

ESCOBAR - URIBE ASOCIADOS

A B O - G A D O S

Carrera 11A No 94-76 - Of 305 - PO Box 94948, Bogotá D.C. - Colombia

Tels (571) 6162051 - Fax (571) 6161889

www.escobaruribe.com - info@escobaruribe.com

SUPERINDUSTRIA Y COMERCIO

Radicacion : 05117555 00000002

Folios: 59

Fecha (AMD): 2006-01-27 14:13:07

Tramite : 002 PATENTES D 1 REGISTRO/ 444 REPUESTA

Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

2903/P

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO DIVISION DE NUEVAS CREACIONES

E. S. D.

Ref.: Expediente No. 05-117 555
Solicitud de Patente a nombre de
Codman & Shurtleff, Inc.

Yo, JIMENA ESCOBAR URIBE, identificada como aparece al pie de mi firma, domiciliada en la Carrera 11 A No 94-76, of 305, obrando como apoderada de la sociedad **Codman & Shurtleff, Inc.**, domiciliada en Raynham, Massachusetts, Estados Unidos de América, solicitante de la patente de la referencia, en respuesta al oficio No. 11312, notificado por fijación en lista el día 01 de diciembre de 2005, atentamente me permito presentar los siguientes documentos.

1. Copia certificada de la solicitud de patente número 10/995,947 presentada en Estados Unidos de América el día 22 de noviembre de 2004, con la debida traducción de lo pertinente.
2. Dibujos formales (los cuales fueron anunciados en el capítulo descriptivo) de acuerdo con lo establecido en el artículo 4-d del Decreto 117 de 1994.
3. Artes finales en tamaño 12 x 12 centímetros (por duplicado) de la figura característica.
4. Documento (1) de cesión suscrito por el inventor a favor de mi mandante.

Sobre el particular, es importante resaltar que de conformidad con las normas legales vigentes, artículo 1 de la Resolución 210 de 2001, expedida por el Superintendente de Industria y Comercio y artículo 2 de la Convención de la Haya, el documento en inglés que se pretenda aportar como parte de los trámites de propiedad industrial ante la Superintendencia de Industria y Comercio no

ESCOBAR - URIBE ASOCIADOS

A B O G A D O S

Carrera 11A No 94 -76 - Of 305 - PO Box 94948, Bogotá, D.C. - Colombia

Tels (571) 6162051 - Fax (571) 6161889

www.escobaruribe.com - info@escobaruribe.com

46

requieren traducción. Por otro lado, la legalización consular y/o diplomática de los documentos expedidos en el extranjero no es necesaria. Por lo tanto, el documento de cesión anexo a este memorial es válidamente presentado en idioma inglés y con la correspondiente Apostilla.

Espero con esto haber dado cabal cumplimiento a lo solicitado por ese despacho y de conformidad con lo indicado en los artículos 3º, inciso 3; 35, inciso 2 y 59, inciso 2 del CCA, al analizar este memorial, atentamente ruego se traten todas las cuestiones planteadas con motivo del mismo.

Señor Superintendente,


JIMENA ESCOBAR URIBE
C.C.39.779.452 de Usaquén
T.P. 68228
Cód. 5376

48

ESTADOS UNIDOS DE AMERICA
A TODOS AQUELLOS A QUIENES EL PRESENTE LLEGUE.

DEPARTAMENTO DE COMERCIO DE LOS ESTADOS
UNIDOS

Oficina de Patentes y Marcas de los Estados Unidos

Noviembre 28 de, 2005

La presente es para certificar que el anexo es una copia fiel de los registros de la Oficina de Patentes y Marcas de los Estados Unidos, de los documentos de la solicitud de patente identificada más adelante, que cumplió con los requerimientos para que se le concediera una fecha de presentación de acuerdo con 35 USC 111.

Número de Solicitud: 10/995,947 .

Fecha de Presentación: Noviembre 22 de 2004

EL CÓDIGO DEL PAÍS Y EL NÚMERO DE SU SOLICITUD DE PRIORIDAD PARA SER USADO EN UNA PRESENTACIÓN EXTRANJERA BAJO EL CONVENIO DE PARIS, ES US10/995,947

Por la autoridad del
Comisionado de Patentes y Marca

(fdo) P. SWAIN
Oficial Certificador
Sello oficial de la Oficina de Patentes y Marcas de los
Estados Unidos de América

48 ST
4

PA 1397188



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

November 28, 2005

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: 10/995,947

FILING DATE: November 22, 2004

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS US10/995,947

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



**P. SWAIN
Certifying Officer**

18328 U.S. PTO
112204

49 82
22264 U.S. PTO
10/995947
112204

PTO/SB/05 (08-04)
Approved for use through 07/31/2006 OMB 0651-0032
U.S. Patent and Trademark Office U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

UTILITY PATENT APPLICATION TRANSMITTAL (ONLY FOR NEW NONPROVISIONAL APPLICATIONS UNDER 37 CFR 1.53(b))	Attorney Docket No	022719-0059
	First Inventor	Robert G. Kraus
	Title	VENTRICULOSTOMY RESERVOIR
	Express Mail Label No	EV324847690US

APPLICATION ELEMENTS See MPEP chapter 600 concerning utility patent application contents	ADDRESS TO: Commissioner for Patents P O Box 1450 Alexandria, VA 22313-1450
1. ☐ Fee Transmittal Form (e.g., PTO/SB/17) (Submit an original and a duplicate for fee processing) 2. ☐ Applicant claims small entity status. See 37 CFR 1.27 3. ☒ Specification [Total Pages 18] Both the claims and abstract must start on a new page (For information on the preferred arrangement, see MPEP 608.01(a)) 4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 7] 5. Oath or Declaration [Total Sheets 1] a. ☐ Newly executed (original or copy) b. ☐ A copy from a prior application (37 CFR 1.83(d)) (For continuation/divisional with Box 18 completed) 6. ☒ Application Data Sheet. See 37 CFR 1.78 7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix) ☐ Landscape Table on CD 8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, items a - c. are required) a. ☐ Computer Readable Form (CRF) b. Specification Sequence Listing on ☐ CD-ROM or CD-R (2 copies), or ☐ Paper c. ☐ Statements verifying identity of above copies	ACCOMPANYING APPLICATION PARTS 9. ☐ Assignment Papers (cover sheet & document(s)) Name of Assignee 10. ☐ 37 CFR 3.73(b) Statement ☐ Power of Attorney (when there is an assignee) 11. ☐ English Translation Document (if applicable) 12. ☐ Information Disclosure Statement (PTO/SB/08 or PTO-1446) 14. ☒ Return Receipt Postcard (MPEP 503) (Should be specifically itemized) 15. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed) 16. ☐ Nonpublication Request under 35 U.S.C. 122 (b)(2)(B)(i) Applicant must attach form PTO/SB/35 or its equivalent. 17. ☒ Other Application Title Sheet

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.78

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No _____

Prior application information Examiner _____ Art Unit _____

19. CORRESPONDENCE ADDRESS

☒ The address associated with Customer Number:

021125

 OR ☐ Correspondence address below

Name	William C. Geary III NUTTER MCCLENNEN & FISH LLP				
Address	World Trade Center West 155 Seaport Boulevard				
City	Boston	State	MA	Zip Code	02210-2604
Country	US	Telephone	(617) 439-2766	Fax	(617) 310-9766

Signature		Date	November 22, 2004
Name (Print/Type)	William C. Geary III	Registration No (Attorney/Agent)	31,359

Utility Patent Application Transmittal	
I hereby certify that this correspondence is being deposited with the U.S. Postal Service as Express Mail, Airmail No. EV324847690US, in an envelope addressed to: MS Patent Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below	
Dated: November 22, 2004	Signature (William C. Geary III)

1380051 1

Application Data Sheet

Application Information

Application Type:: Regular
Subject Matter:: Utility
Suggested Group Art Unit:: N/A
CD-ROM or CD-R?: None
Sequence submission?: None
Computer Readable Form (CRF)?:: No
Title:: VENTRICULOSTOMY RESERVOIR
Attorney Docket Number:: 022719-0059
Request for Early Publication?: No
Request for Non-Publication?: No
Total Drawing Sheets:: 7
Small Entity?: No
Petition included?: No
Secrecy Order in Parent Appl.?: No

Applicant Information

Applicant Authority Type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Robert
Middle Name:: G.
Family Name:: Kraus
City of Residence:: Attleboro
State or Province of Residence:: MA
Country of Residence:: US
Street of mailing address:: 46 Doral Lane
City of mailing address:: Attleboro
State or Province of mailing address:: MA
Postal or Zip Code of mailing address:: 02703

51 39

Applicant Authority Type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: Robert
Family Name:: Taylor
City of Residence:: Coventry
State or Province of Residence:: RI
Country of Residence:: US
Street of mailing address:: 261 Weaver Hill Road
City of mailing address:: Coventry
State or Province of mailing address:: RI
Postal or Zip Code of mailing address:: 02816

Applicant Authority Type:: Inventor
Primary Citizenship Country:: US
Status:: Full Capacity
Given Name:: John
Family Name:: Buonanno
City of Residence:: Bristol
State or Province of Residence:: RI
Country of Residence:: US
Street of mailing address:: 7 Harbor View
City of mailing address:: Bristol
State or Province of mailing address:: RI
Postal or Zip Code of mailing address:: 02809

Correspondence Information

Correspondence Customer Number:: 021125

Representative Information

Representative Customer Number:: 021125

52 ~~55~~

Domestic Priority Information

Foreign Priority Information

Assignee Information

1381129.1

53 ~~56~~

APPLICATION
FOR
UNITED STATES PATENT

Ventriculostomy Reservoir

Inventors:

Robert Kraus, Robert Taylor, and John Buonanno

NUTTER, McCLENNEN & FISH, LLP
World Trade Center West
155 Seaport Blvd.
Boston, MA 02210-2604
Telephone: (617) 439-2000
Atty. Docket No.: 22719-59

EXPRESS MAIL NO.: EV324847690US

54 ~~88~~

VENTRICULOSTOMY RESERVOIR

CROSS-REFERENCE TO RELATED APPLICATIONS

[001] Not applicable.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH

[002] Not Applicable.

FIELD OF THE INVENTION

[003] The present invention relates to surgically implantable valves, and in particular to valves capable of resealable assembly and adapted for the drainage of cerebrospinal fluid from the ventricle of the brain.

BACKGROUND OF THE INVENTION

[004] Hydrocephalus is a condition afflicting patients who are unable to regulate cerebrospinal fluid flow through their body's own natural pathways. Produced by the ventricular system, cerebrospinal fluid (CSF) is normally absorbed by the body's venous system. In a patient suffering from hydrocephalus, the cerebrospinal fluid is not absorbed in this manner, but instead accumulates in the ventricles of the patient's brain. If left untreated, the increasing volume of fluid elevates the patient's intracranial pressure and can lead to serious medical conditions such as compression of the brain tissue and impaired blood flow to the brain.

[005] The treatment of hydrocephalus has conventionally involved draining the excess fluid away from the ventricles and rerouting the cerebrospinal fluid to another area of the patient's body, such as the abdomen or vascular system. A drainage system, which usually includes a shunt valve, is often used to carry out the transfer of fluid. In order to install the shunt valve, typically a scalp incision is made and a small hole is drilled in the skull. A proximal, or ventricular, catheter is installed in the ventricular cavity of the patient's brain, while a distal, or drainage, catheter is installed in that portion of the patient's body where the excess fluid is to be

55 \$8

reintroduced. Ventriculostomy reservoirs are often utilized in connection with such shunt valves to provide a convenient location for sampling accumulated cerebrospinal fluid as close to the brain ventricles as possible. Such ventriculostomy reservoirs may be placed over a burr hole through the skull to facilitate sampling of cerebrospinal fluid before the implantation of the fluid conduit.

[006] Conventional ventriculostomy reservoirs typically include a metal base having a catheter connector, an integral, upwardly extending cylindrical wall portion, and a flange portion integrally formed with and overlying the wall portion. A cap made of a silicone elastomer material is typically provided to enclose the upper end of the base and define, with the base, an internal reservoir.

[007] The cap and the base of such known ventriculostomy reservoirs are usually separated prior to implantation. The surgeon, after drilling a burr hole through the skull, attaches a catheter to the connector at the lower end of the base, positions the base, and assembles the cap.

[008] One drawback of the conventional ventriculostomy reservoirs is the difficulty of manipulating the various components and assembling them into a fluid-tight and securely mated device within a patient. As will become apparent from the following description, the present invention satisfies these needs and provides other related advantages.

SUMMARY OF THE INVENTION

[009] The present invention generally provides a ventriculostomy reservoir device that is useful in treating hydrocephalus. The ventriculostomy reservoir device includes a base having an upper and lower opening, the upper opening defining an internal reservoir well, and a cap having an open bottom portion. The device further includes a flange element having a first portion disposed within a portion of the cap and a second portion extending distally beyond the open bottom portion of the cap and adapted for detachably mating with the internal reservoir well of the base. The detachable connection is facilitated by a snap fit element on the flange element that is adapted to cooperate with a complementary feature on the base to secure the flange

56 58

element and the base together. The device also includes at least one sealing element disposed between the internal reservoir well and the flange element. The sealing element is adapted to provide a fluid tight seal between the base and the flange element when the base and the flange element are detachably mated.

