

PA 2038729

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

20 de diciembre de 2018

POR LA PRESENTE SE CERTIFICA QUE EL DOCUMENTO ADJUNTO ES UNA COPIA FIEL DE LOS REGISTROS DE LA OFICINA DE PATENTES Y MARCAS DE LOS ESTADOS UNIDOS DE DICHS DOCUMENTOS DE LA SOLICITUD DE PATENTE IDENTIFICADA A CONTINUACIÓN QUE CUMPLIÓ CON LOS REQUISITOS PARA QUE SE LE OTORGARA UNA FECHA DE PRESENTACIÓN EN VIRTUD DE 35 USC 111.

NÚMERO DE SOLICITUD: 15/850.993

FECHA DE PRESENTACIÓN: 21 de diciembre de 2017

EL CÓDIGO DE PAÍS Y EL NÚMERO DE SU SOLICITUD DE PRIORIDAD, QUE SE USARÁ PARA LA PRESENTACIÓN EN EL EXTRANJERO EN VIRTUD DE LA CONVENCIÓN DE PARÍS, ES US15/850.993

Por autoridad del
Subsecretario de Comercio para la Propiedad Intelectual
y Director de la Oficina de Patentes y Marcas de los Estados Unidos



M. TARVER
Funcionario certificador

Reivindicaciones:

1. Un sistema de desacoplamiento para suministrar un dispositivo médico implantable a una ubicación objetivo de un vaso del cuerpo, que comprende:

un tubo distal generalmente hueco que comprende:

5 un extremo proximal;

un extremo distal; y

una porción comprimible del propio tubo distal, entre los extremos proximal y distal que es móvil axialmente desde una condición comprimida a una condición alargada;

10 un tubo proximal generalmente hueco que tiene un extremo proximal y un extremo distal;

un acoplamiento dispuesto entre el extremo proximal del tubo distal y el extremo distal del tubo proximal, que une los tubos proximal y distal;

15 un sistema de acoplamiento que acopla y despliega el dispositivo médico implantable acoplado en el extremo distal del tubo distal;

en donde el sistema de acoplamiento mueve la porción comprimible a la condición comprimida cuando acopla el dispositivo médico implantable, y

en donde el sistema de acoplamiento despliega el dispositivo médico implantable y libera la porción comprimible a la condición alargada.

20

2. El sistema de desacoplamiento de la reivindicación 1, en donde el sistema de acoplamiento se fija de manera desmontable al extremo proximal del tubo distal cuando se acopla el dispositivo médico implantable para mantener la condición comprimida.

3. El sistema de desacoplamiento de la reivindicación 2, en donde el sistema de acoplamiento se fija de manera desmontable al extremo proximal del tubo proximal al acoplar el dispositivo médico implantable.

5 4. El sistema de desacoplamiento de la reivindicación 2, en donde el sistema de acoplamiento comprende:

un miembro de bloqueo; y

un cable de bucle,

10 en donde cuando el cable de bucle interactúa con el miembro de bloqueo para acoplar el dispositivo médico implantable, una fuerza sobre el cable de bucle mueve la porción comprimible a la condición comprimida, y

en donde el cable de bucle está soldado al extremo proximal del tubo distal para fijar de manera desmontable el sistema de acoplamiento.

15 5. El sistema de desacoplamiento de la reivindicación 4, en donde una fuerza en el miembro de bloqueo libera el cable de bucle, desacopla el dispositivo médico implantable y permite que la porción comprimible regrese a la condición alargada.

20 6. El sistema de desacoplamiento de la reivindicación 1, en donde la porción comprimible del tubo distal es una porción cortada en espiral del tubo distal.

7. El sistema de desacoplamiento de reivindicación 1, en donde la porción comprimible se adapta para desplegar el dispositivo médico implantable acoplado por el sistema de acoplamiento cuando la porción comprimible se mueve a la condición alargada.

8. El sistema de desacoplamiento de la reivindicación 1, en donde la porción comprimible del tubo distal se adapta para moverse automáticamente/elásticamente a la condición alargada cuando el sistema de acoplamiento se desacopla del dispositivo médico implantable.

5

9. El sistema de desacoplamiento de la reivindicación 1,

en donde el tubo proximal se superpone parcialmente al acoplamiento,

en donde el tubo distal se superpone parcialmente al acoplamiento,

en donde una separación formada en el acoplamiento entre el tubo proximal y el tubo

10 distal comprende una banda de soldadura para soldar el acoplamiento al tubo proximal y al tubo distal.

10. El sistema de desacoplamiento de la reivindicación 1, en donde el acoplamiento es radiopaco.

15

11. El sistema de desacoplamiento de la reivindicación 1,

en donde el tubo proximal comprende una porción flexible del propio tubo proximal, entre los extremos proximal y distal que es flexible; y

en donde el tubo distal comprende una porción flexible del propio tubo distal, entre

20 el extremo proximal y la porción comprimible, que es flexible.

12. Un método para desacoplar un dispositivo médico implantable, que comprende un tubo distal hueco que tiene un extremo proximal y un extremo distal, un tubo proximal

hueco tiene un extremo proximal y un extremo distal y un acoplamiento, que comprende las etapas de:

formar una porción comprimible en el tubo distal entre los extremos proximal y distal;

acoplar el dispositivo médico implantable con un sistema de acoplamiento;

5 aplicar una fuerza al sistema de acoplamiento para comprimir la porción comprimible;

fijar el sistema de acoplamiento al tubo distal para mantener un estado comprimido;

unir el tubo distal y el tubo proximal juntos usando el acoplamiento;

13. El método de desacoplamiento de la reivindicación 12, en donde el sistema de
10 acoplamiento se fija de manera desmontable al extremo proximal del tubo distal.

14. El método de desacoplamiento de la reivindicación 13, que comprende, además, la
etapa de fijar de manera desmontable el sistema de acoplamiento al extremo proximal
del tubo proximal cuando se acopla el dispositivo médico implantable.

15

15. El método de desacoplamiento de acuerdo con la reivindicación 13, en donde el sistema
de acoplamiento comprende un miembro de bloqueo y un cable de bucle,

en donde la etapa de acoplamiento comprende, además, la etapa de usar el cable de
bucle con el miembro de bloqueo para acoplar el dispositivo médico implantable; y

20 en donde la etapa de aplicación comprende, además, la etapa de aplicar fuerza al
cable de bucle para mover la porción comprimible a la condición comprimida.

16. El método de desacoplamiento de la reivindicación 15, que comprende, además, las
etapas de:

aplicar una fuerza en el miembro de bloqueo;
desacoplar el dispositivo médico implantable; y
permitir que la porción comprimible regrese a la condición alargada.

5 17. El método de desacoplamiento de la reivindicación 12, en donde la etapa de formación comprende la etapa de cortar en espiral una porción del tubo distal.

18. El método de desacoplamiento de la reivindicación 12, que comprende, además, la etapa de desplegar el dispositivo médico implantable acoplado al mover la porción comprimible a
10 la condición alargada.

19. El método de desacoplamiento de la reivindicación 12, en donde la porción comprimible del tubo distal se adapta para moverse automáticamente/elásticamente a la condición alargada cuando el sistema de acoplamiento se desacopla del dispositivo médico
15 implantable.

20. El método de desacoplamiento de la reivindicación 12, en donde la etapa de unir comprende, además, las etapas de:

superponer parcialmente el tubo proximal sobre el acoplamiento;
20 superponer parcialmente el tubo distal sobre el acoplamiento;
formar una separación en el acoplamiento entre el tubo proximal y el tubo distal que comprende una banda de soldadura; y
soldar el acoplamiento al tubo proximal y al tubo distal en la banda de soldadura.

TRADUCCIÓN OFICIAL No. 099/CKM REALIZADA POR DIEGO F. VARGAS ZAMORA, TRADUCTOR E INTÉRPRETE OFICIAL INGLÉS-ESPAÑOL, RECONOCIDO MEDIANTE RESOLUCIÓN No. 0001 DEL 4 DE ENERO DE 1999 DEL MINISTERIO DE JUSTICIA



OFICINA DE MARCAS Y PATENTES DE LOS ESTADOS UNIDOS

*Subsecretario de Comercio para los Propiedad Intelectual y
Director de la Oficina de Marcas y Patentes de los Estados Unidos*

20 de diciembre de 2018

PTAS

505245765

TROUTMAN SANDERS
875 THIRD AVENUE
NUEVA YORK, NY 10022

OFICINA DE MARCAS Y PATENTES DE LOS ESTADOS UNIDOS
NOTIFICACIÓN DE INSCRIPCIÓN DE DOCUMENTO DE CESIÓN

EL DOCUMENTO ADJUNTO HA SIDO INSCRITO POR LA SECCIÓN DE REGISTRO DE CESIONES DE LA OFICINA DE MARCAS Y PATENTES DE LOS ESTADOS UNIDOS. UNA COPIA COMPLETA ESTÁ DISPONIBLE EN LA SALA DE BÚSQUEDAS DE CESIONES CON EL NÚMERO DE ROLLO Y CUADRO INDICADOS A CONTINUACIÓN.

POR FAVOR REVISE TODA LA INFORMACIÓN QUE CONTIENE LA PRESENTE NOTIFICACIÓN. LA INFORMACIÓN QUE CONTIENE ESTA NOTIFICACIÓN DE INSCRIPCIÓN REFLEJA LA INFORMACIÓN PRESENTE EN EL SISTEMA DE CESIONES DE MARCAS Y PATENTES. SI ENCUENTRA ERRORES O TIENE PREGUNTAS RELATIVAS A ESTA NOTIFICACIÓN, PUEDE CONTACTAR LA SECCIÓN DE INSCRIPCIÓN DE CESIONES AL 571-272-3350. POR FAVOR ENVÍE SU SOLICITUD DE CORRECCIÓN A: U.S.

