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(54) TISSUE CLIP DEVICES, SYSTEMS, AND TRACTION METHODS

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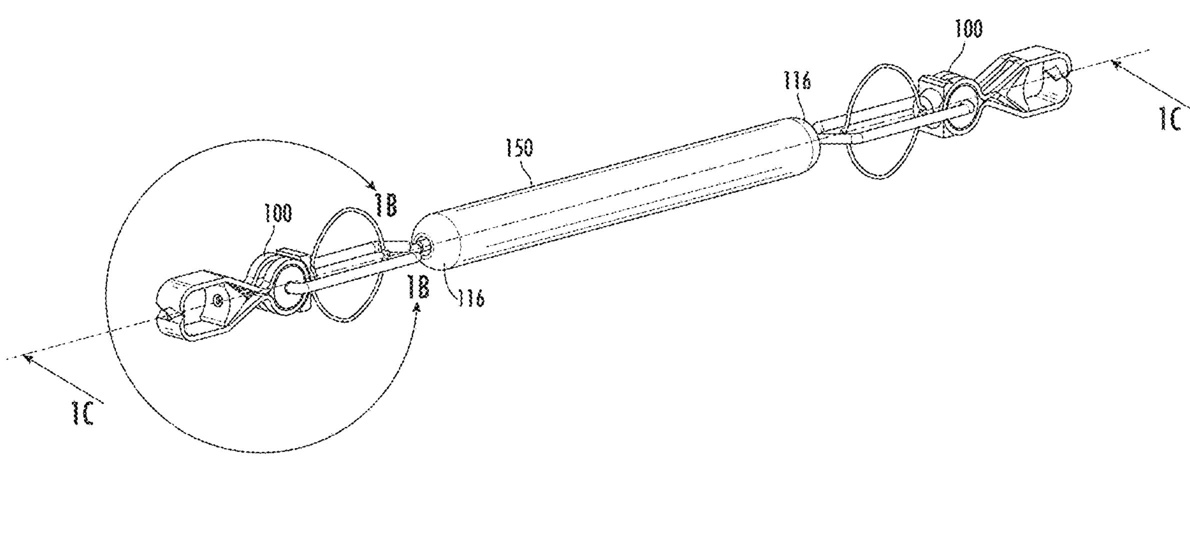
CPC *A61B 17/1227* (2013.01); *A61B 17/128* (2013.01)

(57) ABSTRACT

The present disclosure pertains to medical devices. More particularly, the present disclosure pertains to tissue clip devices and related systems and methods. In an embodiment, a tissue clip may include a grasper including jaws at a first end, and a spring portion at a second end, and a longitudinal axis extending along a length of the grasper from the first end to the second end, wherein the spring portion is configured to bias the jaws toward each other. A wedge may be slidably disposed between the jaws such that an apex of the wedge is oriented toward the spring portion. A filament may be coupled to the wedge at a first end of the filament and may extend through a channel of the spring portion of the grasper to a second end of the filament.