[0010] Unlike prior art reservoirs with connector elements that perform both the securing and the sealing functions, the present invention includes separate snap fit and sealing elements. The snap fit element is particularly well adapted to provide a secure and detachable connection between the base and the flange, while the seal is particularly well suited to provide a fluid tight closure. For example, the seal can be formed from a more pliable material than the snap fit connection so that the seal can conform to the area between the base and the flange.

[0011] In one aspect of the invention, the snap fit element includes a protruding feature formed on the flange element that is matable with a complementary feature formed on the internal reservoir well. For example, the protruding feature can be formed on an outer surface of the flange element and a complementary recess can be formed on the base. The flange element and base are then mated by seating the flange element inside the internal reservoir well. In an alternative embodiment, the protruding feature can be formed on the base and the complementary feature can be formed on the flange element.

[0012] In another aspect of the invention, the snap fit element can include a split ring disposed in a recess on the flange element that is adapted to mate with a complementary feature formed on internal reservoir well. The split ring is sized and configured such that during assembly of the flange element and the base, the split ring is compressed. When assembly is complete, the split ring aligns with a recess and expands into position within the recess.

[0013] In yet another aspect of the invention, the snap fit element may take the form of multiple locking fingers, each of which is matable with a recess. For example, the base can include multiple locking fingers each having a protruding feature at a first end, and the flange element can include a complementary mating recess adapted to mate with the multiple locking fingers.

[0014] In a further aspect of the invention, the base can include an egress lumen having an upper portion and a lower portion. The snap fit element of the present invention can be formed between the egress lumen and the flange element. For example, the egress lumen can include a barb adapted to mate with a receiving area on the flange element.

[0015] The sealing element of the present invention can, in one aspect, be positioned within a sealing recess on the inner surface of the base and/or on the outer surface of the flange element. In another aspect, the device can include multiple seals in multiple sealing recesses.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The invention can be more fully understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

[0017] FIG. 1 is a perspective view of one embodiment of the ventriculostomy reservoir device of the present invention;

[0018] FIG. 2A is a sectional view of the ventriculostomy reservoir device of FIG. 1;

[0019] FIG. 2B is a sectional view of the ventriculostomy reservoir device of FIG. 1 in a disassembled state;

[0020] FIG. 2C is a partially cut-away view of the ventriculostomy reservoir device of FIG. 1 in a disassembled state;

[0021] FIG. 3 is a sectional view of another embodiment of the ventriculostomy reservoir device of the present invention;

[0022] FIG. 4A is a sectional view of yet another embodiment of the ventriculostomy reservoir device of the present invention;

[0023] FIG. 4B is a partially cut-away view of the ventriculostomy reservoir device of FIG. 4A;

58 67

[0024] FIG. 5 is a sectional view of still another embodiment of the ventriculostomy reservoir device of the present invention;

[0025] FIG. 6A is a sectional view an alternative embodiment of the ventriculostomy reservoir device of the present invention;

[0026] FIG. 6B is a sectional view of the ventriculostomy reservoir device of FIG. 6A shown in a disassembled state;

[0027] FIG. 7A is a sectional view of an additional embodiment of the ventriculostomy reservoir device of the present invention; and

[0028] FIG. 7B is a perspective view of the ventriculostomy reservoir device of FIG. 7A.

DETAILED DESCRIPTION OF THE INVENTION

[0029] In general, the present invention provides a ventriculostomy reservoir device having a reservoir area and a cap positionable over the reservoir area. A snap connection and a sealing element connect the reservoir area to the cap and thereby provide a detachable, fluid-tight connection. In one aspect, the snap connection is formed between non-elastomeric, substantially rigid materials such that the reservoir area and the cap are securely mated, while the seal is formed of a more pliable material to facilitate a fluid tight seal.

[0030] FIG. 1 illustrates an assembled ventriculostomy reservoir device 10, including a cap 12 and a base 14. The cap and the base are able to be mated to one another as described below and the assembled device encloses an internal reservoir well which can be sampled by inserting a sampling tool through cap 12.

[0031] FIGS. 2A through 2C illustrate the construction of the device 10 pictured in FIG. 1. As shown, cap 12 includes a closed top and an open bottom portion. The ingress lumen 16 extends through the cap 12 into the internal reservoir well 20 via the open bottom portion. In another embodiment (not illustrated), the cap may include a closed bottom portion with the ingress lumen 16 feeding directly into internal reservoir well 20.

[0032] The base 14 defines an internal reservoir well 20 which is disposed below cap 12 when the ventriculostomy device is assembled. As shown, base 14 can have a funnel-like shape including an open top, side walls 13, and a narrow, lower tube 17. Sidewalls 13 can provide an a surface that is able to detachably mate with the flange element 22 and to enclose internal reservoir well 20. Lower tube 17 defines an egress lumen 18 that is adapted to drain fluid from the reservoir to another location or to another other implanted device. For example, lower tube 17 can mate with a catheter 35 (FIG. 1) and can include features, such as barb 36, to facilitate mating with the catheter.

[0033] Base 14 can be formed from a substantially rigid material so that it is able to maintain its shape after it is implanted and so that it can provide support to the portions of the device formed from a more pliable material, such as cap 12. The substantially rigid material properties of the base and the more pliable material properties of the cap would render them difficult to effectively and efficiently mate to one another during a surgical procedure. Accordingly, in one embodiment a substantially rigid flange element is used as a connecting element to join the cap 12 and base 14 together. In this embodiment, the pliable cap is fixedly mated with an upper portion 24 of rigid flange element 22, and the lower portion 26 of the flange element 22 is detachably mated with rigid base 14. The joinder of the cap and flange elements thus provides a cap/flange assembly 27 capable of securely and detachably mating to the base 14.

[0034] In an exemplary embodiment, illustrated in FIGS. 2A-2C, flange element 22 has an upper portion 24 that is in the form of an annular, substantially horizontally oriented ring. Integrally attached to upper portion 24 of flange element 22 is lower flange element portion 26, which is in the form of an annular ring that is oriented in a plane substantially orthogonal to upper portion 24. The upper portion 24 of flange element 22 is adapted to mate with the cap. One skilled in the art will appreciate that the flange can be mated to the cap 12 by a variety of techniques and that the engagement can be permanent or reversible. In an exemplary embodiment, however, upper portion 24 of flange element 22 is seated within a recess 33 formed in cap 12. The upper portion 24 can be maintained within recess 33 by an interference fit, or other techniques (e.g., use of adhesives, ultrasonic welding) may be used to secure the two

60 63

components. In addition, upper portion 24 and/or the internal walls of recess 33 can have surface features that will enhance securement of the flange element to the cap.

[0035] As noted above, the flange element serves as an connecting element joining cap 12 and base 14. This can be accomplished by using lower portion 26 of flange element 22 to detachably mate with base 14. In one embodiment, a snap fit element can provide the secure, detachable connection between the lower portion 26 of the flange element 22 and the base 14. A variety of snap fit elements are contemplated, but they are generally characterized by the presence of opposed, complementary mating features on the flange element and the base. The invention encompasses the use of snap fit elements that are formed integrally with the base and flange element, as well as, snap fit elements that are separate from but matable to the flange element and the base.

[0036] In one example shown in FIGS. 2A-2C, a snap fit element 28 includes a protruding feature 30 formed on an outer surface of the flange element 22 and a complementary recess 31 formed on an inner surface of base 14. In this embodiment, the flange/cap assembly 27 can be joined to the base by inserting the lower portion 26 of flange element 22 within the base, causing the lower flange portion 26 to slightly compress or deflect until protruding feature 30 reaches recess 31. At such point, the lower flange portion 26 will assume its original dimensions and feature 30 will be seated within recess 31. One skilled in the art will appreciate that the position of the protruding feature and the complementary recess can be reversed, as shown in FIG. 3, such that protruding feature 30 is positioned on base 14 and complementary recess 31 is positioned on lower flange portion 26. Further, it is understood that the feature 30 can be continuous, or it can be in the form of a plurality of discrete features.

[0037] In addition to snap fit element 28, a seal 32 can be used to enhance the mating of the flange element and the base, as well as to provide a fluid-tight connection between these components. Seal 32 is preferably positioned between flange element 22 and base 14, and in one embodiment, seal 32 is positioned between the inner surface of base 14 and the outer surface of flange element 22. The seal can be formed of a pliable material, such as an elastomer, such that

the seal sufficiently conforms to the space between the flange and the base when the ventriculostomy reservoir is assembled.

[0038] The seal 32 can be seated in a seal recess 34 this can be formed in flange 22 or in base 14. The seal recess 34 helps to prevent migration of the seal when the flange/cap assembly 27 is joined to the base 14. In addition, since only a portion of seal 32 extends from the seal recess 34, the seal 32 creates minimal resistance to assembly when the flange element is inserted into the base.

[0039] In one embodiment, seal 32 is in the form of an o-ring positioned between base 14 and flange 22. For example, seal 32 shown in FIGS. 2A – 2C can be an o-ring having a circular cross section which will conform to the space between flange element 22 and base 14. One skilled in the art will appreciate that the cross section of the seal can have a variety of other shapes, such as, for example rectangular, triangular, or irregular. As shown, the overall shape of seal 32 can be a ring, and the diameter of the ring can be matched to that of base 14 and/or flange element 22. In one embodiment, the diameter of the seal can be slightly smaller than the diameter of the base so that the seal is stretched around base 14.

[0040] FIGS. 4A and 4B illustrate an alternative snap fit engagement that can be substituted for or be used with the protruding feature/complementary recess snap fit arrangement described above with respect to FIGS. 2A-3. As shown, the snap fit element is effected using a split ring 40 that joins the flange 22 to the base 14. The split ring 40 seats within a slot 42, and the split ring is of as size and shape such that a portion of the split ring extends beyond the perimeter of the slot 42, which as illustrated in FIGS. 4A and 4B, is formed in flange element 22. The portion of the split ring 40 that extends beyond the perimeter of slot 42 is adapted to seat within a complementary recess 48 formed in the base.

[0041] The split ring is generally circular and can have an opening 44 along one portion that allows the split ring to be compressed so that its diameter decreases. In addition, the split ring should be made from a resilient or shape-memory material such that once a compressive force is released, the split ring returns to its original configuration and dimensions. In use, the portion of

62-68

the split ring that extends beyond the perimeter of the slot 42 is compressed as the flange element is slid within the base. Once the split ring is aligned with a recess 48 in the base, the compressive force on the split ring is removed and the split ring expands to occupy the recess 48. The split ring 40 thus acts to secure the flange/cap assembly to the base.

[0042] In an alternate embodiment, the split ring can snap around a raised portion of flange element 22 rather than snapping into a recess. For example, FIG. 5 illustrates ventriculostomy reservoir device 10 including a raised area 50 formed on the inner surface of base 14. The split ring 40' is seated within a groove 43 that is formed in the outer surface of the flange element 22. The relative dimensions of groove 43 and the split ring 40' are such that the split ring 40' remains seated in groove 43 during assembly of device 10, while still protruding to an extent sufficient to facilitate locking with base 12.

[0043] To mate base 14 to the cap/flange element assembly, the lower portion 26 of flange element 22 is slid within base 14. As the flange element is inserted, split ring 40' reaches the raised area 50 and is compressed. Once split ring 40' slides passed raised area 50, the split ring expands to provide a snap fit connection between flange element 22 and base 14. In yet another aspect, both raised area 50 and recess 48 can be used to hold the split ring within base 14.

[0044] In yet another aspect of a snap fit arrangement, a continuous ring (not illustrated) and a complementary feature can be used. For example, a ring similar to the split rings 40, 40', but lacking an opening 44, can be used to provide a snap fit connection. To assemble the cap/flange element with such a ring, the flange element is slid within the base. When the ring on the flange element reaches the complementary feature (e.g., a raised area), the base and/or the flange element slightly deforms to allow the ring to pass the raised area and snap fit into position behind the raised area. A continuous ring may also be used with a recess, with a similar slight deformation of the base required to snap the continuous ring of the flange element into the recess in the base.

[0045] One skilled in the art will appreciate that the location of the split or continuous ring can be varied. For example, a split or continuous ring could be positioned in base 14 instead of in flange element 22. In such an configuration, the location of the corresponding raised area or recess would be on the sidewall of flange element 22.

[0046] In another embodiment of the snap fit arrangement, a snap fit is formed between the bottom of internal reservoir well 20, defined by a bottom surface 54 of the flange element 22, and an upper portion of the lower tube 17. As shown in FIGS. 6A and 6B, the lower portion of the flange element extends across and encloses the bottom of the internal reservoir well with a bottom surface 54. The bottom surface 54 can be a continuous surface, or it can be formed of a plurality of discrete elements as shown in FIGS. 6A and 6B.

