises a braided mesh.

6. The hemostatic valve of example 4 or 5, wherein the reinforcement structure is coupled to the elongate member at a position proximate to the first end of the elongate member and at a position proximate to the second end of the elongate member.

7. The hemostatic valve of example 6, wherein the reinforcement structure is not coupled to the elongate member at a position between the first end of the elongate member and the second end of the elongate member.

8. The hemostatic valve of any one of examples 3–7, wherein the tensioning mechanism comprises an actuator coupled to the at least one filament, wherein the actuator is moveable to control movement of the at least one filament from a first position wherein the central lumen is constricted and sealed to a second position wherein the central lumen is open, wherein the at least one filament is in the first position when the tensioning mechanism is in the first configuration.

9. The hemostatic valve of example 8, wherein the actuator is biased towards the first position.

10. The hemostatic valve of example 8 or 9, wherein the actuator is biased toward the second position.

11. The hemostatic valve of any one of examples 8–10, wherein the actuator comprises a manual actuator.

12. The hemostatic valve of any one of examples 8–11, wherein the at least one filament forms a loop around the elongate member.

13. The hemostatic valve of any one of examples 8–12, wherein the at least one filament forms a bight around a portion of the elongate member.

14. The hemostatic valve of any one of examples 8–13, wherein the at least one filament comprises a first filament and a second filament, wherein each of the first filament and the second filament are coupled to the actuator, and wherein the first filament and the second filament are moveable from the first position to the second position.

15. The hemostatic valve of example 14, wherein each of the first filament and the second filament form a loop around the elongate member.

16. The hemostatic valve of example 14 or 15, wherein the first filament forms a first bight around a first portion of the elongate member, and wherein the second filament forms a second bight around a second portion of the elongate member.

17. The hemostatic valve of example 16, wherein the first bight extends through the second bight.

18. The hemostatic valve of any one of examples 1–17, further comprising a shell defining a first aperture and a second aperture, wherein the elongate member extends from the first aperture to the second aperture and fluidly couples the first aperture and the second aperture.

19. The hemostatic valve of any one of examples 1–18, wherein the tensioning mechanism is self-adjustable to seal around tools of different sizes extending through the hemostatic valve.

20. The hemostatic valve of any one of examples 1–19, wherein the central lumen comprises a single lumen.

21. The hemostatic valve of any one of examples 1–20, wherein the central lumen comprises a plurality of lumens.

22. A delivery system for intravascular access of a blood vessel within a patient's body, the delivery system comprising:

a catheter having a first end, a second end, and a catheter lumen extending therebetween;

a hemostatic valve coupled to the first end of the catheter, the hemostatic valve comprising:

a tubular member having a first end, a second end, and a central lumen extending therebetween, wherein the central lumen of the tubular member is fluidly coupled with the catheter lumen; and

an active tensioning mechanism coupled to the tubular member, the tensioning mechanism moveable between a first configuration wherein the tensioning mechanism constricts on the central lumen and the central lumen is sealed and a second configuration wherein the central lumen is open.

23. The delivery system of example 22, wherein the hemostatic valve further comprises a reinforcement structure extending along at least a portion of the tubular member.

24. The delivery system of example 22 or 23, wherein the reinforcement structure is located between the tensioning mechanism and the tubular member.

25. The delivery system of example 24, wherein the reinforcement structure comprises a braided mesh.

26. The delivery system of example 24 or 25, wherein the reinforcement structure is coupled to the tubular member at a position proximate to the first end of the tubular member and at a position proximate to the second end of the tubular member.

27. The delivery system of example 26, wherein the reinforcement structure is adhered to the tubular member at the first end of the tubular member and at the second end of the tubular member.

28. The delivery system of example 27, wherein the reinforcement structure is uncoupled to the tubular member between the first end of the tubular member and the second end of the tubular member.

29. The delivery system of any one of examples 22–28, wherein the tensioning mechanism comprises at least one filament extending at least partially around the tubular member.

30. The delivery system of example 29, wherein the tensioning mechanism comprises an actuator coupled to the at least one filament, wherein moving the tensioning mechanism from the first configuration to the second configuration comprises moving the actuator and the thereto coupled at least one filament from a first position to a second position, wherein the filament constricts and seals the central lumen of the tubular member when the filament is in the first position.

31. The delivery system of example 30, wherein the actuator comprises a manual actuator.

32. The delivery system of example 31, wherein the actuator comprises a pair of opposing and depressable buttons, wherein the buttons are biased towards an undepressed position.

33. The delivery system of example 31 or 32, wherein the central lumen is sealed when the buttons are in the undepressed position.

34. The delivery system of any one of examples 30–33, wherein the filament comprises a monofilament.

35. The delivery system of any one of examples 30–34, wherein the filament comprises at least one of: a polymer filament; or a metallic filament.

36. The delivery system of any one of examples 22–35, wherein the catheter comprises a thrombus extraction device.

37. A method of sealing a delivery device accessing a blood vessel of a patient, the method comprising:

inserting the delivery device comprising a catheter and a hemostatic valve into the blood vessel of the patient, the catheter having a first end, a second end, and a catheter lumen extending therethrough, and the hemostatic valve coupled to the first end and having a tubular member defining a central lumen fluidly coupled with the catheter lumen and a tensioning mechanism coupled with the tubular member, wherein the tensioning mechanism collapses and seals the central lumen in a first configuration and thereby seals access to the blood vessel;

moving the tensioning mechanism of the hemostatic valve to a second configuration, wherein the central lumen is open and access to the blood vessel is unsealed when the tensioning mechanism is in the second configuration;

advancing a shaft of a tool through the delivery device until a first end of the tool reaches a desired position within the blood vessel of the patient and a portion of the shaft is positioned within the central lumen of the tubular member; and

returning the tensioning mechanism of the hemostatic valve to the first configuration such that the tubular member collapses on the shaft of the tool and seals around the shaft of the tool.

38. The method of example 37, further comprising retracting the shaft of the tool from the delivery device.

39. The method of example 38, wherein the tensioning mechanism is maintained in the first configuration during and after the retracting of the shaft of the tool from the delivery device.

40. The method of example 38 or 39, wherein the tensioning mechanism is moved to the second configuration during the retracting of the shaft of the tool from the delivery device, and wherein the tensioning mechanism is returned to the first configuration after the shaft of the tool is retracted from the delivery device.

41. The method of any one of examples 37–40, wherein the tensioning mechanism comprises at least one filament extending at least partially around the tubular member, wherein the at least one filament collapses the tubular member when the tensioning mechanism is in the first configuration.

42. The method of example 41, wherein the at least one filament circumferentially constricts the tubular member to collapse the tubular member when the tensioning mechanism is in the first configuration.

43. The method of example 41 or 42, wherein the hemostatic valve comprises a reinforcement structure located between the at least one filament and the tubular member.

44. The method of any one of examples 41–43, wherein the at least one filament forms a loop around the elongate member, and wherein moving the tensioning mechanism from the second configuration to the first configuration reduces a size of the loop to thereby constrict the tubular member within the loop.