DIEGO F. VARGAS Z.
TRADUCTOR E INTÉRPRETE OFICIAL
ESPAÑOL - INGLÉS - INGLÉS - ESPAÑOL
RES. 0001 DE ENERO 4 DE 1999
MINISTERIO DE JUSTICIA

PATENT AND TRADEMARK OFFICE, MAIL STOP: ASSIGNMENT
RECORDATION BRANCH, P.O. BOX 1450, ALEXANDRIA, VA 22313.

FECHA DE INSCRIPCIÓN: 12/19/2018 ROLLO/CUADRO: 047820/0664

NÚMERO DE HOJAS: 3

RESUMEN: CESIÓN DEL INTERÉS DE LOS CEDENTES (VER DOCUMENTO
PARA MAYOR INFORMACIÓN)

REFERENCIA DEL APODERADO NÚMERO: 243382.000058

CEDENTE:

LORENZO, JUAN

FECHA DOCUMENTO: 12/18/2018

CESIONARIO:

DEPUY SYNTHES PRODUCTS, INC.

325 PARAMOUNT DRIVE

RAYNHAM, MASSACHUSETTS 02767

NÚMERO DE SOLICITUD: 15850993 FECHA DE PRESENTACIÓN: 12/21/2017

NÚMERO DE PATENTE:

FECHA DE EXPEDICIÓN:

TÍTULO: SISTEMA DE DESFIJACIÓN DE DISPOSITIVO MÉDICO
IMPLANTABLE CON TUBO DIVIDIDO Y ACOPLAMIENTO METÁLICO

SECCIÓN DE INSCRIPCIÓN DE CESIONES

DIVISIÓN DE REGISTROS PÚBLICO

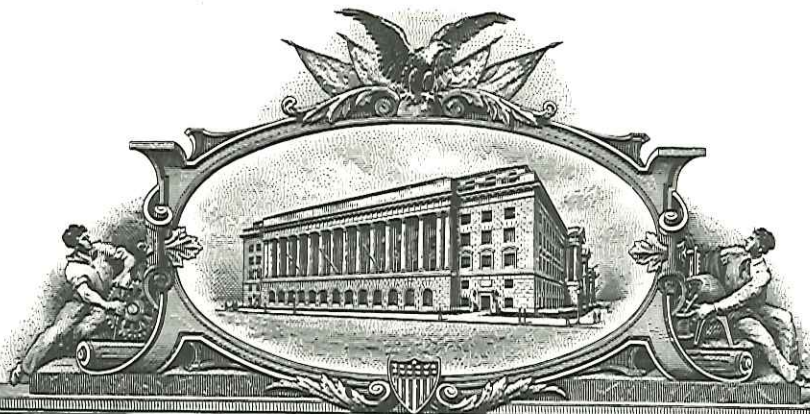
FIN DE LA TRADUCCIÓN

Bogotá D.C., 26 de febrero de 2019

Es traducción fiel y completa del documento original realizada por:

DIEGO F. VARGAS ZAMORA, Traductor e Intérprete Oficial, Resolución No. 0001 de 1999 del
Ministerio de Justicia de Colombia.

DIEGO F. VARGAS Z
TRADUCTOR E INTERPRETE OFICIAL
ESPAÑOL - INGLÉS - INGLÉS - ESPAÑOL
RES. 0001 DE ENERO 4 DE 1999
MINISTERIO DE JUSTICIA



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

December 20, 2018

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: 15/850,993

FILING DATE: December 21, 2017

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS US15/850,993

**By Authority of the
Under Secretary of Commerce for Intellectual Property
and Director of the United States Patent and Trademark Office**



M. Tarver

**M. TARVER
Certifying Officer**

Electronic Acknowledgement Receipt

EFS ID:	31310096
Application Number:	15850993
International Application Number:	
Confirmation Number:	7587
Title of Invention:	IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND CYLINDRICAL COUPLING
First Named Inventor/Applicant Name:	Juan LORENZO
Customer Number:	6980
Filer:	Louis J. DelJuidice/Dwight Peck
Filer Authorized By:	Louis J. DelJuidice
Attorney Docket Number:	243382.000058
Receipt Date:	21-DEC-2017
Filing Date:	
Time Stamp:	16:37:09
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$ 1740
RAM confirmation Number	122217INTEFSW00004276201507
Deposit Account	201507
Authorized User	Dwight Peck

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:
37 CFR 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	UTILITY-TRANSMITTAL- FINAL-2017-12-21.PDF	293188	no	2
			666b66bd299c900c64b6d04af4202ee238 c12e0		

Warnings:**Information:**

2	Application Data Sheet	ADS-FINAL-2017-12-21.PDF	1822943	no	8
			9c34dc7ebad4b1a0d94a3d40dff1c1d3558 42930		

Warnings:**Information:**

3		SPECIFICATION- FINAL-2017-12-21.PDF	143607	yes	15
			b0a85f0a919e34644744bdb9f5c189dd004 44d72		

Multipart Description/PDF files in .zip description

	Document Description	Start	End
	Specification	1	10
	Claims	11	14
	Abstract	15	15

Warnings:**Information:**

4	Drawings-only black and white line drawings	DRAWINGS-FINAL_2017-12-21. PDF	1882517	no	5
			fd2b7b52909ccc0c6a59da2c725989cb9f70 ba19		

Warnings:**Information:**

5	Power of Attorney	POA-FINAL-2017-12-21.PDF	482517	no	2
			220551352b4b8894f85fb56feba164dc4c73 d548		

Warnings:					
Information:					
6	Information Disclosure Statement (IDS) Form (SB08)	SB08-FINAL-2017-12-21.PDF	1043146 c5137b87a9d2b69a874a7b87f72fdea36b67939c	no	4
Warnings:					
Information:					
7	Fee Worksheet (SB06)	fee-info.pdf	36994 8579fb534db86049f291163f7c246aa6600b4ece	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			5704912		
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.					

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.	243382.000058
	First Named Inventor	Juan Lorenzo
	Title	IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND
	Express Mail Label No.	

APPLICATION ELEMENTS <i>See MPEP chapter 600 concerning utility patent application contents.</i>	ADDRESS TO: Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450
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 <u>15</u>] 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 <u>5</u>] 6. Inventor's Oath or Declaration [Total Pages _____] (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 or 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	ACCOMPANYING APPLICATION PAPERS 10. ☐ Assignment Papers (cover sheet & document(s)) Name of Assignee _____ 11. ☐ 37 CFR 3.73(c) Statement ☒ Power of Attorney (when there is an assignee) 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: _____ _____ _____ _____

*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: <u>06980</u> OR ☐ Correspondence address below					
Name					
Address					
City	State	Zip Code			
Country	Telephone	Email			
Signature	/Louis J. DelJuidice - 47,522/			Date	2017-12-21
Name (Print/Type)	Louis John DelJuidice			Registration No. (Attorney/Agent)	47522

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.

IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND CYLINDRICAL COUPLING

Field of the Invention

This invention generally relates to interventional medical device systems that are navigable through body vessels of a human subject. More particularly, this invention relates to detachment systems for deploying an implantable medical device to a target location of a body vessel and methods of using the same.

Background

The use of catheter delivery systems for positioning and deploying therapeutic devices, such as dilation balloons, stents and embolic coils, in the vasculature of the human body has become a standard procedure for treating endovascular diseases. It has been found that such devices are particularly useful in treating areas where traditional operational procedures are impossible or pose a great risk to the patient, for example in the treatment of aneurysms in cranial blood vessels. Due to the delicate tissue surrounding cranial blood vessels, especially for example brain tissue, it is very difficult and often risky to perform surgical procedures to treat defects of the cranial blood vessels. Advancements in catheter deployment systems have provided an alternative treatment in such cases. Some of the advantages of catheter delivery systems are that they provide methods for treating blood vessels by an approach that has been found to reduce the risk of trauma to the surrounding tissue, and they also allow for treatment of blood vessels that in the past would have been considered inoperable.

Typically, these procedures involve inserting the distal end of a delivery catheter into the vasculature of a patient and guiding it through the vasculature to a predetermined delivery site. A vascular occlusion device, such as an embolic coil, is attached to the end of a delivery member which pushes the coil through the catheter and out of the distal end of the catheter into the delivery site. Some of the problems that have been associated with these procedures relate to ensuring the complete release and deployment of the coil. For example, U.S. Pat. No. 5,250,071 to Palermo, which is hereby incorporated herein by reference, describes a detachment system whereby interlocking clasps of the system and the coil are held together by a control wire. The control wire is moved proximally to disengage the clasps from each other. However, the system

does not include any positive means for separating the disengaged clasps from each other, so merely retracting the control wire does not ensure release and deployment of the coil. Numerous other detachment systems currently in use suffer from similar problems.

In addition, U.S. Pat. No. 8,062,325 discloses a single tubular carrier to deliver and deploy the vascular occlusion device, but has only a single compressible section. Therefore, a need remains for a more rapid release detachment system or method that can ensure release and deployment of an implantable medical device. Further advantages could be realized with a detachment system or method incorporating a simple and inexpensive locking and deployment system.

Summary

A detachment system delivers an implantable medical device to a target location of a body vessel with a generally hollow distal tube. The distal tube has a proximal end, a distal end, and a compressible portion of the distal tube itself axially movable from a compressed condition to an elongated condition, between the proximal and distal ends. Also included is a generally hollow proximal tube having a proximal end and a distal end, a coupling disposed between the proximal end of the distal tube and the distal end of the proximal tube, joining the proximal and distal tubes, and an engagement system engaging and deploying the implantable medical device engaged at the distal end of the distal tube. The engagement system moves the compressible portion to the compressed condition when engaging the implantable medical device, and deploys the implantable medical device and releases the compressible portion to the elongated condition.

In another example, the engagement system can be removably fixed to the proximal end of the distal tube when engaging the implantable medical device to maintain the compressed condition. Also, the engagement system can be removably fixed to the proximal end of the proximal tube when engaging the implantable medical device.