[0047] As further illustrated in FIGS. 6A and 6B, the base 14 includes a lower tube 17 that extends upwardly between the sidewalls 13 of base 14. An upper portion of the lower tube 17 includes surface features, such as barbs 58 to assist in the snap fit engagement. In addition, the bottom surface 54 includes an engagement tab 56 that is formed on an inner portion of the bottom surface of the flange element 22. The engagement tab 56 is complementary with the barbs 58 of the lower tube to facilitate snap fit engagement of the flange/cap assembly with the base.

[0048] FIGS. 6A and 6B also illustrate a seal 32 that can be positioned between the inner surface of the base 14 and the outer surface of the flange element 22 to provide a fluid tight seal. In addition, or alternatively, the seal can be positioned between bottom surface 54 of flange element 22 and base 14.

[0049] To assemble device 10, cap/flange assembly 27 is received between the sidewalls of base 14 until the barb on the lower tube 17 snap fits with the receiving area 54 of the flange element. It is understood that the lower tube 17 and/or lower surface 54 may deform to some extent during the assembly process.

64 ~~62~~

[0050] In yet another embodiment of the snap fit arrangement, snap fit fingers 60 formed on base 14 can snap into a recess 62 or behind a raised area (not shown) on flange element 22. In this embodiment illustrated in FIGS. 7A and 7B, snap fit fingers 60 extend from outer surface of base 14 and are adapted to mate with the outer surface of flange element 22. Snap fit fingers 60 can include a plurality of parallel, elongate members, each having a mating feature, such as protrusion 64, on the upper portion thereof. In addition, the outer surface of flange element 22 includes complementary recess 62 adapted to seat protrusions 64. When the device is assembled, the snap fit fingers encircle flange element 22 and snap fit into recess 62. This embodiment can also include seal 32 positioned between the inner surface of flange element 22 and the outer surface of the base 14 sidewalls 13 as shown in FIG. 7B.

[0051] One skilled in the art will appreciate that the exemplary snap fit arrangements disclosed above can secure the base and cap/flange assembly together such that the device will not accidentally disassemble after implantation. For example, the cap flange/assembly can be mated to the base such that more than about one half pound of force is required to pull the assembled device apart, and in another aspect, more than about 1 pound of force is required to pull the assembled device apart. In yet another aspect, the required force is in the range of about 1 to 10 pounds of force, and even more preferably 1 to 5 pounds of force.

[0052] As discussed above, the seal and the snap fit element can be formed from different materials. For example, the material used to form the seal is preferably a biocompatible, elastomeric material adapted to provide a fluid-tight seal between more rigid portions of the device. Exemplary materials that can be used to form the seal include, by way of non-limiting example, silicon rubber, fluoropolymers, and polyurethane. In one aspect, the materials used to form the seal can include materials having a hardness in the range of about 25 to 90 Shore A Durometer.

[0053] The substantially rigid material from which the base and flange element are formed can include various biocompatible materials that have sufficient strength to withstand implantation while retaining enough flexibility to allow a snap fit. Exemplary materials for forming the base

65 68

Atty. Docket No.: 22719-59 (COD5024)

and the flange include, nylon, polypropylene, fluoropolymers, ABS, polycarbonate, and stainless steel. While the same or different materials can be used to form the base, the flange element, and/or the snap fit element, the selected materials are preferably more rigid than seal 32.

[0054] One skilled in the art will appreciate further features and advantages of the invention based on the above-described embodiments. Accordingly, the invention is not to be limited by what has been particularly shown and described, except as indicated by the appended claims. All publications and references cited herein are expressly incorporated herein by reference in their entirety.

What is claimed is:

66 62

REIVINDICACIONES

- 1 Un dispositivo de reservorio para ventriculostomía, que comprende

Una base que tiene una abertura superior e inferior, la abertura superior define un pozo de reservorio interno,

Una tapa que tiene una porción de fondo abierta;

Un elemento de reborde que tiene una primera porción dispuesta en una porción de la tapa y una segunda porción que se extiende distalmente mas allá de la porción abierta de fondo de la tapa y adaptada para ser desmontable de la unión con el pozo de reservorio interno de la base, la segunda porción del elemento de reborde incluye un elemento de ajuste por presión adaptado para cooperar con una característica en el pozo del reservorio interno para asegurar el elemento de reborde y la base juntos; y

Al menos un elemento de sello dispuesto entre el pozo del reservorio interno y el elemento de reborde, el elemento de sello está adaptado para proporcionar un sello hermético al fluido entre la base y el elemento de reborde cuando la base y el elemento de reborde se desmontan.

2. El dispositivo de la reivindicación 1, donde el elemento de sello está formado de un material elastomérico que es mas dúctil que la base y el elemento de reborde

- 3 El dispositivo de la reivindicación 1, donde el elemento de ajuste por presión es sustancialmente rígido.

67 70

4. El dispositivo de la reivindicación 1, donde el elemento de ajuste por presión sobre la segunda porción del elemento de reborde se adapta para cooperar con una característica en una superficie interna del pozo de reservorio interno
5. El dispositivo de la reivindicación 1, donde la tapa está formada de un material elastomérico y el elemento de reborde está formado de un material no elastomérico
6. El dispositivo de la reivindicación 5, donde la tapa es dúctil y el elemento de reborde es sustancialmente rígido
7. El dispositivo de la reivindicación 1, donde la tapa esta construida de materiales seleccionados del grupo que consiste de silicona, poliuretano, y combinaciones de ellos.
8. El dispositivo de la reivindicación 1, donde el elemento de reborde está construido de materiales seleccionados del grupo que consiste de, nylon, polipropileno, fluoropolímeros, ABS, policarbonato, acero inoxidable, y combinaciones de ellos.
9. El dispositivo de la reivindicación 1, que incluye múltiples elementos de sello
10. El dispositivo de la reivindicación 1, donde el elemento de sello es un anillo en O.

11. El dispositivo de la reivindicación 1, donde el elemento de sellao está dispuesto entre una superficie interna del pozo de reservorio interno y una superficie externa del elemento de reborde

12. El dispositivo de la reivindicación 1, donde el elemento de ajuste por presión incluye una característica de protrusión formada en el elemento de reborde que se puede unir con una característica complementaria formada en el pozo de reservorio interno

13. El dispositivo de la reivindicación 12, donde la característica de protrusión está formada en una superficie externa del elemento de reborde.

14. El dispositivo de la reivindicación 13, donde la característica de protrusión es integral con el elemento de reborde

15. El dispositivo de la reivindicación 1, donde el elemento de ajuste por presión incluye una depresión formada en el elemento de reborde que se puede unir con una característica complementaria formada en la superficie interna del pozo de reservorio interno.

16. El dispositivo de la reivindicación 1, donde el elemento de ajuste por presión incluye un anillo hendido dispuesto en una depresión sobre el elemento de reborde y adaptado para unirse con una característica complementaria formada en el pozo de reservorio interno

17. El dispositivo de la reivindicación 1, donde la característica del pozo de reservorio interno es un anillo hendido dispuesto en una depresión

18. El dispositivo de la reivindicación 1, donde la primera porción del elemento de reborde esta permanentemente unida a la tapa.
- 19 El dispositivo de la reivindicación 1, donde al menos una libra de fuerza se requiere para separar el elemento de reborde y la base
20. El dispositivo de la reivindicación 1, donde la fuerza requerida para separar el elemento de reborde inferior unido desmontablemente de la base está en el intervalo de cerca de 1 libra a 5 libras
- 21 El dispositivo de la reivindicación 1, donde la segunda porción del elemento de reborde está posicionada en el interior del pozo de reservorio interno
- 22 El dispositivo de la reivindicación 1, donde la característica en el pozo de reservorio interno incluye múltiples dedos aseguradores cada uno de los cuales se puede unir con el elemento de ajuste por presión
23. El dispositivo de la reivindicación 1, donde la base incluye múltiples dedos aseguradores cada uno teniendo una característica de protrusión en el primer extremo, y donde el elemento de ajuste por presión del elemento de reborde incluye una depresión que se une complementariamente adaptada para unirse con los múltiples dedos aseguradores.
24. El dispositivo de la reivindicación 1, donde la característica en el pozo de reservorio interno incluye una primera porción que se extiende desde una superficie externa de la base, la primera porción incluye al menos un dedo asegurador adaptado para unirse con el elemento de ajuste por presión dispuesto sobre una superficie externa del elemento de reborde

25. El dispositivo de la reivindicación 24, donde el elemento de sello está dispuesto entre una superficie externa del pozo de reservorio interno y una superficie interna en el elemento del reborde.

26 El dispositivo de la reivindicación 1, donde la base incluye una luz de salida que incluye una porción superior y una porción inferior adaptadas para unirse con un catéter.

27. El dispositivo de la reivindicación 26, donde el elemento de ajuste por presión está adaptado para cooperar con una característica sobre la porción superior de la luz de salida

28 El dispositivo de la reivindicación 27, donde la luz de salida incluye una lengüeta adaptada para unirse con una segunda porción del reborde

29 El dispositivo de la reivindicación 1, donde la tapa incluye un canal de introducción.

30. El dispositivo de reservorio para ventriculostomía, que comprende

Un reservorio formado por un elemento de reborde que tiene una porción de reborde superior, una porción de reborde inferior, y una pared lateral que se extiende entre ellas, y donde la pared lateral define un pozo de reservorio interno,

Una tapa que tiene una superficie superior cerrada, una porción de fondo abierta, y un canal de introducción, y donde la porción de reborde superior está permanentemente unida a una porción de la tapa,

Un elemento de conexión desmontable que tiene un primer extremo adaptado para unirse al elemento de reborde y un segundo extremo adaptado para unirse a un catéter, el primer extremo del elemento de conexión incluye al menos un elemento de ajuste por presión adaptado para cooperar con una característica del elemento de reborde para asegurar el elemento de conexión al elemento de reborde, y

Al menos un elemento de sello dispuesto entre el reservorio y el elemento de conexión, el elemento de sello se adapta para proporcionar un sello hermético al fluido entre el elemento de reborde y el elemento de conexión.

31 El dispositivo de la reivindicación 30, donde el elemento de ajuste por presión está adaptado para unirse desmontablemente a una superficie exterior del reservorio.

32. El dispositivo de la reivindicación 30, donde la tapa está formada de un material elastomérico y el elemento de reborde está formado de un material no elastomérico

33 El dispositivo de la reivindicación 30, donde el elemento de sello es un anillo en O.

34. El dispositivo de la reivindicación 30, donde el elemento de ajuste por presión está formado en cada una de la pluralidad de dedos aseguradores del elemento conector

CLAIMS:

1. A ventriculostomy reservoir device, comprising
a base having an upper and lower opening, the upper opening defining an internal reservoir well;
a cap having an open bottom portion;
a flange element having a first portion disposed within a portion of the cap and a second portion extending distally beyond the open bottom portion of the cap and adapted for detachably mating with the internal reservoir well of the base, the second portion of the flange element including a snap fit element adapted to cooperate with a feature on the internal reservoir well to secure the flange element and the base together; and
at least one sealing element disposed between the internal reservoir well and the flange element, the sealing element being adapted to provide a fluid tight seal between the base and the flange element when the base and the flange element are detachably mated.
2. The device of claim 1, wherein the sealing element is formed of an elastomeric material that is more pliable than the base and the flange element.
3. The device of claim 1, wherein the snap fit element is substantially rigid.
4. The device of claim 1, wherein the snap fit element on the second portion of the flange element is adapted to cooperate with a feature on an inner surface of the internal reservoir well.
5. The device of claim 1, wherein the cap is formed from an elastomeric material and the flange element is formed from a non-elastomeric material.
6. The device of claim 5, wherein the cap is pliable and the flange element is substantially rigid.

7. The device of claim 1, wherein the cap is constructed from materials selected from the group consisting of silicone, polyurethane, and combinations thereof.
8. The device of claim 1, wherein the flange element is constructed from materials selected from the group consisting of, nylon, polypropylene, fluoropolymers, ABS, polycarbonate, stainless steel, and combinations thereof.
9. The device of claim 1, including multiple sealing elements.
10. The device of claim 1, wherein the sealing element is an o-ring.
11. The device of claim 1, wherein the sealing element is disposed between an inner surface of the internal reservoir well and an outer surface of the flange element.
12. The device of claim 1, wherein the snap fit element includes a protruding feature formed on the flange element that is matable with a complementary feature formed on the internal reservoir well.
13. The device of claim 12, wherein the protruding feature is formed on an outer surface of the flange element.
14. The device of claim 13, wherein the protruding feature is integral with the flange element.
15. The device of claim 1, wherein the snap fit element includes a recess formed on the flange element that is matable with a complementary feature formed on the on an inner surface of the internal reservoir well.