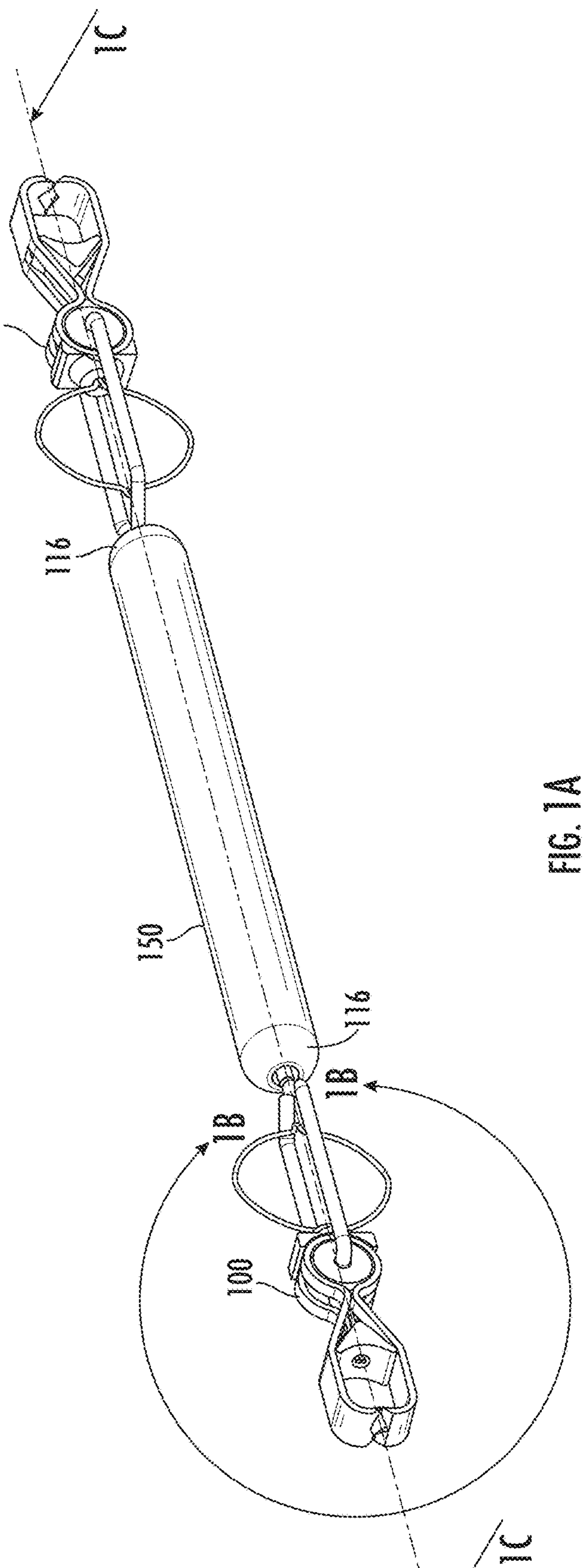


FIG. 1A

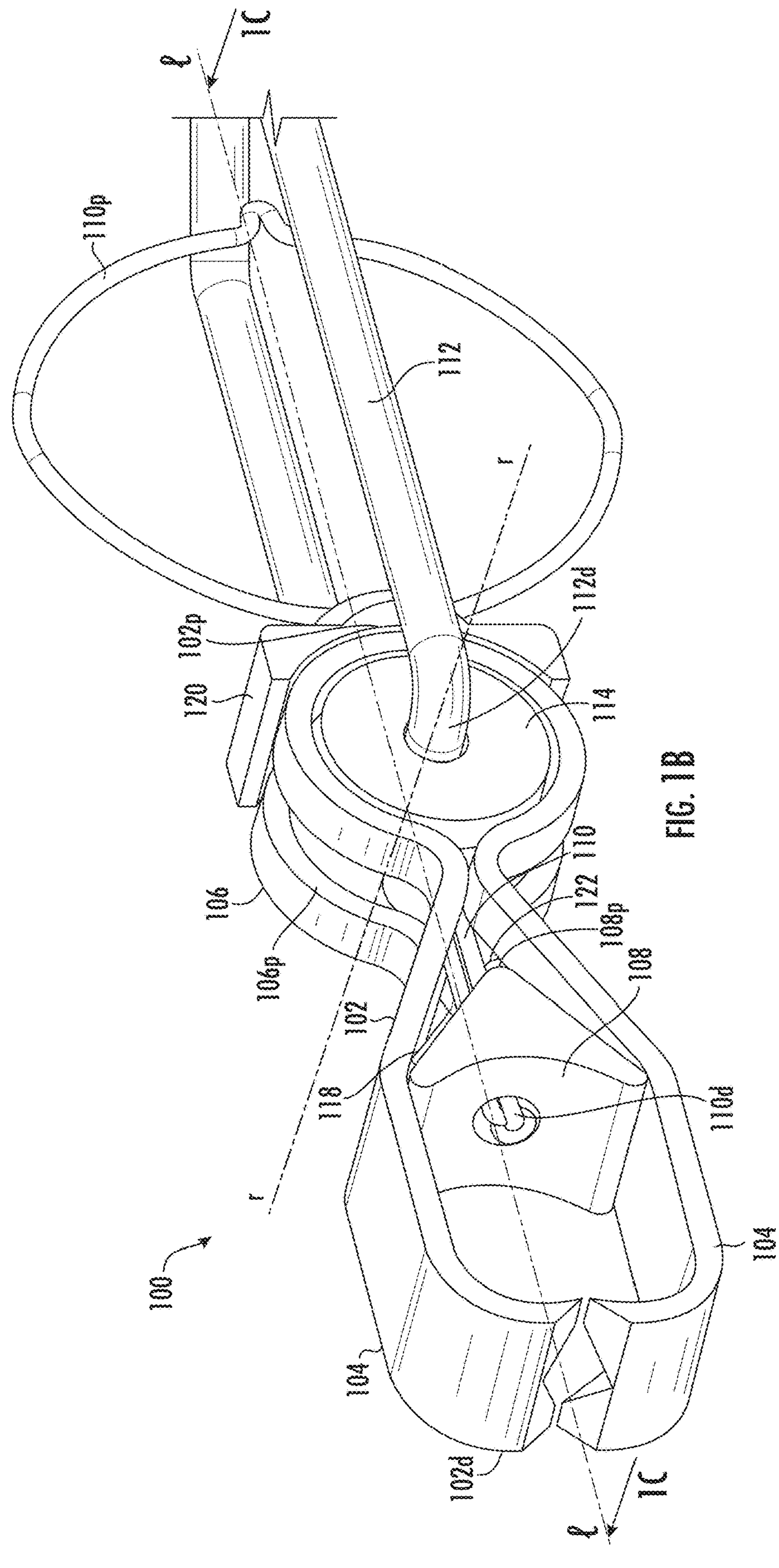

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FIG. 1B

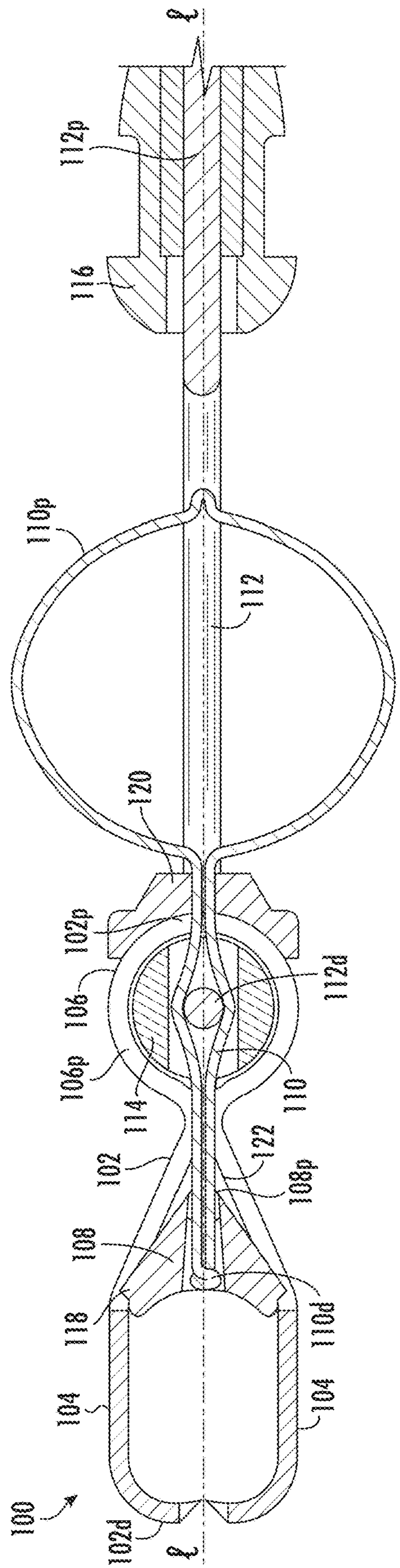
