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(54) GUIDEWIRE STOP

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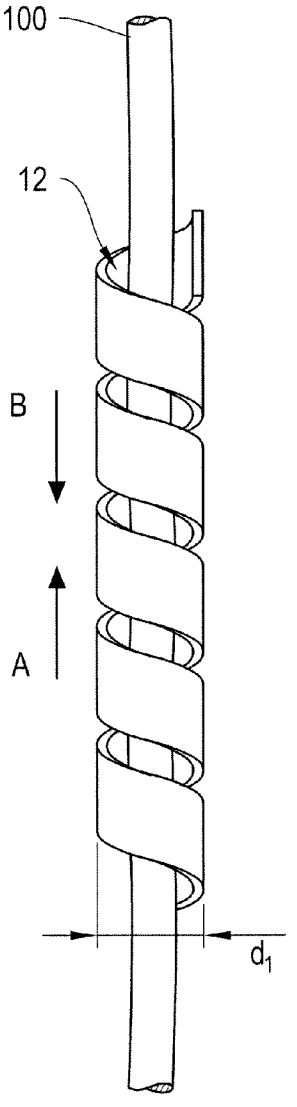
(57) **ABSTRACT**

A user-actuatable guidewire stop is disclosed which can be used to stop and/or lock a medical device on a guidewire advanced through a body lumen. In one embodiment, the guidewire stop is configured as a coil spring having an inner lumen configured to slideably and rotationally receive the guidewire in an unlocked configuration, and to frictionally engage the guidewire in a locked configuration, wherein in the inside diameter of the coil spring in the locked configuration is smaller than the diameter in the unlocked configuration. A restraining member maintains the coil spring in the unlocked configuration during deployment and is removed at the interventional site causing the coil spring to collapse onto the guidewire. The guidewire stop can be employed with an embolic filter or another intravascular device.



