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(54) **GUIDEWIRE FOR EMBOLIC PROTECTION COMPRISING AN ACTIVATABLE STOP AND A FILTER**

FÜHRUNGSDRAHT ALS EMBOLIESCHUTZ MIT AKTIVIERBAREM ANSCHLAG UND FILTER

FIL-GUIDE DESTINE A UNE PROTECTION EMBOLIQUE ET COMPRENANT UNE BUTEE ACTIVABLE ET UN FILTRE

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Description

Field of the Invention

[0001] The present invention relates generally to the field of intravascular guidewires. More particularly, the present invention pertains to intravascular guidewires having an articulating distal section.

Background of the Invention

[0002] The use of guidewires or core wires in conjunction with intravascular devices such as embolic protection filters or catheters is widely known. Typically, a flexible guidewire is inserted into a vascular lumen through a guide catheter, and then advanced to a desired location within the body. Once the guidewire is in place, an intravascular device such as an embolic filter can be advanced along the guidewire distal a lesion and deployed to prevent embolic debris from flowing downstream during, for example, an angioplasty or atherectomy procedure.

[0003] To facilitate steering and tracking through the tortuous vascular system, it is desirable to have a radially flexible guidewire capable of traversing the cavities of the body by applying a force on a proximal section of the guidewire. It is also desireable for the distal section of the guidewire to have a reduced profile capable of placement beyond a lesion or other protrusion in the vasculature with minimal interference. One such series of improvements has resulted in the use of a thin, flexible guidewire having a distally tapering cross-sectional area for improved steering, and a coiled wire helix disposed about an arcuate distal end of the guidewire for improved tracking.

[0004] EP 0 486 157 A shows the features of the preamble of claim 1. This document describes a guidewire for use in guiding a catheter, wherein the guidewire is provided with an expandable element at its distal region. WO 02/069844 describes a system for delivering and/or retrieving a filter fixed to a guidewire, wherein the system includes a locking mechanism to selectively preclude the relative axial movement between the guidewire and the outer shaft of the system.

Summary of the Invention

[0005] The present invention relates generally to the field of intravascular guidewires and is defined by the features of the claims. More particularly, the present invention pertains to intravascular guidewires having an articulating distal section. In one embodiment of the present invention, a guidewire having an articulating distal section is comprised of an elongated core wire having a longitudinal axis, a proximal end and a distal end; and an actuatable tip disposed about the distal end of the core wire having an outwardly expandable portion adapted to have a reduced profile in a first position, and an enlarged profile in a second position. The expandable portion of the actuatable tip may comprise a plurality of openings circumferentially disposed about the length of a tubular member. The outer diameter of the tubular member may be adapted to permit an intravascular device such as a cartridge filter to slide thereon.

[0006] In another embodiment of the present invention, a guidewire having an articulating distal section includes an elongated core wire having a longitudinal axis, a proximal end and a distal end; an actuator moveable about the core wire; and an actuatable tip adapted to have a reduced profile in a first position, and an enlarged profile in a second position. In one implementation of the present invention, the actuatable tip may include a spring coil helically disposed about the core wire. In another exemplary implementation, the actuatable tip may include a mesh sleeve adapted to outwardly expand when compressed axially. In yet another exemplary implementation, the actuatable tip may include an accordion-shaped polymeric tube similarly adapted to outwardly expand when compressed axially.

[0007] In another embodiment, the distal section of an articulating guidewire includes a friction fit between the core wire and the actuatable tip which can be utilized to prevent the distal section of the guidewire from reverting to the first position, once articulated. Alternatively, a locking mechanism such as a locking hub can be utilized to prevent the distal section of the guidewire from reverting to the first position, once articulated.

Brief Description of the Drawings

[0008]

Figure 1 is a plan view of an articulating guidewire in accordance with a first embodiment of the present invention.

Figure 2 is a cross-sectional view of the distal section of the guidewire in Figure 1 showing the guidewire in a first position having a reduced profile.

Figure 3 is another cross-sectional view of the distal section of the guidewire in Figure 1 showing the guidewire in a second position having an enlarged profile.

Figure 4 is cross-sectional view of a particular implementation of the present invention employing a locking mechanism on the distal section of the guidewire.

Figure 5 is a cross-sectional view of the distal section of an articulating guidewire in accordance with a second embodiment of the present invention, wherein the guidewire is shown in a first position having a reduced profile.

Figure 6 is another cross-sectional view of the guidewire in Figure 5 showing the distal section of the guidewire in a second position having an enlarged profile.

Figure 7 is a cross-sectional view of the distal section

of an articulating guidewire in accordance with a third embodiment of the present invention, wherein the guidewire is shown in a first position having a reduced profile.

Figure 8 is a plan view of the guidewire in Figure 7 showing a plurality of openings circumferentially disposed about a distal section of the guidewire.

Figure 9 is another cross-sectional view of the guidewire in Figure 7 showing the distal section of the guidewire in a second position having an enlarged profile.

Figure 10 is a cross-sectional view of a distal section of an articulating guidewire in accordance with a fourth embodiment of the present invention, wherein the guidewire is shown in a first position having a reduced profile.

Figure 11 is another cross-sectional view of the guidewire in Figure 10 showing the distal section of the guidewire in a second position having an enlarged profile.

Figure 12 is a cross-sectional view of a distal section of an articulating guidewire in accordance with a fifth embodiment of the present invention, wherein the guidewire is shown in a first position having a reduced profile.

Figure 13 is another cross-sectional view of the guidewire in Figure 12 showing the distal section of the guidewire in a second position having an enlarged profile.

Detailed Description of the Invention

[0009] The following detailed description should be read with reference to the drawings, in which like elements in different drawings are numbered in like fashion. Although examples of construction, dimensions, materials and manufacturing processes are illustrated for the various elements, those skilled in the art will recognize that many of the examples provided have suitable alternatives that may be utilized.

[0010] Figure 1 is a plan view of an articulating guidewire 30 in accordance with a first embodiment of the present invention. Guidewire 30 includes an elongated core wire 10 having a relatively stiff proximal section 12, and relatively flexible distal section 14. As shown in Figure 1, core wire 10 has a relatively large profile on proximal section 12 which tapers to a smaller profile from point 16 to point 18, and again at point 20 to point 22. Core wire 10 may have any number of tapering sections disposed thereon without deviating from the scope of the invention. In one implementation of the present invention (not shown), core wire 10 may continuously taper from proximal section 12 to distal section 14.

[0011] Disposed on distal section 14 of core wire 10 is a wire tip 32. Wire tip 32 has a rounded distal end 34, and is generally circular in cross-sectional area. Wire tip 32 can be atraumatic for reduced tissue damage during advancement of the guidewire. Alternatively, wire tip 32 can be comprised of a substantially hard material.