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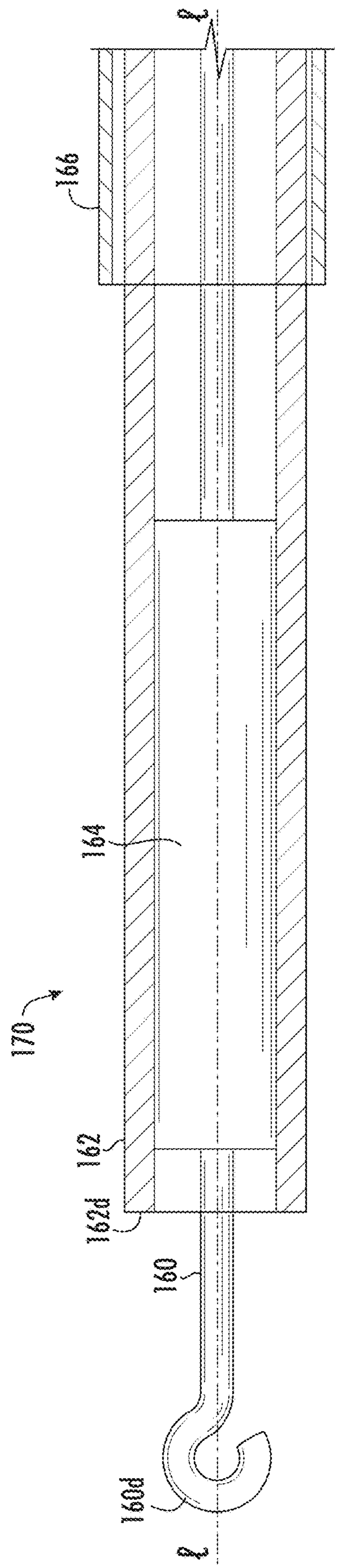
FIG. 1C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162d
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FIG. 2A