45. The method of any one of examples 41–44, wherein the filament forms at least one bight around a portion of the elongate member.

46. The method of example 45, wherein the filament comprises a first filament and a second filament, and wherein the at least one bight comprises a first bight oriented in a first direction and formed by the first filament and a second bight oriented in a second direction and formed by the second filament, wherein the first and second bights overlap to encircle a portion of the tubular member within an constricting area.

47. The method of example 46, wherein moving the tensioning mechanism from the second configuration to the first configuration comprises moving the first bight in the first direction and the second bight in the direction to reduce the size of the constricting area and collapse and seal the central lumen of the tubular member.

48. The method of any one of examples 37–47, wherein the tensioning mechanism comprises an actuator, and wherein moving the tensioning mechanism to the second configuration comprises manipulating the actuator.

49. The method of any one of examples 37–48, further comprising applying a vacuum to the delivery device to aspirate material through the catheter, wherein the central lumen remains sealed during the aspiration.

50. The method of any one of examples 37–49, wherein the tool comprises a thrombus extraction device.

51. A hemostatic valve for sealing a medical device, the hemostatic valve comprising:

an elongate member having a first end, a second end, and a central lumen comprising a plurality of lumens extending therebetween, wherein the elongate member is pliable; and

an active tensioning mechanism coupled to the elongate member, wherein the tensioning mechanism is moveable between a first configuration wherein the central lumen is constricted and sealed and a second configuration wherein the central lumen is open.

[0082] Other variations are within the spirit of the present invention. Thus, while the invention is susceptible to various modifications and alternative constructions, certain illustrated embodiments thereof are shown in the drawings and have been described above in detail. It should be understood, however, that there is no intention to limit the invention to the specific form or forms disclosed, but on the contrary, the intention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention, as defined in the appended claims.

[0083] In the previous description, various embodiments of the present invention are described. For purposes of explanation, specific configurations and details are set forth in order to provide a thorough understanding of the embodiments. However, it will also be apparent to one skilled in the art that the present invention may be practiced without the specific details. Furthermore, well-known features may be omitted or simplified in order not to obscure the embodiment being described.

[0084] The use of the terms "a" and "an" and "the" and similar referents in the context of describing the invention (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms "comprising," "having," "including," and "containing" are to be construed as open-ended terms (i.e., meaning "including, but not limited to,") unless otherwise noted. The term "connected" is to be construed as partly or wholly contained within, attached to, or joined together, even if there is something intervening. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., "such as") provided herein, is intended merely to better illuminate embodiments of the invention and does not pose a limitation on the scope of the invention unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the invention.

[0085] Preferred embodiments of this invention are described herein, including the best mode known to the inventors for carrying out the invention. Variations of those preferred embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the invention to be practiced otherwise than as specifically described herein. Accordingly, this invention includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the invention unless otherwise indicated herein or otherwise clearly contradicted by context.

[0086] All references, including publications, patent applications, and patents, cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

CLAIMS

1. A valve, comprising:

a tubular member defining a lumen configured to slidably receive a catheter;

a constricting mechanism including at least one filament and an actuator coupled to the filament, the filament comprising a first portion extending around at least a portion of the tubular member and a second portion having a first end extending from the first portion in one direction and a second end extending from the first portion in another direction, and the actuator comprises a first member coupled to the first end of the filament and a second member couped to the second end of the filament, wherein the first member and the second member of the actuator are moveable between (a) a first position wherein the filament circumferentially constricts the lumen to create a seal and (b) a second position wherein the filament is moved to at least partially open the lumen; and

a biasing system configured to bias the first member and the second member to the first position.

2. The valve of claim 1 wherein the tubular member is pliable.

3. The valve of claim 1 wherein the first portion of the filament extends in a loop completely around the tubular member.

4. The valve of claim 1 wherein the first member of the actuator comprises a first button and the second member of the actuator comprises a second button, wherein the first button and the second button are undepressed in the first position, and wherein the first button and the second button are depressed in the second position.

5. The valve of claim 1 wherein, when the first member and the second member of the actuator are in the first position, the lumen of the tubular member is configured to remain constricted and sealed when a pressure differential exists between (a) a first volume outside the

lumen and adjacent to a first end of the tubular member and (b) a second volume outside the central lumen and adjacent to a second end of the tubular member.

6. The valve of claim 1 wherein, when the first member and the second member of the actuator are in the first position, the lumen of the tubular member is configured to remain constricted and sealed when vacuum pressure is applied to a volume outside the lumen and adjacent to either a first end or a second end of the tubular member.

7. The valve of claim 1 wherein the lumen of the tubular member extends a long a first longitudinal axis, wherein the first member and the second member of the actuator are movable between the first and second positions along a second longitudinal axis, and wherein the first longitudinal axis is orthogonal to the second longitudinal axis.

8. The valve of claim 1 wherein the biasing system comprises a first compression spring coupled to the first member and a second compression spring coupled to the second member.

9. The valve of claim 1 wherein, in the first position, the first member and the second member of the actuator pull the filament to circumferentially constrict the tubular member such that the lumen is constricted and sealed.

10. A hemostasis valve, comprising:

a support;

an actuator having a least a first member movably coupled to the support;

a collapsible tubular sidewall defining a lumen carried by the support;

a filament formed in a loop around the tubular sidewall, the filament having at least a first end portion extending away from the loop to the first member; and

a first spring configured to move the first member in a direction that pulls the first end portion away from the tubular sidewall, reducing a diameter of the lumen in response to reducing a diameter of the loop.

11. The hemostasis valve of claim 10, further comprising a second member movably coupled to the support.

12. The hemostasis valve of claim 11 wherein the filament further comprises a second end portion extending away from the loop to the second member.

13. The hemostasis valve of claim 12 first end portion, the loop, and the second end portion are one continuous filament.

14. The hemostasis valve of claim 12 wherein first member and the second member are biased in a direction that places the first end portion and the second end portion under sufficient tension to reduce the diameter of the lumen and provide a seal around a device extending through the lumen.

15. The hemostasis valve of claim 12 wherein the first member and the second member are biased in a direction that places the first end portion and the second end portion under sufficient tension to close the lumen.

ABSTRACT OF THE DISCLOSURE

Devices, systems, and methods for sealing medical devices, particularly during intravascular access, are disclosed herein. Some aspects relate to a hemostatic valve for sealing a wide range of medical devices, such as catheters, wires, embolectomy systems. The valve can include an elongate member having a first end, a second end, and a central lumen extending therebetween. A reinforcement structure extends along at least a portion of the elongate member and is coupled to the elongate member. A shell defining a first aperture and a second aperture may be included, which first and second apertures can be fluidly coupled by the elongate member. A tensioning mechanism is coupled to the shell and to the elongate member, the tensioning mechanism can be moveable between a first configuration wherein the tensioning mechanism is collapsed and the central lumen is sealed and a second configuration wherein the central lumen is open.