[0012] In the particular embodiment of Figure 1, guidewire 30 also includes a tubular member 26 and a spring coil 24, both moveable about distal section 14 of core wire 10. Tubular member 26 may have a length substantially similar to the length of core wire 10. Conversely, tubular member 26 may have a length substantially shorter than the length of core wire 10. In either implementation, the outer diameter of tubular member 26 is adapted to permit an intravascular device such as an embolic protection filter to slide thereon.

[0013] As discussed in greater detail below, spring coil 24 is adapted to have a reduced profile in a first position, and an enlarged profile in a second position. In the first (*i.e.* reduced profile) position, spring coil 24 has an outer diameter which is substantially similar to the outer diameter of tubular member 26, facilitating placement of guidewire 30 beyond a lesion or other protrusion within the vasculature with minimal interference. In the second (*i.e.* enlarged profile) position, spring coil 24 has an outer diameter greater than the outer diameter of tubular member 26, allowing spring coil 24 to function as a distal stop.

[0014] Also shown in the embodiment of Figure 1 is a proximal locking hub 28. Proximal locking hub 28 is any suitable and any commercially available locking mechanism that can be configured to lock tubular member 26 to core wire 10.

[0015] Figure 2 is a cross-sectional view of the distal section 14 of the guidewire illustrated in Figure 1. Tubular member 26 has a proximal end (not shown) and a distal end 40. A shoulder 36 disposed on the proximal end of wire tip 32 is adapted to prevent tubular member 26 and spring coil 24 from sliding off the distal end of core wire 10.

[0016] Abutting the distal end 40 of tubular member 26, and the shoulder 36 of wire tip 32, is spring coil 24. In the embodiment shown in Figure 2, spring coil 24 has one or more coils helically disposed about a portion of core wire 10. The distal end of spring coil 24 may be attached to the shoulder 36 of wire tip 32. Similarly, the proximal end of spring coil 24 may be attached to the distal end 40 of tubular member 26. Attachment of spring coil 24 to either shoulder 36 or tubular member 24 may be accomplished by solder, braze, adhesive or any other suitable attachment means.

[0017] In use, guidewire 30 can be inserted through a guide catheter into the body and placed at a desired location distal a lesion. Tubular member 26 is then advanced distally, as shown in Figure 3, causing spring coil 24 to compress axially and expand in an outward direction to form a distal stop. Once the guidewire is in position and the distal stop is engaged, a embolic protection filter 2 can then be advanced to a desired location along the guidewire to capture embolic debris dislodged during the procedure.

[0018] While the particular embodiment shown in Figure 3 illustrates the actuation of spring coil 24 by advancing tubular member 26 distally, it is to be recognized that other methods to actuate the distal stop may be utilized.

For example, tubular member 26 may be rotated about its major axis in either a clockwise or counterclockwise direction, depending on the disposition of the coils, causing spring coil 24 to expand radially and form a distal stop. In another exemplary implementation, a friction fit between the inner diameter of filter 2 and the outer diameter of tubular member 26 can be utilized to actuate spring coil 24. In use, the frictional force resulting from the distal movement of filter 2 about tubular member 26 causes tubular member 26 to advance distally and compress spring coil 24 axially, thus forming a distal stop.

[0019] To prevent tubular member 26 from sliding proximally once the distal section 14 of the guidewire has been articulated, a friction fit between the inner diameter of tubular member 26 and the outer diameter of core wire 10 can also be utilized as an alternative to proximal locking hub 28. This frictional fit is adapted to permit motion of the tubular member 26 along core wire 10 only when a sufficient force is applied to tubular member 26 by the physician.

[0020] In addition to the frictional fit between core wire 10 and tubular member 26, or the locking hub 28 described with respect to Figure 1, a locking mechanism can be employed on the guidewire to prevent undesired movement of spring coil 24, once guidewire 30 has been articulated. As illustrated in the exemplary embodiment of Figure 4, the locking mechanism can be comprised of an enlarged outer diameter section 42 disposed on core wire 10 corresponding in size and shape to a reduced inner diameter portion 44 disposed on tubular member 26. When tubular member 26 is advanced distally, as shown in Figure 4, the enlarged diameter section 42 locks into the reduced inner diameter section 44, thereby preventing tubular member 26 from retracting proximally.

[0021] Although the use of a frictional fit and/or locking mechanism are described with respect to the exemplary embodiments illustrated in Figures 1-4, these features are not limited to those embodiments. Instead, a frictional fit and/or locking mechanism may be utilized in conjunction with any embodiment to prevent the tip from reverting to a collapsed position once the guidewire has been articulated.

[0022] Figures 5 and 6 are cross-sectional views of the distal section 114 of an articulating guidewire in accordance with an additional embodiment of the present invention. As shown in Figure 5, an accordion-shaped polymeric tube 124 can be utilized as a distal stop when actuated by a tubular member 126. Polymeric tube 124 can be attached proximally to distal end 140 of tubular member 126, and distally to shoulder 136 of wire tip 132.

[0023] As shown in Figure 6, once the guidewire is advanced to a desired location within the body, tubular member 126 is advanced distally, forcing polymeric tube 124 to compress axially and expand in an outward direction. A embolic protection filter can then be advanced along tubular member 126 until the distal end of the filter abuts a portion of the outwardly expanded polymeric tube 124.

[0024] Figures 7-9 illustrate yet another exemplary embodiment in accordance with the present invention. A tubular member 224 having a proximal end 238 and a distal end 240 is moveable about core wire 10. Tubular member 224 includes a distal section 252 which expands outwardly when compressed axially.

[0025] As shown in greater detail in Figure 8, distal section 252 includes a plurality of openings 250 circumferentially disposed about tubular member 224. The supports 254 between the openings 250, in turn, are biased to displace in an outward direction when compressed axially. As illustrated in Figure 9, when tubular member 224 is advanced distally against the shoulder 236 of wire tip 232, the supports 254 are compressed axially and displace in an outward direction, creating a distal stop.

[0026] Figures 10 and 11 show another exemplary embodiment in accordance with the present invention. In the exemplary embodiment of Figure 10, an articulating guidewire is comprised of an elongated core wire 10, a tubular segment 326 having proximal end 338 and distal end 340, an actuatable tip 324, and a wire tip 332. A portion of tip 324 is adapted to expand in an outward direction when tubular segment 326 is advanced distally against the proximal end thereof. Tip 324 may be comprised of any number of suitable polymeric materials such as polyethylene or polystyrene.

[0027] In the particular embodiment of Figure 10, an axially stiff pushing member 356 having a handle (not shown) disposed proximally thereof is shown attached to the proximal end 338 of tubular segment 326. To articulate the distal section of the guidewire, the operator advances tubular segment 326 distally against tip 324 with the aid of pushing member 356, causing tip 324 to expand in the outward direction, as shown in Figure 11.