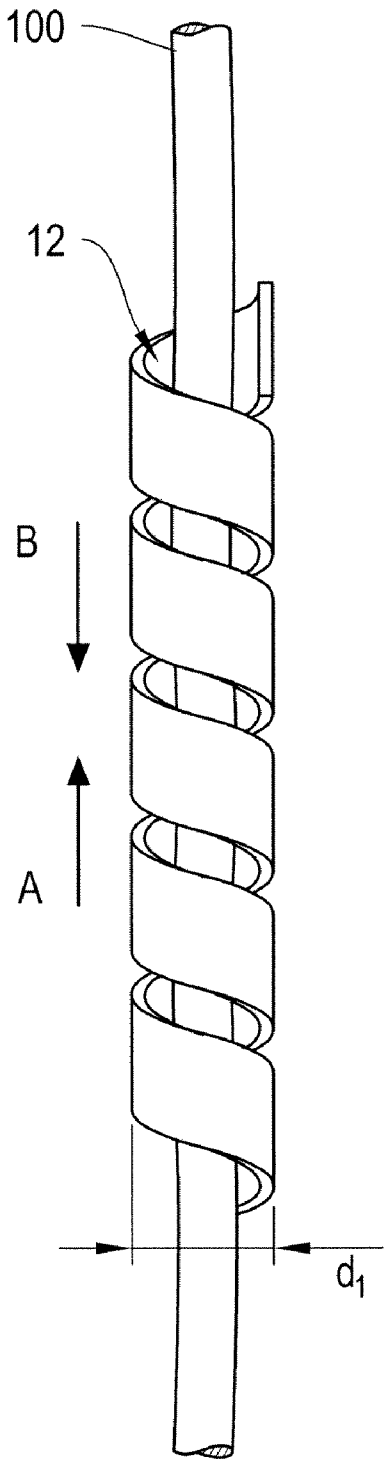


Fig. 1a

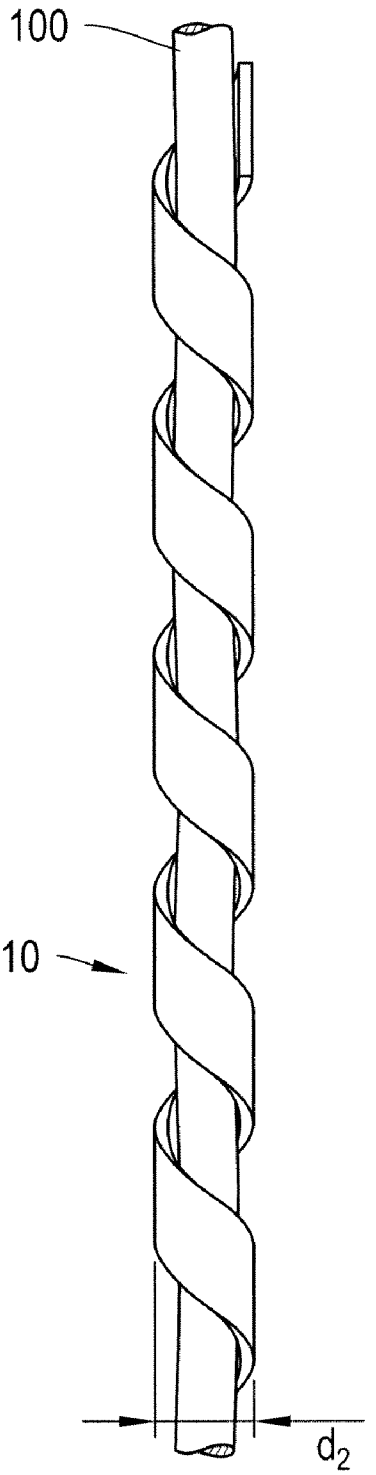


Fig. 1b

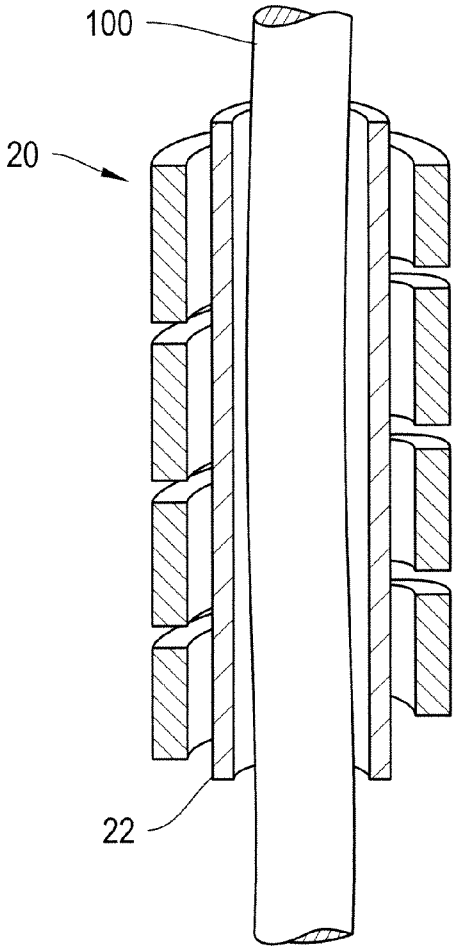


Fig. 2a

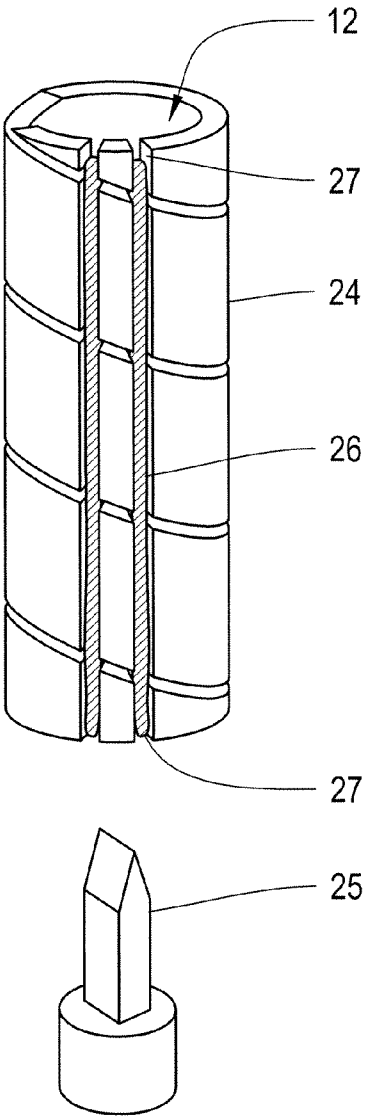


Fig. 2b

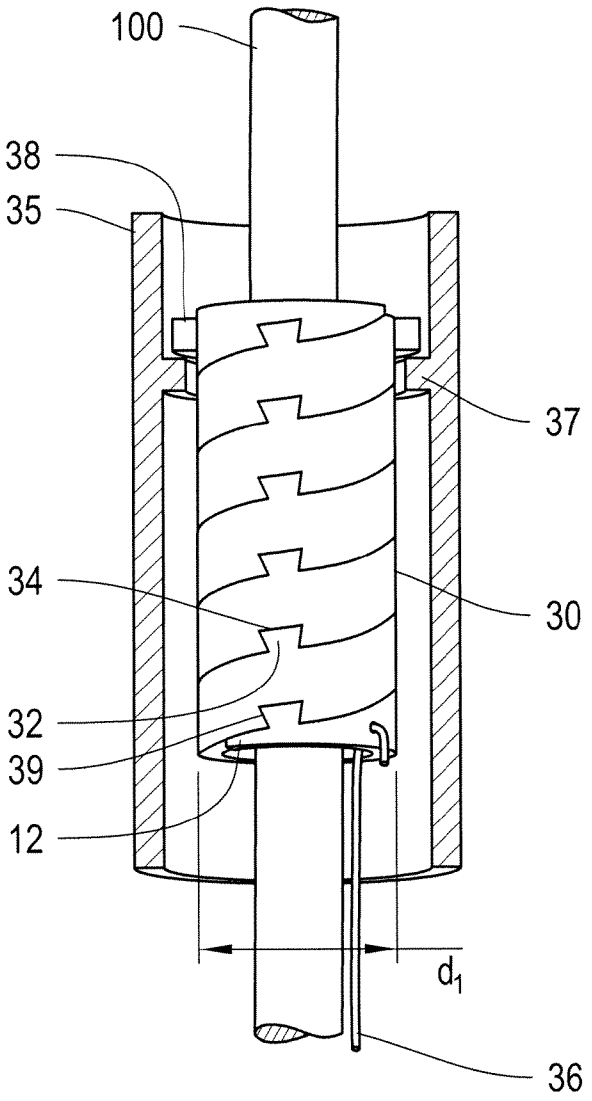


Fig. 3a

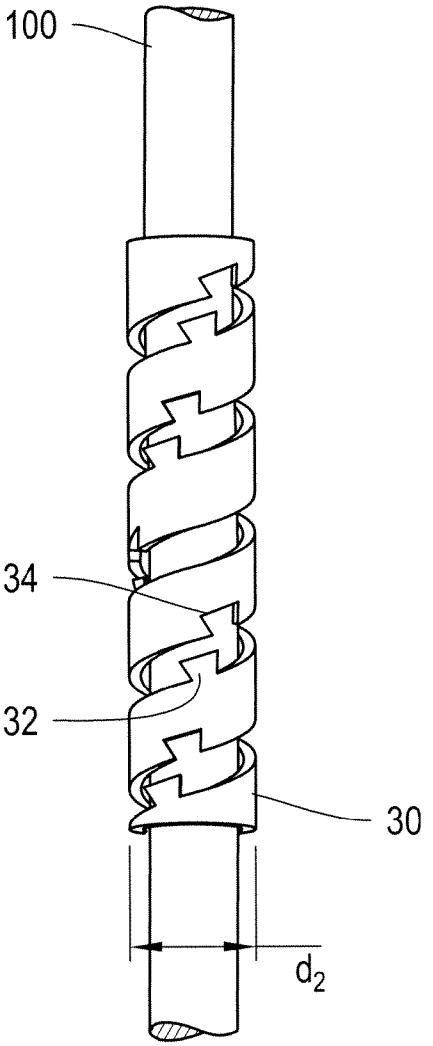


Fig. 3b

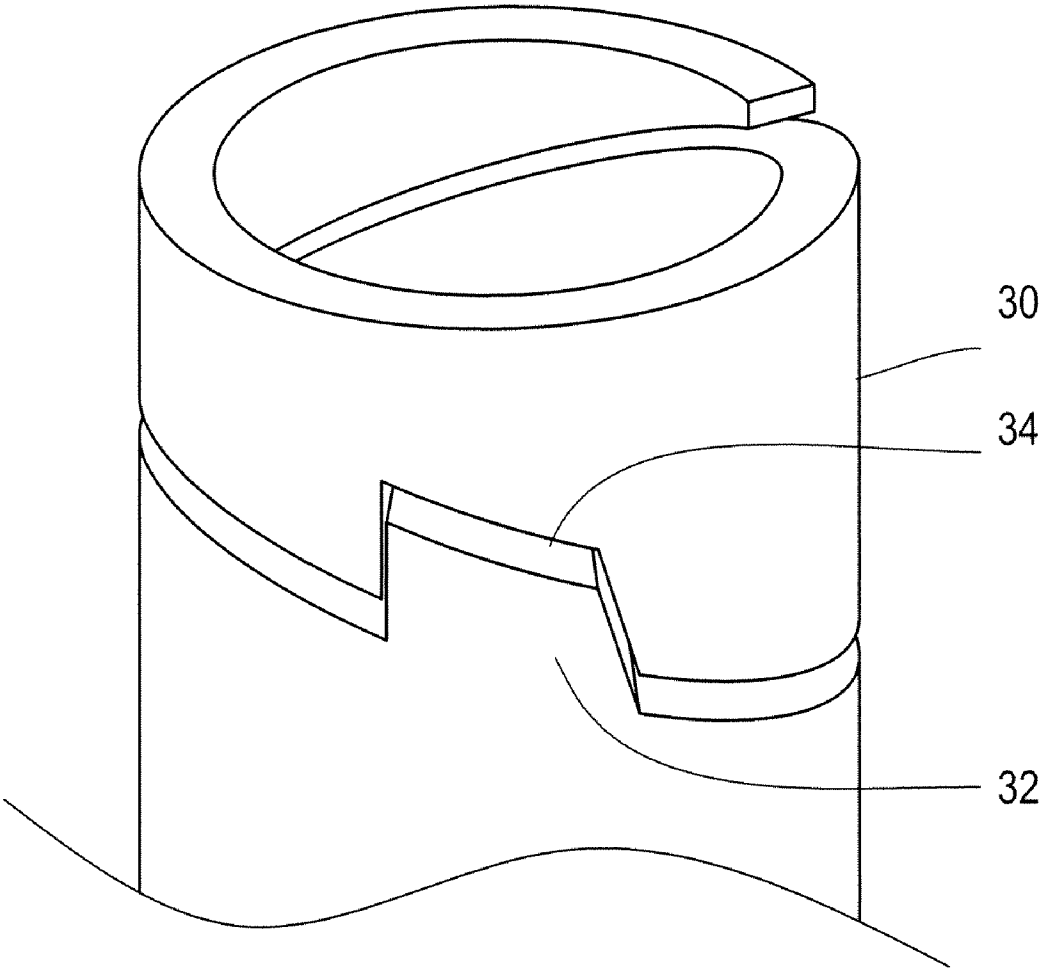


Fig. 3c

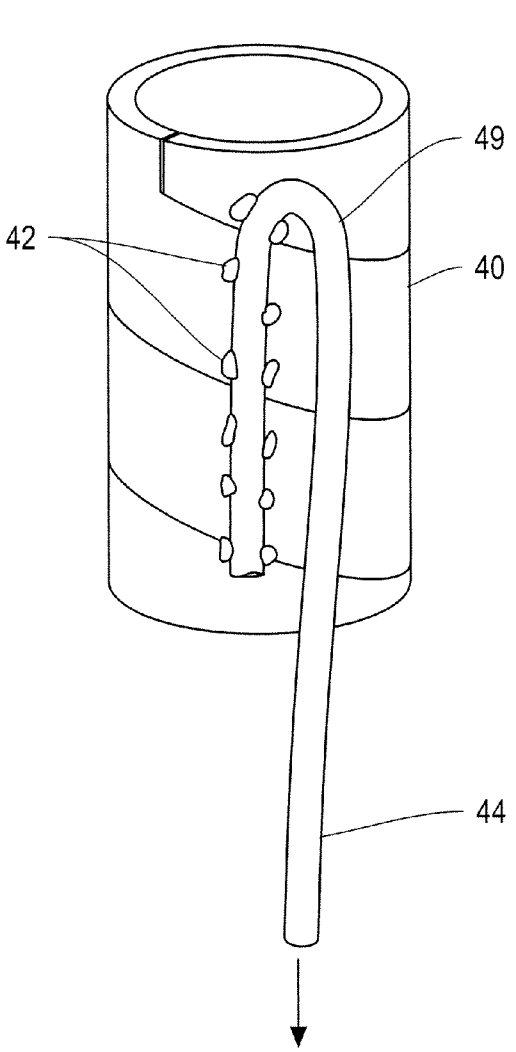


Fig. 4a

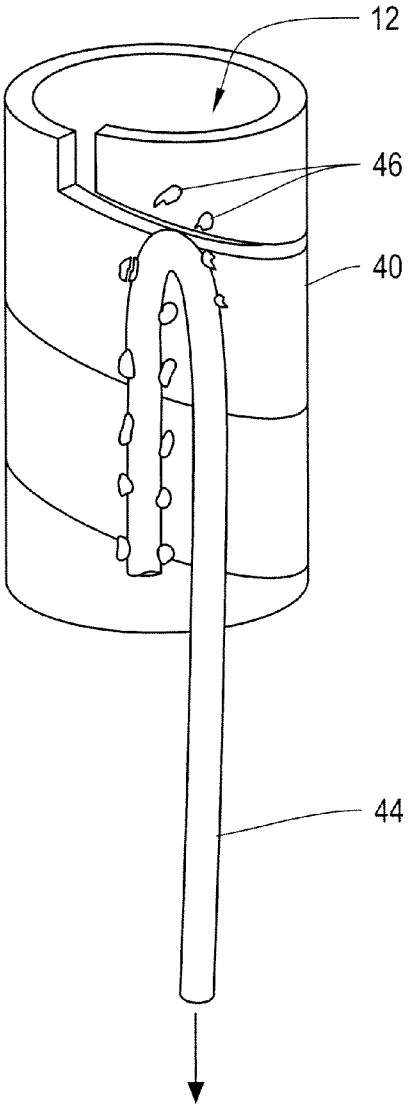


Fig. 4b

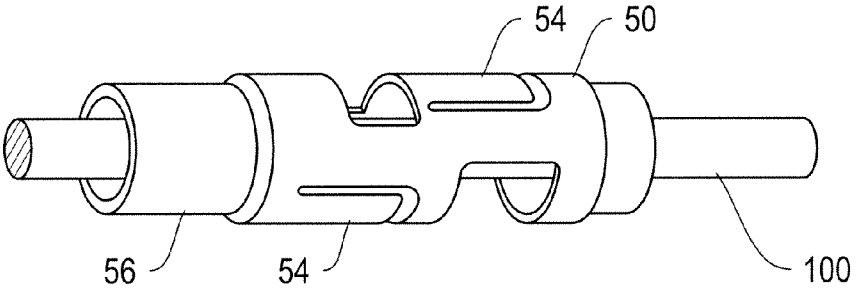


Fig. 5a

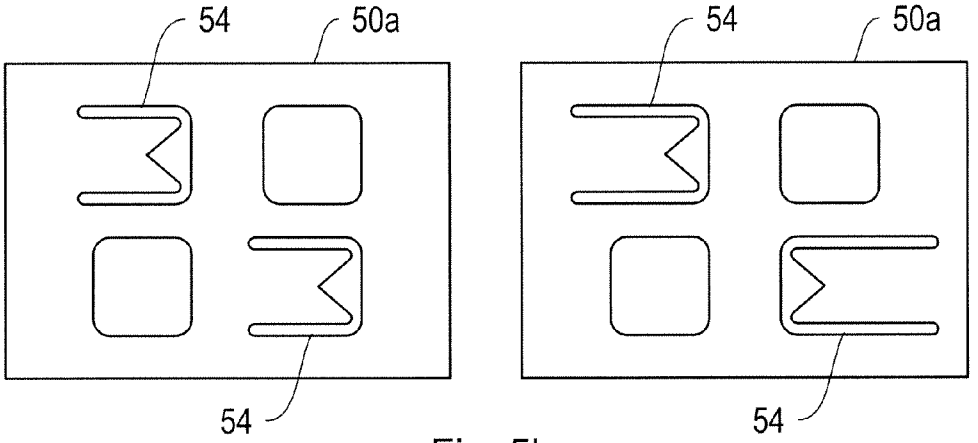


Fig. 5b

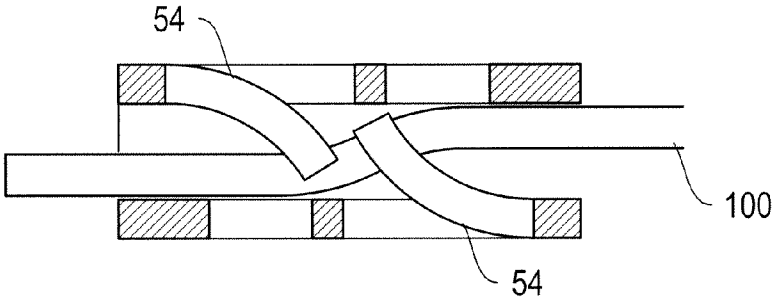


Fig. 5c

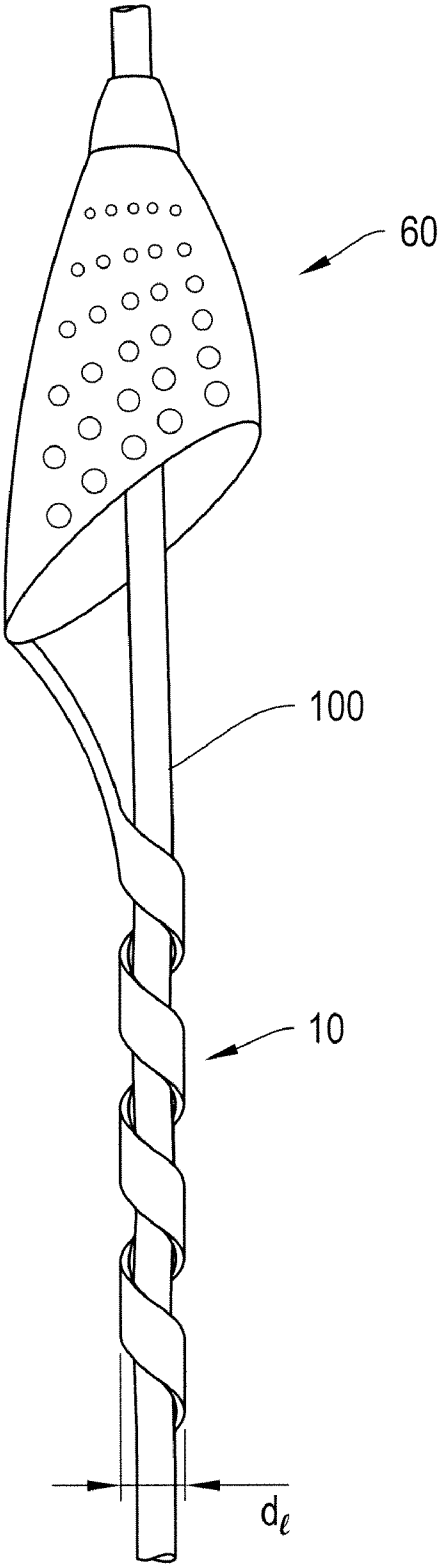


Fig. 6

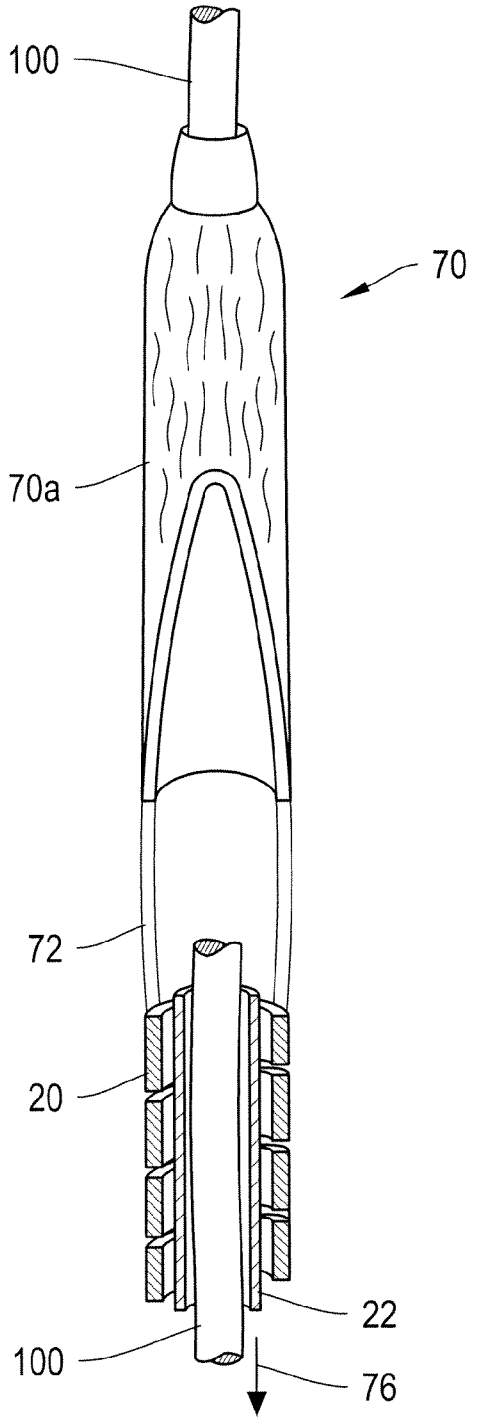


Fig. 7a

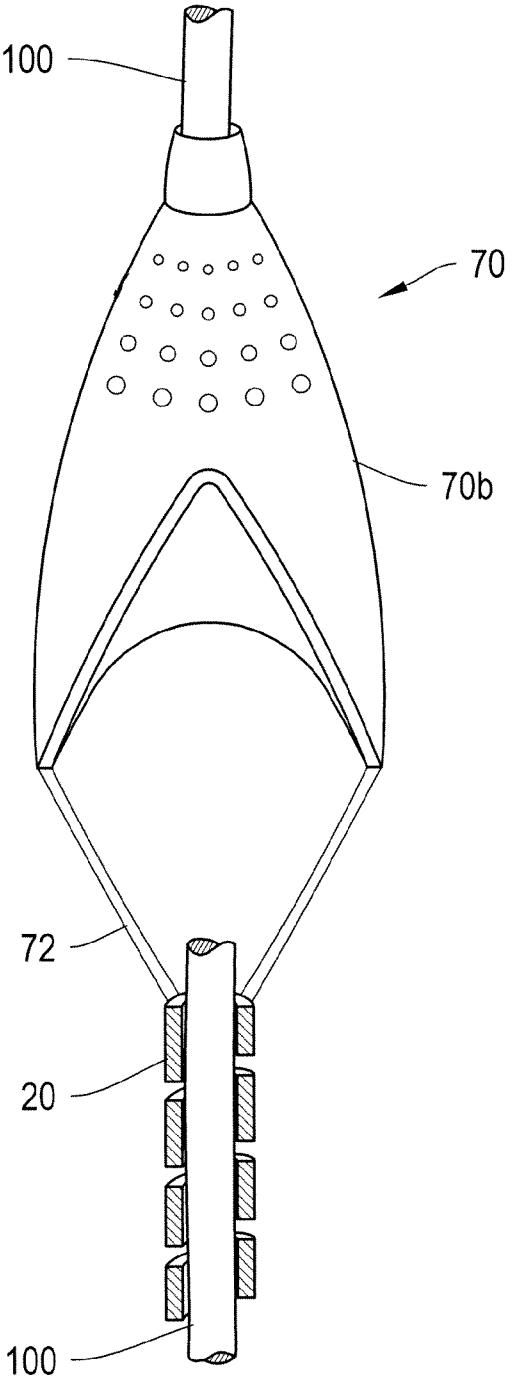


Fig. 7b

GUIDEWIRE STOP

FIELD OF THE INVENTION

[0001] The present invention relates generally to the field of medical procedures which employ a guidewire. In particular, the present invention relates to an actuatable guidewire stop capable of stopping and/or locking a medical device on a guidewire at a location in the body lumen defined by the user.

BACKGROUND OF THE INVENTION

[0002] Transcatheter procedures are employed in increasing numbers for opening stenosed or occluded blood vessels in patients caused by deposits of plaque or other materials on the walls of the blood vessels. Such minimally invasive procedures have proven to be advantageous compared to traditional surgical procedures, such as open heart surgery. Stenosis in arteries and other blood vessels can be treated by permanently or temporarily introducing a stent into the stenosed region to open the lumen of the vessel.