74

Atty. Docket No.: 22719-59 (COD5024)

16. The device of claim 1, wherein the snap fit element includes a split ring disposed in a recess on the flange element and adapted to mate with a complementary feature formed on internal reservoir well.
17. The device of claim 1, wherein the feature on the internal reservoir well is a split ring disposed in a recess.
18. The device of claim 1, wherein the first portion of the flange element is permanently joined to the cap.
19. The device of claim 1, wherein at least about 1 pound of force is required to separate the flange element and the base.
20. The device of claim 1, wherein the force required to separate the detachably mated lower flange element from the base is in the range of about 1 lb to 5 lbs.
21. The device of claim 1, wherein the second portion of the flange element is positioned within an interior of the internal reservoir well.
22. The device of claim 1, wherein the feature on the internal reservoir well includes multiple locking fingers each of which is matable with the snap fit element.
23. The device of claim 1, wherein the base includes multiple locking fingers each having a protruding feature at a first end, and wherein the snap fit element of the flange element includes a complementary mating recess adapted to mate with the multiple locking fingers.
24. The device of claim 1, wherein the feature on the internal reservoir well includes a first portion extending from an outer surface of the base, the first portion including at least one locking finger adapted to mate with the snap fit element disposed on an outer surface of the

flange element.

25. The device of claim 24, wherein the sealing element is disposed between an outer surface of the internal reservoir well and an inner surface of the flange element.

26. The device of claim 1, wherein the base includes an egress lumen including an upper portion and a lower portion adapted to mate with a catheter.

27. The device of claim 26, wherein the snap fit element is adapted to cooperate with a feature on the upper portion of the egress lumen.

28. The device of claim 27, wherein the egress lumen includes a barb adapted to mate with the second portion of the flange.

29. The device of claim 1, wherein the cap includes an introduction channel

30. A ventriculostomy reservoir device, comprising
a reservoir formed by a flange element having an upper flange portion, a lower flange portion, and a sidewall extending therebetween, and wherein the sidewall defines an internal reservoir well;

a cap having a closed upper surface, an open bottom portion, and an introduction channel, and wherein the upper flange portion is permanently attached to a portion of the cap;

a detachable connection element having a first end adapted to mate to the flange element and a second end adapted to mate to a catheter, the first end of the connection element including at least one snap fit element adapted to cooperate with a feature on the flange element to secure the connection element to the flange element; and

at least one sealing element disposed between the reservoir and the connection element, the sealing element being adapted to provide a fluid tight seal between the flange element and the

76

Atty. Docket No.: 22719-59 (COD5024)

connection element.

31. The device of claim 30, wherein the snap fit element is adapted for detachably mating to an outer surface of the reservoir.

32. The device of claim 30, wherein the cap is formed from an elastomeric material and the flange element is formed from a non-elastomeric material.

33. The device of claim 30, wherein the sealing element is an o-ring.

34. The device of claim 30, wherein the snap fit element is formed on each of a plurality of locking fingers of the connector element.

86
27

ABSTRACT

A resealable ventriculostomy reservoir device is provided. The device includes a base having an upper and lower opening, the upper opening defining an internal reservoir well, and a cap having an open bottom portion. The device further includes a flange element having a first portion disposed within a portion of the cap and a second portion extending distally beyond the open bottom portion of the cap and adapted for detachably mating with the internal reservoir well of the base. The second portion of the flange element includes a snap fit element adapted to cooperate with a feature on the internal reservoir well to secure the flange element and the base together. A sealing element is disposed between the internal reservoir well and the flange element to provide a fluid tight seal between the base and the flange element when the base and the flange element are detachably mated.