[0028] Figures 12 and 13 illustrate yet another embodiment in accordance with the present invention employing a mesh sleeve. As shown in Figure 12, the distal section 414 of an articulating guidewire comprises an elongated core wire 10, a tubular segment 426 having a proximal end 438 and distal end 440, a wire tip 432, and an expandable mesh sleeve 424.

[0029] The mesh sleeve 424 can be attached proximally to distal end 440 of tubular segment 426, and distally at proximal end 436 of wire tip 432. The mesh sleeve is adapted to expand outwardly when compressed axially. Mesh sleeve 424 can be comprised of any suitable material(s) such as DACRON, which is available from E. I. du Pont de Nemours and Company in Wilmington, Delaware. DACRON is a synthetic polyester material used in many medical procedures for its strength and biocompatibility.

[0030] As illustrated in Figure 13, once the guidewire is in a desired position within the body, the operator can advance tubular segment 426 distally, causing the mesh sleeve 424 to expand outwardly to form a distal stop along the guidewire. As with any of the previous embodiments, a frictional fit and/or locking mechanism can be utilized to prevent proximal motion of tubular member 426 once

the mesh sleeve has been expanded to the second position.

[0031] Having thus described the several embodiments of the present invention, those of skill in the art will readily appreciate that other embodiments may be made and used which fall within the scope of the claims attached hereto. Numerous advantages of the invention covered by this document have been set forth in the foregoing description. It will be understood, however, that this disclosure is, in many respects, only illustrative. Changes may be made in details, particular in matters of shape, size and arrangement of parts without exceeding the scope of the invention.

Claims

1. An articulating guidewire, comprising:

an elongated core wire (10) having a longitudinal axis, a proximal end (12) and a distal end (14); and
an actuatable stop (24, 124, 254, 324, 424) disposed at the distal end (14) of said core wire (10), said actuatable stop moveable between a collapsed position and an expanded position, the guidewire having an outer diameter at the stop, the outer diameter being greater when the stop is in the expanded position than when the stop is in the collapsed position;
an actuator (26, 126, 224, 326, 426) coupled to the stop, said actuator moveable between a first position and a second position to move the stop between the collapsed position and the expanded position; and **characterized by**
a filter disposed on the guidewire, wherein the filter slides over the guidewire until the distal end of the filter abuts the actuatable stop.

2. The guidewire of claim 1, wherein said actuatable stop (24, 124, 254, 324, 424) comprises a tubular member having a proximal end and a distal end.

3. The guidewire of claim 2, wherein the distal section of said tubular member includes a plurality of circumferentially disposed openings adapted to permit a plurality of struts disposed therebetween to expand in an outward direction.

4. The guidewire of claim 2, wherein the inner diameter of said tubular member is substantially similar to the outer diameter of the core wire.

5. The guidewire of claim 2, wherein the inner diameter of said tubular member is larger than the outer diameter of the core wire.

6. The guidewire of claim 1, further comprising a locking mechanism adapted to prevent relative motion between the actuatable stop and the core wire.

7. The guidewire of claim 6, wherein the locking mechanism comprises an enlarged outer diameter portion disposed on the core wire.

8. The guidewire of claim 6, wherein the locking mechanism comprises an enlarged outer diameter portion disposed on the core wire corresponding in size and shape to a reduced inner diameter portion disposed on the actuatable stop (24, 124,254, 324, 424).

9. The guidewire of claim 6, wherein the locking mechanism comprises a locking hub (28) disposed about a proximal portion of the core wire.

10. The guidewire of claim 1, wherein said actuatable stop (24, 124, 254, 324, 424) comprises a spring coil (24).

11. The guidewire of claim 1, wherein said actuatable stop (24, 124, 254, 324, 424) comprises a spring coil helically disposed about the core wire.

12. The guidewire of claim 1, wherein said actuatable stop (24, 124, 254, 324, 424) comprises a polymeric tube.

13. The guidewire of claim 12, wherein said polymeric tube (124) is accordion-shaped.

14. The guidewire of claim 1, wherein said actuatable stop (24, 124, 254, 324, 424) comprises a mesh sleeve.

15. The guidewire of claim 14, wherein said mesh sleeve (424) comprises Dacron.

Patentansprüche

1. Biegsamer Führungsdraht mit:

einem länglichen Kerndraht (10) mit einer Längsachse, einem proximalen Ende (12) und einem distalen Ende (14); und
einem betätigbaren Anschlag (24, 124, 254, 324, 424), der am distalen Ende (14) des Kerndrahts (10) angeordnet ist, wobei der betätigbare Anschlag zwischen einer kollabierten Position und einer expandierten Position beweglich ist, der Führungsdraht einen Außendurchmesser am Anschlag hat und der Außendurchmesser in der expandierten Position des Anschlags größer als in der kollabierten Position des Anschlags ist;
einem Betätigungselement (26, 126, 224, 326,

426), das mit dem Anschlag gekoppelt ist, wobei das Betätigungselement zwischen einer ersten Position und einer zweiten Position beweglich ist, um den Anschlag zwischen der kollabierten Position und der expandierten Position zu bewegen; und **gekennzeichnet durch**
ein Filter, das auf dem Führungsdraht angeordnet ist, wobei das Filter über dem Führungsdraht gleitet, bis das distale Ende des Filters an den betätigbaren Anschlag anstößt.

2. Führungsdraht nach Anspruch 1, wobei der betätigbare Anschlag (24, 124, 254, 324, 424) ein Röhrenteil mit einem proximalen Ende und einem distalen Ende aufweist.

3. Führungsdraht nach Anspruch 2, wobei das distale Teilstück des Röhrenteils mehrere über den Umfang angeordnete Öffnungen aufweist, die geeignet sind, mehrere dazwischen angeordnete Streben in Auswärtsrichtung expandieren zu lassen.

4. Führungsdraht nach Anspruch 2, wobei der Innendurchmesser des Röhrenteils dem Außendurchmesser des Kerndrahts im wesentlichen ähnelt.

5. Führungsdraht nach Anspruch 2, wobei der Innendurchmesser des Röhrenteils größer als der Außendurchmesser des Kerndrahts ist.

6. Führungsdraht nach Anspruch 1, ferner mit einem Verriegelungsmechanismus, der geeignet ist, Relativbewegung zwischen dem betätigbaren Anschlag und dem Kerndraht zu verhindern.

7. Führungsdraht nach Anspruch 6, wobei der Verriegelungsmechanismus einen Abschnitt mit vergrößertem Außendurchmesser aufweist, der auf dem Kerndraht angeordnet ist.

8. Führungsdraht nach Anspruch 6, wobei der Verriegelungsmechanismus einen Abschnitt mit vergrößertem Außendurchmesser aufweist, der auf dem Kerndraht angeordnet ist und in Größe und Form einem Abschnitt mit verkleinertem Innendurchmesser entspricht, der auf dem betätigbaren Anschlag (24, 124, 254, 324, 424) angeordnet ist.