[0003] However, embolic material may be released into the blood stream during implantation of a stent or another prosthetic device, placing the patient at great risk. Embolic material formed of calcium deposits, intimal debris, pieces of artheromatous plaque and/or thrombi has the potential of migrating downstream and causing distal tissue damage, for example stroke or myocardial infarction (see Topol, E. J. and Yadov, J. S., "Recognition of the Importance of Embolization in Athereosclerotic Vascular Disease", Circulation 2000, 101: 570). Embolic material which can potentially damage the distal tissue is often released during vascular intervention procedures, such as stenting of an artheromatous region. To alleviate this problem, an embolic filter may be advanced to a site distal to the treatment site to filter and capture undesired embolic material from the blood. The filter is typically formed from a mesh material mounted on an expansion frame adapted to open from a contracted (or collapsed) state to a deployed (or open) state. The filter is typically inserted over or together with a guidewire using a delivery catheter. Following the treatment procedure, the filter is collapsed and removed from the body over the guidewire or together with the guidewire. Additional treatment devices, such as balloons and stents, can be inserted and removed via the same guidewire.

[0004] The filter should be positioned at a location as close as possible distal of the treatment site to ensure that most or all of the embolic debris is trapped by the filter. On the other hand, the guidewire should extend as far as possible into the body lumen to stabilize the treatment site. It is extremely difficult to achieve both these objectives simultaneously when using a built-in filter stop, because accurate placement of the stop relative to the treatment site by fluoroscopic observation is very difficult.

