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**SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISION DE NUEVAS CREACIONES**

E. S. D.

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Codman & Shurtleff, Inc.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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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, me permito presentar el documento (1) en que consta la cesión del derecho a la patente otorgada por los inventores a favor de mi mandante.

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Número de Solicitud: 11/382,165

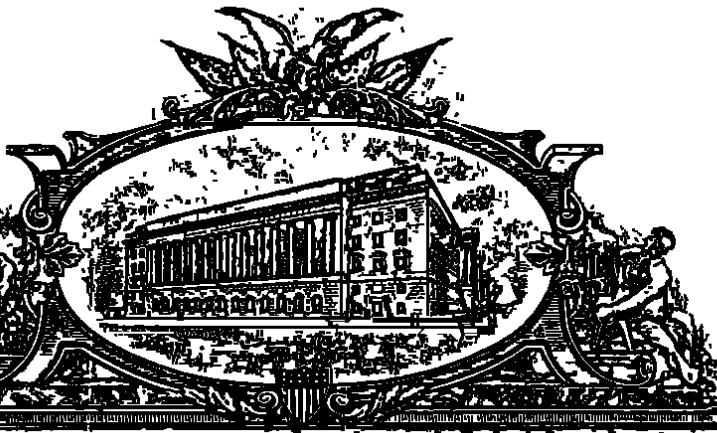
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THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS US11/382,165

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Warnings:					
Information:					
2	Oath or Declaration filed	Dec pdf	137566	no	3
Warnings:					
Information:					
3	Drawings	Dwgs pdf	27217	no	1
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CATHETER HAVING REINFORCING RINGS AND METHOD OF USE

BACKGROUND OF THE INVENTION

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1. Field of the Invention

The present invention relates to a catheter having reinforcing rings. More particularly, the present invention relates to a catheter having reinforcing rings that can be cut to length after surgical placement and securely connected to a barbed connector.

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2. Discussion of Related Art

There are many applications in which a catheter is fluidly connected to a connector. In medical applications, a catheter is often simply pushed over a barbed connector. But this connection may fail if, for example, an inadvertent force is applied to pull the catheter away from the connector. Thus, some have attempted to solve this problem by using an additional connector element radially about the catheter. However, these additional elements increase the outer profile of the connection. Additionally, in many embodiments, the additional element is made of a hard plastic material that cannot be treated with currently available antimicrobial impregnation processes. These elements also prevent the surgeon from cutting the length of the catheter to size after it has been surgically placed at a desired location in the body. Thus, the surgeon must make an educated guess at the length of catheter needed before placing it within the body. If the surgeon guesses wrong at the length, removal of that catheter and reinsertion of another catheter is required.

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In some instances, the surgeon will suture a catheter that has been connected to a barbed connector to maintain the connection over time. However, suturing a silicone rubber catheter to a barbed connector results in an inconsistent connection. If the suture is too tight, a cut to the catheter can cause leakage and tensile failure. If the suture is too loose, the catheter can be pulled loose and disconnect. Sutures are also subject to degradation over time and can fail years later after being placed within the body. Also, suturing a right angle connection requires the catheter to be lifted away from its preferred location within the body to provide a region for suturing. This is especially true for current shunt housings for treating hydrocephalus that use a right angle connection to the ventricular catheter. After suturing, the catheter is then replaced or pushed further into the

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body, such as, for example, brain tissue when a ventricular catheter is connected to a shunt housing.

Thus, there is a need in the art for a catheter that has a low outer profile, which can be treated with an antimicrobial impregnation process, and that can be cut to length after surgical placement and securely connected to a barbed connector, without requiring moving the catheter once it has been placed at the desired location within the body.

SUMMARY OF THE INVENTION

In accordance with a currently preferred exemplary embodiment, the present invention catheter includes a sleeve having a first end and a second end. Reinforcing rings are embedded in the sleeve at the first end.

In accordance with a currently preferred exemplary embodiment, the present invention connector assembly includes a sleeve having a first end and a second end. Reinforcing rings are embedded in the sleeve at the first end. A connector, which has a barbed end, is fluidly connected to the first end of the catheter.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and still further objects, features and advantages of the present invention will become apparent upon consideration of the following detailed description of a specific embodiment thereof, especially when taken in conjunction with the accompanying drawings wherein like reference numerals in the various figures are utilized to designate like components, and wherein:

Figure 1 is a perspective view of a catheter having reinforcing rings used with a shunt housing,

Figure 2 is a partial side view of a right angle connection;

Figure 3 is a cross-sectional view taken along line 3-3 of Fig. 2 and looking in the direction of the arrows; and

Figure 4 is a partial perspective view, with parts broken away, of a catheter having reinforcing rings.