9. Führungsdraht nach Anspruch 6, wobei der Verriegelungsmechanismus eine Verriegelungsnabe (28) aufweist, die um einen proximalen Abschnitt des Kerndrahts angeordnet ist.

10. Führungsdraht nach Anspruch 1, wobei der betätigbare Anschlag (24, 124, 254, 324, 424) eine Federwindung (24) aufweist.

11. Führungsdraht nach Anspruch 1, wobei der betätigbare Anschlag (24, 124, 254, 324, 424) eine Federwindung (24) aufweist, die um den Kerndraht spiralförmig angeordnet ist.

12. Führungsdraht nach Anspruch 1, wobei der betätigbare Anschlag (24, 124, 254, 324, 424) eine Polymerröhre aufweist.

13. Führungsdraht nach Anspruch 12, wobei die Polymerröhre (124) akkordeonförmig ist.

14. Führungsdraht nach Anspruch 1, wobei der betätigbare Anschlag (24, 124, 254, 324, 424) eine Maschenhülle aufweist.

15. Führungsdraht nach Anspruch 14, wobei die Maschenhülle (424) Dacron aufweist.

Revendications

1. Fil guide d'articulation, comprenant :

un fil métallique central allongé (10) possédant un axe longitudinal, une extrémité proximale (12) et une extrémité distale (14) ; et
un arrêt qui peut être actionné (24, 124, 254, 324, 424) disposé à l'extrémité distale (14) dudit fil métallique central (10), ledit arrêt qui peut être actionné étant mobile entre une position affaissée et une position déployée, le fil guide possédant un diamètre externe à hauteur de l'arrêt, le diamètre externe lorsque l'arrêt se trouve dans la position déployée étant supérieur à celui en vigueur lorsque l'arrêt se trouve dans la position affaissée ;
un actionneur (26, 126, 224, 326, 426) couplé à l'arrêt, ledit actionneur étant mobile entre une première position et une deuxième position pour faire passer l'arrêt entre la position affaissée et la position déployée ; et
caractérisé par un filtre disposé sur le fil guide, le filtre glissant par-dessus le fil guide jusqu'à ce que l'extrémité distale du filtre vienne buter contre l'arrêt qui peut être actionné.

2. Fil guide selon la revendication 1, dans lequel ledit arrêt qui peut être actionné (24, 124, 254, 324, 424) comprend un membre tubulaire possédant une extrémité proximale et une extrémité distale.

3. Fil guide selon la revendication 2, dans lequel la section distale dudit membre tubulaire englobe plusieurs ouvertures disposées en position circonférentielle, conçues pour permettre à plusieurs entretoises disposées entre elles de se déployer dans une direction orientée vers l'extérieur.

4. Fil guide selon la revendication 2, dans lequel le diamètre interne dudit membre tubulaire est essentiellement similaire au diamètre externe du fil métallique central.

5. Fil guide selon la revendication 2, dans lequel le diamètre interne dudit membre tubulaire est supérieur au diamètre externe du fil métallique central.

6. Fil guide selon la revendication 1, comprenant en outre un mécanisme de verrouillage conçu pour empêcher un mouvement réciproque entre l'arrêt qui peut être actionné et le fil métallique central.

7. Fil guide selon la revendication 6, dans lequel le mécanisme de verrouillage comprend une portion dont le diamètre externe est agrandi, disposée sur le fil métallique central.

8. Fil guide selon la revendication 6, dans lequel le mécanisme de verrouillage comprend une portion dont le diamètre externe est agrandi, disposée sur le fil métallique central, dont la dimension et la configuration correspondent à celles d'une portion à diamètre interne réduit disposée sur l'arrêt qui peut être actionné (24, 124, 254, 324, 424).

9. Fil guide selon la revendication 6, dans lequel le mécanisme de verrouillage comprend un raccord de verrouillage (28) qui est disposé autour d'une portion proximale du fil métallique central.

10. Fil guide selon la revendication 1, dans lequel ledit arrêt qui peut être actionné (24, 124, 254, 324, 424) comprend une spire d'un ressort (24).

11. Fil guide selon la revendication 1, dans lequel ledit arrêt qui peut être actionné (24, 124, 254, 324, 424) comprend une spire d'un ressort disposée en position hélicoïdale autour du fil métallique central.

12. Fil guide selon la revendication 1, dans lequel ledit arrêt qui peut être actionné (24, 124, 254, 324, 424) comprend un tube polymère.

13. Fil guide selon la revendication 12, dans lequel ledit tube polymère (124) possède une configuration en accordéon.

14. Fil guide selon la revendication 1, dans lequel ledit arrêt qui peut être actionné (24, 124, 254, 324, 424) comprend un manchon à mailles.