An example of the engagement system has a locking member and a loop wire. When the loop wire interacts with the locking member to engage the implantable medical device, a force on the loop wire moves the compressible portion to the compressed condition, and the loop wire is welded to the proximal end of the distal tube to removably fix the engagement system. A force on the locking member releases the loop wire, disengages the implantable medical device, and allows the compressible portion to return the elongated condition.

Other examples have the compressible portion of the distal tube as a spiral-cut portion of the distal tube. The compressible portion can be adapted to deploy the implantable medical device engaged by the engagement system when the compressible portion moves to the elongated condition. Further, the compressible portion of the distal tube is adapted to automatically/resiliently move to the elongated condition when the engagement system is disengaged from the implantable medical device. The proximal tube can also include a flexible portion of the proximal tube itself, between the proximal and distal ends which is flexible, and the distal tube can comprise a flexible portion of the distal tube itself, between the proximal end and the compressible portion, which is flexible.

A further example has the proximal tube partially overlapping the coupling, the distal tube partially overlapping the coupling, and a gap formed on the coupling between the proximal tube and the distal tube includes a weld band to weld the coupling to the proximal tube and the distal tube. In an example, the coupling is radiopaque.

A method of detaching an implantable medical device, using the examples above can include the steps of forming a compressible portion on the distal tube between the proximal and distal ends, engaging the implantable medical device with an engagement system, applying a force to the engagement system to compress the compressible portion, fixing the engagement system to the distal tube to maintain a compressed state, and joining the distal tube and proximal tube together using the coupling. As above, the engagement system can be removably fixed to the proximal end of the distal tube.

The detachment method example can further have the step of removably fixing the engagement system to the proximal end of the proximal tube when engaging the implantable medical device. The engagement step can include the step of using the loop wire with the locking member to engage the implantable medical device; and the applying step further comprises the step of applying force to the loop wire to move the compressible portion to the compressed condition. Other example steps include applying a force on the locking member, disengaging the implantable medical device, and allowing the compressible portion to return the elongated condition.

Examples of the forming step can include the step of spiral-cutting a portion of the distal tube and the further have the step of deploying the implantable medical device engaged by

moving the compressible portion to the elongated condition. Additionally, the compressible portion of the distal tube can be adapted to automatically/resiliently move to the elongated condition when the engagement system is disengaged from the implantable medical device.

Further, the joining step further has the steps of partially overlapping the proximal tube over the coupling, partially overlapping the distal tube over the coupling, forming a gap on the coupling between the proximal tube and the distal tube comprising a weld band, and welding the coupling to the proximal tube and the distal tube at the weld band.

Brief Description of the Drawings

The above and further aspects of this invention are further discussed with reference to the following description in conjunction with the accompanying drawings, in which like numerals indicate like structural elements and features in various figures. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating principles of the invention. The figures depict one or more implementations of the inventive devices, by way of example only, not by way of limitation.

Figure 1A is an exploded view of an example of the detachment system of the present invention with the medical device partially disengaged;

Figure 1B is a magnified view of Figure 1A;

Figure 2 is an exploded view of an example of the detachment system of the present invention with the medical device engaged;

Figure 3A is a side perspective view of an example of a loop wire according to an example;

Figure 3B is a plan view of an example of a loop wire according to another example;

Figure 4 is a front perspective detail view of an opening of the loop wire in an up-turned condition in an alternate example;

Figure 5A is an exploded view of an example of the detachment system of the present invention with the medical device engaged and the loop wire secured;

Figure 5B is a magnified view of the loop wire secured to the distal tube;

Figure 6 is a plan view of the proximal and distal tubes overlapping the coupling;

Figure 7 is a plan view of the proximal and distal tubes welded to the coupling;

Figure 8 illustrates the proximal weld at the small tube;

Figure 9 illustrates the fluoroscopic view of an example of the detachment system;

Figure 10 illustrates an example method of forming the detachment system of the present invention;

Figures 11A-11D illustrate the the medical device being detached with a partial cross-section;

Figure 12 is a side view of an example of the distal tube in the compressed and expanded state; and

Figure 13 is a front-side perspective view of an example of the medical device being detached.

Detailed Description

The figures illustrate a generally hollow or tubular structure according to the present invention. When used herein, the terms "tubular" and "tube" are to be construed broadly and are not limited to a structure that is a right cylinder or strictly circumferential in cross-section or of a uniform cross-section throughout its length. For example, the tubular structure or system is generally illustrated as a substantially right cylindrical structure. However, the tubular system may have a tapered or curved outer surface without departing from the scope of the present invention.

An example of a detachment system 10 of the present invention, as illustrated in Figures 1A, 1B, and 2, can have a proximal elongated delivery hypotube assembly 100, an intermediate coupling 200, and a distal delivery tube 300. An implantable medical device 12 is engaged at one end of the distal delivery tube 300. The implantable medical device 12 can be an embolic coil, but it will be appreciated that virtually any implantable medical device 12 may be delivered and deployed by the detachment system 10 according to the present invention. The medical device 12 is engaged to the system using a locking member 140 and a loop wire 400. The medical device 12 has a locking portion 18 to interface with an engagement system 140, 400.

The proximal delivery tube 100 can have a proximal end portion 102, distal end portion 104, and a flexible portion 106 in between. The proximal delivery tube 100 forms an axial lumen 108 therein. The proximal end 102 engages with a smaller diameter tube 110 (see Figures 5A, 6-8) along the axial lumen 108. The distal delivery tube 300 can have a proximal end portion 302, distal end portion 304, and between the two, a compressible portion 306. In one example, the

compressible portion 306 can be closer to the distal end portion 304, and between the proximal end portion 302 and the compressible portion 306 can be a flexible portion 305. The distal delivery tube 300 forms an axial lumen 308 therein.

The delivery tubes 100, 300 can be made of a biocompatible material, such as stainless steel. The tubes 100, 300 can typically have a diameter of between about 0.010 inch and about 0.018 inch, a preferred tube having a diameter of approximately 0.0145 inch. These examples of tube size are suitable for delivering and deploying embolic coils to target locations, typically aneurysms, within the neurovasculature. Differently sized tubes 100, 300 comprised of other materials may be useful for different applications and are within the scope of the present invention.

The flexible portions 106, 305 allow the delivery tubes 100, 300 to bend and flex. This assists tracking the system 10 through the catheter and the tortuous path through the human vasculature. The flexible portions 106, 306 can be formed with interference spiral cuts. These cuts allow for gaps to permit bending but in one example, do not act as a spiral-cut spring. Thus, can bend and flex but do not compress.

The compressible portion 306 is axially adjustable between an elongated condition and a compressed condition. Preferably, the compressible portion 306 is formed from a spiral-cut portion of the tube 300, formed by a laser-cutting operation. However, any other arrangement allowing axial adjustment (e.g., a wound wire or spiral ribbon) is also suitable for use with detachment systems according to the present invention. Most preferably, the compressible portion 306 is in the elongated condition at rest and automatically or resiliently returns to the elongated condition from a compressed condition, unless otherwise constrained. The function of the compressible portion 306 is described in greater detail herein.

An example of the coupling 200 has a proximal section 202, a distal section 204, a weld band 206 between and an axial lumen 208 therein. The coupling 200 bridges both delivery tubes 100, 300, and can provide a radiopaque marking to assist in the alignment of the detachment system 10 in a delivery catheter while in clinical use. An example of the intermediate coupling 200 can be a marker band or coil segment.

Figures 3A, 3B, and 4 illustrate examples of the loop wire 400. The loop wire 400 can be relatively small, having the thickness of a hair in some embodiments, so it may be preferred for it to be entirely shielded by the distal end 304 of the distal delivery tube 300 to prevent damage

from accidental contact. The loop wire 400 can be an elongated wire that is looped, as in Figure 3A. The loop wire 400a can also be a single elongated wire with an opening 405, as illustrated in Figure 3B. The opening 405 can be formed by loosely bending the loop wire 400a in half. In an alternative example, the loop wire 400b comprises a flat ribbon defining an opening 405a at a distal portion and the opening 405a can be in an up-turned condition suitable for engaging an end of the implantable medical device 12. An example of the loop wire 400, 400a, 400b can be elastically deformable to the up-turned condition such that it will return to the substantially flat condition when not otherwise constrained. The loop wire 400, 400a, 400b may be formed from of any of a number of materials, including nitinol and stainless steel.

To load the detachment system 10, the locking member 140 is inserted axially within the lumens 108, 208, 308 of both tubes 100, 300 and the coupling 200. A distal end 404 of the loop wire 400 is inserted into the distal delivery tube 300 through an anchor portion 310 located on the proximal end 302 of the distal tube 300 and passed through the lumen 308 to the distal end 304. The distal end of the loop wire 404 can then be looped to form the opening 405. The opening 405 is passed through the locking portion 18 and the locking member 140 is passed through the opening 405 to engage the medical device 12. See, Figures 1A and 11A.

The loop wire 400 is pulled taught at a proximal end of the loop wire 402 and continued force F compresses the compressible portion 306. The amount of compression can be controlled by the amount of force F applied to the proximal end 402 of loop wire 400 after the medical device 12 is mounted on the distal end 304 of the distal tube 300. Figures 2 and 11A illustrate the mounted medical device 12 and the distal tube 300 in a compressed state. Once the distal tube 300 is compressed the appropriate amount, the loop wire 400 is anchor welded 408 at wire weld point 406 (between the proximal 402 and distal 404 ends) to the proximal end 302 (i.e. behind the compressible portion 306) at or approximate to the anchor portion 310 of the distal delivery tube 300. See, Figures 5A and 5B. The level of compression of the distal delivery tube 300 is adjusted by varying the amount of force F on the loop wire 400 prior to securing the loop wire 400 in place with the anchor weld 408.