1374232 1

~~84~~
78

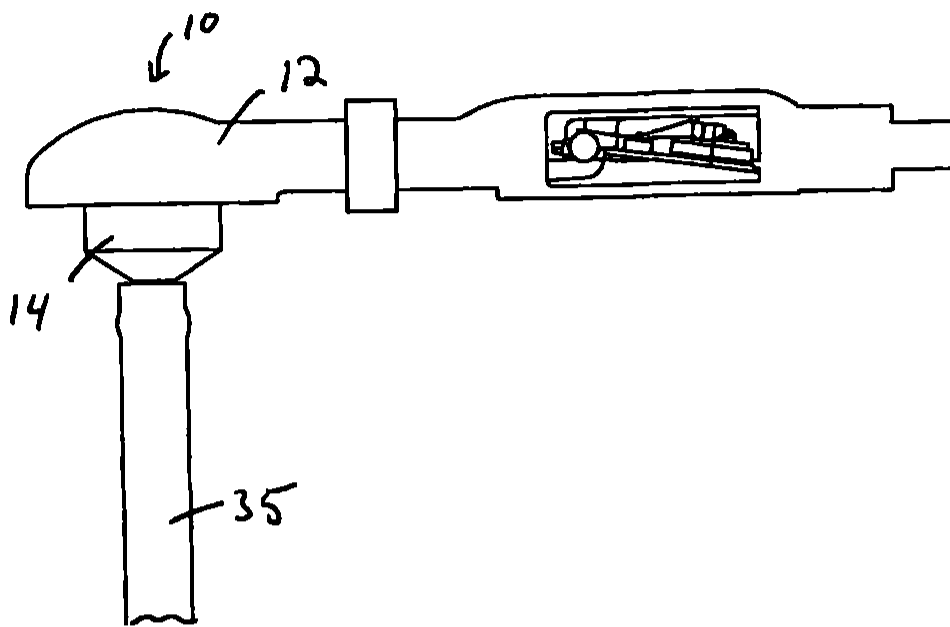


FIG. 1

79 ~~82~~

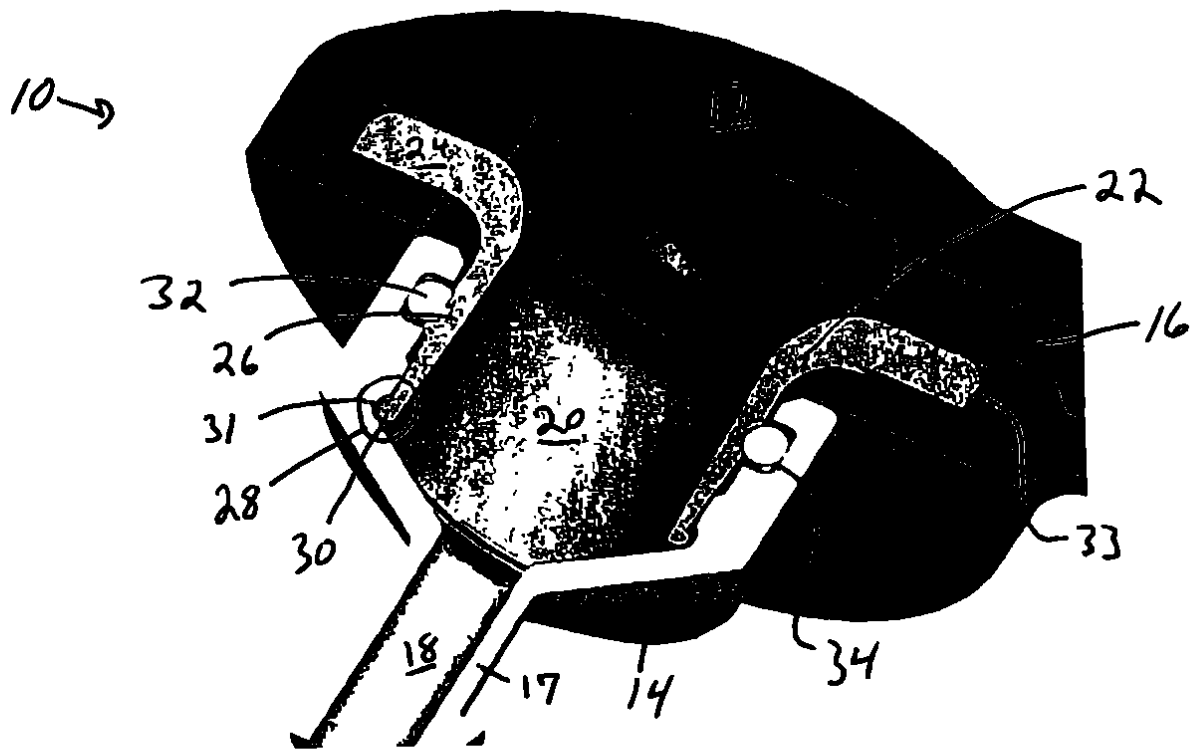


FIG. 2A

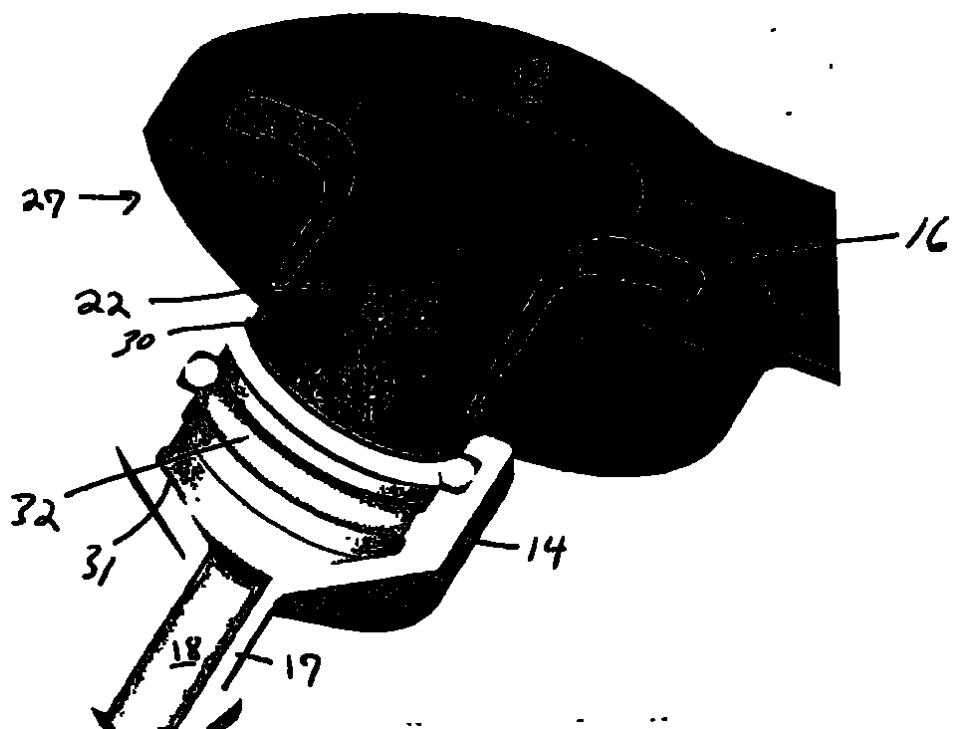


FIG. 2B

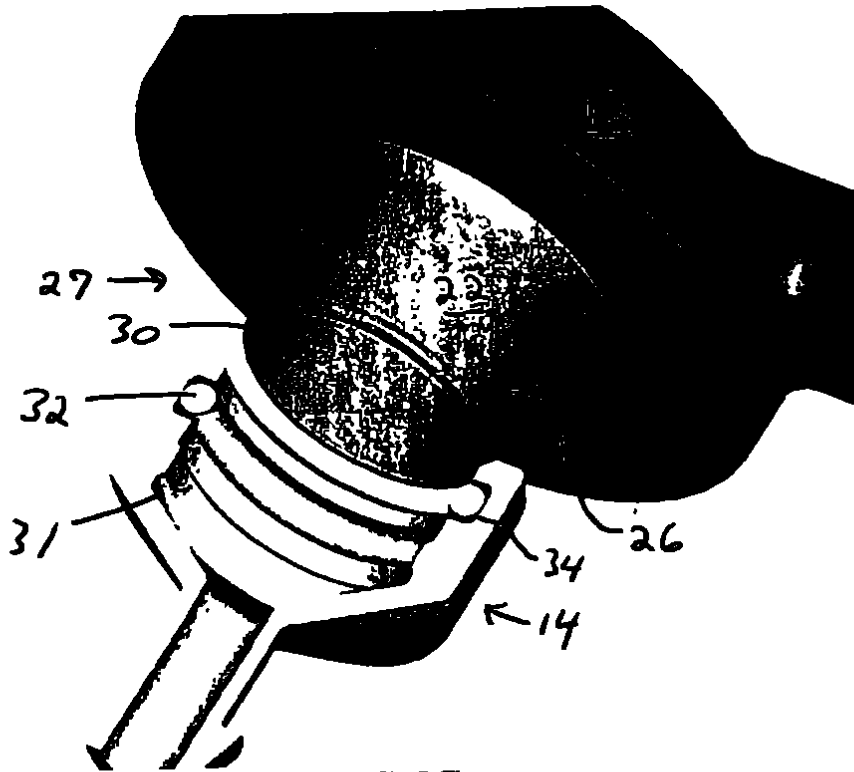


FIG. 2C

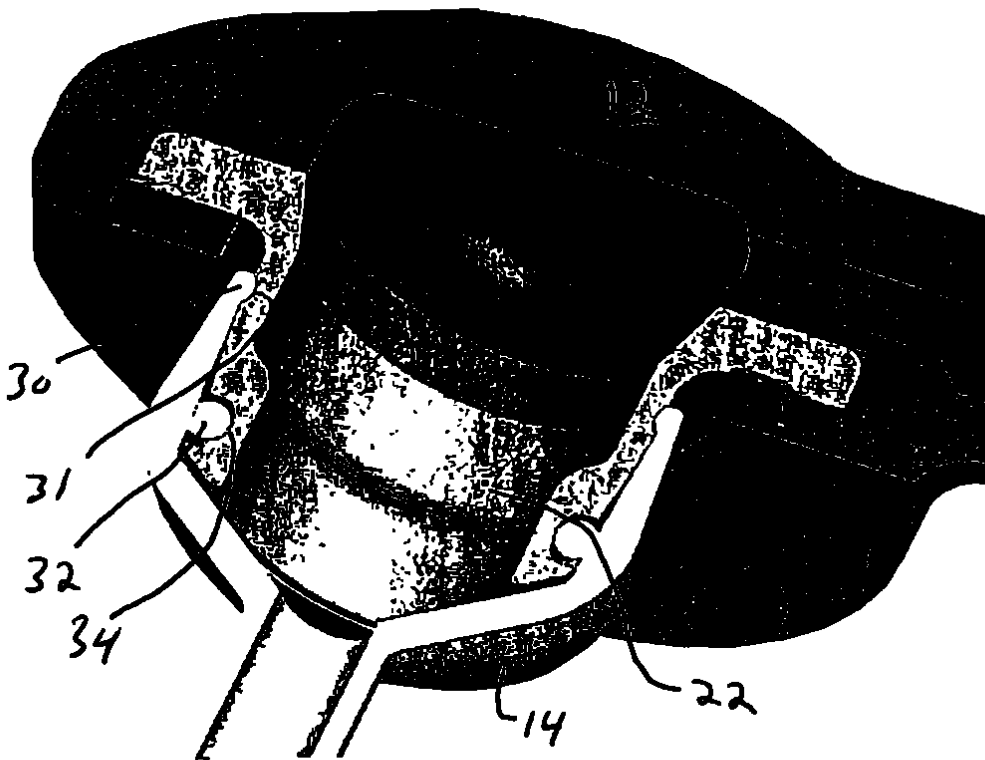


FIG. 3

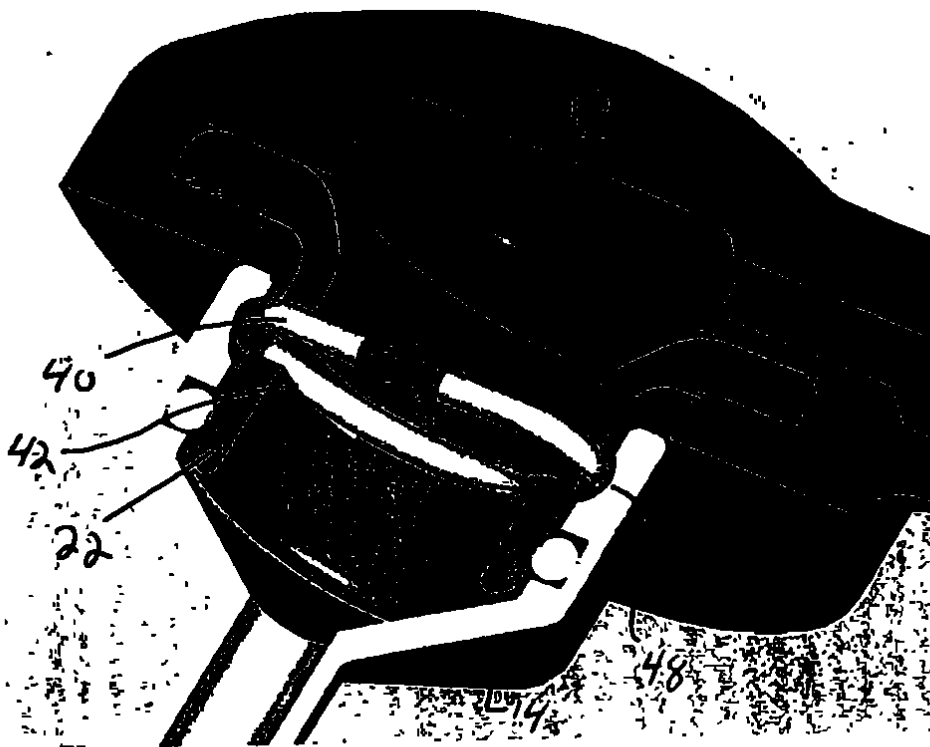


FIG. 4A

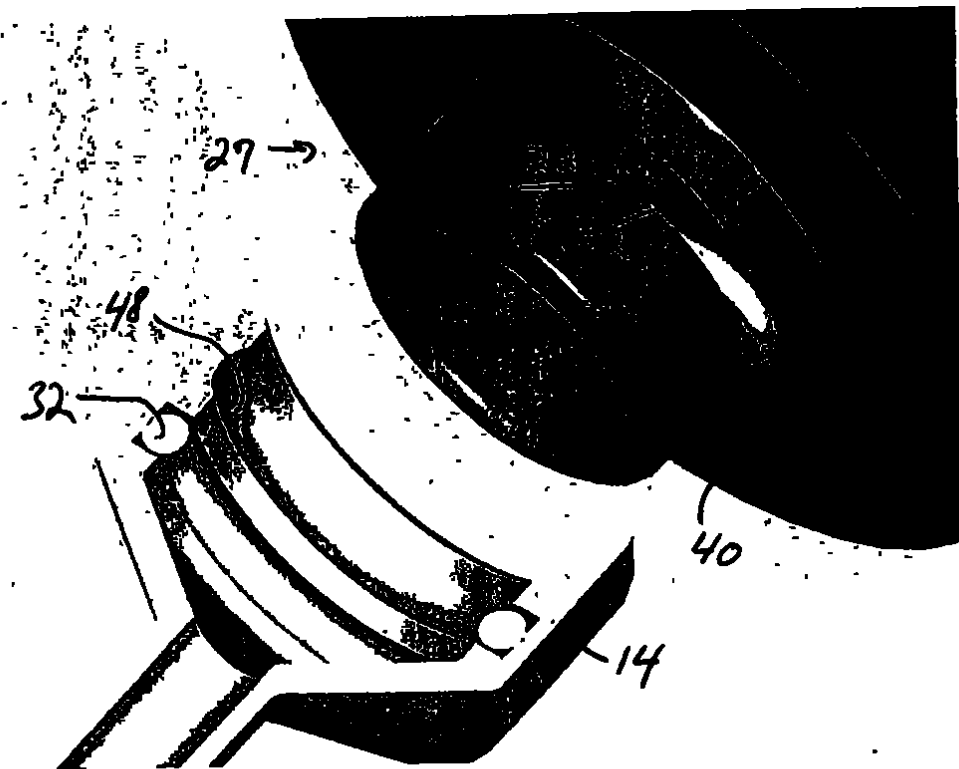


FIG. 4B

85
82

22719-59

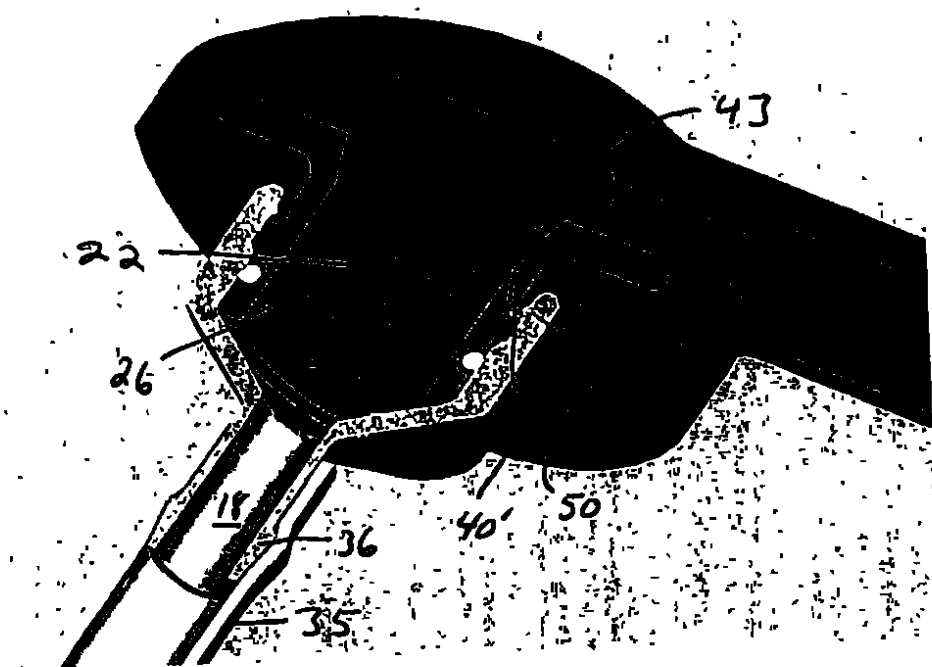


FIG. 5

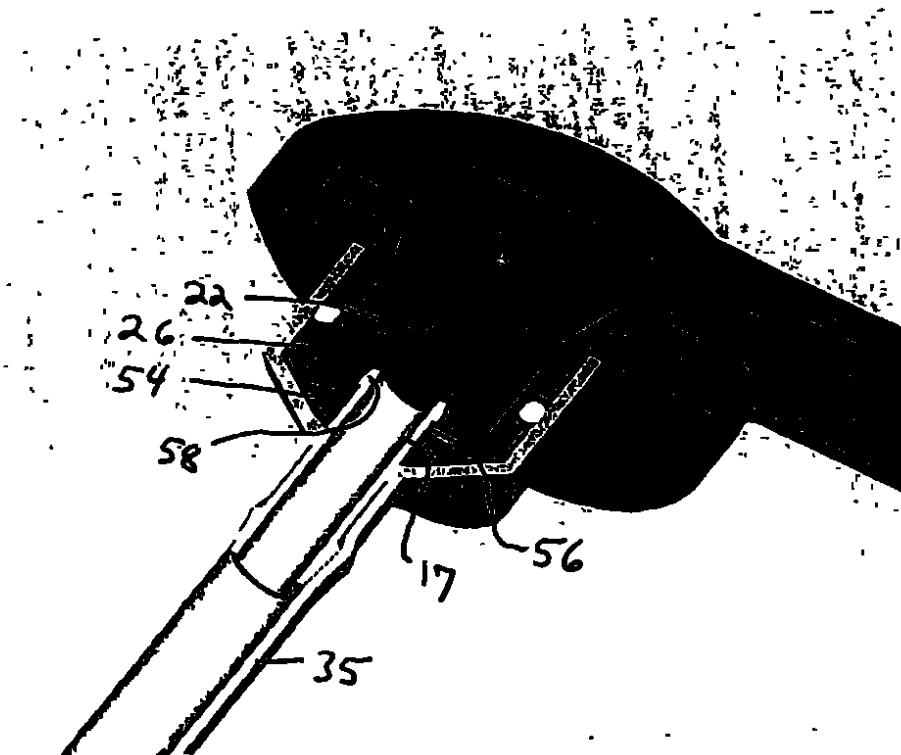


FIG. 6A

86
83

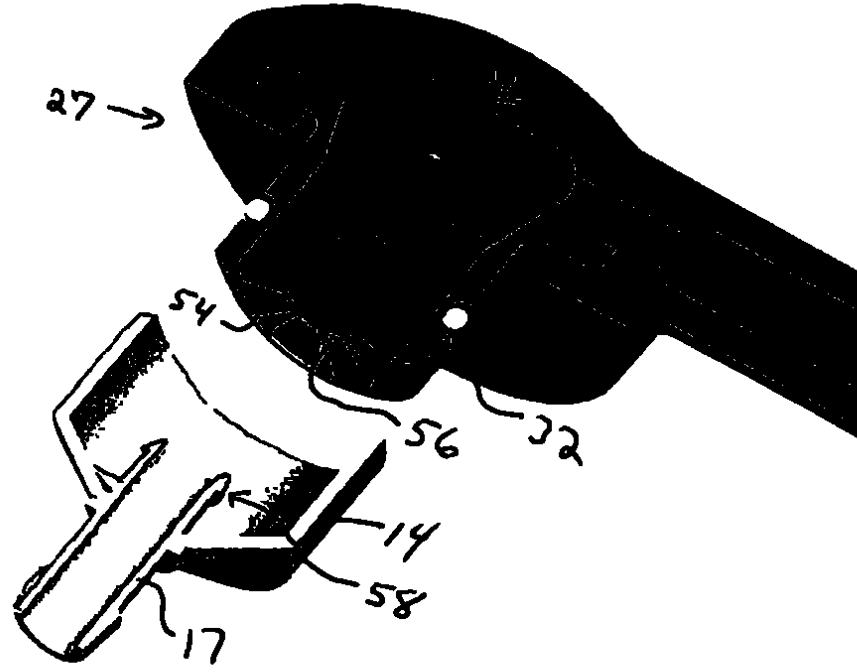


FIG. 6B

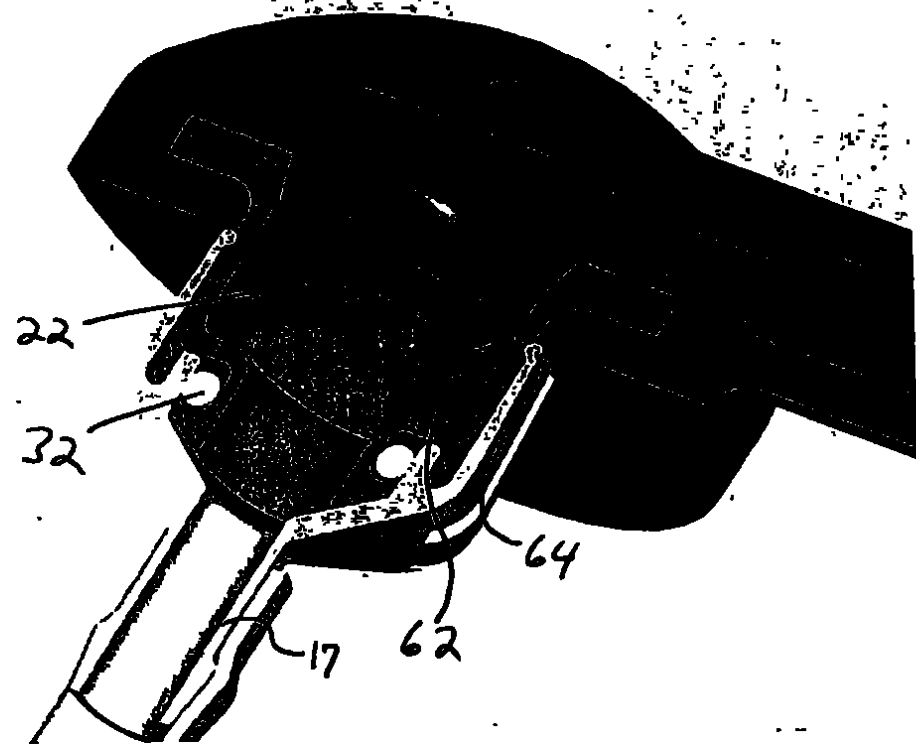


FIG. 7A



FIG. 7B

1374236.1

85

APOSTILLE

(CONVENTION DE LA HAYE DU 5 OCTOBRE 1961)

1. COUNTRY: UNITED STATES OF AMERICA
2. THIS PUBLIC DOCUMENT HAS BEEN SIGNED BY:
CHRISTINA A CLICKNER
3. ACTING IN THE CAPACITY OF:
NOTARY PUBLIC OF NEW JERSEY
4. BEARS THE SEAL/STAMP OF:
CHRISTINA A CLICKNER, NOTARY

CERTIFIED

5. AT TRENTON, NEW JERSEY
6. THE 3RD DAY OF JANUARY 2006
7. BY: John E McCormac, CPA, NEW JERSEY TREASURER
8. NO. A247881
9. SEAL/STAMP:
10. SIGNATURE



John E McCormac

COD 5024 CO

CERTIFICATION

I hereby certify that I have compared the attached document with the original, and that such said document is a true copy of the original Assignment document as filed and recorded in the U.S. Patent Office in connection with USSN 10/995,947 filed NOVEMBER 22, 2004.

A handwritten signature in cursive script, reading "Christina A. Clickner", is written over a horizontal line.

Christina A. Clickner
(Notary Public of New Jersey)
My Commission Expires:
March 2, 2010



87-48

UNITED STATES PATENT AND TRADEMARK OFFICE

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

AUGUST 26, 2005

PTAS



102983652A

NUTTER MCCLENNEN & FISH LLP
WILLIAM C. GEARY III
155 SEAPORT BOULEVARD
WORLD TRADE CENTER WEST
BOSTON, MA 02210-2604

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

THE ENCLOSED DOCUMENT HAS BEEN RECORDED BY THE ASSIGNMENT DIVISION OF THE U.S. PATENT AND TRADEMARK OFFICE. A COMPLETE MICROFILM 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 EMPLOYEE WHOSE NAME APPEARS ON THIS NOTICE AT 703-308-9723. PLEASE SEND REQUEST FOR CORRECTION TO: U.S. PATENT AND TRADEMARK OFFICE, MAIL STOP: ASSIGNMENT SERVICES DIVISION, P.O. BOX 1450, ALEXANDRIA, VA 22313.

RECORDATION DATE: 04/14/2005

REEL/FRAME: 016456/0085
NUMBER OF PAGES: 5

BRIEF: ASSIGNMENT OF ASSIGNOR'S INTEREST (SEE DOCUMENT FOR DETAILS).

ASSIGNOR:

KRAUS, ROBERT G.

DOC DATE: 03/04/2005

ASSIGNOR:

TAYLOR, ROBERT

DOC DATE: 04/06/2005

ASSIGNOR:

BUONANNO, JOHN

DOC DATE: 03/04/2005

ASSIGNEE:

CODMAN & SHURTLEFF, INC.
325 PARAMOUNT DRIVE
RAYNHAM, MASSACHUSETTS 02767-0350

SERIAL NUMBER: 10995947

FILING DATE: 11/22/2004

PATENT NUMBER:

ISSUE DATE:

TITLE: VENTRICULOSTOMY RESERVOIR

016456/0085 PAGE 2

88 ~~88~~

MARCUS KIRK, EXAMINER
ASSIGNMENT DIVISION
OFFICE OF PUBLIC RECORDS

04-18-2005

U.S. DEPARTMENT OF COMMERCE
Patent and Trademark Office

RE

102983652

To the Director of the U.S. Patent and Trademark Office. Please record the attached documents or the new address(es) below.

1. Name of conveying party(ies)/Execution Date(s):
Robert G. Kraus (03/04/2005), Robert Taylor
(04/06/2005), and John Buonanno (03/04/2005)

Execution Date(s): in parentheses after inventor name

Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No

3. Nature of Conveyance:

- ☒ Assignment ☐ Merger
☐ Security Agreement ☐ Change of Name
☐ Government Interest Assignment
☐ Executive Order 9424, Confirmatory License
☐ Other

2. Name and address of receiving party(ies)

Name: CODMAN & SHURTLEFF, INC.

Internal Address: _____

Street Address

325 Paramount Drive

City: Raynham

State: Massachusetts

Country: United States of America Zip: 02767-0350

Additional name(s) & address(es) attached? ☐ Yes ☒ No

4. Application or patent number(s):

A. Patent Application No.(s)
10/985,947

☐ This document is being filed together with a new application

B. Patent No (s)

Additional numbers attached? ☐ Yes ☒ No

5. Name and address to whom correspondence concerning document should be mailed:

Name: William C. Geary III
NUTTER MCCLENNEN & FISH LLP
Internal Address: Atty. Dkt., 022719-0059
Street Address: World Trade Center West
165 Seaport Boulevard

City: Boston

State: MA Zip: 02210-2604

Phone Number: (617) 439-2000

Fax Number: (617) 310-9000

Email Address: _____

6. Total number of applications and patents involved:

7. Total fee (37 CFR 1.21(h) & 3.41) \$ 40.00

- ☐ Authorized to be charged by credit card
☐ Authorized to be charged to deposit account
☒ Enclosed
☐ None required (government interest not affecting title)