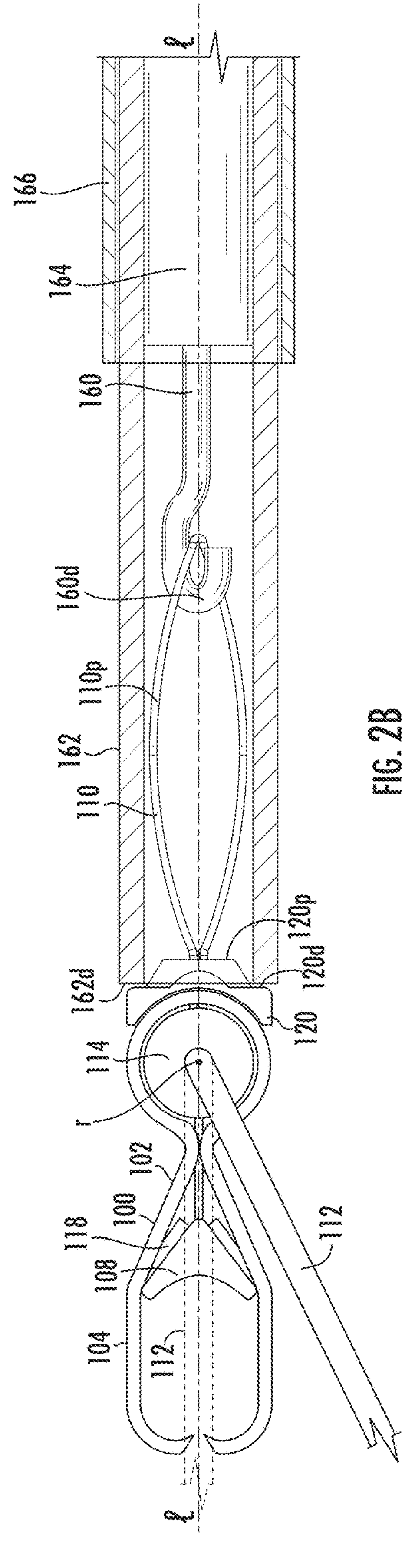
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FIG. 2B