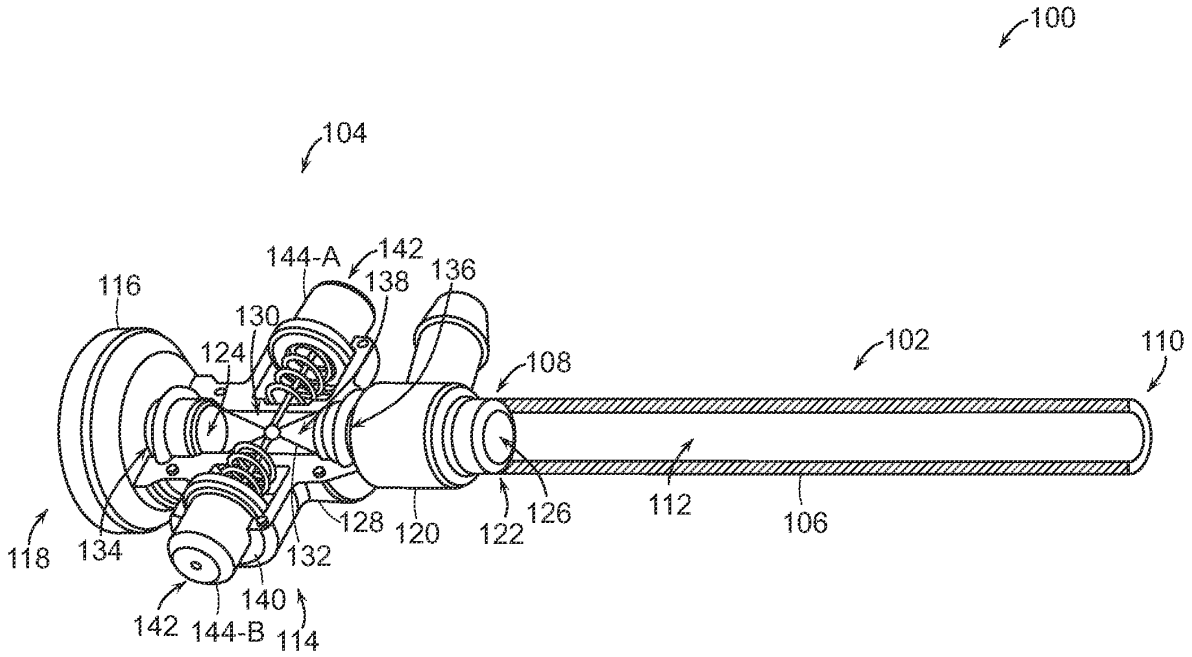

100
104
144-A
142
138
136
116
130
124
108
102
110
1/10
118
134
132
128
120
122
126
112
106
140
142
144-B
114

FIG. 1

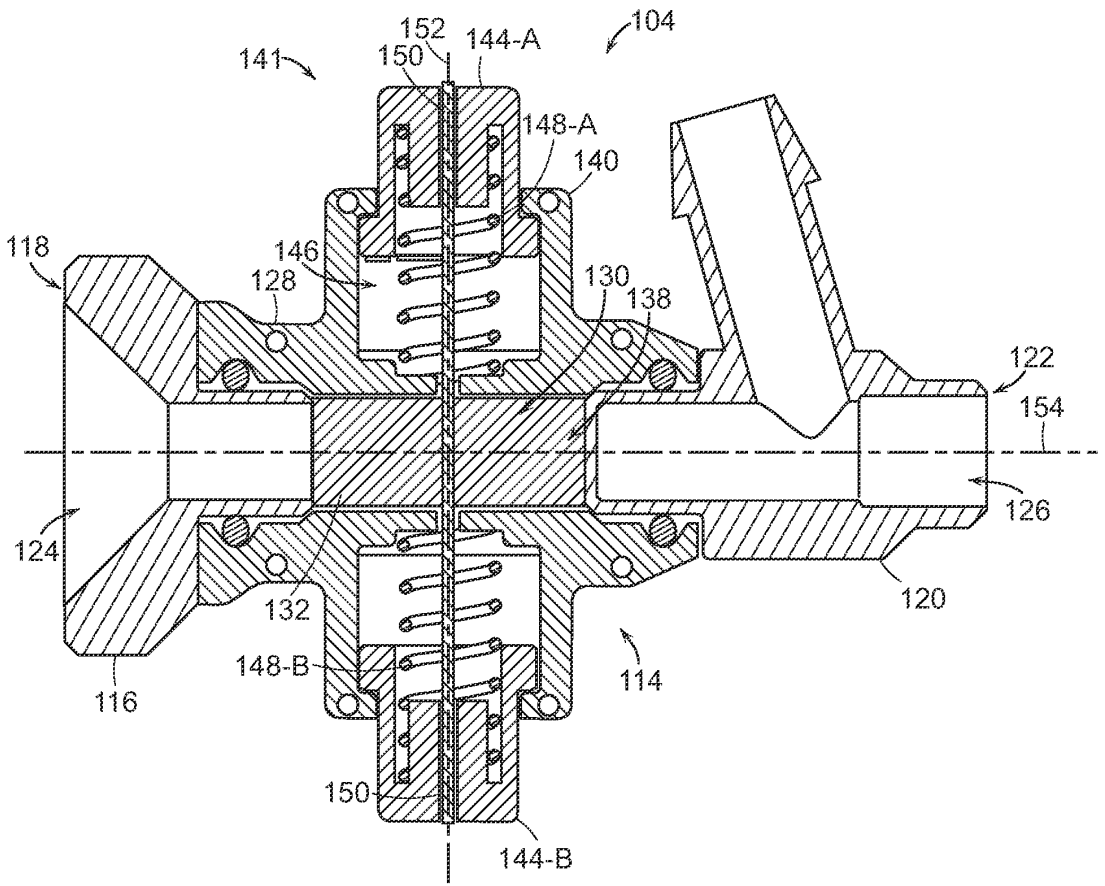

141
152
150
144-A
104
148-A
140
118
146
128
130
138
122
154
126
124
132
120
148-B
114
116
150
144-B

FIG. 2

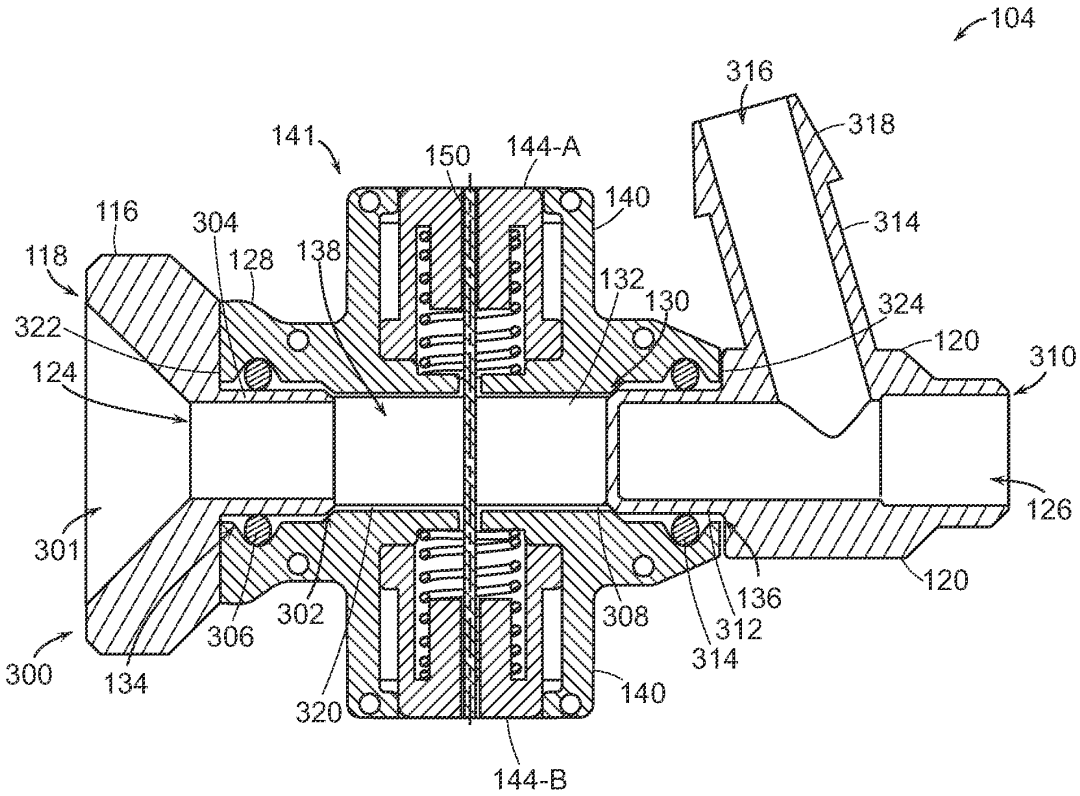

104
316
318
141
150
144-A
140
116
304
314
118
128
138
132
130
324
322
120
310
124
126
301
120
136
312
314
308
302
306
300
134
320
140
144-B