DETAILED DESCRIPTION OF THE CURRENTLY PREFERRED EXEMPLARY EMBODIMENT

5 Referring now to Figs. 1-4, a device and method of using a catheter 10, which has reinforcing rings 12, in accordance with the present invention, is illustrated.

Catheter 10 is in the form of a sleeve 14 and has a first end 16 and a second end 18. A plurality of reinforcing rings 12 are embedded in sleeve 14 at its first end 16. In a currently preferred exemplary embodiment, the catheters are a ventricular catheter 14' and a drainage catheter 14'' for use with a hydrocephalus shunt valve 20. Ventricular catheter 14' has at its second end 18 a plurality of inlet openings 22. Inlet openings 22 permit CSF to be drained from the patient's ventricles into the ventricular catheter and delivered to shunt valve 20. Shunt valve 20 regulates the amount of fluid to be drained from the ventricles and then to be delivered to the drainage catheter 14''. Drainage catheter 14'' delivers the cerebrospinal fluid ("CSF") to a portion of the body that can absorb the CSF. CSF is normally absorbed by the body's venous system. The lower end of the distal catheter of the shunt can be led into the abdomen (ventriculo-peritoneal shunt), wherein CSF passes into the bloodstream.

Reinforcing rings 12 are illustrated as being disposed at regular intervals. However, the rings could be disposed at irregular intervals, such as, for example, becoming closer together as the rings approach the end of the catheter. Another example for spacing the rings at irregular intervals would be to avoid kinking at specific bends in the catheter. In a currently preferred exemplary embodiment there are at least twenty (20) reinforcing rings disposed at regular intervals at the first end of the catheter 10. In a currently preferred embodiment, the ventricular catheter 14' has about thirty (30) reinforcing rings, and the drainage catheter 14'' has about ten (10). In some embodiments, the reinforcing rings could be disposed throughout the entire length of the catheter 14. This would be especially practical in embodiments where the length of the catheter is relatively short, such as, for example, less than a two or three inches in length.

30 Referring now to Fig. 3, at least four (4) reinforcing rings 12 are preferred to effect an adequate connection of the catheter to a barbed connector 24. Preferably, at least two (2) reinforcing rings 12 should pass the barb apex 26 to ensure an optimum attachment. The most proximal ring 12', near the cut end, may be exposed and may have less adherence to the catheter. Thus, the need to ensure that at least two rings 12 (i.e., 12' and

12") pass over the barb apex 26. This attachment can be visualized by the surgeon if the catheter sleeve 14 is made of clear silicone. Reinforcing rings 12 preferably have a smaller inside diameter than the largest barb diameter, which is the barb apex.

The catheter sleeve 14 is preferably made of silicone. At least in the area of the reinforcing rings, sleeve 14 is at least partially transparent so that the reinforcing rings 12 can be seen. The reinforcing rings can be made of titanium, stainless steel, or even a rigid plastic material. In fact, just about any material can be used so long as it is MRI compatible and biocompatible. As shown in Fig. 3, the plurality of reinforcing rings 12 are positioned axially discrete from one another. Thus, ventricular catheter 14' can be relatively easily cut to length after surgical placement and securely connected to a barbed connector. The surgeon's blade can simply cut between adjacent reinforcing rings 12, while still preferably leaving at least four rings to ensure an adequate connection to the barbed connector.

Reinforcing rings 12 are preferably embedded in the sleeve 14 at its first end. Rings 12 can, in one embodiment be embedded in a separate sleeve 28. Sleeve 28 can be placed over the proximal end 16 of each catheter 14 and bonded thereto. Alternatively, the reinforcing rings 12 can be placed on the outer surface of the proximal end 16 of catheter 14 with a slight interference fit. Silicone could then be applied to the outer surface of the proximal end of catheter 14 by, for example, using a dipping process or over molding process. The resulting structure would be a plurality of reinforcing rings embedded in the sleeve at its proximal end.