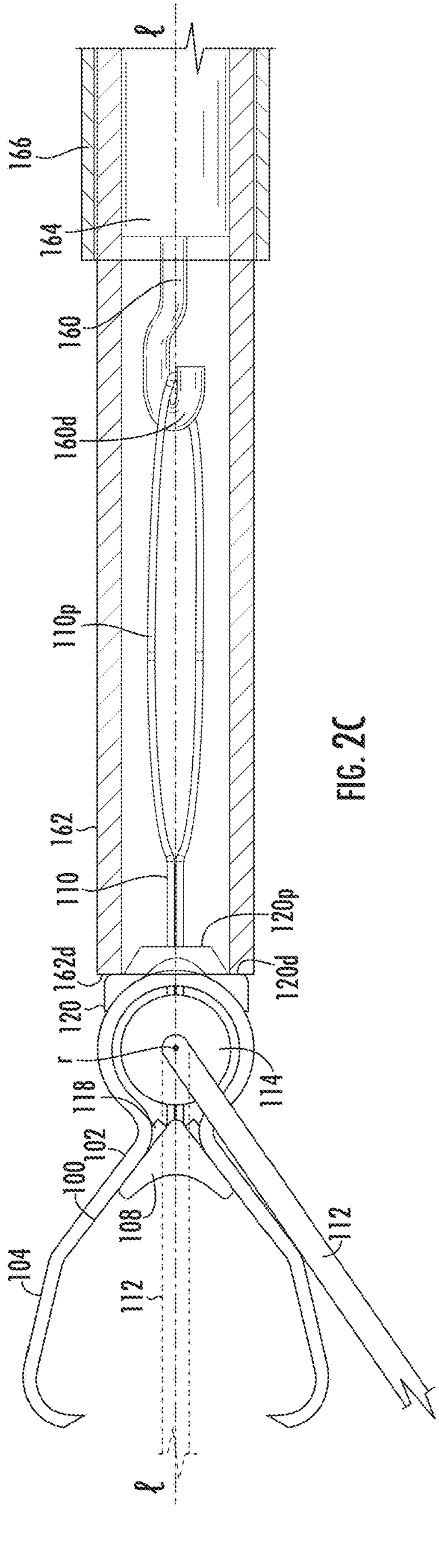

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FIG. 2C

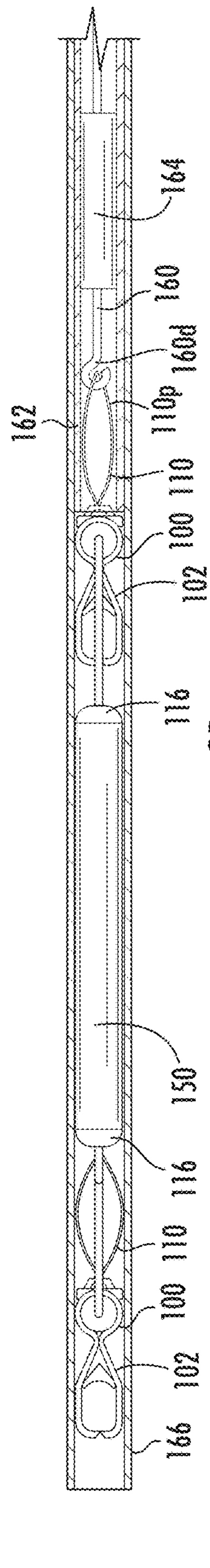

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FIG. 2D

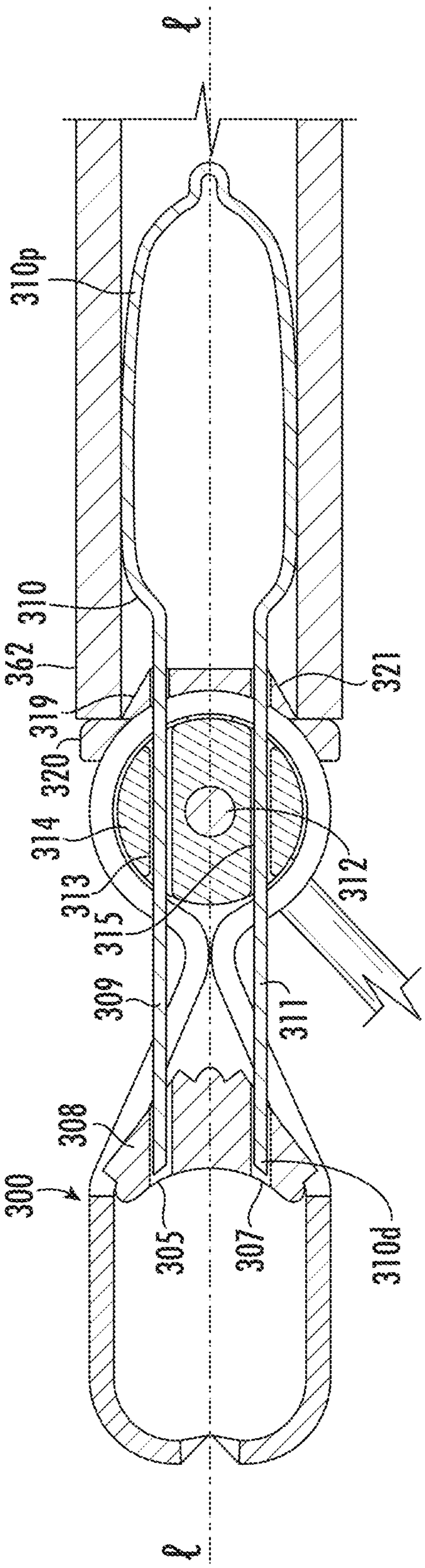

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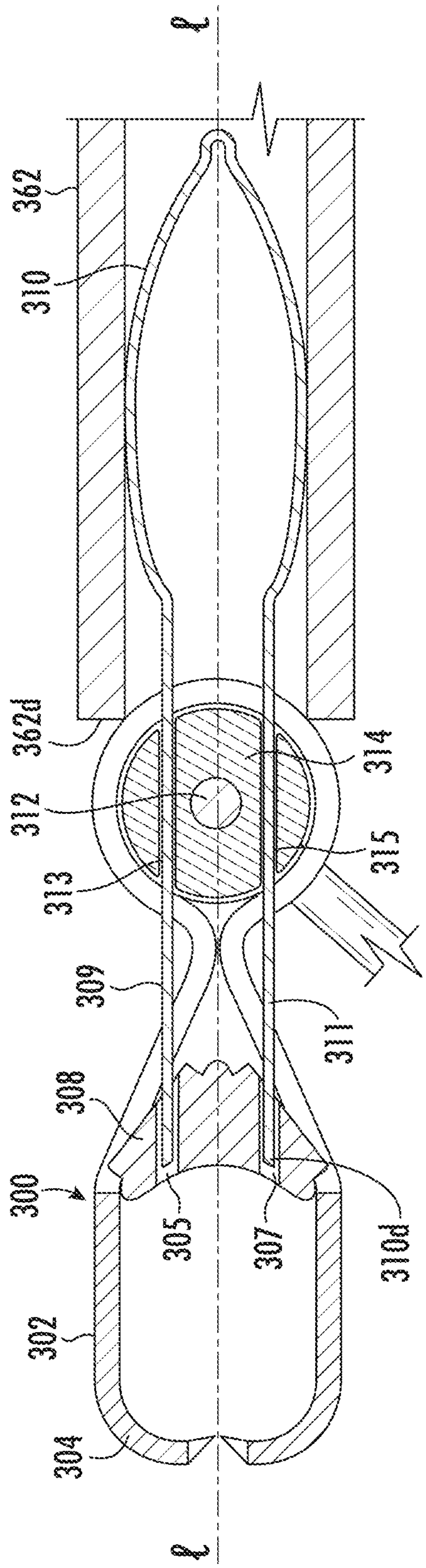
FIG. 3A



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310d
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304
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FIG. 3B