[0005] Therefore, there is a need for a guidewire stop capable of being stopped/locked on a bare guidewire, i.e. a guidewire section devoid of a preformed or fixedly attached stop. There is also a need for an intravascular treatment device capable of being stopped and/or locked on the guidewire at any user-selectable position following deployment of the treatment device in the body lumen.

SUMMARY OF THE INVENTION

[0006] The present invention relates to a user-actuatable guidewire stop which can be used to stop and/or lock a medical device on a guidewire advanced through a body lumen. It will be appreciated that this provides the user with a significant advantage, since instead of the medical device being preassembled onto the guidewire as is known in the art, the present invention allows for the user to determine precisely where the medical device is to be placed after the guidewire has been introduced into the body. This is of particular significance, especially when dealing with occluded blood vessels where it is crucial to place an embolic filter at a location where virtually all embolic debris will be trapped. The term "guidewire" as employed in the present disclosure is intended to refer to any elongated member used to facilitate the advancement of other elements through body lumens. The guidewire may be any standard, non-dedicated guidewire known in the art. There is no need for dedicated guidewire. After the guidewire stop is locked onto the guidewire, the proximal length of the guidewire is available for use for any other purpose or with additional medical devices. While some embodiments of the invention will be described with reference to an embolic filter, it will be appreciated that the guidewire stop of the invention may be useful for any medical device that is