Referring now to Figure 4, an alternate embodiment of the reinforcing rings is illustrated. The reinforcing rings 112 can be made as one part, such as, for example, by injection molding. Each ring 112 is connected to an adjacent ring by three attachments 113. The three attachments 113 are frangible by a scalpel. Of course, the three attachments may limit flexibility of the catheter and would be harder to cut than just silicone.

A method of connecting a catheter to a barbed connector, where the catheter is comprised of a sleeve having a first end and a second end, and a plurality of reinforcing rings are embedded in the sleeve at the first end, is described below.

During surgery, the first end can be cut to exact length after ideal surgical placement. The cut end of the catheter is held, possibly with a conforming tool. The barb connector on the shunt housing and the cut end are brought together such that the barb advances into the cut end of the catheter and at least two rings snap over the barb, thereby

forming a solid attachment and seal. As the first end of the sleeve is placed over the barbed end of the connector a fluid connection is created between the catheter and the connector. The placing step is sufficient to place at least two reinforcing rings 12', 12" passed the apex of the barb. After the placing step, the surgeon can visually verify that at least two reinforcing rings passed the apex of the barb because, at least in the area of the reinforcing rings, the catheter is transparent.

Preferably the method in accordance with the present invention connects a ventricular catheter to a first connector on a shunt housing and connects a drainage catheter to a second connector on the shunt housing. The ventricular catheter is comprised of a sleeve having a first end and a second end, and a plurality of reinforcing rings are embedded in the sleeve at the first end of the ventricular catheter. The drainage catheter is comprised of a sleeve having a first end and a second end, and a plurality of reinforcing rings are embedded in the sleeve at the first end of the drainage catheter. The first and second connector each having a barbed end. The first end of the sleeve of the ventricular catheter is placed over the barbed end of the first connector to fluidly connect the ventricular catheter to the shunt housing. The first end of the sleeve of the drainage catheter is placed over the barbed end of the second connector to fluidly connect the drainage catheter to the shunt housing. The ventricular catheter is placed within the ventricles of the brain. Before the placing of the ventricular catheter, the ventricular catheter is cut to exact size between two reinforcing rings. This cutting step occurs before the step of placing the first end of the sleeve of the ventricular catheter over the barbed end of the first connector.

The catheter with the reinforcing rings embedded therein can be treated with an antimicrobial agent, such as is done with the Bactiseal® catheter that is currently sold by Codman & Shurtleff of Raynham, Mass.

Having described the presently preferred exemplary embodiment of an apparatus and a method of using a catheter having reinforcing rings that can be cut to length after surgical placement and securely connected to a barbed connector, it is believed that other modifications, variations and changes will be suggested to those skilled in the art in view of the teachings set forth herein. Substitutions of elements from one described embodiment to another are also fully intended and contemplated. It is also to be understood that the drawings are not necessarily drawn to scale, but that they are merely conceptual in nature. It is, therefore, to be understood that all such modifications,

variations, and changes are believed to fall within the scope of the present invention as defined by the appended claims

Every issued patent, pending patent application, publication, journal article, book or any other reference cited herein is each incorporated by reference in their entirety.

REIVINDICACIONES

Lo que se reivindica es:

1. Un catéter que comprende:
un manguito que tiene un primer y un segundo extremo; y
una pluralidad de anillos de refuerzo embebidos en el manguito en un primer extremo.
2. El catéter de acuerdo con la reivindicación 1, en donde la pluralidad de anillos de refuerzo están dispuestos en intervalos regulares.
3. El catéter de acuerdo con la reivindicación 1, en donde existen al menos cuatro anillos de refuerzo.
4. El catéter de acuerdo con la reivindicación 1, en donde existen al menos 20 anillos de refuerzo.
5. El catéter de acuerdo con la reivindicación 1, en donde el manguito se hace de una silicona.
6. El catéter de acuerdo con la reivindicación 5, en donde la silicona, al menos en el área de los anillos de refuerzo es al menos parcialmente transparente.

7. El catéter de acuerdo con la reivindicación 1, en donde la pluralidad de anillos de refuerzo se hace de titanio.
8. El catéter de acuerdo con la reivindicación 1, en donde la pluralidad de anillos de refuerzo se hace de acero inoxidable.
9. El catéter de acuerdo con la reivindicación 1, en donde la pluralidad de anillos de refuerzo se hace de material plástico rígido.
10. El catéter de acuerdo con la reivindicación 1, en donde la pluralidad de anillos de refuerzo es distinta la una de la otra.
11. El catéter de acuerdo con la reivindicación 2 la pluralidad de anillos de refuerzo es distinto el uno del otro.
12. El catéter de acuerdo con la reivindicación 1, en donde la pluralidad de anillos de refuerzo se dispone en intervalos irregulares.
13. El catéter de acuerdo con la reivindicación 1, en donde la pluralidad de anillos de refuerzo se interconecta como un ensamble de una pieza.