15. Fil guide selon la revendication 14, dans lequel ledit manchon à mailles (424) comprend du Dacron.

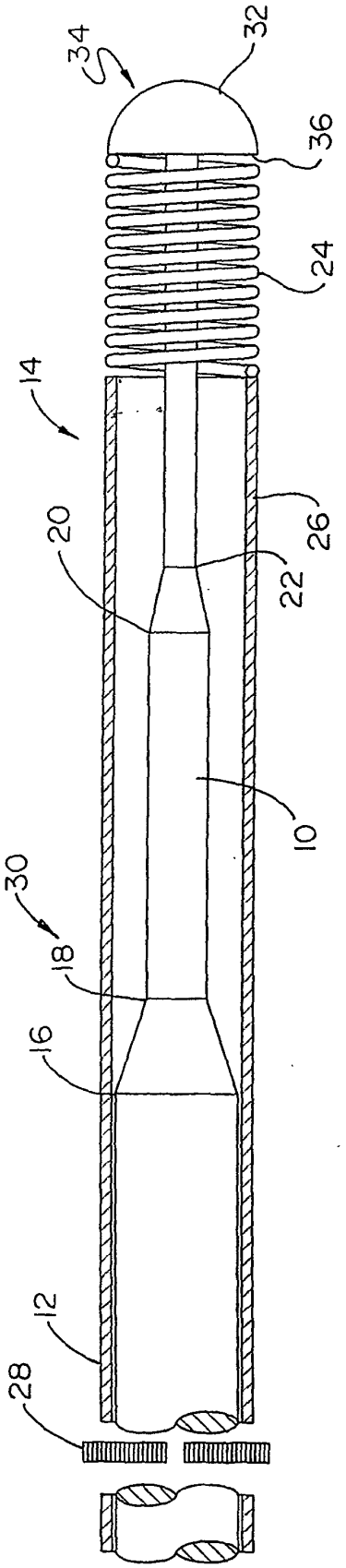


Fig. 1

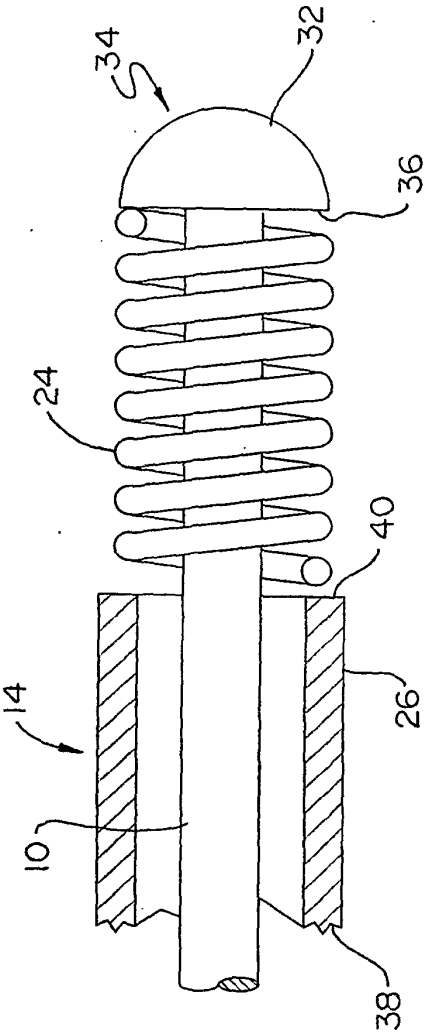


Fig. 2

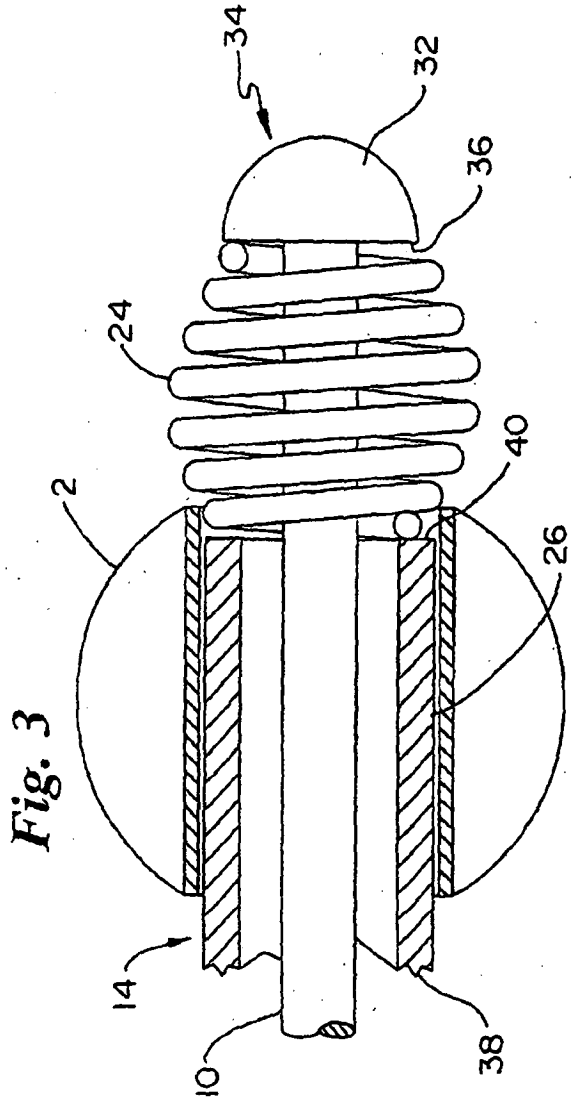


Fig. 3