8. Payment Information

a. Credit Card Last 4 Numbers _____
Expiration Date _____
b. Deposit Account Number _____
Authorized User Name _____

9. Signature:



Signature

April 12, 2005

Date

William C. Geary III - 31,359

Name of Person Signing

Total number of pages including cover sheet, attachments, and documents: 5

Recordation Form Cover Sheet

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail, in an envelope addressed to: MS Assignment Recordation Services, Director of the US Patent and Trademark Office, P.O. Box 1460, Alexandria, VA 22313-1460, on the date shown below.

Dated April 12, 2005

Signature:  (William C. Geary III)

1420738.1

04/15/2005 ECDUPER 00000106 10995947

01 FC18021

40.00 USD

ASSIGNMENT

We, Robert G. Kraus, of Attleboro, Massachusetts, Robert Taylor, of Coventry, Rhode Island, and John Buonanno, of Bristol, Rhode Island in consideration of One Dollar and other valuable consideration paid to us by

CODMAN & SHURTLEFF, INC.

a New Jersey corporation having a place of business at 325 Paramount Drive, Raynham, Massachusetts 02767-0350, the receipt of which is hereby acknowledged, do hereby sell, assign and transfer unto said

CODMAN & SHURTLEFF, INC.

its successors and assigns, the entire interest for the United States of America and all foreign countries including all rights of priority under the International Convention for the Protection of Industrial Property in a certain invention or improvement in

VENTRICULOSTOMY RESERVOIR

described in a U.S. Patent Application executed by us and filed in the United States Patent and Trademark Office on November 22, 2004 and assigned 10/995,947, and in all Letters Patent of the United States and all foreign countries which may or shall be granted on said invention, or any parts thereof, or on said application, or any divisional, continuing, reissue or other applications based in whole or in part thereon. And we agree, for ourselves and our executors and administrators, with said corporation and its successors and assigns but at its or their expense and charges, hereafter to execute all applications, amended specifications, deed or other instrument, and to do all acts necessary or proper to secure the grant of Letters Patent in the United States and in all other countries to said corporation, with specifications and claims in such form as shall be approved by the counsel of said corporation and to vest and confirm in said corporation, its successors and assigns, the legal title to all such patents.

And we do hereby authorize and request the Commissioner of Patents and Trademarks of the United States to issue such Letters Patent as shall be granted upon said application or applications based thereon to said corporation, its successors and assigns.

[SIGNATURES ON NEXT PAGES]

WITNESS my hand and seal this 4TH day of MARCH, 2005.

By: Robert G. Kraus
Robert G. Kraus

NOTARIAL SEAL

State/Commonwealth of: MA

County of: Bristol

On this 4th day of March, 2005 before me, the undersigned notary public, personally appeared Robert G. Kraus (name of document signer), proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose as an inventor for certain inventions, discoveries, or improvements indicated in said document.

Maria C. Furtado (official signature and seal of Notary)



SEAL.

[SIGNATURE ON NEXT PAGE]

92

WITNESS my hand and seal this 6 day of APRIL, 2005.

By: Robert Taylor
Robert Taylor

NOTARIAL SEAL

State/Commonwealth of: Massachusetts
County of: NORFOLK

On this 6th day of April, 2005 before me, the undersigned notary public, personally appeared Robert Taylor (name of document signer), proved to me through satisfactory evidence of identification, which were DRIVER LICENSE, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose as an inventor for certain inventions, discoveries, or improvements indicated in said document.

Nancy A. Wooster (official signature and seal of Notary)

SEAL

[SIGNATURE ON NEXT PAGE]



NANCY A. WOOSTER
Notary Public
Commonwealth of Massachusetts
My Commission Expires 9-29-06

WITNESS my hand and seal this 4th day of March, 2005.

By:

John Buonanno

NOTARIAL SEAL

State/Commonwealth of: MASS

County of: Bristol

On this 4th day of MARCH, 2005 before me, the undersigned notary public, personally appeared John Buonanno (name of document signer), proved to me through satisfactory evidence of identification, which were _____, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that he signed it voluntarily for its stated purpose as an inventor for certain inventions, discoveries, or improvements indicated in said document.