14. Un ensamble de conector comprende:

un manguito que tiene un primer y un segundo extremo;

una pluralidad de anillos de refuerzo embebidos en el manguito en dicho extremo;

un conector que tiene un extremo de púa, dicho primer extremo de dicho manguito se conecta a dicho extremo de púa.

15. El ensamble de conector de acuerdo con la reivindicación 14, en donde la pluralidad de anillos de refuerzo está dispuesto en intervalos regulares.

16. El ensamble de conector de acuerdo con la reivindicación 14, en donde existen al menos cuatro anillos de refuerzo.

17. El ensamble de conector de acuerdo con la reivindicación 14, en donde existen al menos 20 anillos de refuerzo.

18. El ensamble de conector de acuerdo con la reivindicación 14, en donde el manguito se hace de una silicona.

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19. El ensamble de corrector de acuerdo con la reivindicación 18, en donde la silicona al menos en el área de los anillos de refuerzo es al menos parcialmente transparente.
20. El ensamble de conector de acuerdo con la reivindicación 14, en donde la pluralidad de anillos de refuerzo se hace de titanio.
21. El ensamble de conector de acuerdo con la reivindicación 14, en donde la pluralidad de anillos de refuerzo se hace de acero inoxidable.
22. El ensamble de conector de acuerdo con la reivindicación 14, en donde la pluralidad de anillos de refuerzo se hace de material plástico rígido.
23. El ensamble de conector de acuerdo con la reivindicación 14, en donde la pluralidad de anillos de refuerzo es distinto uno del otro.
24. El ensamble de conector de acuerdo con la reivindicación 15 la pluralidad de anillos de refuerzo es distinto uno del otro.
25. El ensamble de conector de acuerdo con la reivindicación 14, en donde la pluralidad de

anillos de refuerzo se dispone en intervalos irregulares.

26. El ensamble de conector de acuerdo con la reivindicación 14, en donde la pluralidad de anillos de refuerzo se interconecta como un ensamble de una pieza.

27. Un método para conectar un catéter a un conector, e donde dicho catéter está comprendido de un manguito que tiene un primer y un segundo extremo y una pluralidad de anillos de refuerzo están embebidos en el manguito en el primer extremo, el conector tiene un extremo de púa, dicho método comprende las etapas de:

colocar el primer extremo del manguito sobre el extremo de púa del conector para conectar de forma fluida el catéter al conector.

28. El método de acuerdo con la reivindicación 27, en donde la etapa de ubicación es suficiente para colocar al menos dos anillos de refuerzo pasados el ápice de púa.

29. El método de acuerdo con la reivindicación 28, en donde dicho método comprende adicionalmente la etapa de, después de la etapa de ubicación,

verificar que al menos dos anillos de refuerzo pasan el ápice de púa.

30. El método de acuerdo con la reivindicación 29, en donde el manguito, al menos en el área de los anillos de refuerzo, es al menos parcialmente transparente, dicho método comprende adicionalmente la etapa de, después de la etapa de ubicación, verificar visualmente que al menos dos anillos de refuerzo de refuerzo pasan el ápice de púa.
31. Un método para conectar un catéter ventricular a un primer conector en una carcasa de derivación y conectar un catéter de drenaje a un segundo conector en la carcasa de derivación, en donde dicho catéter ventricular está comprendido de un manguito que tiene un primer extremo y segundo extremo, y una pluralidad de anillos de refuerzo están embebidos en el manguito en el primer extremo del catéter ventricular, dicho catéter de drenaje está comprendido de un manguito que tiene un primer extremo y un segundo extremo, y una pluralidad de anillos de refuerzo están embebidos en el manguito en el primer extremo del catéter de drenaje, el primero y segundo conector cada uno tienen un extremo de púa, dicho método comprende la etapa de:

colocar el primer extremo del manguito del catéter ventricular sobre el extremo de púa del primer conector para conectar de forma fluida el catéter ventricular la carcasa de derivación;

colocar el primer extremo del manguito al catéter de drenaje sobre el extremo de púa del segundo conector para conectar de forma fluida el catéter de drenaje la carcasa de derivación.