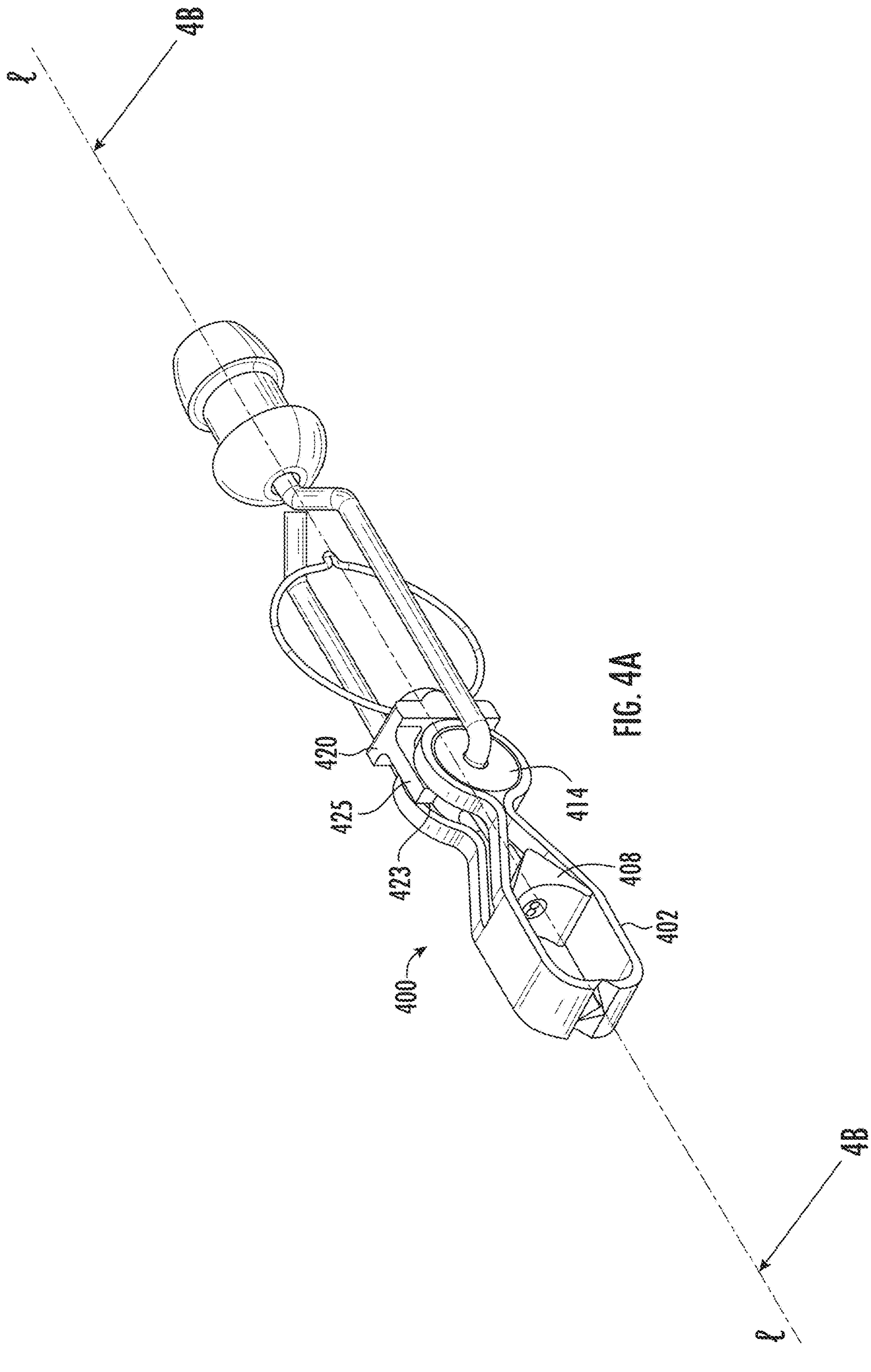

FIG. 4A

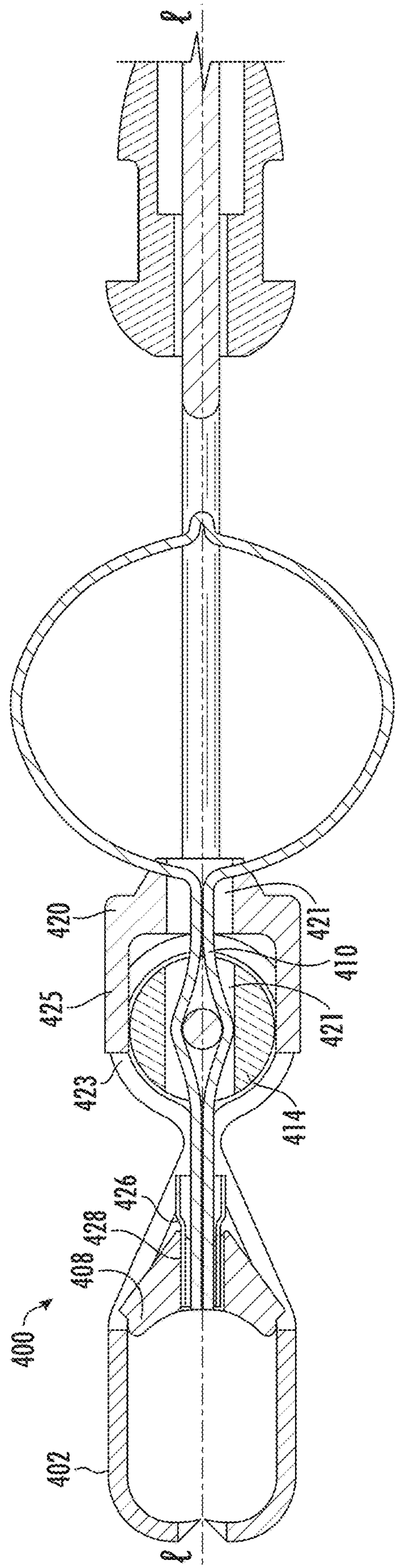

FIG. 4B

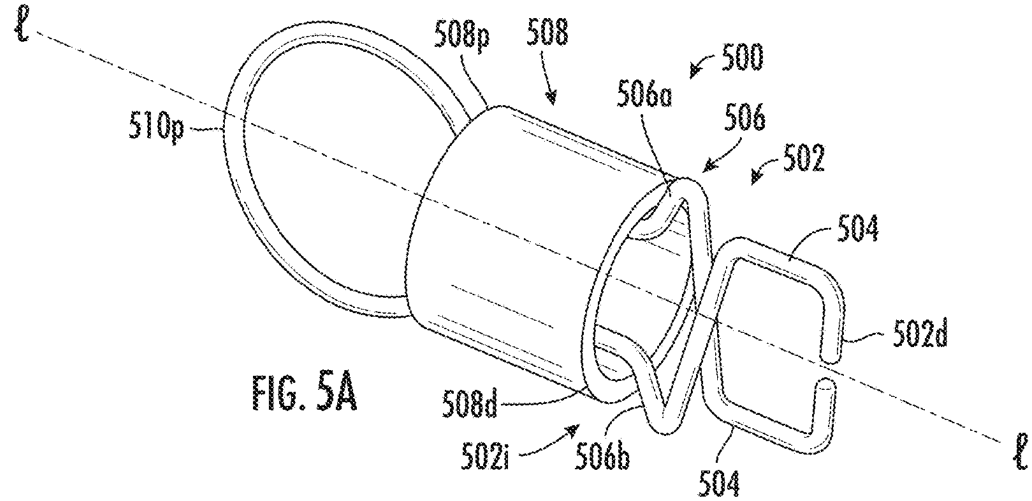

FIG. 5A