Maria O. Fortado

(official signature and seal of Notary)



SEAL

1380347.1

Effective on 12/01/2004. Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4610) FEE TRANSMITTAL For FY 2005		Complete if Known <table border="1"> <tr> <td>Application Number</td> <td>10/895,947-Conf. #5589</td> </tr> <tr> <td>Filing Date</td> <td>November 22, 2004</td> </tr> <tr> <td>First Named Inventor</td> <td>Robert G. Kraus</td> </tr> <tr> <td>Examiner Name</td> <td>Not Yet Assigned</td> </tr> <tr> <td>Art Unit</td> <td>3784</td> </tr> <tr> <td>Attorney Docket No.</td> <td>022719-0059</td> </tr> </table>		Application Number	10/895,947-Conf. #5589	Filing Date	November 22, 2004	First Named Inventor	Robert G. Kraus	Examiner Name	Not Yet Assigned	Art Unit	3784	Attorney Docket No.	022719-0059
Application Number	10/895,947-Conf. #5589														
Filing Date	November 22, 2004														
First Named Inventor	Robert G. Kraus														
Examiner Name	Not Yet Assigned														
Art Unit	3784														
Attorney Docket No.	022719-0059														
☐ Applicant claims small entity status. See 37 CFR 1.27															
TOTAL AMOUNT OF PAYMENT		(\$) 40.00													

METHOD OF PAYMENT (check all that apply)

☒ Check
 ☐ Credit Card
 ☐ Money Order
 ☐ None
 ☐ Other (please identify): _____

☐ Deposit Account
 Deposit Account Number: 141449
 Deposit Account Name: Nutter McClennen & Fish LLP

For the above-identified deposit account, the Director is hereby authorized to (check all that apply)

☐ Charge fee(s) indicated below
 ☐ Charge fee(s) indicated below, except for the filing fee

☐ Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17
 ☒ Credit any overpayments

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims Extra Claims Fee (\$) Fee Paid (\$) Multiple Dependent Claims Fee (\$) Fee Paid (\$)

Indep. Claims Extra Claims Fee (\$) Fee Paid (\$)

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s)

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
_____	_____	_____	_____	_____

4. OTHER FEE(S)

Description	Fee (\$)	Fee Paid (\$)
Non-English Specification, \$130 fee (no small entity discount)		
Other (e.g., late filing surcharge): 8021 Recording each patent assignment, agreement or ...	40.00	

SUBMITTED BY

Signature		Registration No. (Attorney/Agent)	31,359	Telephone	(817) 439-2000
Name (Print/Type)	William C. Geary III	Date	April 12, 2005		

Fee Transmittal

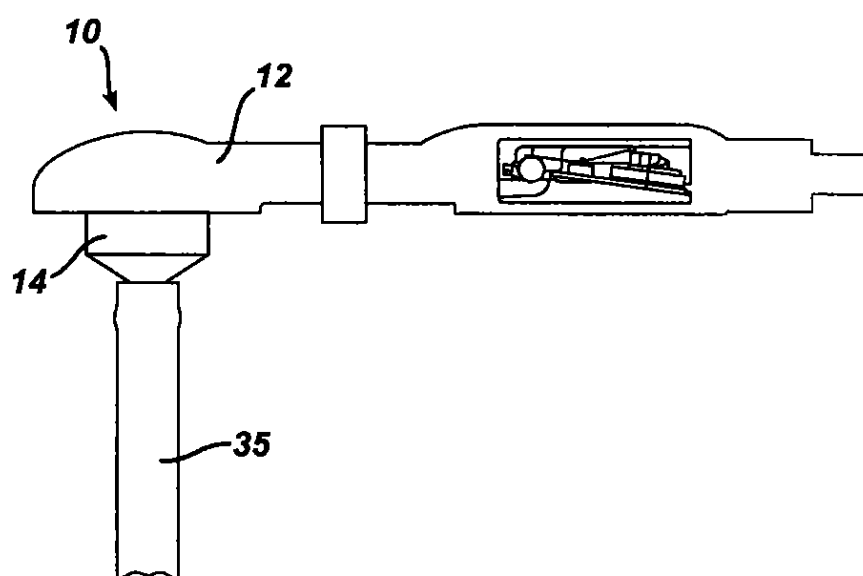
I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail, in an envelope addressed to: MS Assignment Recordation Services, Director of the US Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below

Dated: April 12, 2005 Signature: (William C. Geary III)

95 ~~10~~

1/7

FIG. 1



9/6 ~~9/9~~

2/7

FIG. 2A

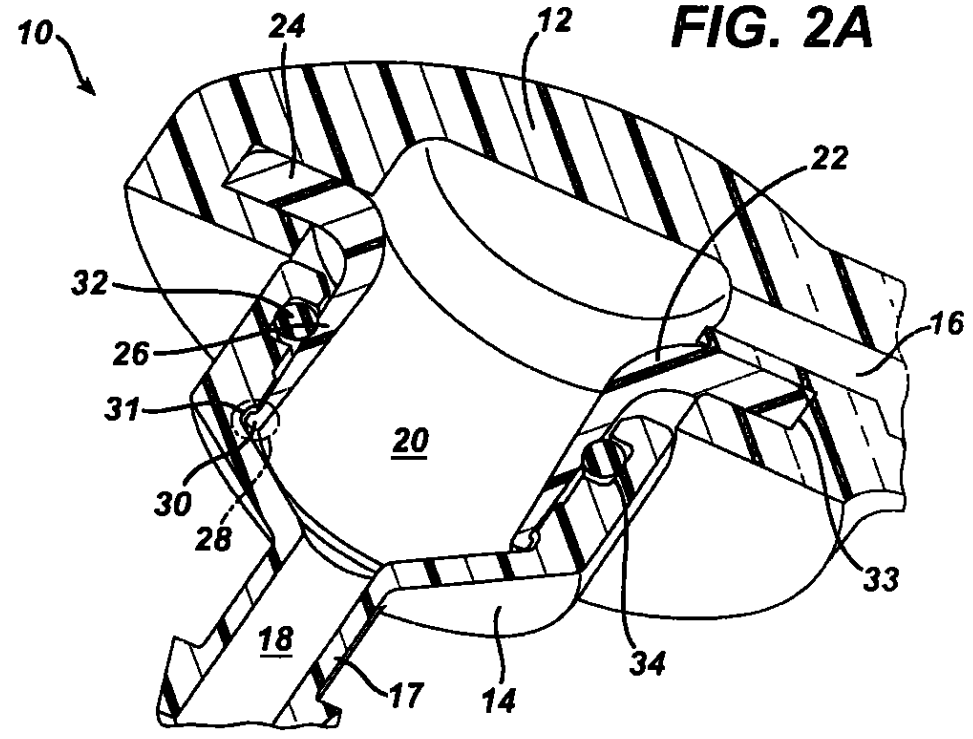
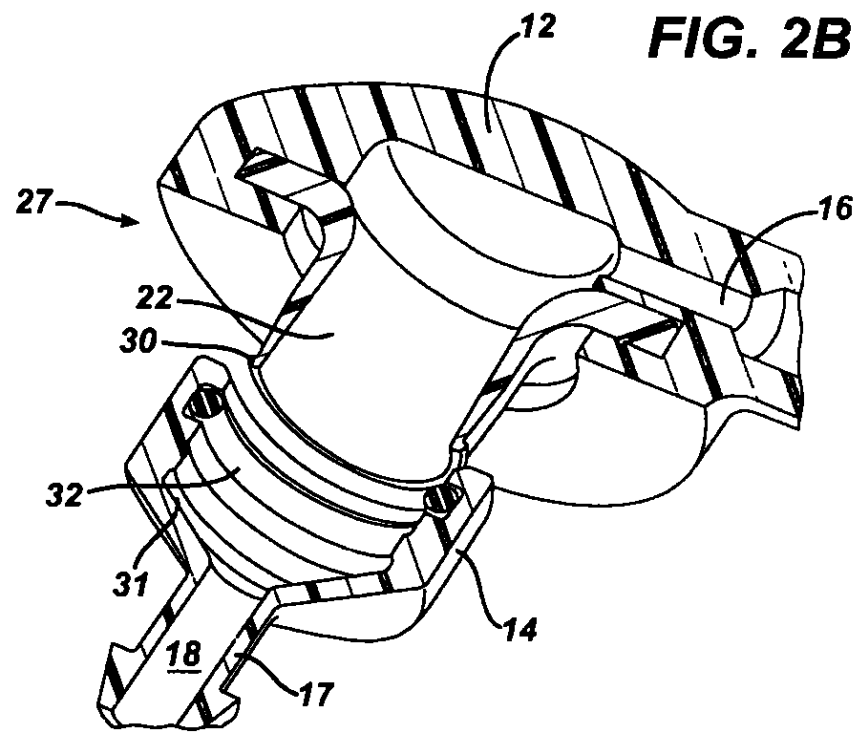


FIG. 2B



97 ~~100~~

3/7

FIG. 2C

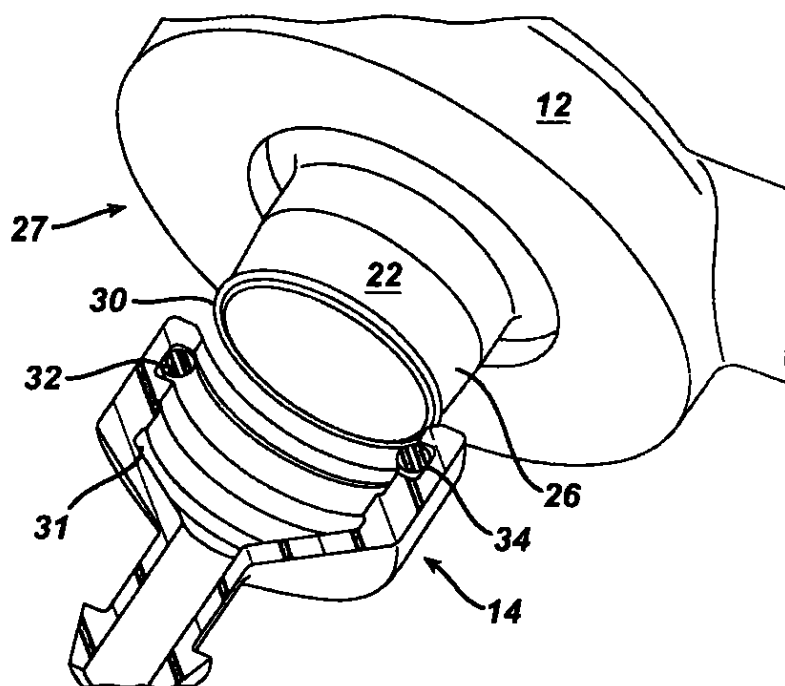
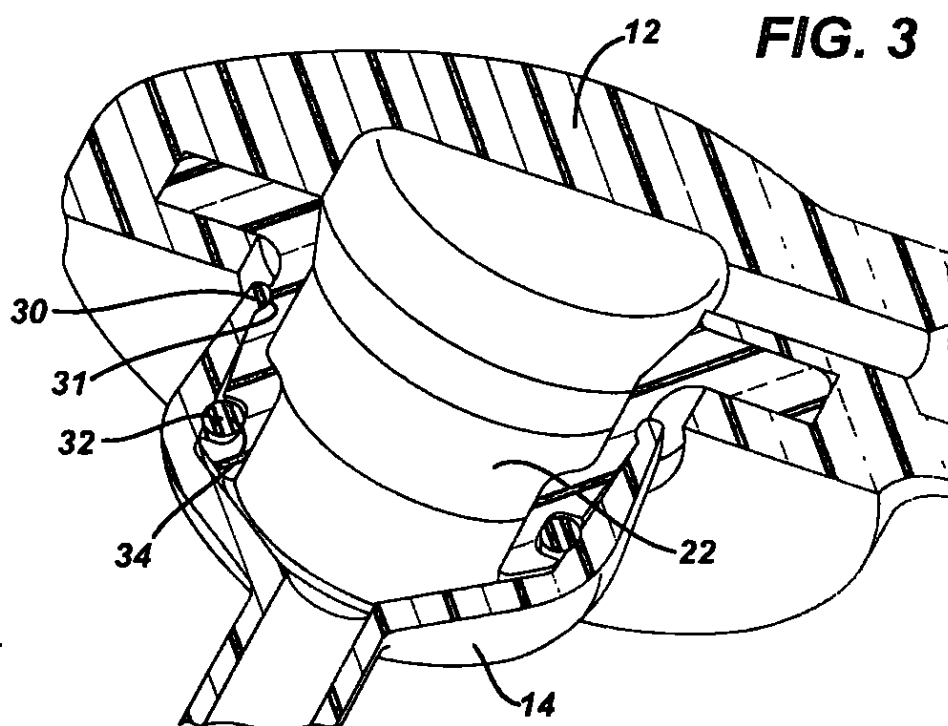