Figure 6 and 7 illustrate the joining of the proximal delivery tube 100 and the distal delivery tube 300 using the coupling 200. Figure 6 illustrates the distal end 104 of the proximal tube 100 being pulled toward and overlapping the proximal end 202 of the coupling 200. Similarly, the proximal end 302 of the distal tube 300 is pulled toward and overlaps the distal

end 204 of the coupling 200. The proximal and distal tubes 100, 300, in this example, do not come into contact, but leave the weld band 206 as a gap on the coupling 200. The two tubes 100, 300 are then circumferentially welded 210 together at the weld band 206 to form a unitary device 10. The intermediate coupling 200 bridges both delivery tubes 100, 300, as well as provides a radiopaque marking for alignment of the system 10 to a delivery catheter (not illustrated) while in clinical use.

Prior to the overlapping and welding of the two tubes and coupling, 100, 200, 300, the the locking member 140 (as discussed above) is pulled through the coupling lumen 208 and the proximal tube lumen 108 through to the small tube 110. At a proximal opening 112 in the small tube 110, opposite the proximal end 102 of the proximal tube 100, the locking member 140 is welded 142 to the small tube 110. This is illustrated in Figure 8.

Figure 9 illustrates the detachment system 10 in a fluoroscopic view. Given that the coupling 200 and the medical device 12 typically are made of or have radiopaque markings, it allows for a view of the proximal 100a and distal 300a tubes having a different contrast from the coupling 200a or the medical device 12a. This provides visual feedback to indicate when the device 12a has been released (to be discussed further below).

Figure 10 illustrates an example of a method of assembling the detachment system 10. The method includes forming the compressible portion 306 on the distal tube 300 (step 1000) and forming the flexible portion 106 on the proximal tube 100 (step 1002). Step 1002 can also include forming the flexible portion 305 on the distal tube 300. The compressible portion 306 can be formed by spiral cutting the distal tube 300 or by any other means to form a tube that can be compressed and then return to its uncompressed state quickly. The flexible portion 106 of the proximal tube 100 can be interference cut or by any other means to increase the flexibility of the proximal tube 100. Once at least the distal tube 300 is ready, the medical device 12 can be engaged with an engagement system 140, 400 (step 1004) and a force F can be applied to the engagement system 140, 400 to compress the compressible portion 306 (step 1006). Here it is noted that while an example is presented above using the locking member 140 and the loop wire 400 as an engagement system, one of ordinary skill can realize different methods to secure the medical device 12 while still applying releasable force on the compressible portions 306 to be released when the engagement system 140, 400 is disengaged from the medical device 12. A section 406 of the engagement system 140, 400 is then engaged to the distal tube 300 to maintain

the compressed state of the compressible portion 306 (step 1008). A portion of the engagement system 140, 400 is threaded through the coupling 200 and the proximal tube 100 (step 1010). The distal 300 and proximal tubes 100 are joined together using a coupling 200 (step 1012). Here, in this example, the ends 104, 302 of the tubes 100, 300 overlap the coupling 200 and all three are welded together 210. The end 144 of the engagement system 140, 400 can then be joined to a proximal end 102 of the proximal tube 100 (step 1014) to complete the device 10.

Turning to Figures 11A-11D, the detachment of the medical device 12 is illustrated in more detail. Figure 11A illustrates the engagement system 140, 400 locked into the locking portion 18 of the medical device 12. The loop wire 400 opening 405 can be placed through the locking portion 18. When the locking member 140 is put through the opening 405 the medical device 12 is now secure. Force F was previously applied to place the distal tube 300 in the compressed state. Figure 11B illustrates the locking member 140 being drawn proximally to begin the release sequence for the medical device 12. Figure 11C illustrates the instant the locking member 140 exits the opening 405 and is pulled free of the loop wire 400. The distal end 404 of the loop wire 400 falls away/returns to its preformed shape (as discussed above) and exits the locking portion 18. As can be seen, there is now nothing holding the medical device 12 to the detachment system 10. Figure 11D illustrates the end of the release sequence. Here, the compressible portion 306 has expanded/returned to its original shape and “sprung” forward. An elastic force E is imparted by the distal end 304 of the distal tube 300 to the medical device 12 to “push” it away to ensure a clean separation and delivery of the medical device 12.

Figure 12 shows the distal tube 300 illustrated without the medical device 12 but with the compressible portion 306 shortened in axial length to the compressed condition. In particular, a distance “D” is illustrated by which the distal tube 300 is axially foreshortened in moving the compressible portion 306 from the elongated condition to the compressed condition. This compression can occur along the axis A. Figure 13 illustrates another view of the medical device 12 at the point of detachment. The locking member 140 has been pulled proximally so that it separated from the loop wire 400, allowing the medical device 12 to separate as the distal compressed portion 306 expands and further separates the medical device 12 from the delivery system 10. The arrow “E” denotes the elastic force “pushing” the medical device 12 away from the distal end 304 to assure a clean separation and delivery to the target site inside the patient.

The elastic force E acts in the axis A of the lumen 308 and “pushes” the medical device 12 along the same axis A (see Figures 8 and 12).

The descriptions contained herein are examples of embodiments of the invention and are not intended in any way to limit the scope of the invention. As described herein, the invention contemplates many variations and modifications of the inventive delivery and release system for a vascular occlusion device, including numerous configurations, numerous stiffness properties and methods for delivering the same. Also, there are many possible variations in the materials and configurations of the release mechanism. These modifications would be apparent to those having ordinary skill in the art to which this invention relates and are intended to be within the scope of the claims which follow.

What is Claimed is:

1. A detachment system for delivering an implantable medical device to a target location of a body vessel, comprising:
 - a generally hollow distal tube comprising:
 - a proximal end;
 - a distal end; and
 - a compressible portion of the distal tube itself, between the proximal and distal ends which is axially movable from a compressed condition to an elongated condition;
 - a generally hollow proximal tube having a proximal end and a distal end;
 - a coupling disposed between the proximal end of the distal tube and the distal end of the proximal tube, joining the proximal and distal tubes;
 - an engagement system engaging and deploying the implantable medical device engaged at the distal end of the distal tube;
 - wherein the engagement system moves the compressible portion to the compressed condition when engaging the implantable medical device, and
 - wherein the engagement system deploys the implantable medical device and releases the compressible portion to the elongated condition.
2. The detachment system of claim 1, wherein the engagement system is removably fixed to the proximal end of the distal tube when engaging the implantable medical device to maintain the compressed condition.
3. The detachment system of claim 2, wherein the engagement system is removably fixed to the proximal end of the proximal tube when engaging the implantable medical device.
4. The detachment system of claim 2, wherein the engagement system comprises:
 - a locking member; and
 - a loop wire,

wherein when the loop wire interacts with the locking member to engage the implantable medical device, a force on the loop wire moves the compressible portion to the compressed condition, and

wherein the loop wire is welded to the proximal end of the distal tube to removably fix the engagement system.

5. The detachment system of claim 4, wherein a force on the locking member releases the loop wire, disengages the implantable medical device, and allows the compressible portion to return the elongated condition.

6. The detachment system of claim 1, wherein the compressible portion of the distal tube is a spiral-cut portion of the distal tube.

7. The detachment system of claim 1, wherein the compressible portion is adapted to deploy the implantable medical device engaged by the engagement system when the compressible portion moves to the elongated condition.

8. The detachment system of claim 1, wherein the compressible portion of the distal tube is adapted to automatically/resiliently move to the elongated condition when the engagement system is disengaged from the implantable medical device.

9. The detachment system of claim 1,

wherein the proximal tube partially overlaps the coupling,

wherein the distal tube partially overlaps the coupling,

wherein a gap formed on the coupling between the proximal tube and the distal tube comprises a weld band to weld the coupling to the proximal tube and the distal tube.

10. The detachment system of claim 1, wherein the coupling is radiopaque.

11. The detachment system of claim 1,

wherein the proximal tube comprises a flexible portion of the proximal tube itself, between the proximal and distal ends which is flexible; and

wherein the distal tube comprises a flexible portion of the distal tube itself, between the proximal end and the compressible portion, which is flexible.

12. A method of detaching an implantable medical device, comprising a hollow distal tube having a proximal end and a distal end, a hollow proximal tube having a proximal end and a distal end and a coupling, comprising the steps of:

forming a compressible portion on the distal tube between the proximal and distal ends;

engaging the implantable medical device with an engagement system;

applying a force to the engagement system to compress the compressible portion;

fixing the engagement system to the distal tube to maintain a compressed state;

joining the distal tube and the proximal tube together using the coupling;

13. The detachment method of claim 12, wherein the engagement system is removably fixed to the proximal end of the distal tube.

14. The detachment method of claim 13, further comprising the step of removably fixing the engagement system to the proximal end of the proximal tube when engaging the implantable medical device.

15. The detachment method of claim 13, wherein the engagement system comprises a locking member, and a loop wire,

wherein the engagement step further comprising the step of using the loop wire with the locking member to engage the implantable medical device; and

wherein the applying step further comprises the step of applying force to the loop wire to move the compressible portion to the compressed condition.

16. The detachment method of claim 15, further comprising the steps of:

applying a force on the locking member;

disengaging the implantable medical device; and
allowing the compressible portion to return the elongated condition.

17. The detachment method of claim 12, wherein the forming step comprises the step of spiral-cutting a portion of the distal tube.

18. The detachment method of claim 12, further comprising the step of deploying the implantable medical device engaged by moving the compressible portion to the elongated condition.

19. The detachment method of claim 12, wherein the compressible portion of the distal tube is adapted to automatically/resiliently move to the elongated condition when the engagement system is disengaged from the implantable medical device.

20. The detachment method of claim 12, wherein the joining step further comprises the steps of:
partially overlapping the proximal tube over the coupling;
partially overlapping the distal tube over the coupling;
forming a gap on the coupling between the proximal tube and the distal tube comprising a weld band; and
welding the coupling to the proximal tube and the distal tube at the weld band.