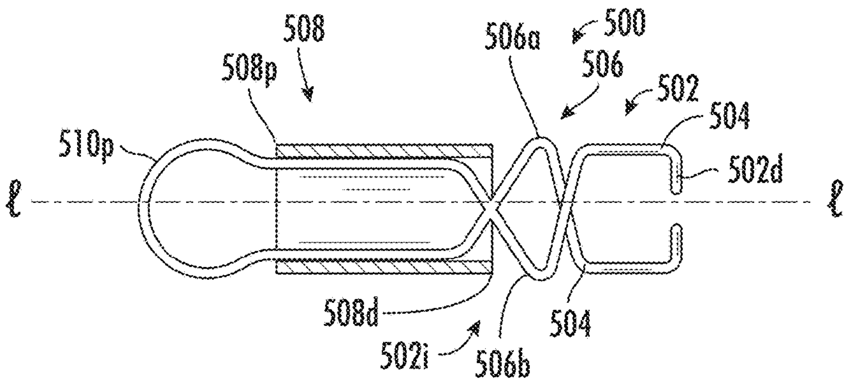

FIG. 5B

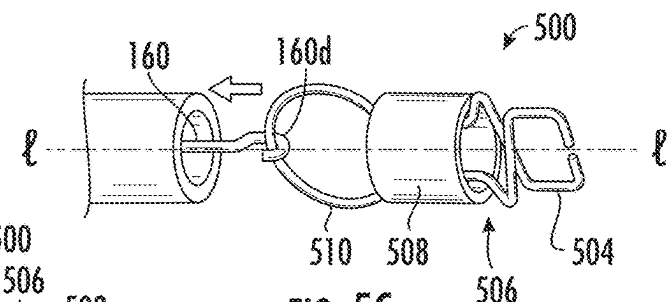

FIG. 5C

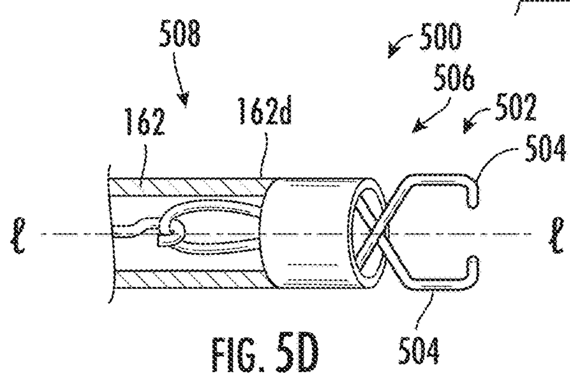

FIG. 5D

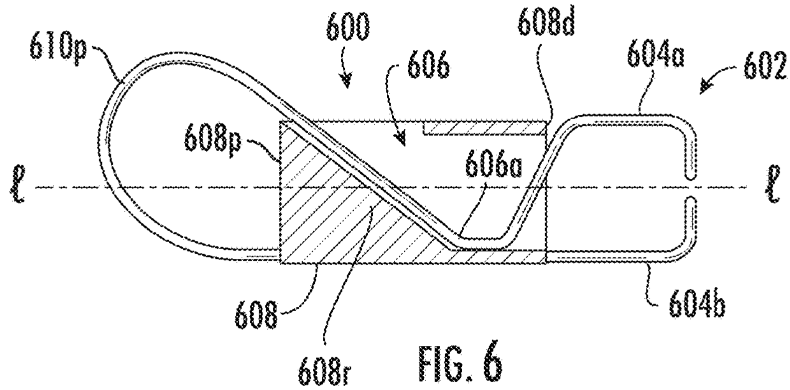