32. El método de acuerdo con la reivindicación 31, en donde las etapas de ubicación son suficientes para colocar al menos dos anillos de refuerzo que pasan el ápice de púa.
33. El método de acuerdo con la reivindicación 32, en donde dicho método comprende adicionalmente la etapa de, después de las etapas de ubicación, verificar que al menos dos de los anillos de refuerzo pasan el ápice de púa.
34. El método de acuerdo con la reivindicación 33, en donde el manguito del catéter ventricular y el catéter de drenaje, al menos en el área de los anillos de refuerzo, es al menos parcialmente transparente, dicho método comprende adicionalmente la etapa de, después de la etapa de empuje,

verificar visualmente que al menos dos anillos de refuerzo pasan el ápice de púa.

35. El método de acuerdo con la reivindicación 31, que comprende adicionalmente la etapa de colocar el catéter ventricular dentro de los ventrículos del cerebro.
36. El método de acuerdo con la reivindicación 35, que comprende adicionalmente la etapa de, antes de colocar la etapa del catéter ventricular, cortar el catéter ventricular entre dos anillos de refuerzo.
37. El método de acuerdo con la reivindicación 36, en donde la etapa de corte ocurre antes de la etapa de colocar el primer extremo del manguito del catéter ventricular sobre el extremo de púa del primer conector.
38. El método de acuerdo con la reivindicación 1, en donde el catéter tiene un agente antimicrobiano embebido allí.
39. El método de acuerdo con la reivindicación 14, en donde el catéter tiene un agente antimicrobiano embebido allí.

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CLAIMS

What is claimed is:

- 5 1. A catheter comprising:
a sleeve having a first end and a second end; and
a plurality of reinforcing rings embedded in the sleeve at said first end.
2. The catheter according to claim 1, wherein the plurality of reinforcing rings are
10 disposed at regular intervals.
3. The catheter according to claim 1, wherein there are at least four reinforcing rings.
4. The catheter according to claim 1, wherein there are at least twenty reinforcing
rings
5. The catheter according to claim 1, wherein the sleeve is made of a silicone.
- 15 6. The catheter according to claim 5, wherein the silicone, at least in the area of the
reinforcing rings, is at least partially transparent.
7. The catheter according to claim 1, wherein the plurality of reinforcing rings are
made of titanium.
8. The catheter according to claim 1, wherein the plurality of reinforcing rings are
20 made of stainless steel.
9. The catheter according to claim 1, wherein the plurality of reinforcing rings are
made of a rigid plastic material.
10. The catheter according to claim 1, wherein the plurality of reinforcing rings are
discreet from one another.
- 25 11. The catheter according to claim 2, wherein the plurality of reinforcing rings are
discreet from one another.
12. The catheter according to claim 1, wherein the plurality of reinforcing rings are
disposed at irregular intervals.
13. The catheter according to claim 1, wherein the plurality of reinforcing rings are
30 interconnected as a one-piece assembly.
14. A connector assembly comprising
a sleeve having a first end and a second end,
a plurality of reinforcing rings embedded in the sleeve at said first end;

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a connector having a barbed end, said first end of said sleeve is connected to said barbed end.

15 The connector assembly according to claim 14, wherein the plurality of reinforcing rings are disposed at regular intervals.

5 16. The connector assembly according to claim 14, wherein there are at least four reinforcing rings.

17. The connector assembly according to claim 14, wherein there are at least twenty reinforcing rings.

10 18. The connector assembly according to claim 14, wherein the sleeve is made of a silicone

19. The connector assembly according to claim 18, wherein the silicone, at least in the area of the reinforcing rings, is at least partially transparent.

20. The connector assembly according to claim 14, wherein the plurality of reinforcing rings are made of titanium

15 21. The connector assembly according to claim 14, wherein the plurality of reinforcing rings are made of stainless steel.

22. The connector assembly according to claim 14, wherein the plurality of reinforcing rings are made of a rigid plastic material

20 23. The connector assembly according to claim 14, wherein the plurality of reinforcing rings are discrete from one another.

24. The connector assembly according to claim 15, wherein the plurality of reinforcing rings are discrete from one another.