FIG. 3

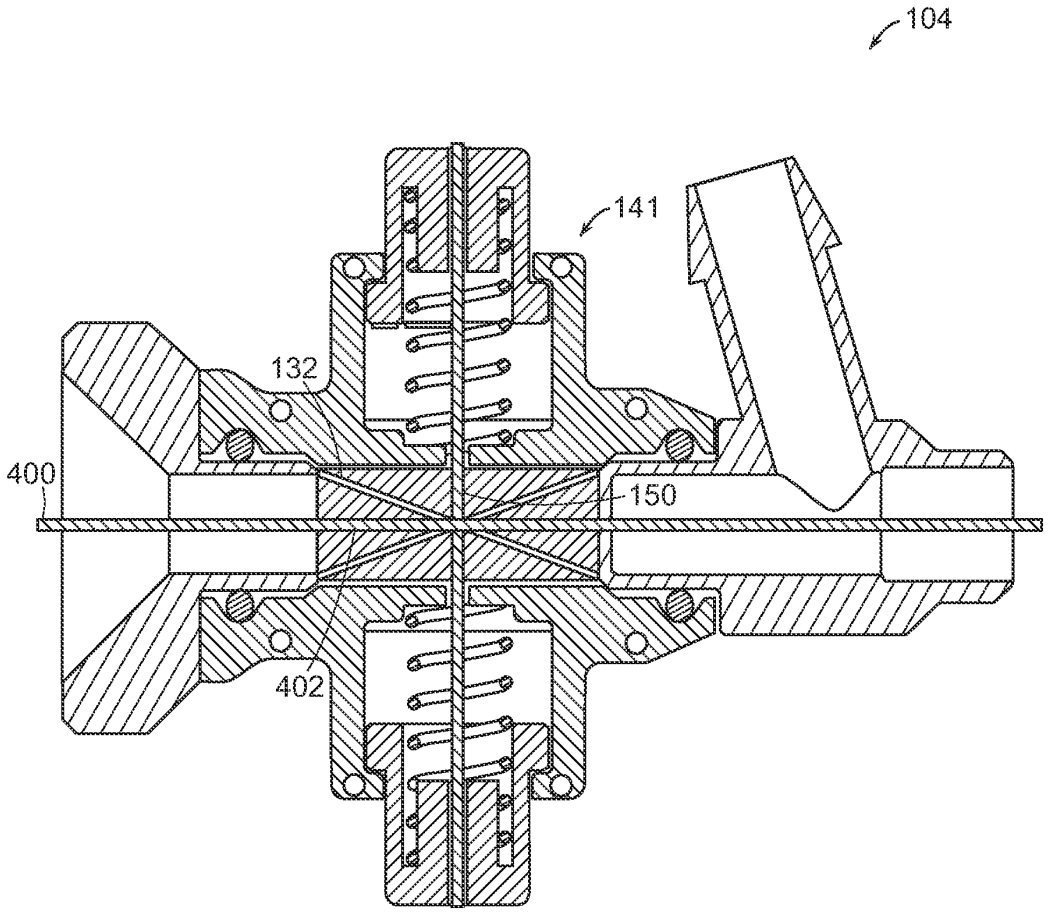


FIG. 4

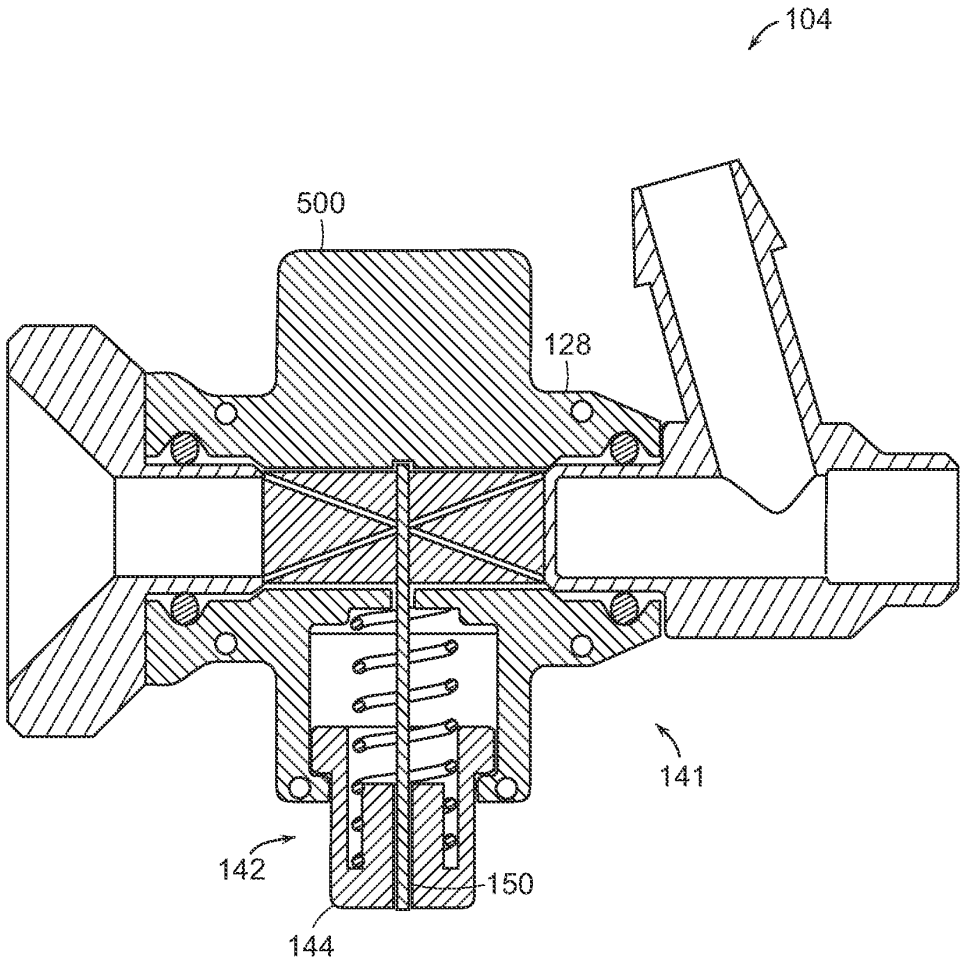


FIG. 5

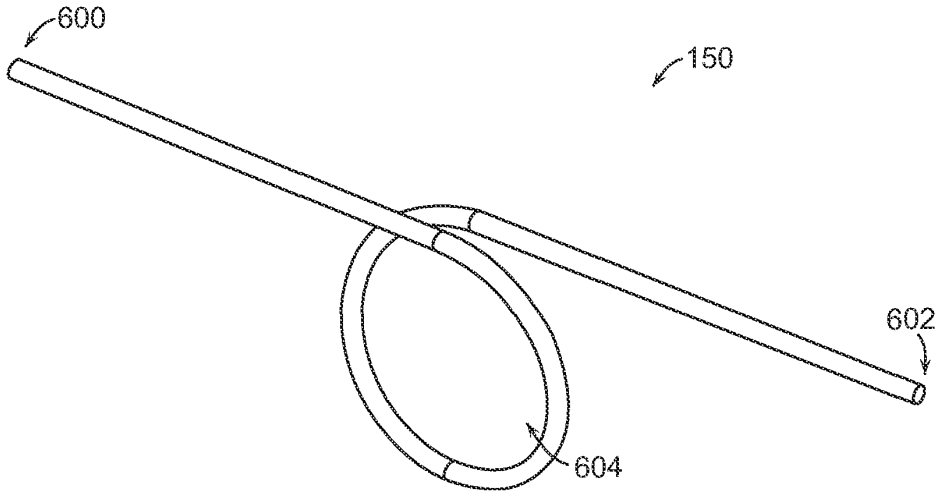


FIG. 6

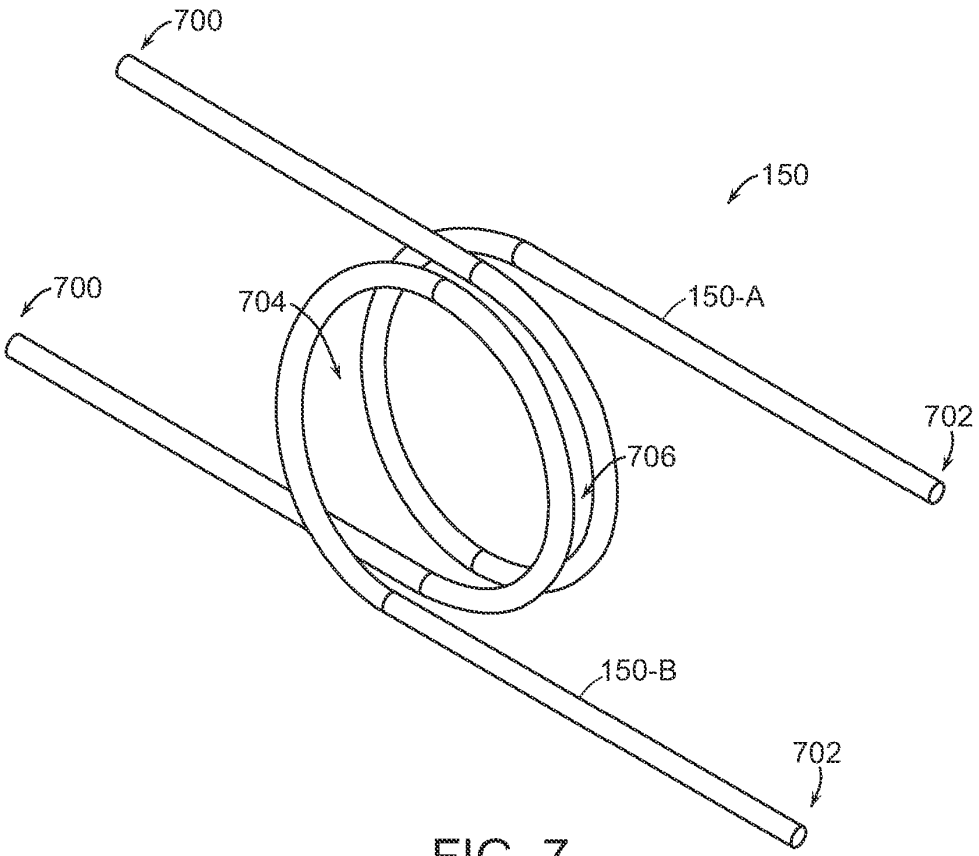


FIG. 7

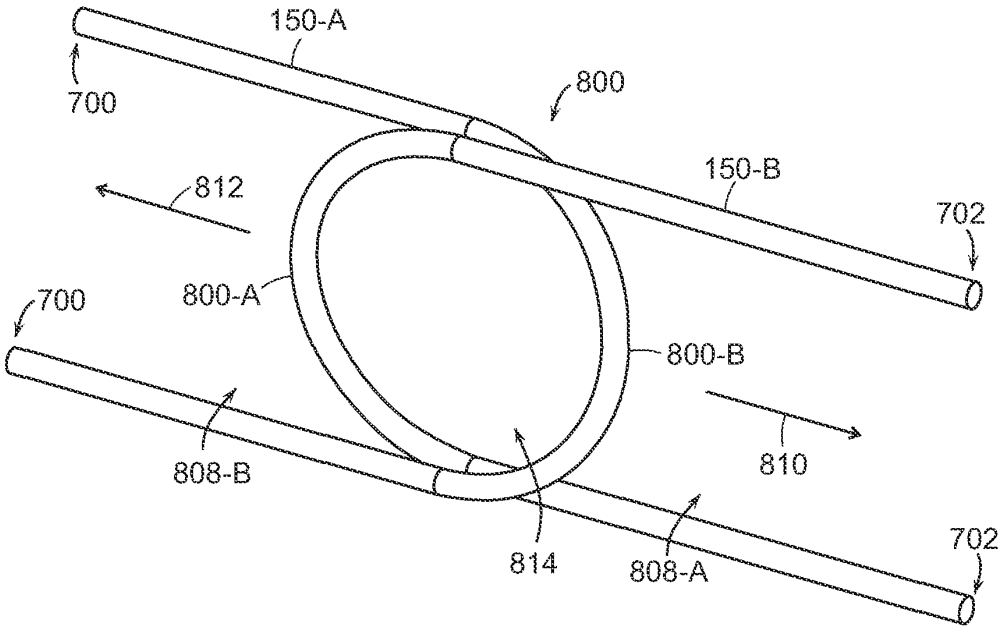

150-A
700
800
150-B