ABSTRACT

A detachment system for delivering an implantable medical device to a target location of a body vessel has a generally hollow distal tube. The distal tube includes a proximal end, a distal end, and a compressible portion of the tube itself, between the proximal and distal ends which is axially movable from a compressed to an elongated condition. A generally hollow proximal tube has a proximal end and a distal end. A coupling joins the proximal and distal tubes. An engagement system engages and deploys the implantable medical device engaged at the distal end of the distal tube. The engagement system moves the compressible portion to the compressed condition when engaging the implantable medical device, and deploys the implantable medical device and releases the compressible portion to the elongated condition.

Doc Code: PA..

Document Description: Power of Attorney

PTO/AIA/82A (07-13)

Approved for use through 11/30/2014. OMB 0651-0051
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/AIA/82B 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	Filed Concurrently Herewith
First Named Inventor	Juan Lorenzo
Title	IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND CYLINDRICAL COUPLING
Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned
Attorney Docket Number	243382.000058

SIGNATURE of Applicant or Patent Practitioner

Signature	/Louis J. DelJuidice - 47,522/	Date (Optional)	2017-12-21
Name	Louis John DelJuidice	Registration Number	47522
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)	DePuy Synthes Products, 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 _____ 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.

Doc Code: PA..

Document Description: Power of Attorney

PTO/AIA/82B(07-12)

Approved for use through 11/30/2014. 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 the attached transmittal letter.

- ☒ I hereby appoint 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 equivalent):

06980

OR

- ☐ I hereby appoint Practitioner(s) named below 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 equivalent):

Name	Registration Number	Name	Registration Number

Please recognize or change the correspondence address for the application identified in the attached transmittal letter 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:

- ☐ Inventor or Joint Inventor
☐ Legal Representative of a Deceased or Legally Incapacitated Inventor
☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign
☐ 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)

SIGNATURE of Applicant for Patent

Signature	/Eugene L. Szczecina, Jr./	Date	April 3, 2013
Name	Eugene L. Szczecina, Jr.	Telephone	732-524-1479
Title and Company	DePuy Synthes Products, LLC		

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. Submit multiple forms for more than one signature, see below *.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) 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.

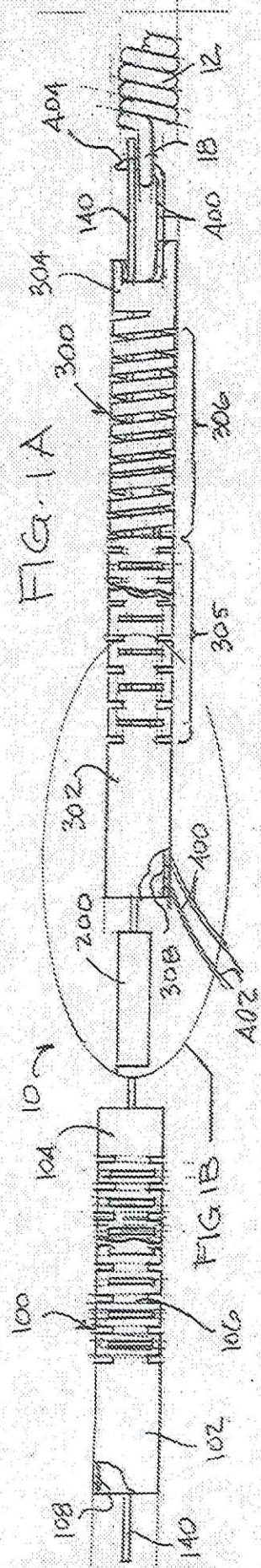


FIG. 1A

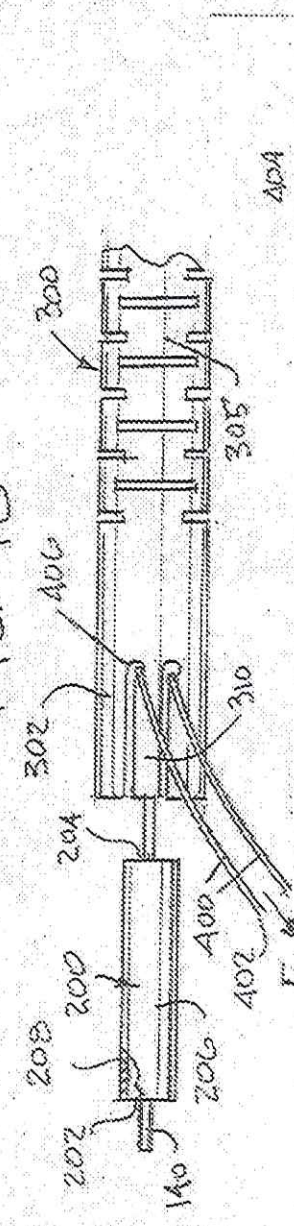


FIG. 1B

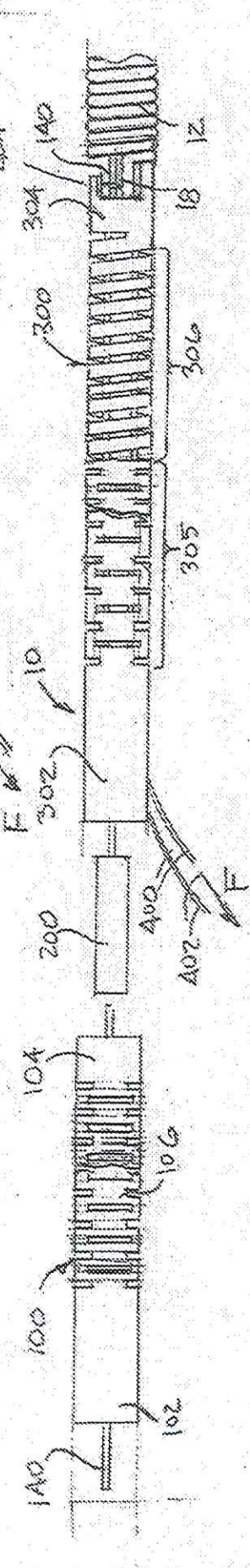


FIG. 2

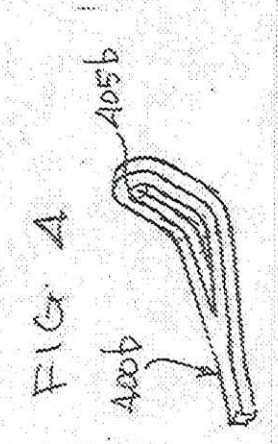


FIG. 3A

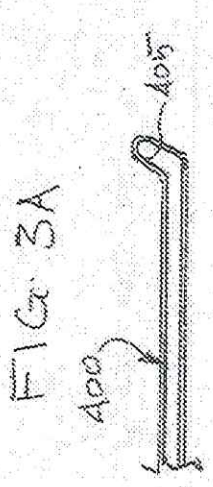


FIG. 3B



FIG. 4

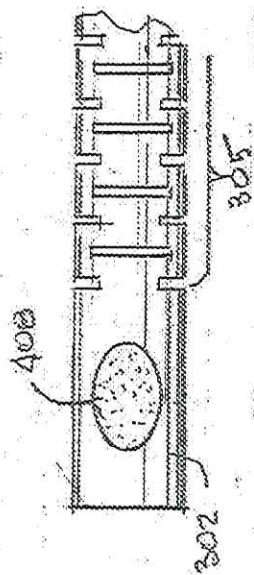
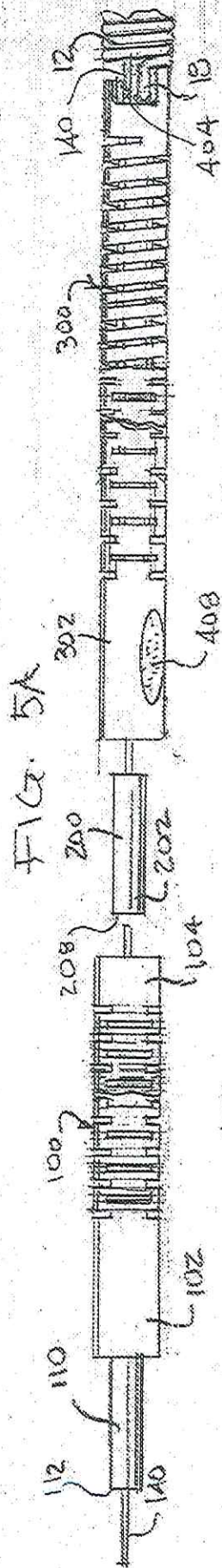