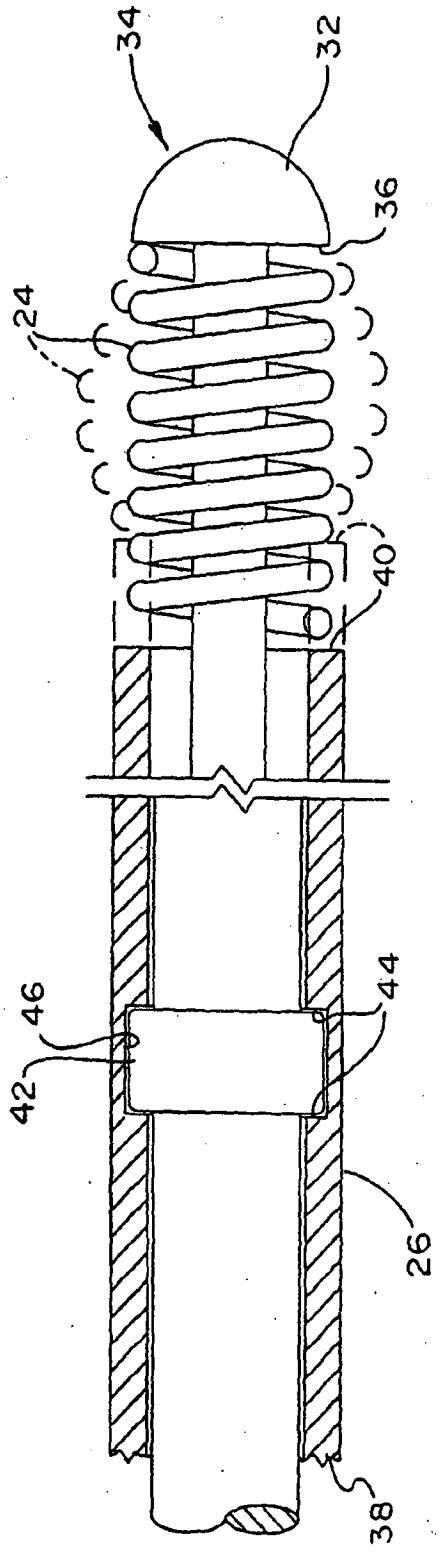


Fig. 4

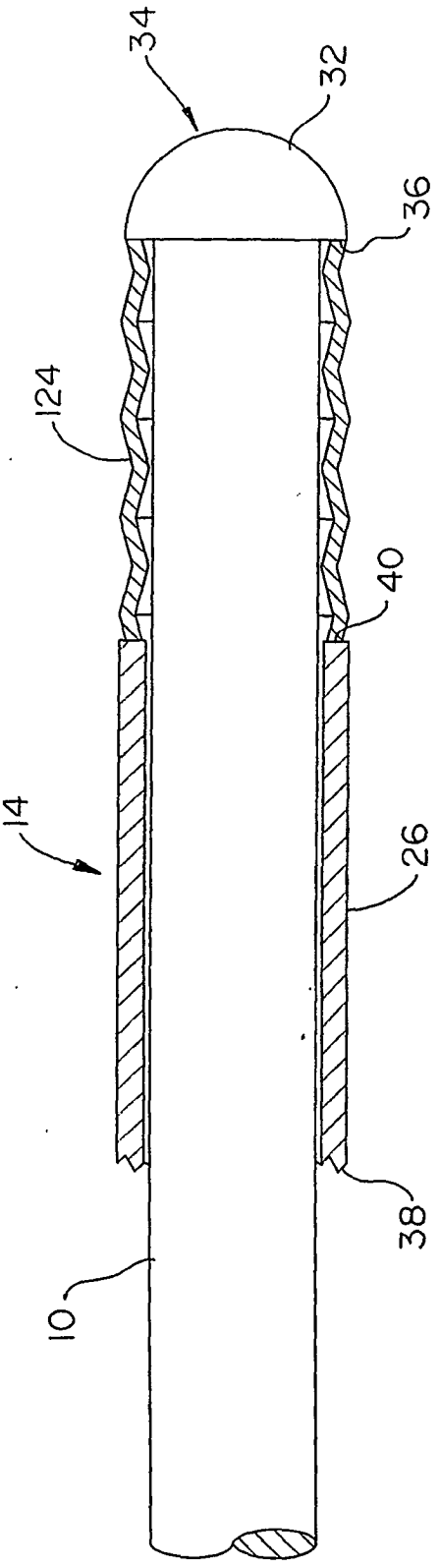


Fig. 5

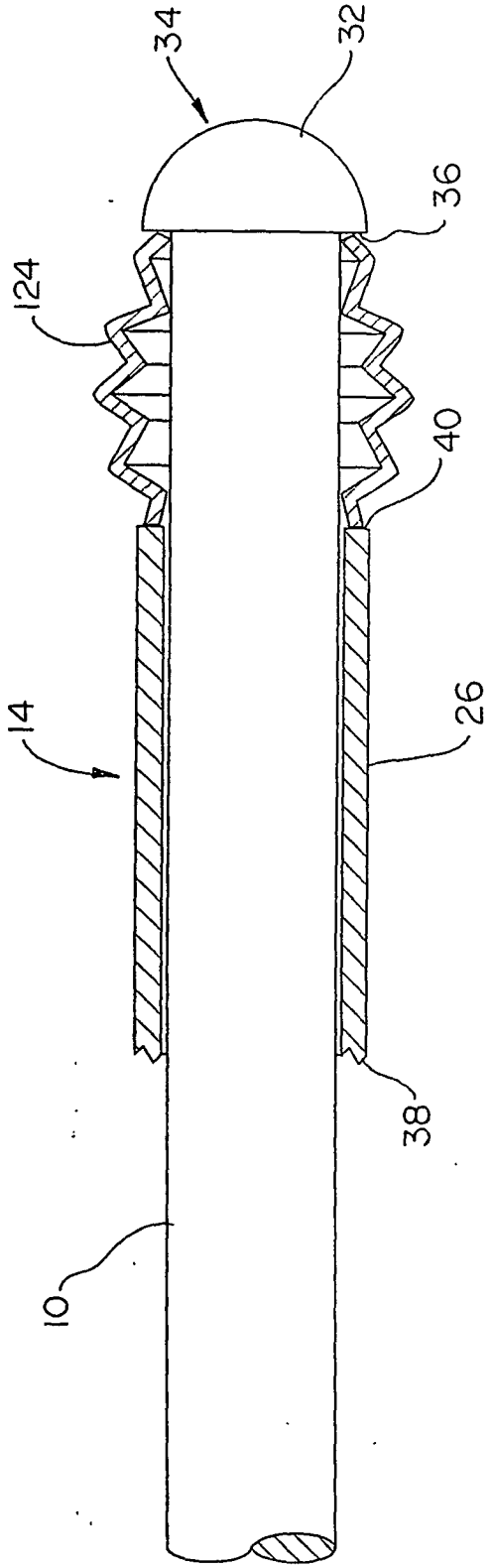


Fig. 6

Fig. 7

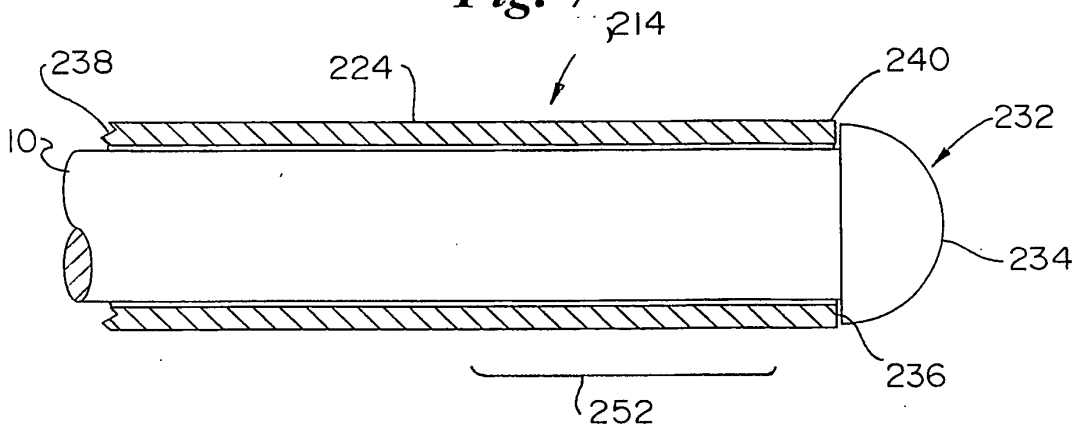


Fig. 8

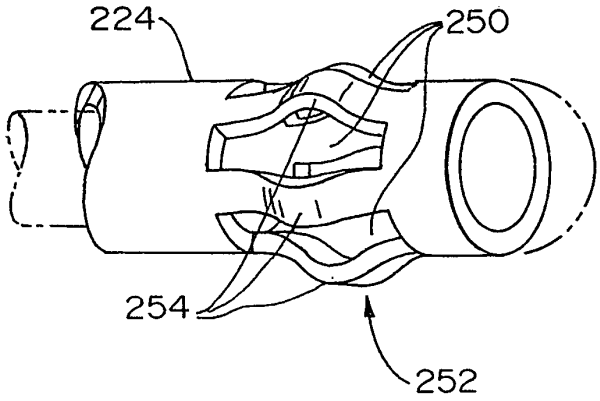
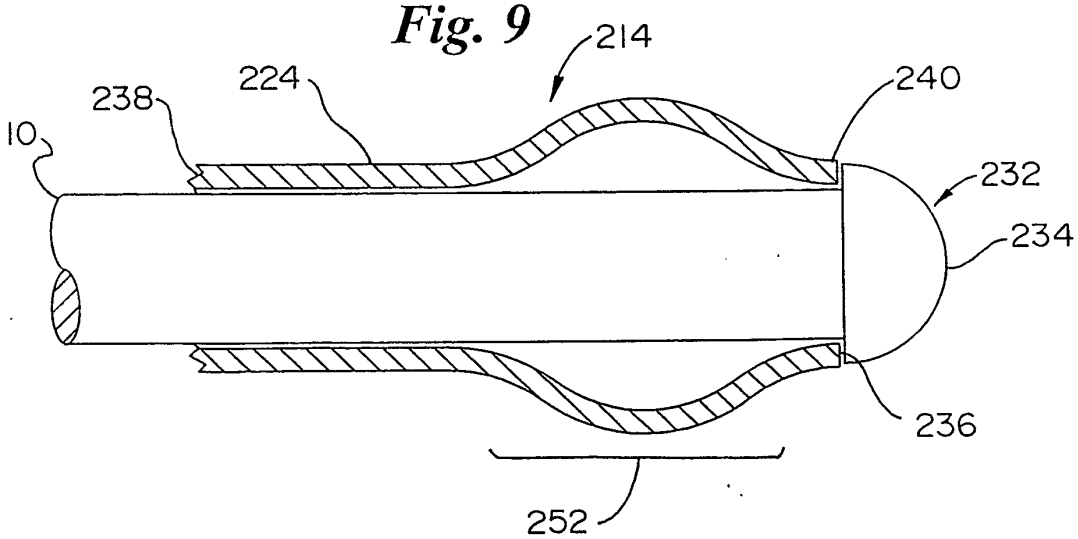