812
702
700
800-A
800-B
808-B
810
814
808-A
702

FIG. 8

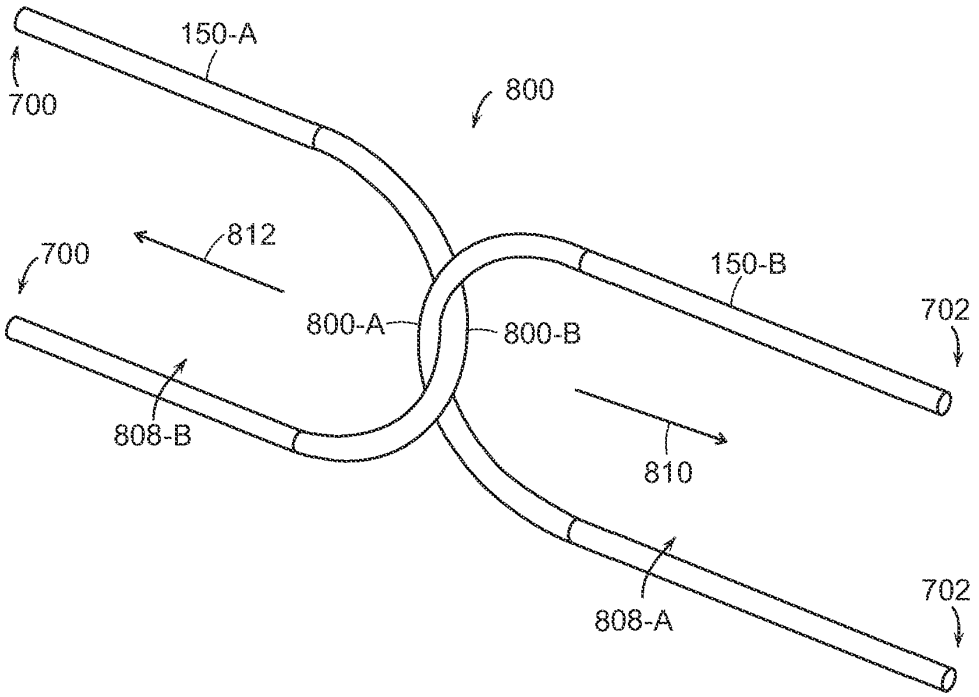

150-A
700
800
812
700
150-B
702
800-A
800-B
808-B
810
808-A
702

FIG. 9

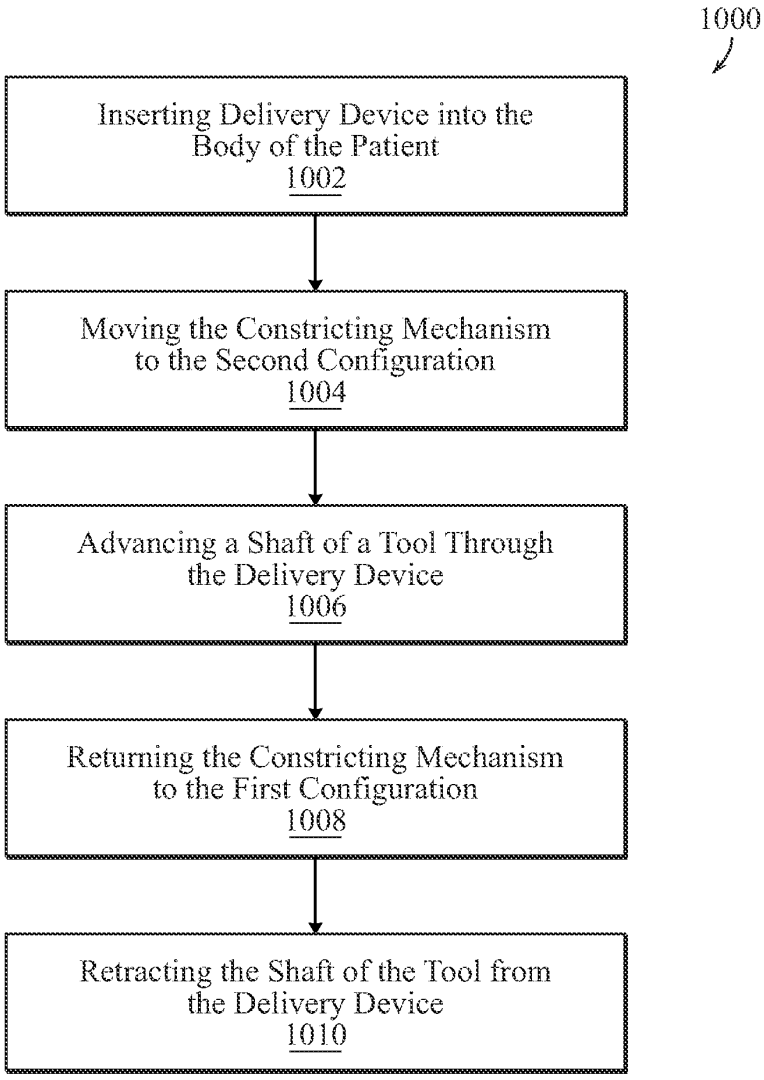

1000
Inserting Delivery Device into the Body of the Patient
1002
Moving the Constricting Mechanism to the Second Configuration
1004
Advancing a Shaft of a Tool Through the Delivery Device
1006
Returning the Constricting Mechanism to the First Configuration
1008
Retracting the Shaft of the Tool from the Delivery Device
1010