FIG 5B

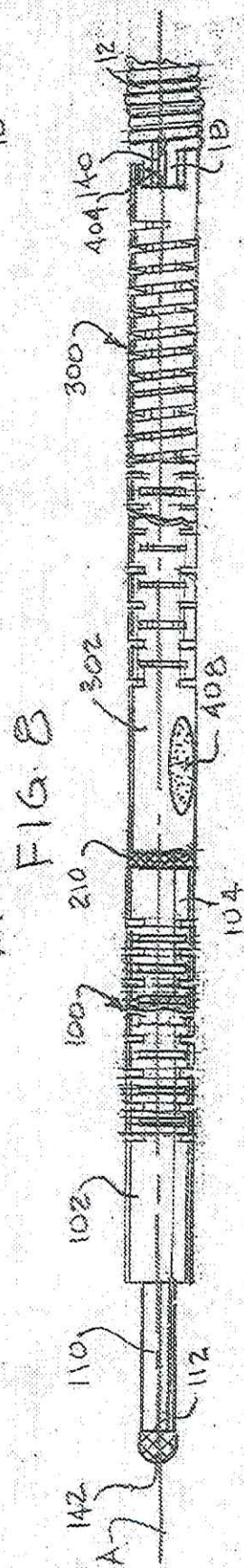
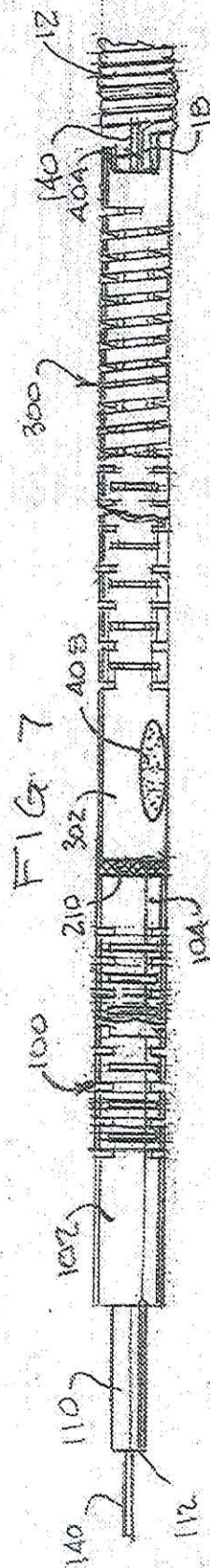
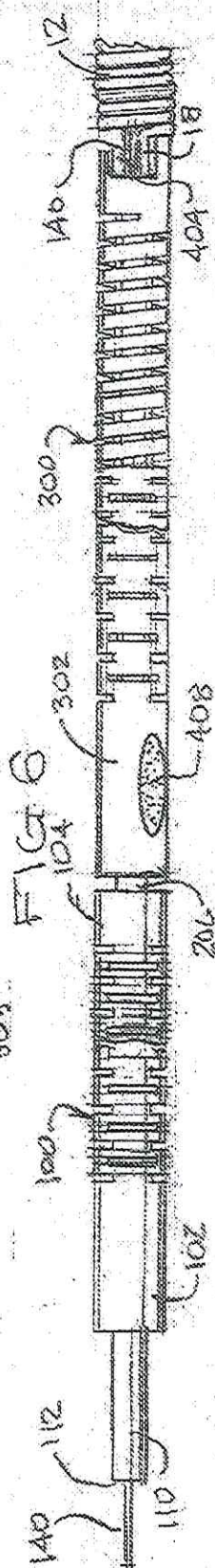


FIG. 9

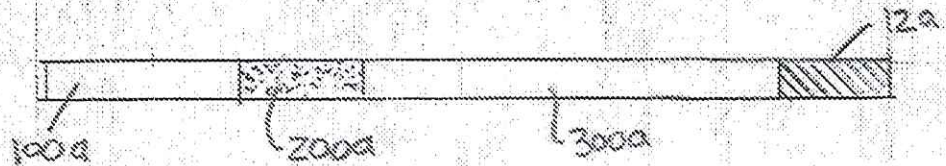
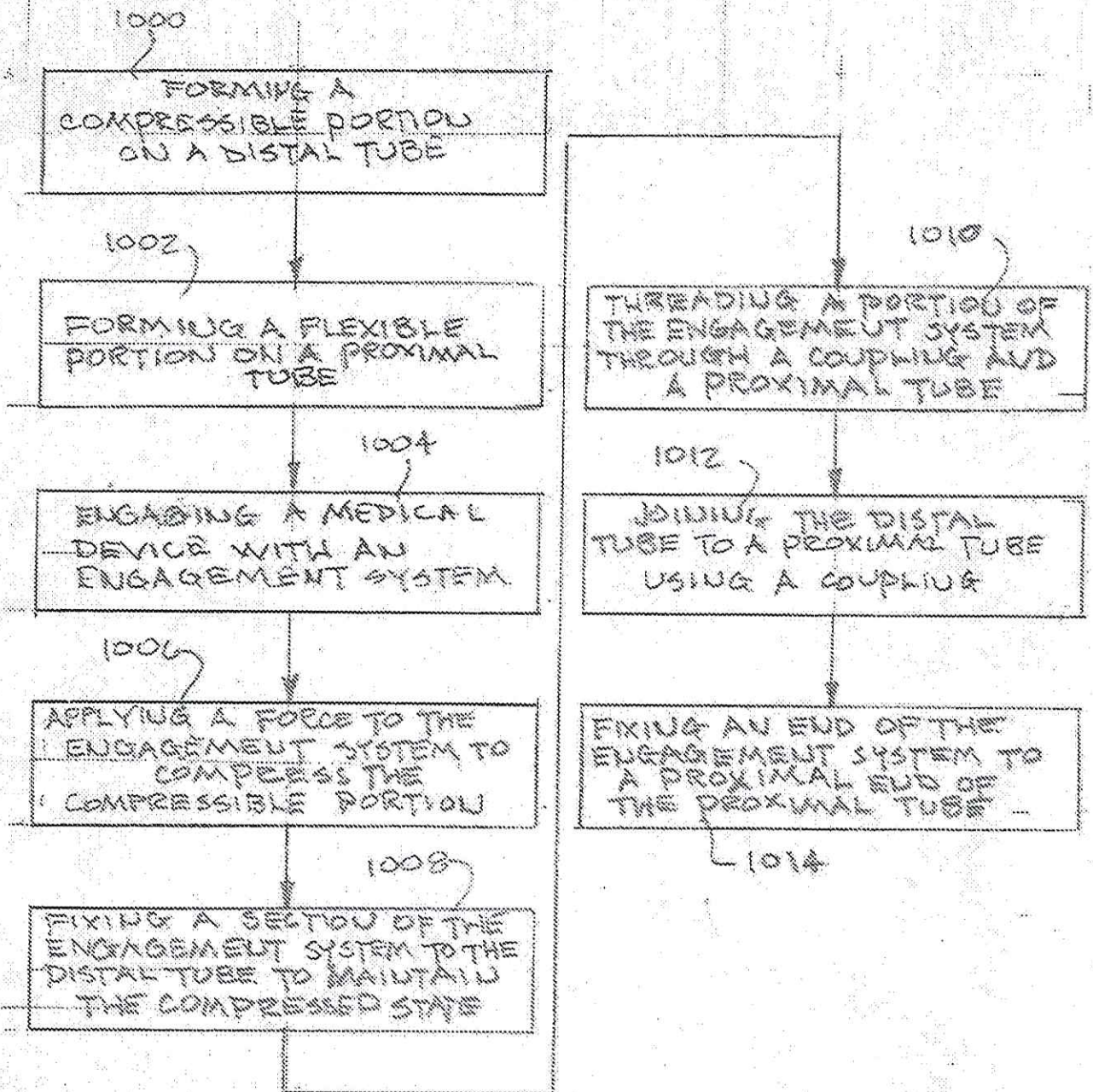
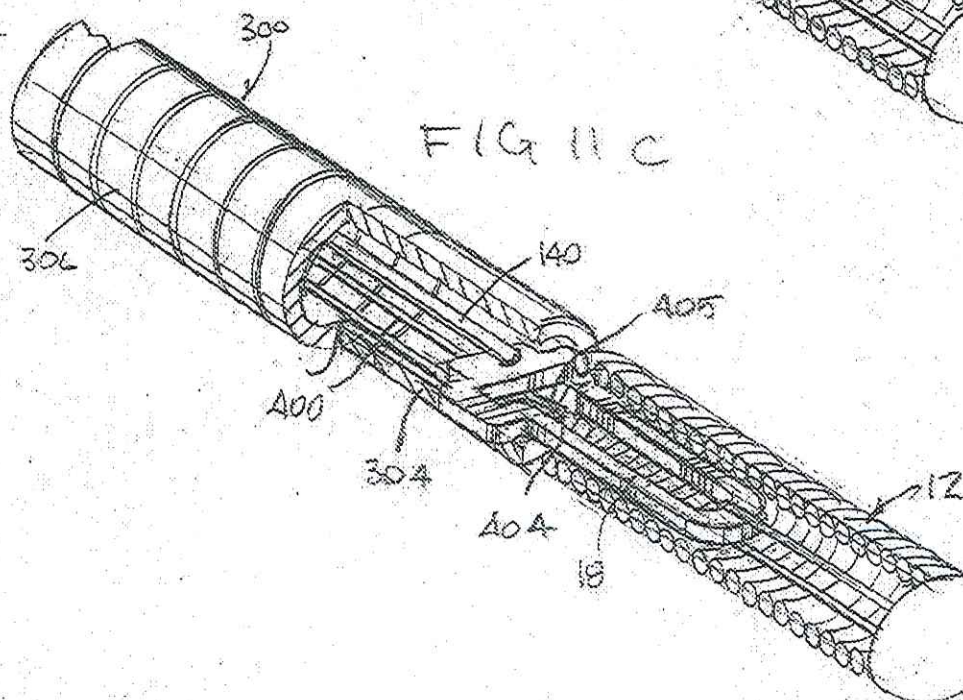
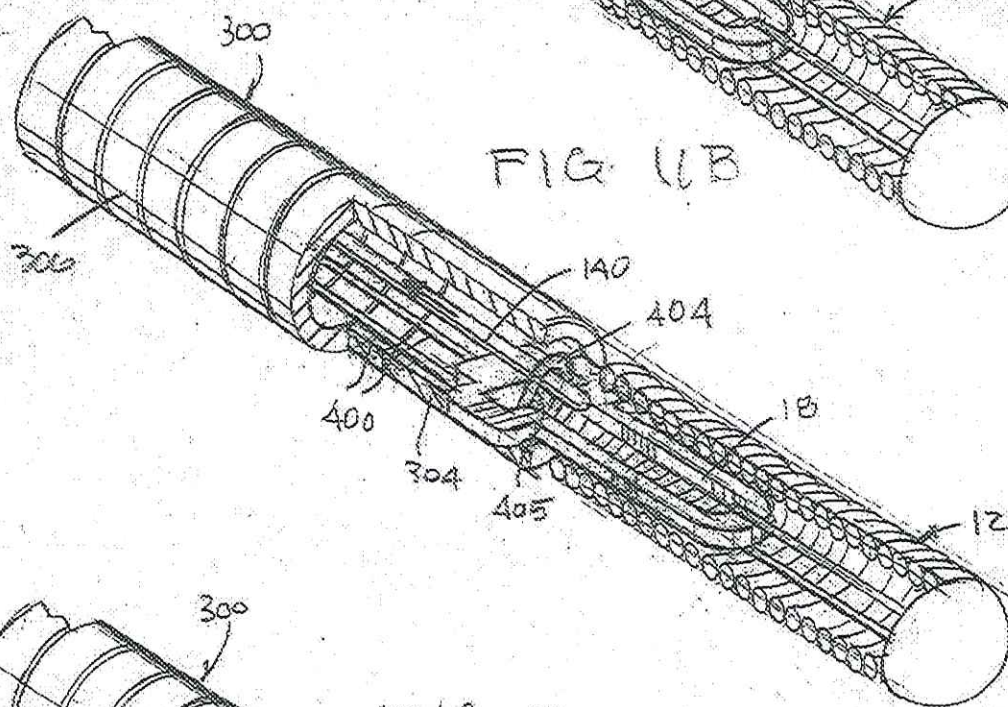
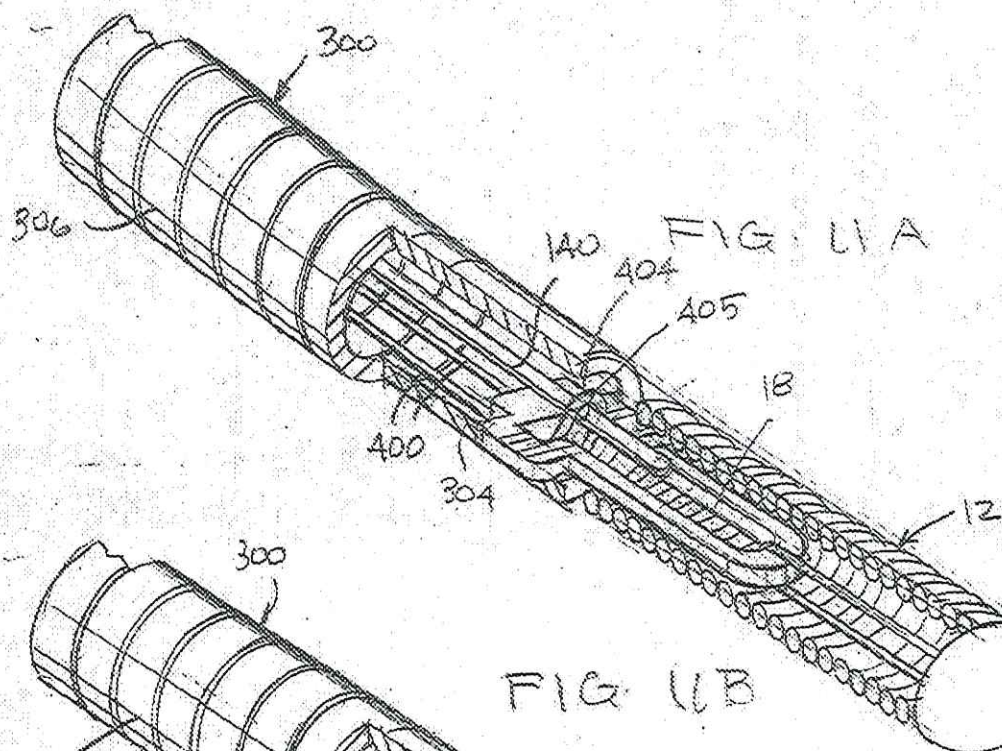
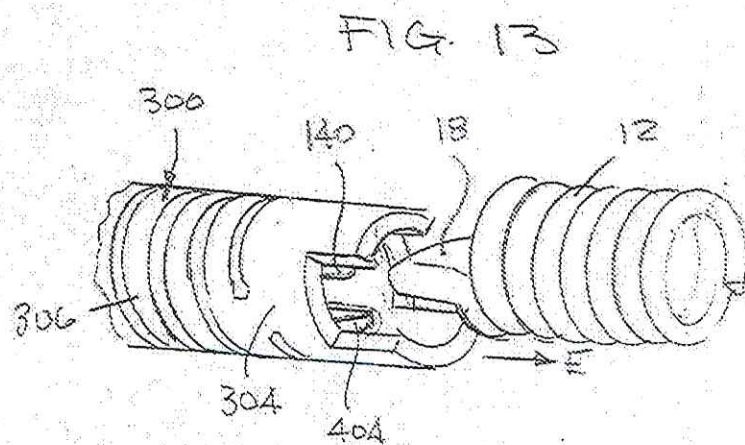
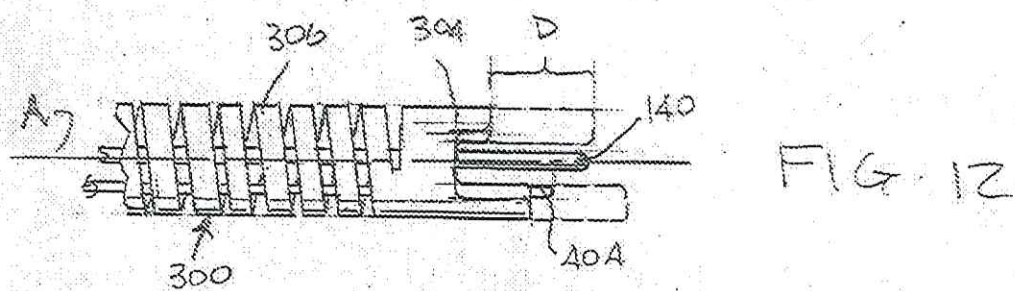
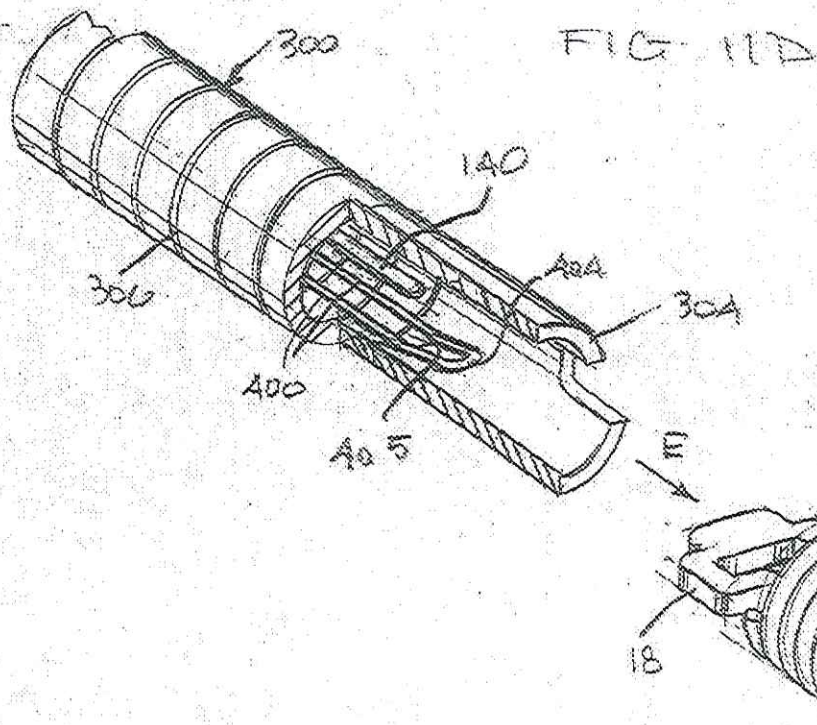