designed to be introduced into a body lumen through the use of a guidewire. Thus, the medical device may be adapted for temporary or permanent implantation into any of the body's systems, such as, but not limited to, urological, neurological, or cardiological. It is also appreciated that the state of the art is such that new medical devices are continuously being developed which are designed for implantation into a body lumen via a transcatheter procedure. The guidewire lock of the present invention provides a unique solution for the positioning of such devices with respect to a guidewire. According to one aspect of the invention, an actuatable guidewire stop configured to limit movement of an intravascular device relative to a guidewire includes a coil spring having an inner lumen with a first diameter configured to slideably and rotationally receive the guidewire in an unlocked configuration, and to frictionally engage the guidewire in a locked configuration, wherein in the locked configuration the inner lumen has a second diameter smaller than the first diameter.

[0007] According to another aspect of the invention, an actuatable guidewire stop configured to limit movement of an intravascular device relative to a guidewire includes a tubular member having one or more resilient members formed in a peripheral opening thereof and exerting a radially inward bias force, the tubular member surrounding the guidewire, and a restraining member interposed between the tubular member and the guidewire to maintain the guidewire stop in an unlocked configuration on the guidewire. Upon removal of the restraining member from a space between the tubular member and the guidewire, the resilient member frictionally engages the guidewire and locks the guidewire stop to the guidewire.