25. The catheter according to claim 14, wherein the plurality of reinforcing rings are disposed at irregular intervals

25 26. The catheter according to claim 14, wherein the plurality of reinforcing rings are interconnected as a one-piece assembly

27. A method of connecting a catheter to a connector, wherein said catheter is comprised of a sleeve having a first end and a second end, and a plurality of reinforcing rings are embedded in the sleeve at the first end, the connector having a barbed end, said
30 method comprising the step of:

placing the first end of the sleeve over the barbed end of the connector to fluidly connect the catheter to the connector.

28. The method according to claim 27, wherein the placing step is sufficient to place at least two reinforcing rings passed the apex of the barb.

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29 The method according to claim 28, wherein said method further comprising the step of, after the placing step, verifying that at least two reinforcing rings passed the apex of the barb.

30. The method according to claim 29, wherein the sleeve, at least in the area of the reinforcing rings, is at least partially transparent, said method further comprising the step of, after the placing step, visually verifying that at least two reinforcing rings passed the apex of the barb.

31. A method of connecting a ventricular catheter to a first connector on a shunt housing and connecting a drainage catheter to a second connector on the shunt housing, wherein said ventricular catheter is comprised of a sleeve having a first end and a second end, and a plurality of reinforcing rings are embedded in the sleeve at the first end of the ventricular catheter, said drainage catheter is comprised of a sleeve having a first end and a second end, and a plurality of reinforcing rings are embedded in the sleeve at the first end of the drainage catheter, the first and second connector each having a barbed end, said method comprising the step of:

placing the first end of the sleeve of the ventricular catheter over the barbed end of the first connector to fluidly connect the ventricular catheter to the shunt housing;

placing the first end of the sleeve of the drainage catheter over the barbed end of the second connector to fluidly connect the drainage catheter to the shunt housing.

32. The method according to claim 31, wherein both of the placing steps are sufficient to place at least two reinforcing rings passed the apex of the barb.

33. The method according to claim 32, wherein said method further comprising the step of, after the placing steps, verifying that at least two reinforcing rings passed the apex of the barb.

34. The method according to claim 33, wherein the sleeve of both the ventricular catheter and the drainage catheter, at least in the area of the reinforcing rings, is at least partially transparent, said method further comprising the step of, after the pushing steps, visually verifying that at least two reinforcing rings passed the apex of the barb.

35. The method according to claim 31, further comprising the step of placing the ventricular catheter within the ventricles of the brain.

36 The method according to claim 35, further comprising the step of, before the placing the ventricular catheter step, cutting the ventricular catheter between two reinforcing rings.

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37. The method according to claim 36, wherein the cutting step occurs before the step of placing the first end of the sleeve of the ventricular catheter over the barbed end of the first connector.

38. The catheter according to claim 1, wherein the catheter has an antimicrobial agent embedded therein.

39. The method according to claim 14, wherein the catheter has an antimicrobial agent embedded therein.

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ABSTRACT OF THE DISCLOSURE

A connector assembly includes a sleeve having a first end and a second end. Reinforcing rings are embedded in the sleeve at the first end. A connector, which has a barbed end, is fluidly connected to the first end of the catheter. During surgery, the first end of the sleeve can be cut to exact length after surgical placement. The barb connector on a shunt housing and the cut end of the catheter are brought together such that the barb advances into the cut end of the catheter and at least two rings snap over the barb, thereby fluidly connecting the shunt housing and the catheter while forming a solid attachment and seal.

Please type a plus sign (+) inside this box: ☐

PTO/SB/01 (10-00)
Approved for use through 10/31/2002 OMB 0851-0032
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

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DECLARATION AND POWER OF ATTORNEY FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63) ☒ Declaration Submitted with Initial Filing ☐ Declaration Submitted after Initial Filing (Surcharge (37 CFR 1.16(e)) required)	Attorney Docket Number	COD5118
	First Named Inventor	Robert G Kraus
	COMPLETE IF KNOWN	
	Application Number	
	Filing Date	
	Group Art Unit	
	Examiner Name	

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

CATHETER HAVING REINFORCING RINGS AND METHOD OF USE
(Title of the Invention)

the specification of which

☒ is attached hereto

OR

☐ was filed on (MM/DD/YYYY) as United States Application Number or PCT International Application Number
 and was amended on (MM/DD/YYYY)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			☐ ☐ ☐ ☐	☐ ☐ ☐ ☐	☐ ☐ ☐ ☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