FIG. 10







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	243382.000058
		Application Number	
Title of Invention	IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND CYLINDRICAL COUPLING		
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		
	Juan		LORENZO			
Residence Information (Select One) • US Residency Non US Residency Active US Military Service						
City	Raynham	State/Province	MA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1	c/o DePuy Synthes Products, Inc.					
Address 2	325 Paramount Drive					
City	Raynham	State/Province	MA			
Postal Code	02767	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	06980		
Email Address	IPServicesNYC@troutmansanders.com		Add Email Remove Email

Application Information:

Title of the Invention	IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND CYLINDRICAL COUPLING		
Attorney Docket Number	243382.000058	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	5	Suggested Figure for Publication (if any)	

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	243382.000058
		Application Number	
Title of Invention	IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND CYLINDRICAL COUPLING		

Filing By Reference:

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

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

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

Publication Information:

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

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

Representative Information:

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

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	06980		

Domestic Benefit/National Stage Information:

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

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			
			Add

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	243382.000058
		Application Number	
Title of Invention	IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND CYLINDRICAL COUPLING		

Foreign Priority Information:

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

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

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

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

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

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	243382.000058
		Application Number	
Title of Invention	IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND CYLINDRICAL COUPLING		

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.

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	243382.000058
		Application Number	
Title of Invention	IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND CYLINDRICAL COUPLING		

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.

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

Mailing Address Information For Applicant:

Address 1	325 Paramount Drive		
Address 2			
City	Raynham	State/Province	MA
Country	US	Postal Code	02767
Phone Number		Fax Number	
Email Address			

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

Assignee Information including Non-Applicant Assignee Information:

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

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	243382.000058
		Application Number	
Title of Invention	IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND CYLINDRICAL COUPLING		

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.



Organization Name

DePuy Synthes Products, Inc.

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1	325 Paramount Drive		
Address 2			
City	Raynham	State/Province	MA
Country ⁱ	US	Postal Code	02767
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	/Louis J. DeJuidice - 47,522/		Date (YYYY-MM-DD)	2017-12-21
First Name	Louis John	Last Name	DeJuidice	Registration Number
			47522	

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

Add

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	243382.000058
		Application Number	
Title of Invention	IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND CYLINDRICAL COUPLING		

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 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.

General Assignment

WHEREAS, Juan LORENZO, having its place of business at 325 Paramount Drive Raynham, MA 02767 (hereinafter referred to as "Assignor"), is the owner of certain new and useful inventions relating to

**IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH
SPLIT TUBE AND CYLINDRICAL COUPLING**

for which application was filed in the U.S. Patent and Trademark Office on December 21, 2017 and assigned Serial No. 15/850,993.