[0008] According to yet another aspect of the invention, an intravascular filter device includes a filter frame disposed about a guidewire, a filter membrane operatively coupled to the filter frame, and a coil spring attached to the filter frame. The coil spring has an inner lumen with a first diameter configured to slideably and rotationally receive the guidewire in an unlocked configuration, and frictionally engage the guidewire in a locked configuration, wherein in the locked configuration the inner lumen has a second diameter smaller than the first diameter. In this embodiment, a medical device is connected to the guidewire stop such that locking of the

stop onto the guidewire causes the medical device to become locked to the guidewire as well. In other embodiments, the guidewire stop may be independent from the medical device.

[0009] The invention is further directed to a method for locking a guidewire stop onto a guidewire at a desired location along the length of the guidewire, with the steps of advancing a guidewire stop configured as a coil spring having an inner lumen with a first diameter configured to slideably and rotationally receive the guidewire in an unlocked configuration to the desired location, and removing a restraining member which maintains the coil spring in the unlocked configuration, thereby causing the coil spring to frictionally engage the guidewire in a locked configuration and lock the guidewire stop on the guidewire, wherein in the locked configuration the inner lumen has a second diameter smaller than the first diameter.

[0010] Embodiments of the invention may include one or more of the following features. In certain embodiments, the inner lumen of the coil spring may have the first diameter when a longitudinal or radially outward force is applied to the coil spring, and the inner lumen may have a second diameter without an external force being applied to the coil spring.

[0011] In certain embodiments, the guidewire stop may include a restraining member configured to urge the coil spring into the unlocked configuration, wherein the coil spring assumes the locked configuration upon removal of the restraining member. The restraining member may be a tubular member disposed between an inner surface of the coil spring and the guidewire, with an inner diameter of the tubular restraining member being greater than an outside diameter of the section of the guidewire. In other embodiments, the restraining member may be disposed between adjacent turns of the coil spring, wherein the restraining member urges the adjacent turns apart so that the coil spring assumes the unlocked configuration, and wherein the coil spring assumes the locked configuration upon removal of the restraining member. The restraining member may be implemented as a wire or filament.

[0012] In still other embodiments, the restraining member may be disposed along turns of the coil spring and may include at least one protrusion on a turn adapted for engagement with a corresponding recess of an adjacent turn, wherein the protrusion interlocks with the corresponding recess to maintain the coil spring in the unlocked configuration. The recess may have a predetermined undercut angle.

[0013] In other embodiments, the restraining member may include a wire or filament disposed external to and in an axial direction of the coil spring, wherein the wire or filament is affixed to turns of the coil spring by a connection having a rated break point so as to maintain the coil spring in the unlocked configuration, and wherein removal of the wire or filament causes the coil spring to assume the locked configuration on the guidewire. The wire or filament may have a doubled-over configuration with respect to the coil spring and may be affixed to the coil spring by welding spots.

[0014] In certain embodiments, the guidewire stop may include an actuator operatively coupled to a proximal portion of the coil spring for changing the coil spring from the unlocked configuration to the locked configuration. In other embodiments, the actuator may be operatively coupled to a proximal portion of the tubular member for proximally removing the tubular member to change the coil spring from the unlocked configuration to the locked configuration.

[0015] The locking element, for example, the coil spring or tubular member, may be formed from an elastic material or a shape-memory material such as Nitinol.

[0016] The guidewire stop may further include an actuator implemented as a pulling wire, wherein the actuator can be withdrawn together with the restraining member from the body and such that the proximal length of the guidewire is unobstructed and can be used for other purposes.

[0017] These and other features and advantages of the present invention will become more readily appreciated from the detailed description of the invention that follows.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The following figures depict certain illustrative embodiments of the invention in which like reference numerals refer to like elements. These depicted embodiments are to be understood as illustrative of the invention and not as limiting in any way.

[0019] FIGS. **1***a* and **1***b* show schematically in a perspective view an exemplary embodiment of a guidewire stop according to the invention, wherein the guidewire stop locking element comprises a single coil spring;

[0020] FIGS. **2***a* and **2***b* show schematically in cross section other exemplary embodiments of a guidewire stop according to the invention using a coil spring;

[0021] FIGS. **3***a* and **3***b* show schematically another exemplary embodiment of a guidewire stop according to the invention;

[0022] FIG. **3***c* shows a detail of the guidewire stop of FIGS. **3***a* and **3***b;*

[0023] FIGS. **4***a* and **4***b* show schematically in a perspective view another exemplary embodiment of a guidewire stop according to the invention;

[0024] FIG. **5***a* shows schematically in a perspective view another exemplary embodiment of a guidewire stop;

[0025] FIG. **5***b* shows planar views of the surface of the tubular locking element of FIG. **5***a;*

[0026] FIG. **5***c* shows engagement between the guidewire stop of FIG. **5***a* and the guidewire;

[0027] FIG. **6** shows schematically the guidewire stop of FIG. **1***a* with an attached embolic protection filter; and

[0028] FIGS. **7***a* and **7***b* show schematically the guidewire stop of FIG. **2***a* with an attached embolic protection filter.

DETAILED DESCRIPTION OF CERTAIN ILLUSTRATED EMBODIMENTS

[0029] The disclosed devices are directed to guidewire stops (or locks) capable of locking on a bare guidewire, i.e., a guidewire that does not include stops or locks applied to or formed on the guidewire prior to insertion of the guidewire into the body lumen. The approach allows the clinician to use in conjunction with a specific medical device any guidewire suitable for a procedure regardless of the design of the guidewire or its intended use.

[0030] The disclosed guidewire stops have a flexible or resilient body with an inner lumen configured to slideably and rotationally receive a guidewire in an unlocked position and to frictionally engage the guidewire in a locked position. A user-activated actuator enables the user to place the guidewire stop, with or without an attached medical device, such as an embolic protection filter, at any desired location along the guidewire. Placement of the guidewire stop can be monitored

in a conventional manner, for example, by fluoroscopic observation using radiopaque markers.

[0031] In one exemplary embodiment of the invention shown schematically in FIGS. **1***a* and **1***b*, a coil spring **10** defines an inner lumen **12** through which a guidewire **100** passes. The spring **10** is intrinsically biased to contract and lock along the guidewire **100** with an outside diameter d_1 (locked configuration, FIG. **2***b*), preventing further movement of the coil spring **10** with respect to the guidewire **100**. When a force indicated by arrows A and B is applied in the longitudinal direction between the two ends of the coil spring **10**, the spring is compressed and can move freely with respect to guidewire **100** (unlocked configuration, FIG. **2***a*). In the unlocked configuration, coil spring **10** has a larger diameter d_2. An actuating element adapted to be used for applying the longitudinal force along A and B is not shown so as not to obscure the drawing.

[0032] In operation, the coil spring **10** is moved in the unlocked configuration over the guidewire **100** to an area in the body lumen where a medical procedure is to be performed. The actuating element (not shown) is moved away from the spring ends, causing the spring to lock on the guidewire **100** at a user-defined location.