Fig. 9



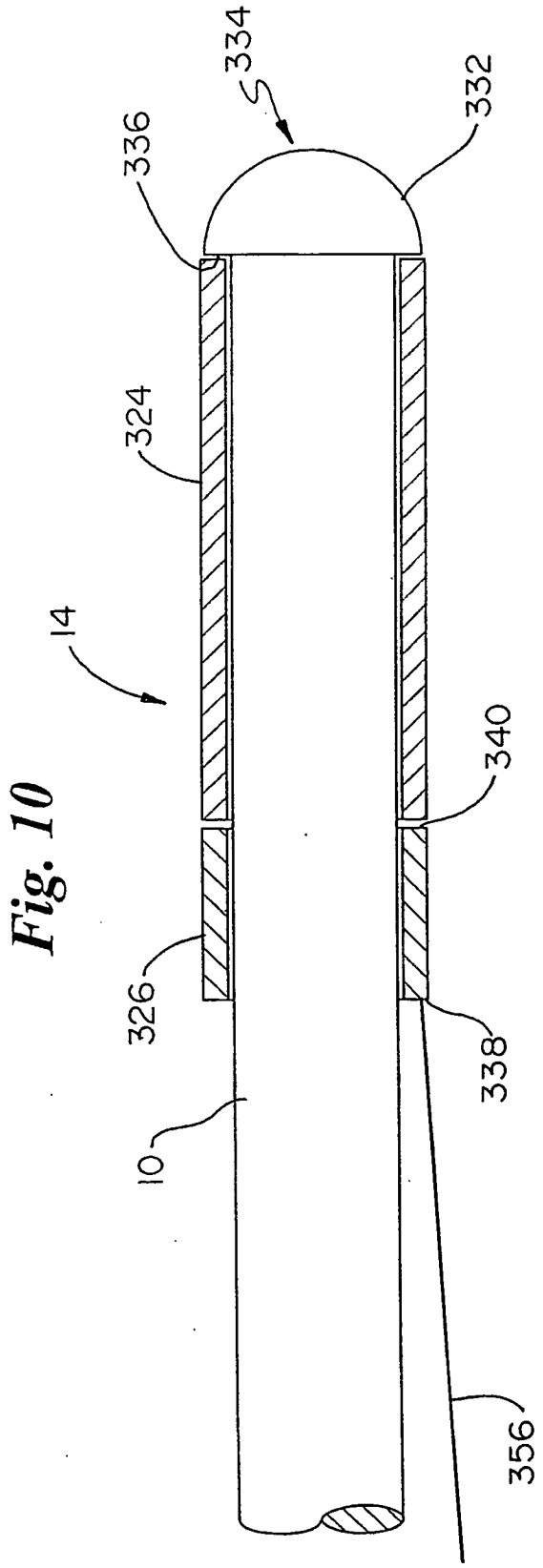

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Fig. 10

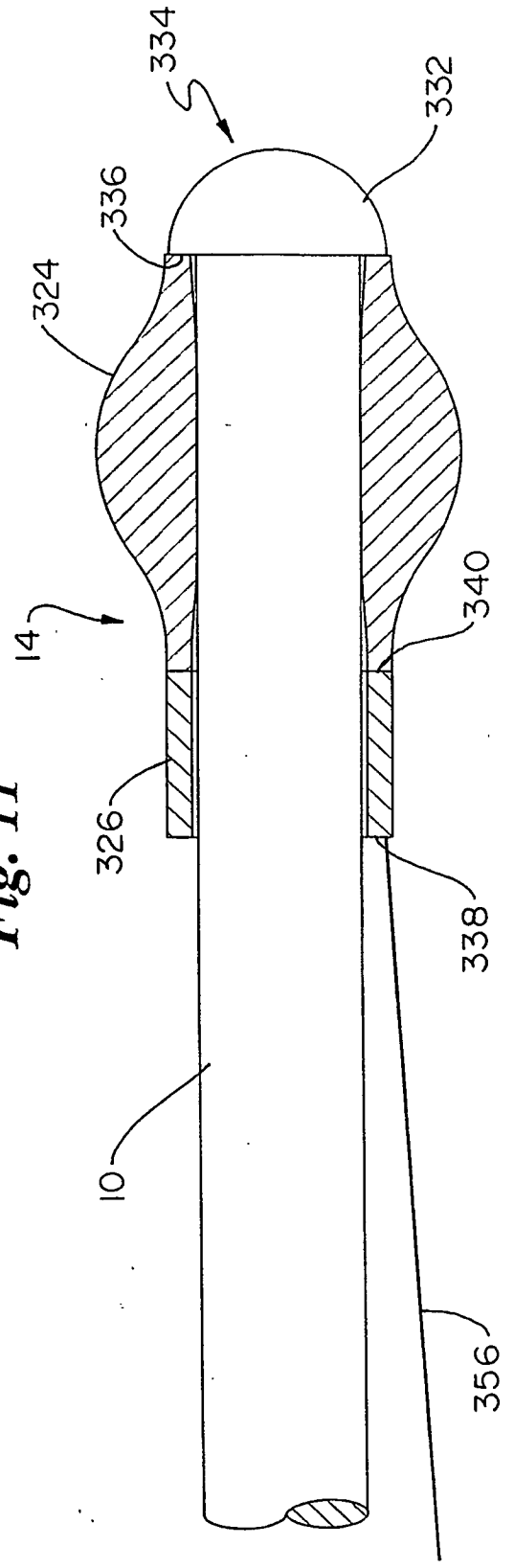
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Fig. 11