WHEREAS, DePuy Synthes Products, Inc., having its place of business at 325 Paramount Drive Raynham, MA 02767 (hereinafter referred to as "Assignee") is desirous of acquiring Assignors' entire right, title and interest therein, including the right to claim priority thereof,

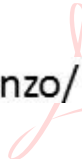
NOW, THEREFORE, BE IT KNOWN, that in view of good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Assignor hereby assigns and transfers, for all countries in the world, to said Assignee its entire right, title and interest, including the right to claim priority, in and to all said inventions disclosed in said applications and in and to said applications, and all foreign equivalents thereof, including all substitutions, divisions, and continuations thereof, and in and to all Letters Patent, that may be granted for said inventions, and in and to all extensions, renewals, and reissues thereof, the same to be held and enjoyed by said Assignee, its successors and assigns, as fully and entirely as the same would have been held and enjoyed by Assignor if this Assignment had not been made.

And for purpose of obtaining patent protection in any foreign country, the Assignor hereby agrees that, any right, title and interest, in and to all said inventions disclosed in said applications and in and to said applications, and all foreign equivalents thereof can be directly assigned by the inventors to the Assignee without explicit confirmation of the Assignor.

The Assignor agrees that this general assignment is effective from December 21, 2017.

IN TESTIMONY WHEREOF, the Assignor set hereunto its hand and seal this date.

FOR Juan Lorenzo

 Digitally signed by JUAN LORENZO
DN: c=US, o=JNJ, ou=Subscribers,
cn=JUAN LORENZO,
0.9.2342.19200300.100.1.1=118229
Reason: I attest to the accuracy and
integrity of this document.
Date: 2018.12.18 15:46:08 -05'00'

Name

Title of Authorized Signatory

Date



UNITED STATES PATENT AND TRADEMARK OFFICE

UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

DECEMBER 20, 2018

PTAS

TROUTMAN SANDERS
875 THIRD AVENUE
NEW YORK, NY 10022

505245765

UNITED STATES PATENT AND TRADEMARK OFFICE NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT RECORDATION BRANCH OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE COPY IS AVAILABLE AT THE ASSIGNMENT SEARCH ROOM ON THE REEL AND FRAME NUMBER REFERENCED BELOW.

PLEASE REVIEW ALL INFORMATION CONTAINED ON THIS NOTICE. THE INFORMATION CONTAINED ON THIS RECORDATION NOTICE REFLECTS THE DATA PRESENT IN THE PATENT AND TRADEMARK ASSIGNMENT SYSTEM. IF YOU SHOULD FIND ANY ERRORS OR HAVE QUESTIONS CONCERNING THIS NOTICE, YOU MAY CONTACT THE ASSIGNMENT RECORDATION BRANCH AT 571-272-3350. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, MAIL STOP: ASSIGNMENT RECORDATION BRANCH, P.O. BOX 1450, ALEXANDRIA, VA 22313.

RECORDATION DATE: 12/19/2018

REEL/FRAME: 047820/0664
NUMBER OF PAGES: 3

BRIEF: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

DOCKET NUMBER: 243382.000058

ASSIGNOR:
LORENZO, JUAN

DOC DATE: 12/18/2018

ASSIGNEE:
DEPUY SYNTHES PRODUCTS, INC.
325 PARAMOUNT DRIVE
RAYNHAM, MASSACHUSETTS 02767

APPLICATION NUMBER: 15850993

FILING DATE: 12/21/2017

PATENT NUMBER:

ISSUE DATE:

TITLE: IMPLANTABLE MEDICAL DEVICE DETACHMENT SYSTEM WITH SPLIT TUBE AND CYLINDRICAL COUPLING

ASSIGNMENT RECORDATION BRANCH
PUBLIC RECORDS DIVISION

TRADUCCIÓN OFICIAL No. 100/CKM REALIZADA POR DIEGO F. VARGAS ZAMORA, TRADUCTOR E
INTÉRPRETE OFICIAL INGLÉS-ESPAÑOL, RECONOCIDO MEDIANTE RESOLUCIÓN No. 0001 DEL 4 DE
ENERO DE 1999 DEL MINISTERIO DE JUSTICIA

Referencia del Apoderado No. 243382/000058

Cesión General

CONSIDERANDO que Juan LORENZO, domiciliado en 325 Paramount Drive, Raynham, MA 02767 (denominado en adelante como el "Cedente"), es propietario de ciertas y útiles invenciones relativas a

SISTEMA DE DESFIJACIÓN DE DISPOSITIVO MÉDICO IMPLANTABLE CON
TUBO DIVIDIDO Y ACOPLAMIENTO METÁLICO

para la cual se presentó una solicitud ante la Oficina de Marcas y Patentes de los Estados Unidos el 21 de diciembre de 2017 y a la cual le fue asignado el número de serie 15/850,993.

CONSIDERANDO que DePuy Synthes Products, Inc., domiciliada en 325 Paramount Drive, Raynham, MA 02767 (en adelante la "Cesionaria") desea adquirir todo el derecho, título e interés del cedente en esta, incluyendo el derecho de reivindicar prioridad respecto a la misma.

POR CONSIGUIENTE, POR EL PRESENTE SE DEJA CONSTANCIA que en razón de contraprestación válida y legal, el recibo y suficiencia de la cual se reconoce por el presente, el Cedente por el presente cede y transfiere, para todos los países del mundo, a dicha Cesionaria, todo su derecho, título e interés, incluyendo el derecho de reivindicar prioridad en y a todas dichas invenciones divulgadas en dichas solicitudes, así como en y a dichas solicitudes y todas las equivalencias extranjeras de las mismas, incluyendo todas las sustituciones, divisiones y continuaciones de las mismas, así

DIEGO F. VARGAS Z.
TRADUCTOR E INTÉRPRETE OFICIAL
ESPAÑOL - INGLÉS - INGLÉS - ESPAÑOL
RES. 0001 DE ENERO 4 DE 1999
MINISTERIO DE JUSTICIA

como en y todas las Patentes de Invención, que se lleguen a otorgar a dichas invenciones, y a todas las prórrogas, renovaciones y reexpediciones de las mismas, para que estas sean tenidas y disfrutadas por dicha Cesionaria, sus sucesores y cesionarios, tan completa y plenamente como estas hubieran sido tenidas y disfrutadas por el Cedente, si no se hubiera realizado la presente Cesión.

Y con el objeto de obtener protección de patentes en cualquier país extranjero, el Cedente por el presente acuerda que cualquier derecho, título e interés en y todas dichas invenciones divulgadas en dichas solicitudes, así como en y a dichas solicitudes y todas las equivalencias extranjeras de las mismas, pueden ser cedidas directamente por los inventores a la Cesionaria, sin que medie confirmación explícita del Cedente.

El Cedente acuerda que la presente cesión general está vigente desde el 21 de diciembre de 2017.

EN TESTIMONIO DE LO CUAL, el Cedente ha fijado su firma y sello el día de hoy.

POR Juan Lorenzo

/Juan Lorenzo/

Firmado Digitalmente por JUAN LORENZO
DN:c=US, o=JNJ, ou=Suscriptores,
cn=JUAN LORENZO
0.9.2342.19200300.100.1.1=118229
Motivo: Certifico la exactitud e
Integridad de este documento.
Fecha: 2018.12.18 15:46:08-05'00'

Firma

Nombre

Cargo del Signatario Autorizado

Fecha

FIN DE LA TRADUCCIÓN

Bogotá D.C., 26 de febrero de 2019

Es traducción fiel y completa del documento original realizada por: DIEGO F. VARGAS ZAMORA,
Traductor e Intérprete Oficial, Resolución No. 0001 de 1999 del Ministerio de Justicia de Colombia.

DIEGO F. VARGAS Z
TRADUCTOR E INTERPRETE OFICIAL
ESPAÑOL - INGLES - INGLES - ESPAÑOL
RES. 0001 DE ENERO 4 DE 1999
MINISTERIO DE JUSTICIA

P-2018/16513

Señores

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

DIRECCIÓN DE NUEVAS CREACIONES

E. S. D.

Ref.: Expediente No. NC2018/0013983

Solicitud de registro patente de invención a nombre de **DEPUY SYNTHES PRODUCTS, INC.**

1. Yo, CAROLINA DAZA MONTALVO, identificada como aparece al pie de mi firma, domiciliada en la Carrera 11 No. 86-53, piso 3, obrando como apoderada de la solicitante de la patente de invención que se tramita en el expediente de la referencia, **DEPUY SYNTHES PRODUCTS, INC.**, en respuesta al Oficio No. 77 notificado el 2 de enero de 2019, atentamente me permito presentar los siguientes documentos:

1.1. **Cesión:** Presento con este escrito el documento en que consta la cesión de derechos del inventor LORENZO Juan, a favor de la sociedad solicitante DEPUY SYNTHES PRODUCTS, INC., con la correspondiente traducción al español.

1.2. **Prioridad:** Allego copia certificada de la solicitud de E.U. No. 15/850,993 del 21 de diciembre de 2017, de la cual se reivindica prioridad en el trámite de la presente solicitud. Adicionalmente, se presenta la correspondiente traducción al español. Este documento está siendo presentado dentro del término legal correspondiente, esto es 21 de abril de 2019, de conformidad con lo dispuesto en el Artículo 10 de la Decisión 486 de la Comisión de la Comunidad Andina.

2. Habiendo dado cumplimiento al requerimiento de ese Despacho, solicito respetuosamente se tengan en cuenta los documentos aportados y se continúe con el trámite de la presente solicitud.

Señor Director,



CAROLINA DAZA MONTALVO

C.C. 66.783.790 de Palmira Valle

TP-141563 CSJ

notificaciones@clarkemodet.com.co