[0033] The embodiment illustrated in FIG. **2***a* is similar to that of FIGS. **1***a* and **1***b*, with the exception that the coil spring **20** is maintained in an unlocked configuration by a restraining sheath **22** disposed between the guidewire **100** and the coil spring **20**. When the restraining sheath **22** is withdrawn from the space between guidewire **100** and coil spring **20**, coil spring **20** automatically constricts and locks around guidewire **100**, as before. It is appreciated that in this embodiment as well as in others disclosed herein, any suitable activating means may be employed for removing the restraining sheath **22**, so as to activate the spring **20**. In this embodiment, for example, a pulling wire or activation catheter may be coupled to the restraining sheath **22** (or formed as a unit with the restraining sheath **22**) for enabling the user to withdraw the restraining sheath **22** from the space between the guidewire **100** and the coil spring **20**.

[0034] In another embodiment of a coil spring shown in FIG. **2***b*, the coil spring **24** is held in an open, unlocked configuration by at least one restraining filament **26** which runs longitudinally along substantially the length of the spring **24**. Any suitable number of filaments, i.e. one or more filaments, may be provided to restrain the spring **24** in the open configuration; two filaments are illustrated for the sake of example only. The filament(s) **26** may be looped through notches **27** disposed at the ends of spring **24**. In addition, the filaments may be routed in longitudinal recesses disposed on the outside or inside, or both, of the spring **24**, so as to maintain the outside and/or inside diameter of the spring **24** within acceptable limits. When the filament(s) **26** is/are cut, the coil spring **24** automatically contracts around a guidewire positioned therein (not shown), so as to lock the spring **24** to the guidewire. In one embodiment, the filament may be severed by actuating means, such as an activation catheter having a sharp end **25** adapted for cutting the filament(s).

[0035] FIGS. **3***a*-**3***c* illustrate another embodiment of the present invention in which the restraining means, meaning the structure that prevents the biased spring to collapse onto and lock on the guidewire, are formed as an integral part of a coil spring **30**. In this embodiment, protrusions **32** are formed on the turns of the coil spring **30**, with the protrusions **32** adapted to engage in corresponding indentations **34** located on an adjacent turn of the spring **30** in an unlocked configuration. FIG. **3***a* shows spring **30** in an unlocked configuration with the aforementioned diameter d_1 (see FIG. **1***a*), allowing spring **30** to slide along guidewire **100**. The configuration in the compressed, unlocked configuration of coil spring **30** is more clearly shown in FIG. **3***c*, with each protrusion **32** engaging in a corresponding indentation **34**, thereby maintaining coil spring **30** in the compressed, unlocked configuration. As shown in FIG. **3***a*, spring **30** may be retained in a retainer tube **35** (with may be part of a delivery catheter) which encircles coil spring **30** and may include an inward pointing shoulder **37** supporting coil spring **30** formed on an outer shoulder **38** of spring **30**.

[0036] In the compressed, unlocked configuration (FIG. **3***a*), the protrusion/indentation pairs are interlocked through frictional force which prevents coil spring **30** from opening unintentionally to the stretched locked configuration shown in FIG. **3***b* with diameter d_2. The level of friction required to disengage the interlocked protrusion/indentation pairs is determined by an undercut angle **39** between a protrusion and the corresponding indentation. Application of a pulling force proximally along a pulling wire **36** causes each of the protrusions the coil spring **30** to disengage from the corresponding indentation, causing the coil spring **30** to open in the longitudinal direction and contract in the radial direction, as shown in FIG. **3***b*, thereby effectively locking the spring **30** to guidewire **100**.

[0037] FIGS. **4***a* and **4***b* illustrate a coil spring **40** of the type shown FIGS. **1***a* and **2***a*. However, instead of being held in the unlocked configuration by an applied longitudinal force (FIG. **1***a*) or a retainer tube **22** (FIG. **2***a*), an actuating wire **44** is attached, for example, by spot welds **42**, to the turns of coil spring **40** to maintain coil spring **40** in a larger-diameter, unlocked configuration. Actuating wire **44** is secured to the body of coil spring **40** in a doubled-over manner, with a bend **49** near the distal end of spring **40**. As the user pulls proximally on actuating wire **44**, spot welds **42** sequentially break off, starting with spot welds **46** near the bend **49**, allowing the inwardly biased turns of coil spring **40** to gradually collapse and engage the guidewire (not shown). This causes coil spring **40** to revert to a relaxed, smaller-diameter state and lock on the guidewire due to the smaller diameter of the inner lumen **12** in coil spring **40**. It will be appreciated that the illustrated arrangement of the welds **42** used to attach the actuating wire **44** and the disclosed bend **49** is meant to be only exemplary and that other arrangements and methods for attaching the actuating wire **44** to the helical coil **40** may be employed, such as soldering, crimping, gluing and the like.

[0038] FIGS. **5***a*-**5***c* illustrate another exemplary embodiment of a locking element **50** made of a tube having a plurality of windows **52** formed in the tube surface **50***a* (FIG. **5***b*), shown here as an unrolled representation of the tube surface. At least some of the windows **52** include inwardly biased protruding members **54** (or prongs) adapted to engage with guidewire **100** passing through the interior of locking element **50** after a restraining element **56** disposed between the locking element and guidewire **100** has been removed. The protruding members **54** may have the configuration shown in FIG. **5***b* or another suitable shape or orientation. For example, the protruding members **54** may be aligned lengthwise in the same direction (left side of FIG. **5***b*), or some of the members **54** may be aligned in the opposite direction of other members **54** (right side of FIG. **5***b*).

[0039] The locking element **50** operates as follows: in the unlocked configuration, tubular restraining element **56** interposed between locking element **50** and guidewire **100** prevents the protruding members **54** from contacting guidewire **100**. Unillustrated actuating means (for example, a delivery catheter and a pulling wire similar to the embodiment depicted in FIG. **3***a*) may be employed to withdraw the restraining element **56** from the space between guidewire **100** and locking element **50**. When restraining element **56** is withdrawn proximally, the protruding members **54** automatically extend inwardly so as to grip the guidewire **100** (see FIG. **5***c*) and effectively lock the locking element **50** on the guidewire **100**. It is noted that in FIG. **5***c*, the shaped protruding members (**54**) grip guidewire **100** from opposite directions. However, as noted above, many other configurations are possible for effectively gripping the guidewire, and the illustration is meant to be exemplary only.

[0040] It is appreciated that the guidewire used with the guidewire stop of the present invention may be any standard guidewire. A dedicated guidewire need not be employed. This provides a substantial advantage by providing the user with a greater degree of freedom as to where to position the medical device. The guidewire lock may be positioned on and locked to the guidewire with or without an attached medical device, such as an embolic protection filter.