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DECLARATION - Utility or Design Patent Application		
I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below		
Application Number(s)	Filing Date (MM/DD/YYYY)	☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/028 attached hereto
I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.		
Application Serial No.	Filing Date	Status
		Patented Patented Patented
I hereby appoint:		
☒ Practitioners at Customer Number 000027777		Place Customer Number Bar Code Label Here
AND		
☐ Practitioner(s) named below: Name _____ Registration Number _____		
as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.		
Address all telephone calls to Eugene L. Szczecina, Jr. at telephone number (732) 524-1479.		
Direct all correspondence to ☒ Customer Number 000027777 OR ☐ Correspondence address below		
Name:		
Address:		
Address:		
City:	State:	ZIP
Country	Telephone:	Fax:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.			
NAME OF SOLE OR FIRST INVENTOR:		☐ A petition has been filed for this unsigned inventor	
Given Name (first and middle (if any)) Robert G		Family Name or Surname Kraus	
Inventor's Signature <i>Robert G Kraus</i>		Date May 5, 2006	
Residence: City Attleboro	State MA	Country US	Citizenship US
Mailing Address 46 Dorset Lane			
City Attleboro	State MA	ZIP 04954	Country US
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.			
NAME OF SECOND INVENTOR:		☐ A petition has been filed for this unsigned inventor	
Given Name (first and middle (if any))		Family Name or Surname	
Inventor's Signature		Date	
Residence: City	State	Country	Citizenship
Mailing Address			
City	State	ZIP	Country
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.			
NAME OF THIRD INVENTOR:		☐ A petition has been filed for this unsigned inventor	
Given Name (first and middle (if any))		Family Name or Surname	
Inventor's Signature		Date	
Residence: City	State	Country	Citizenship
Mailing Address			
City	State	ZIP	Country

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DOCKET NO. COD5118
Sole Inventor

A S S I G N M E N T

Serial No.
Filed

WHEREAS, Robert G. Kraus, residing at 46 Doral Lane, Attleboro, MA 02703 respectively (hereinafter called "Assignor"), have made certain new and useful inventions or discoveries relating to

CATHETER HAVING REINFORCING RINGS AND METHOD OF USE

for which they have on even date herewith executed an application for Letters Patent of the United States; and

WHEREAS, Codman & Shurtleff, Inc., a New Jersey corporation (hereinafter called "Assignee"), are desirous of acquiring Assignor entire right, title, and interest therein:

NOW, THEREFORE, BE IT KNOWN that for and in consideration of other valuable considerations, the receipt of which is hereby acknowledged, Assignors have sold, assigned, and transferred, and do hereby sell, assign and transfer unto said Assignee their entire right, title and interest in and to all said inventions and discoveries disclosed in said application whose identification above by serial number and filing date, when available is hereby authorized, and in and to said application, all substitutions, divisions, and continuations thereof, and in and to all Letters Patent, United States and foreign, that may be granted for said inventions and discoveries, 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 Assignors if this Assignment and sale had not been made;

And Assignors hereby authorize and request the Commissioner of Patents of the United States to issue said Letters Patent in accordance with this Assignment;