FIG. 3



98 ~~584~~

FIG. 4A

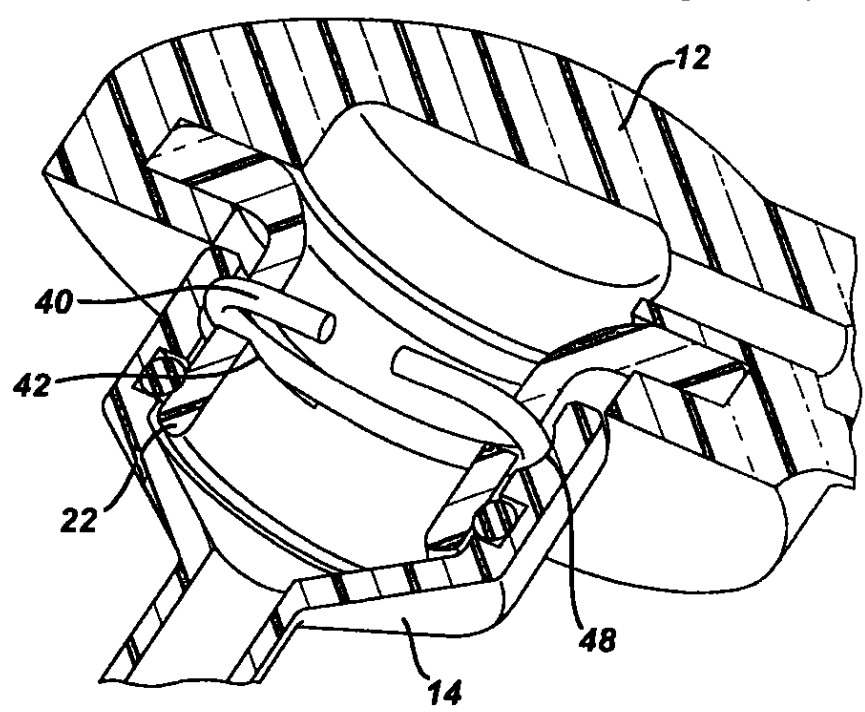
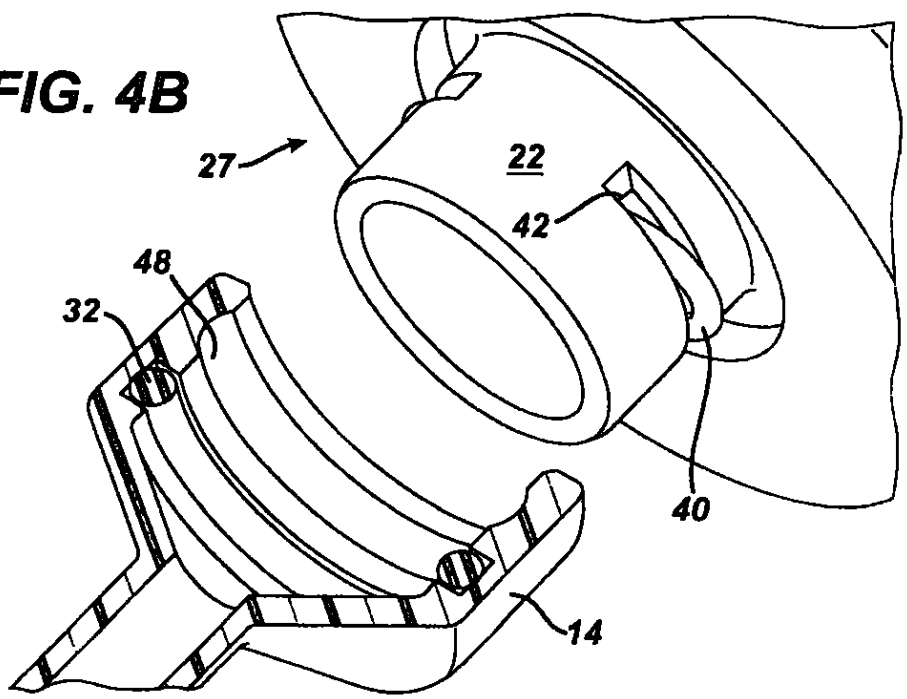


FIG. 4B



99 ~~102~~

5/7

FIG. 5

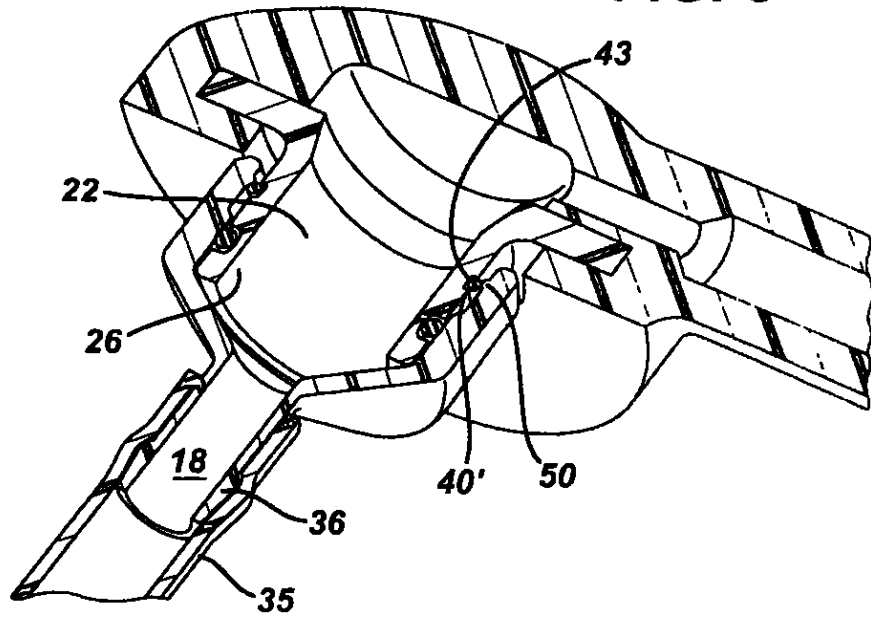
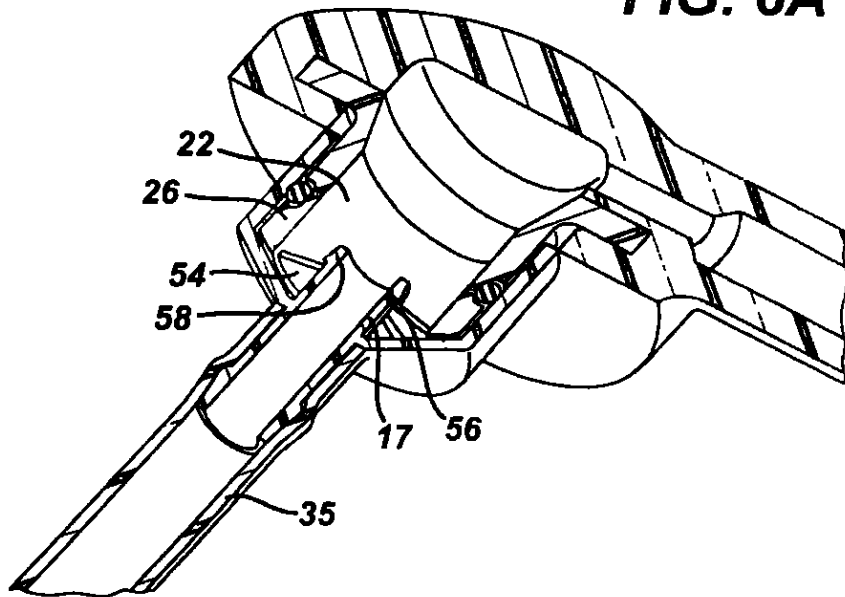


FIG. 6A



6/7

FIG. 6B

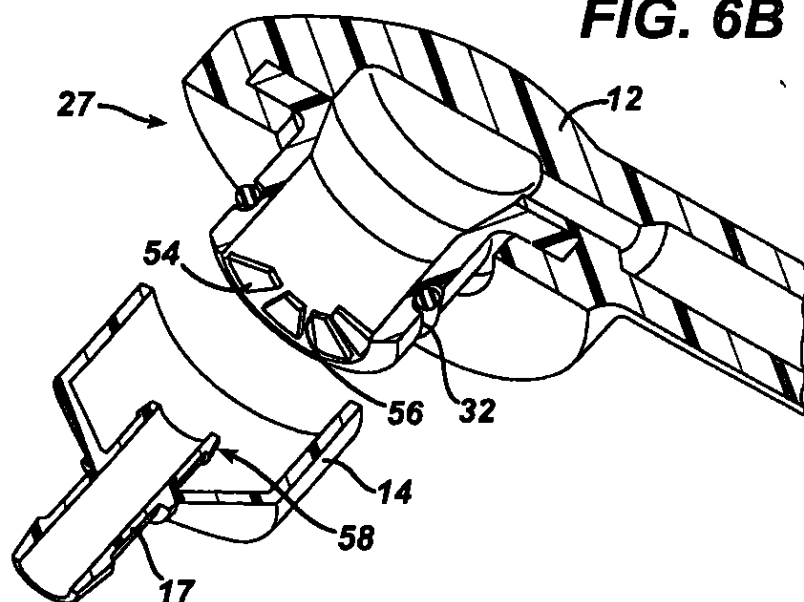
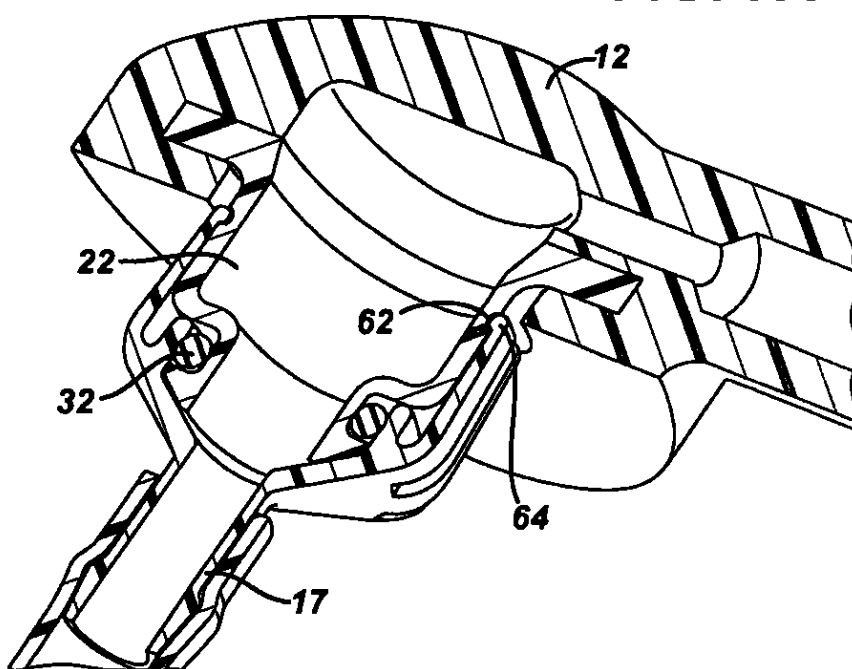


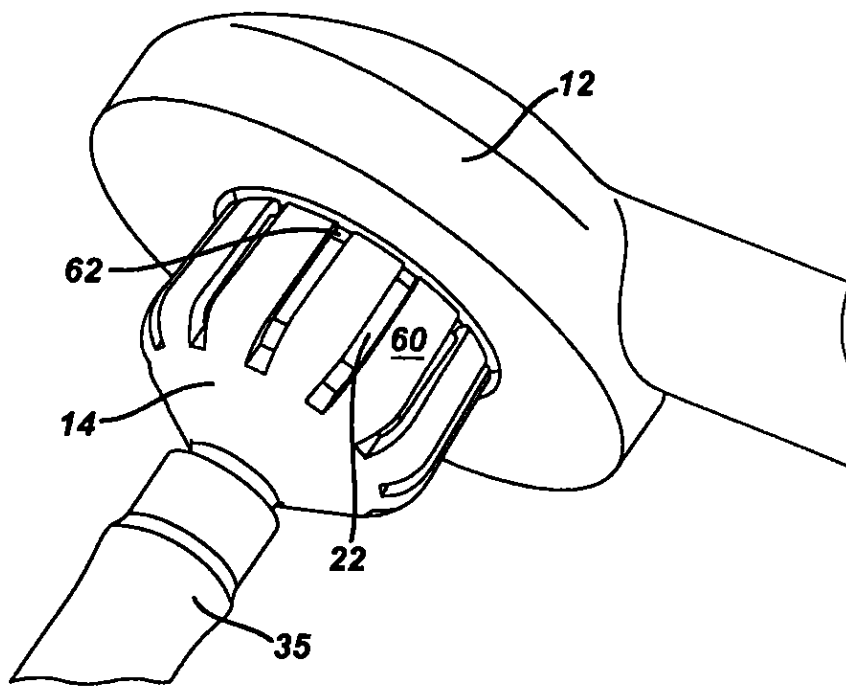
FIG. 7A



101 ~~104~~

7/7

FIG. 7B



Arte final folio ~~29~~ 104

102

REPUBLICA DE COLOMBIA
SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

Folio 186

2020
Bogotá D.C.,

Doctor(a)
ESCOBAR URIBE JIMENA
Apoderado(a) y/o Representante de
CODMAN & SHUITLEFF, INC.

REFERENCIA	Radicación No. 05 117555
	Trámite 2
	Evento 1
	Actuación 416
	Oficio No. 2873
	Folios 1

Teniendo en cuenta que la solicitud de privilegio de patente que se tramita bajo el expediente indicado en la referencia, reúne los requisitos de forma establecidos en los artículos 26 y 27 de la Decisión 486 de la Comisión de la Comunidad Andina, y en las demás disposiciones vigentes sobre la materia, se envía el extracto de la solicitud a la Oficina de Comunicaciones para efecto de su publicación en la Gaceta de Propiedad Industrial, conforme lo establece el artículo 40 de la misma Decisión.

Siendo manifestación expresa del interesado de efectuar la publicación "inmediato", está se realizará en la próxima gaceta de Propiedad Industrial.

Cúmplase
Dado en Bogotá DC,

27 MAR. 2007

ALIX CARMENZA CESPEDES DE VERGEL
Jefe de la división de Nuevas Creaciones

adpa10