FIG. 10

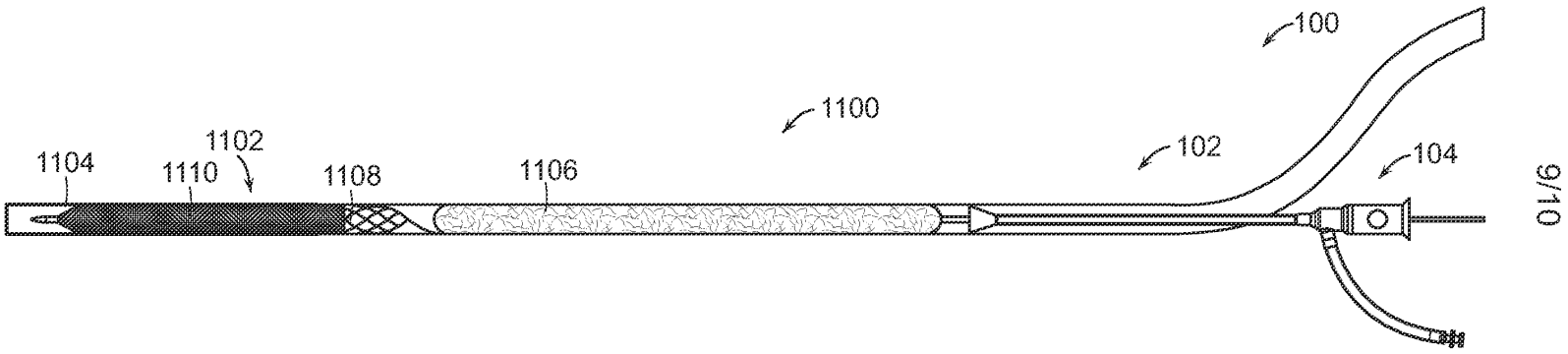


FIG. 11

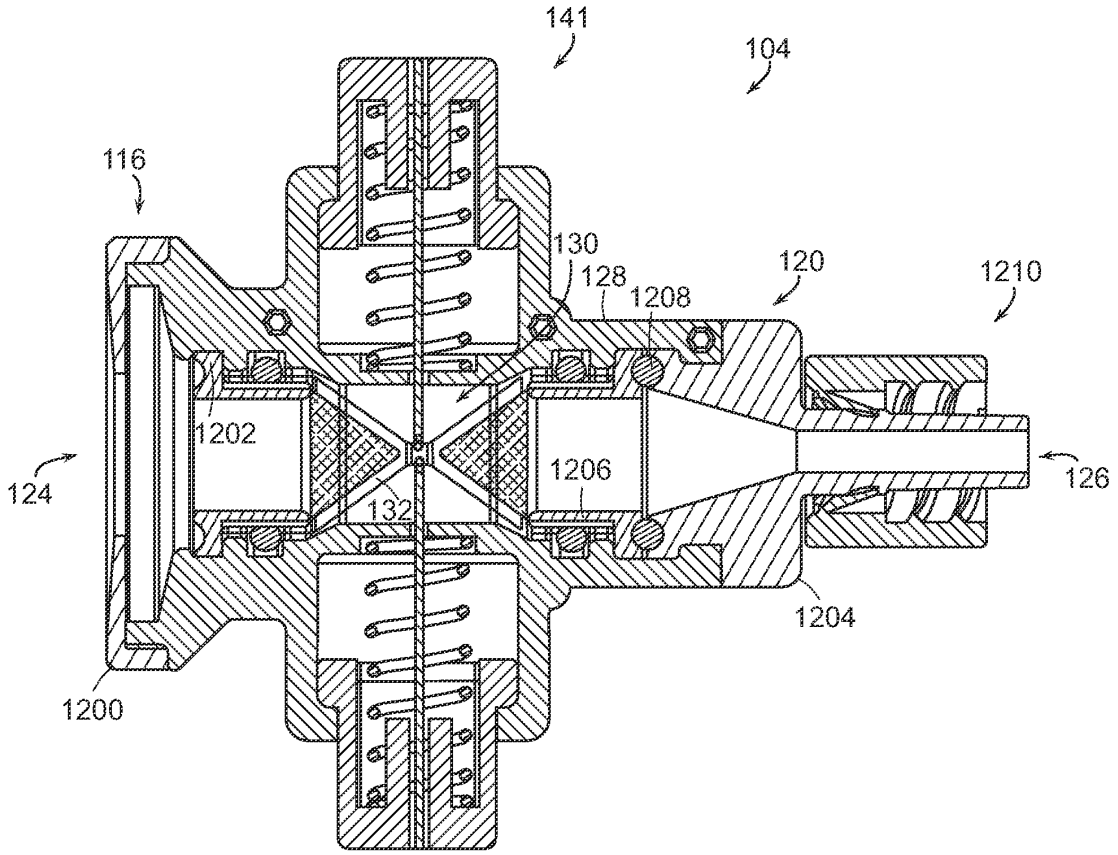

141
104
116
130
128
1208
120
1210
1202
124
1206
126
132
1204
1200

FIG. 12

Electronic Patent Application Fee Transmittal	
Application Number:	
Filing Date:	
Title of Invention:	HEMOSTASIS VALVES AND METHODS OF USE
First Named Inventor/Applicant Name:	Benjamin E. Merritt
Filer:	Paul T Parker/JiYoung Anderson
Attorney Docket Number:	111552-8016.US03
Filed as Large Entity	

Filing Fees for Track I Prioritized Examination - Nonprovisional Application under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	320	320
UTILITY SEARCH FEE	1111	1	700	700
UTILITY EXAMINATION FEE	1311	1	800	800
REQUEST FOR PRIORITIZED EXAMINATION	1817	1	4200	4200
Pages:				
Claims:				
Miscellaneous-Filing:				
PROCESSING FEE, EXCEPT PROV. APPLS.	1830	1	140	140

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		6160

Electronic Acknowledgement Receipt

EFS ID:	45543817
Application Number:	17705189
International Application Number:	
Confirmation Number:	9367
Title of Invention:	HEMOSTASIS VALVES AND METHODS OF USE
First Named Inventor/Applicant Name:	Benjamin E. Merritt
Customer Number:	25096
Filer:	Matthew S. Williams/Michelle Burge
Filer Authorized By:	Matthew S. Williams
Attorney Docket Number:	111552-8016.US03
Receipt Date:	22-APR-2022
Filing Date:	25-MAR-2022
Time Stamp:	18:24:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	WO2021127202.PDF	3575399 b6c9879dbbfc0135431884cd4a2188ca5923dd82	no	66

Warnings:

Imperative EX1002

Information:					
2	Foreign Reference	WO2021248042.PDF	1834999 95883882319569522 9b4370cb9ae79bf58ec16e7	no	42
Warnings:					
Information:					
3	Foreign Reference	WO2022032173.PDF	2896423 00b163ff4b491b4f31ab1b1d6272ee03e6fd80ba	no	75
Warnings:					
Information:					
4	Foreign Reference	WO9833443A1.PDF	1321580 5998a629021e7a38ea9fdcfe735e73879ab4049d	no	35
Warnings:					
Information:					
5	Foreign Reference	WO9839053A1.PDF	2623098 9521529eaee212f873a1e40e4b9c1d55d30b9396	no	69
Warnings:					
Information:					
6	Foreign Reference	WO9851237A1.PDF	1368222 dd8bae690efc61a189d118477cc94816daa3aea9	no	35
Warnings:					
Information:					
7	Non Patent Literature	NPL_Boston-Scientific_Fetch2.PDF	2226666 eb43de37446aeeb3bd381a0cb0356dc96cf9531b	no	2
Warnings:					
Information:					
8	Non Patent Literature	NPL_Capture_Vascular_Systems.PDF	78649 f8edceed946b185da1c4220866ae8cf7923aff60	no	1
Warnings:					
Information:					