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FIG. 1

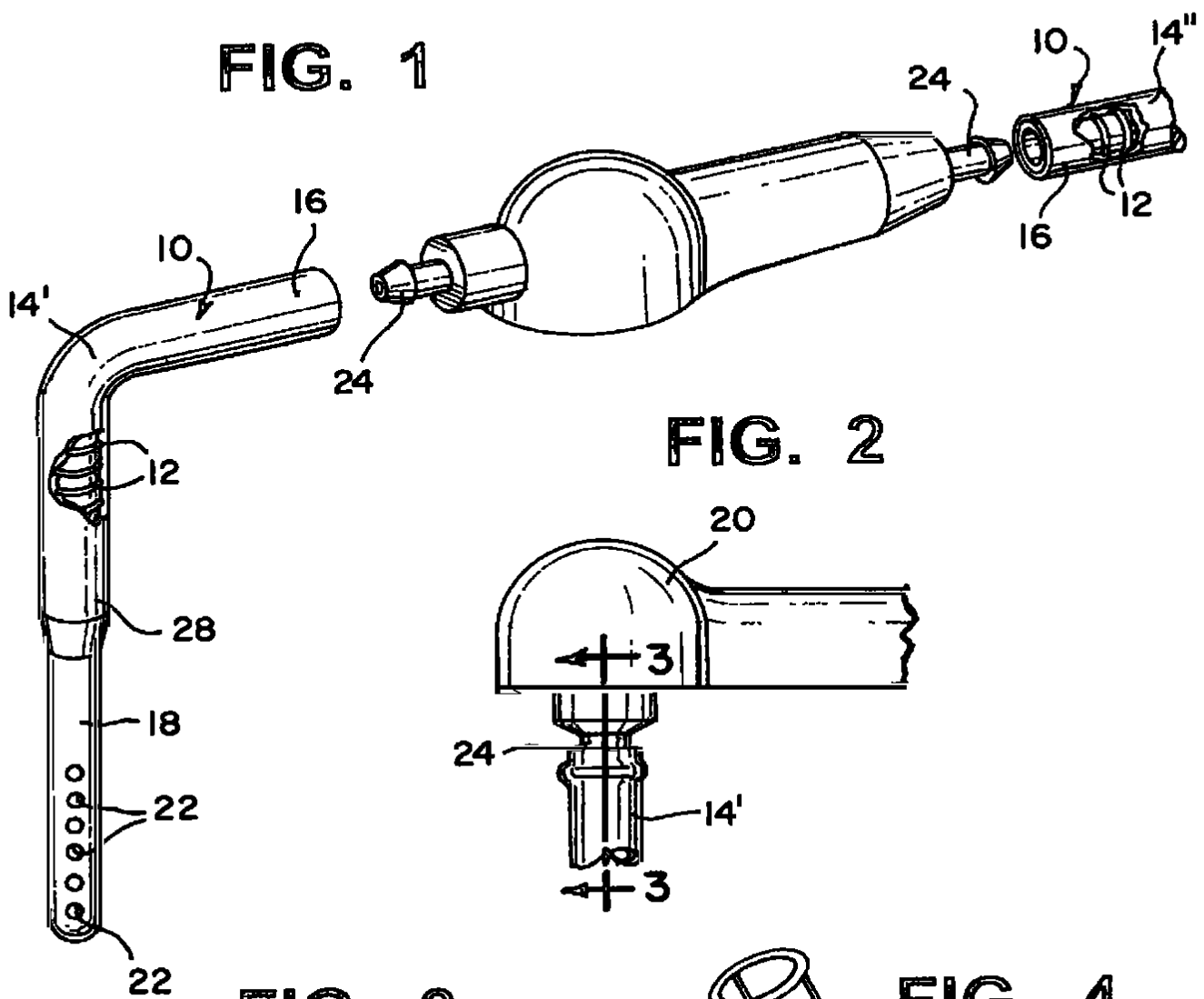


FIG. 2

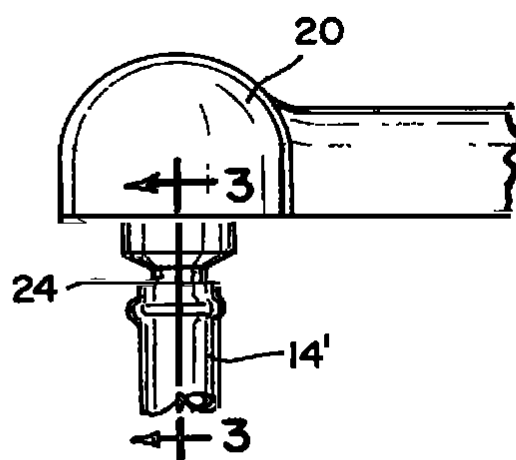


FIG. 3

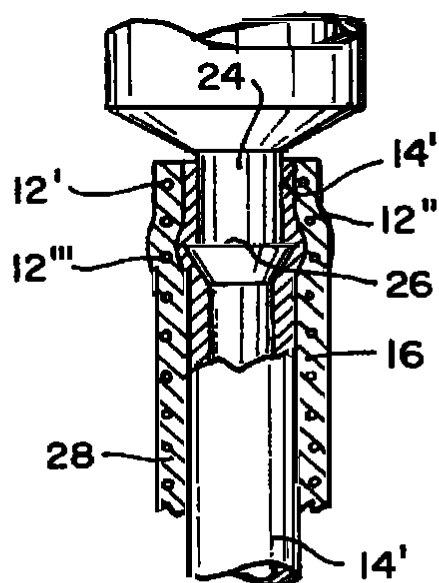


FIG. 4