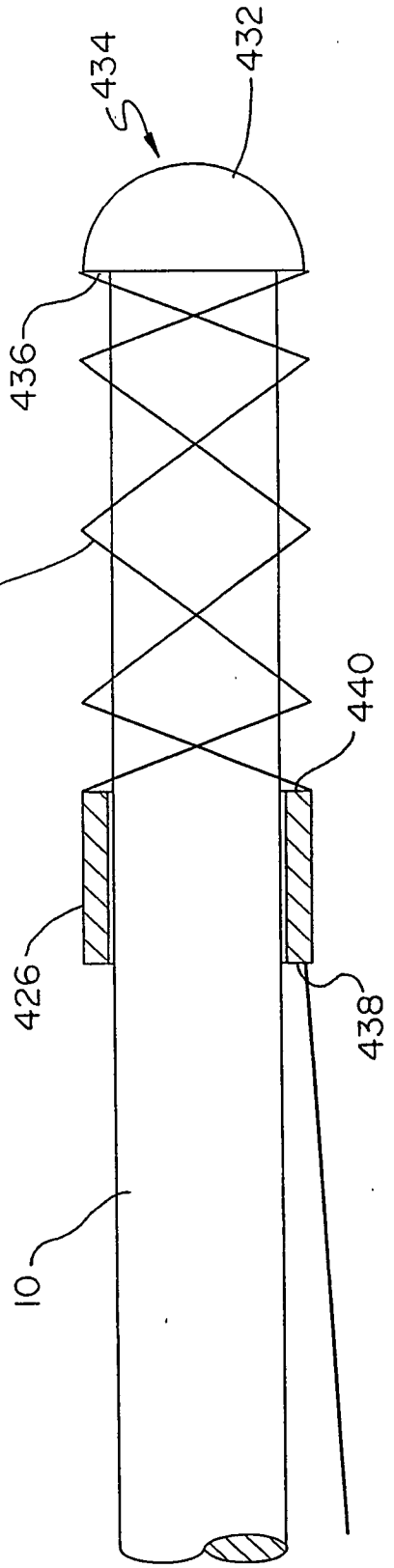

Fig. 12

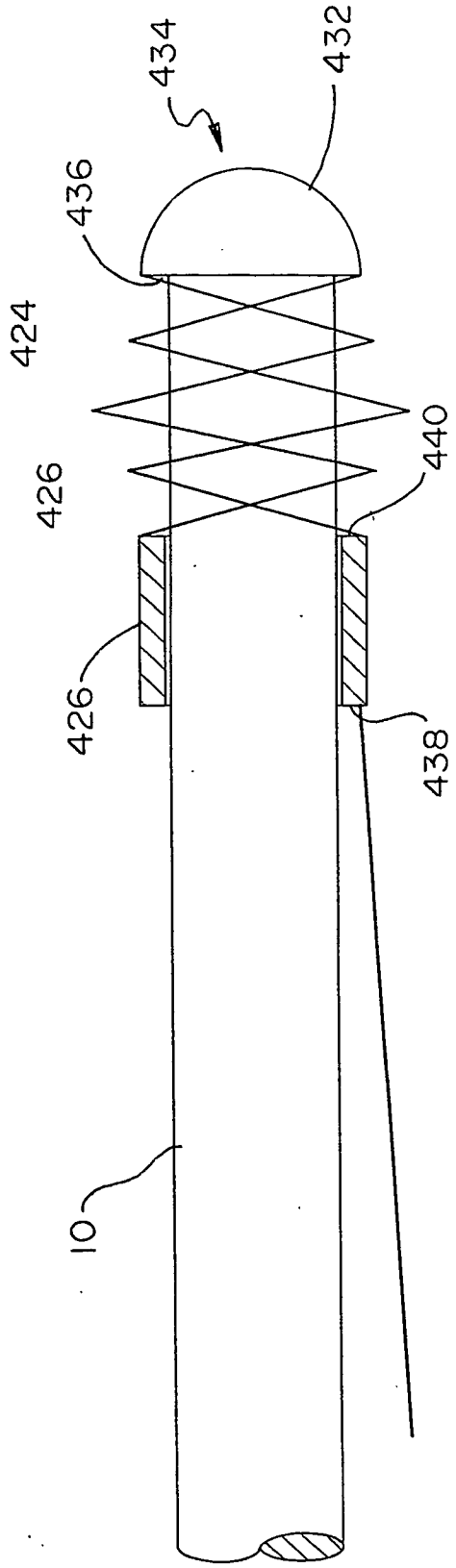

Fig. 13

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 0486157 A **[0004]**
- WO 02069844 A **[0004]**

专利名称(译)	用于栓塞保护的导丝包括可激活的止动件和过滤器		
公开(公告)号	EP1487526B1	公开(公告)日	2010-09-08
申请号	EP2003743193	申请日	2003-02-21
[标]申请(专利权)人(译)	波士顿科学有限公司		
申请(专利权)人(译)	BOSTON SCIENTIFIC LIMITED		
当前申请(专利权)人(译)	BOSTON SCIENTIFIC LIMITED		
[标]发明人	VRBA ANTHONY C ESKURI ALAN		
发明人	VRBA, ANTHONY C. ESKURI, ALAN		
IPC分类号	A61M25/01 A61M25/04 A61B5/00 A61M25/09		
CPC分类号	A61M25/09 A61M25/09025 A61M2025/09175		
代理机构(译)	法思博事务所		
优先权	10/083288 2002-02-26 US		
其他公开文献	EP1487526A1		
外部链接	Espacenet		

摘要(译)

一种血管内导丝，其具有铰接的远端部分，用于改善超出体腔内的损伤或其他突起的可操纵性。具有设置在其上的可致动止动件的细长芯线适于在第一位置具有减小的轮廓，在第二位置具有扩大的轮廓。可致动止动件可适于通过任何数量的装置膨胀，包括弹簧圈，聚合物管或网状套筒。在一个特定实施例中，可致动止动件包括管状构件的远端部分，该管状构件具有多个周向设置的开口，所述开口适于允许设置在其间的多个支柱在轴向压缩时沿向外方向膨胀。

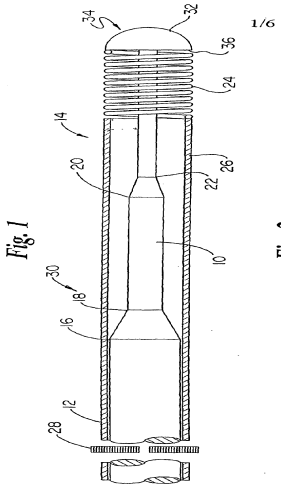

Fig. 1

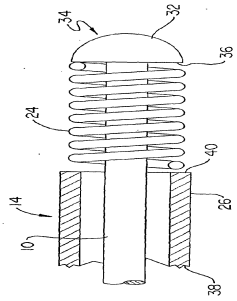

Fig. 2