9	Non Patent Literature	NPL_Covidien_Solitaire.PDF	961842 3303c2f1ac000d2254632e5d97bc353d1ded4cee	no	6
Warnings:					
Information:					
10	Non Patent Literature	NPL_Edwards_Fogarty.PDF	59311 fb66aee8bef21759ab6093de5ba3366df3f03615	no	1
Warnings:					
Information:					
11	Non Patent Literature	NPL_EER_187457940_July_20_2020.PDF	278208 c3de00812c226a22800fca81ed4a92b12203c513	no	4
Warnings:					
Information:					
12	Non Patent Literature	NPL_ESR_201850922_Sep_11_2020.PDF	507357 00d0045ba933f897d25a8ae770ef01094c51b294	no	6
Warnings:					
Information:					
13	Non Patent Literature	NPL_EESR_188534655_May-7-2021-7-pages.PDF	4875642 eafa2beb614bda3b8242622bd85ba09aa5e3b843	no	7
Warnings:					
Information:					
14	Non Patent Literature	NPL_EESR_201915816_Mar_31_2021_11pages.PDF	10145961 be623522bc04da02854d490d4e60c4f70dec09d8	no	11
Warnings:					
Information:					
15	Non Patent Literature	NPL_ESR_168522126_Aug_22_2018.PDF	478171 f9542c801702510c0faf9a846f2ba69856d6e1a5	no	6
Warnings:					
Information:					

16	Non Patent Literature	NPL_ESR_181748914_Oct_5_2018.PDF	534003 4209cef5e8dd4ed57e0daf3630ce0428328a4bcf	no	6
Warnings:					
Information:					
17	Non Patent Literature	NPL_ESR_191919257_Oct_8_2019.PDF	666220 62e930c8ab9892b473beee0ae1f0852e283d55a2	no	7
Warnings:					
Information:					
18	Non Patent Literature	NPL_ISR_WO_PCTUS2055645_April_14_2021_12pages.PDF	450016 82ac7e3d6383acefb4731df58b2b078d10dbcdb9	no	12
Warnings:					
Information:					
19	Non Patent Literature	NPL_ISR_WO_PCTUS2135965_Sep_28_2021_12pages.PDF	528917 5819de047368abac302a838e0e93b73981037b1c	no	12
Warnings:					
Information:					
20	Non Patent Literature	NPL_ISR_WO_PCTUS2145072_Jan_20_2022_10pages.PDF	1444975 bfb221addca453707be3d9b2bd63eeaa1985aa75	no	10
Warnings:					
Information:					
21	Non Patent Literature	NPL_ISR_WO_PCTUS2158793_Mar_16_2022_13pages.PDF	1683995 a62683d5ed54c021203d955c1ed8a5ea49c382554	no	13
Warnings:					
Information:					
22	Non Patent Literature	NPL_ISR_WO_PCTUS2159718_Mar_22_2022_13pages.PDF	5469463 7bdccdaa41f10c50ab504e01c2a9772e64546f02	no	13
Warnings:					
Information:					

23	Non Patent Literature	NPL_ISR_WO_PCTUS2159735_Mar_22_2022_11pages.PDF	3908951 18dbe26f3bbfff7331c394826f63b3886f8c29f6	no	11
Warnings:					
Information:					
24	Non Patent Literature	NPL_ISR_WO_PCTUS1950410_Oct_25_2019.PDF	948328 442d99ec7181116acbe8afd8d5eadf9aaee7136f	no	9
Warnings:					
Information:					
25	Non Patent Literature	NPL_ISR_WO_PCTUS1729345_2-28-2018.PDF	2309325 e0734c82b145dd14d0cfb68b5903137b5c71f1ea	no	23
Warnings:					
Information:					
26	Non Patent Literature	NPL_ISR_WO_PCTUS1859607_Mar_28_2019.PDF	2751454 7aaa1b371a1e5e93938c69b69d8da10c3bbf16ff	no	23
Warnings:					
Information:					
27	Non Patent Literature	NPL_ISR_WO_PCTUS1617982_May_6_2016.PDF	2619784 6388e226ebfa8ad9a4a8318d361162fa5bd2c43c	no	14
Warnings:					
Information:					
28	Non Patent Literature	NPL_ISR_WO_PCTUS1840937_Nov_14_2018.PDF	1446145 3c3c827ab60b9a668862707fae4a3a57c80ab5b8	no	15
Warnings:					
Information:					
29	Non Patent Literature	NPL_OSullivan_Thombolysis.PDF	690858 55fea1994abd71044f5bb92d2627e7321b64d05d	no	8
Warnings:					
Information:					

30	Non Patent Literature	NPL_ISR_WO_PCTUS1729366_Aug_29_2017.PDF	1449171 d6ac32dcab1c0c6b6dc1527c908eed56edcad10c	no	16
Warnings:					
Information:					
31	Non Patent Literature	NPL_ISR_WO_PCTUS1729440_July_7_2017.PDF	1290757 8c8c770b4e34d812c942b385a7042ee384a6a5eb	no	14
Warnings:					
Information:					
32	Non Patent Literature	NPL_ISR_WO_PCTUS1729472_July_7_2017.PDF	1424214 52c5def424774b4b1ada5c9c546bf911775baa52	no	15
Warnings:					
Information:					
33	Non Patent Literature	NPL_ISR_WO_PCTUS1735543_Aug_14_2017.PDF	1067427 80d59072073c564dd72e8134621bc9385c482dab	no	11
Warnings:					
Information:					
34	Non Patent Literature	NPL_ISR_WO_PCTUS1750933.PDF	1248371 867d725d8af483375852a841e30ad37978139c0b	no	13
Warnings:					
Information:					
35	Non Patent Literature	NPL_ISR_WO_PCTUS2014854_Oct_5_2020.PDF	1120645 741de0610ded2a450162b556fc1fa0dc82a67d2e	no	11
Warnings:					
Information:					
36	Non Patent Literature	NPL_ISR_WO_PCTUS2017684_Nov_30_2020.PDF	1639520 e5f4f8af150b51b04be243349cf18911e091db3e	no	17
Warnings:					
Information:					

37	Non Patent Literature	NPL_ISR_WO_PCTUS2018655_Dec_16_2020.PDF	2043552 cbcdf2ee615c3b99ef9e70d033f3ac442377d4c5	no	20
Warnings:					
Information:					
38	Non Patent Literature	NPL_ISR_WO_PCTUS1932601_July_23_2019.PDF	1508895 1621540dc776063216643ec9b3ccd805549bcf4a	no	14
Warnings:					
Information:					
39	Non Patent Literature	NPL_ISR_WO_PCTUS1950467_Dec_18_2019.PDF	1664296 2128c9d0bcf63fa8016133fabca75c03193c9a10	no	16
Warnings:					
Information:					
40	Non Patent Literature	NPL_Penumbra_Indigo_System.PDF	398145 8dc75b153437eee80d877694e4b647fdf09fbf57	no	7
Warnings:					
Information:					
41	Non Patent Literature	NPL_Vorwerk_Temporary_Caval.PDF	2622555 a3fe9609362aaba9e8fe6d186766a29db340c3b6	no	4
Warnings:					
Information:					
42	Non Patent Literature	NPL_Wikipedia_Embolectomy.PDF	259358 2cf35a269c326362d7772b41606b1559ca0c2360	no	4
Warnings:					
Information:					
43	Non Patent Literature	NPL_YouTube_Merci.PDF	841537 3038d44f1db83f07815af06638fe07346c6701d3	no	1
Warnings:					
Information:					
			Total Files Size (in bytes):	77262405	

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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