[0041] FIG. **6** shows schematically how an embolic protection filter **60** may be attached to a locking element, such as locking element **10** depicted in FIGS. **1***a* and **1***b*. Guidewire **100** is shown here as protruding from distal end of filter **60** in a manner known in the art. Filter **60** may include a filter frame which in the illustrated example is attached to a coil spring locking element **10** using a single strut **62**; however, more than one strut can be employed. Filter **60** may be deployed conventionally using a delivery catheter (not shown).

[0042] FIGS. **7***a* and **7***b* show a schematic diagram of a filter **70** before deployment **70***a* and the same filter **70** after deployment **70***b*. The exemplary filter **70** is shown here as being attached to a guidewire stop **20** of the type depicted in FIG. **2***a* by a plurality of struts forming a filter frame **72**. Coil spring **20** can be locked on guidewire **100** by withdrawing restrainer sheet **22** proximally in the direction indicated by arrow **76**. Although not shown, guidewire **100** typically extends continuously through the entire length of filter **70**, **70***b*.

[0043] It will be understood that the other coil spring locking elements illustrated in the drawings can cooperate with the depicted embolic filter and with various other medical devices used, for example, in intravascular procedures in the manner illustrated in FIGS. **6** and **7***a*, **7***b*.

[0044] While embodiments of the present invention have been described with reference to an embolic filter, it will be appreciated that the lock of the present invention may be employed with any medical device that is designed to be introduced into a body lumen through the use of a guidewire. Medical devices, such as, but not limited to, urological, neurological, or cardiological devices, may be implanted temporarily or permanently into a body lumen, for example, via a transcatheter procedure. The guidewire stop of the present invention provides a unique solution for the positioning and optionally locking such devices on bare guidewires.

[0045] While the invention is receptive to various modifications, and alternative forms, specific examples thereof have been shown in the drawings and are herein described in detail. It should be understood, however, that the invention is not limited to the particular forms or methods disclosed, but to the contrary, the invention is meant to cover all modifications, equivalents, and alternatives falling with the spirit and scope of the appended claims.

1. An actuatable guidewire stop configured to limit movement of an intravascular device relative to a guidewire, comprising:

a coil spring having an inner lumen with a first diameter configured to slideably and rotationally receive the guidewire in an unlocked configuration, and frictionally engage the guidewire in a locked configuration, wherein in the locked configuration the inner lumen has a second diameter smaller than the first diameter.

2. The guidewire stop of claim **1**, wherein the inner lumen has the first diameter when a compression force is applied to the coil spring longitudinally, and the inner lumen has the second diameter without an external force being applied to the coil spring.

3. The guidewire stop of claim **1**, wherein the inner lumen has the first diameter when a radially outward force is applied to the coil spring, and the inner lumen has the second diameter without an external force being applied to the coil spring.

4. The guidewire stop of claim **3**, further comprising a restraining member configured to urge the coil spring into the unlocked configuration, wherein the coil spring assumes the locked configuration upon removal of the restraining member.

5. The guidewire stop of claim **4**, wherein the restraining member is a tubular member disposed between an inner surface of the coil spring and the section of the guidewire, with an inner diameter of the tubular restraining member being greater than an outside diameter of the section of the guidewire.

6. The guidewire stop of claim **4**, wherein the restraining member is disposed between adjacent turns of the coil spring, wherein the restraining member urges the adjacent turns apart so that the coil spring assumes the unlocked configuration, and wherein the coil spring assumes the locked configuration upon removal of the restraining member.

7. The guidewire stop of claim **6**, wherein the restraining member comprises a filament.

8. The guidewire stop of claim **4**, wherein the restraining member is disposed along turns of the coil spring and comprises at least one protrusion disposed on a turn of the coil spring and adapted for engagement with a corresponding recess of an adjacent turn of the coil spring, and wherein the protrusion interlocks with the corresponding recess to maintain the coil spring in the unlocked configuration.

9. The guidewire stop of claim **8**, wherein the recess has a predetermined undercut angle.

10. The guidewire stop of claim **1**, further comprising an actuator operatively coupled to a proximal portion of the coil spring for changing the coil spring from the unlocked configuration to the locked configuration.

11. The guidewire stop of claim **4**, further comprising an actuator operatively coupled to a proximal portion of the restraining member for proximally removing the restraining member from a space between the coil spring and the section of the guidewire to change the coil spring from the unlocked configuration to the locked configuration.

12. The guidewire stop of claim **4**, wherein the restraining member comprises a wire or filament disposed external to and in an axial direction of the coil spring, wherein the wire or filament is affixed to turns of the coil spring by a connection having a rated break point so as to maintain the coil spring in

the unlocked configuration, and wherein removal of the wire or filament causes the coil spring to assume the locked configuration on the section of the guidewire.

13. The guidewire stop of claim **12**, wherein the wire or filament has a doubled-over configuration with respect to the coil spring.

14. The guidewire stop of claim **12**, wherein the wire or filament is affixed to the coil spring by a plurality of welding spots.

15. The guidewire stop of claim **12**, further comprising an actuator operatively coupled to a proximal portion of the wire or filament, wherein the actuator is adapted to break the connection between the wire or filament and turns of the coil spring.

16. An actuatable guidewire stop configured to limit movement of an intravascular device relative to a guidewire, comprising:

a tubular member having at least one resilient member formed in a peripheral opening thereof and exerting a radially inward bias force, the tubular member surrounding a section of the guidewire, and

a restraining member interposed between the tubular member and the section of the guidewire to maintain the guidewire stop in an unlocked configuration on the section of the guidewire,

wherein upon removal of the restraining member from a space between the tubular member and the section of the guidewire, the resilient member frictionally engages the section of the guidewire and locks the guidewire stop to the section of the guidewire.

17. The guidewire stop of claim **16**, wherein the resilient member is configured as a prong and formed integrally in a peripheral surface of the tubular member.

18. An intravascular filter device, comprising:

a filter frame disposed about a guidewire;

a filter membrane operatively coupled to the filter frame; and

a coil spring attached to the filter frame, said coil spring having an inner lumen with a first diameter configured to slideably and rotationally receive the guidewire in an unlocked configuration, and frictionally engage the guidewire in a locked configuration, wherein in the locked configuration the inner lumen has a second diameter smaller than the first diameter.

19. A method for locking a guidewire stop onto a guidewire at a desired location along the length of the guidewire, comprising;

advancing the guidewire stop configured as a coil spring having an inner lumen with a first diameter configured to slideably and rotationally receive the guidewire in an unlocked configuration to the desired location; and removing a restraining member which maintains the coil spring in the unlocked configuration, thereby causing the coil spring to frictionally engage the guidewire in a locked configuration and lock the guidewire stop on the guidewire, wherein in the locked configuration the inner lumen has a second diameter smaller than the first diameter.

20. The method of claim **19**, wherein the restraining member is operatively coupled to an actuator, and removing the restraining member comprises withdrawing the actuator and the restraining member from the body lumen.

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