FIG. 6

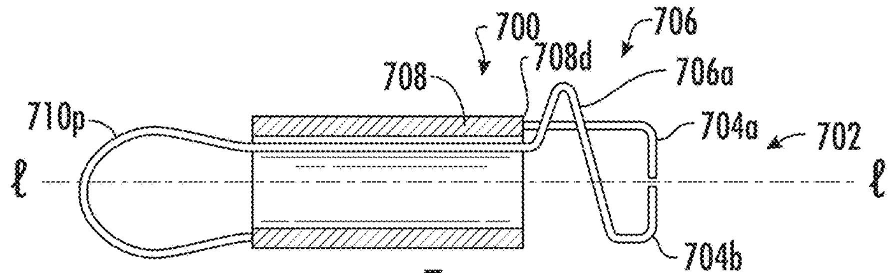

FIG. 7

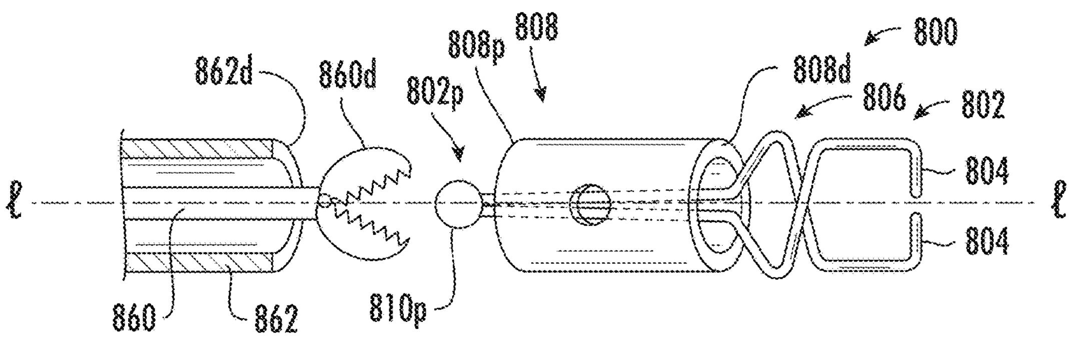

FIG. 8A

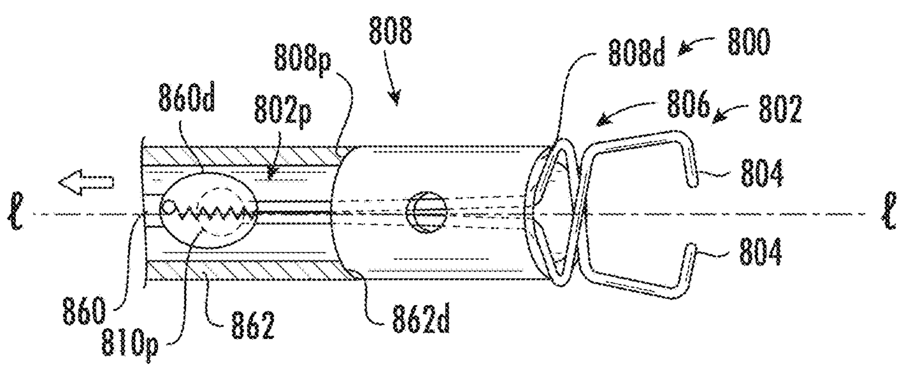

FIG. 8B

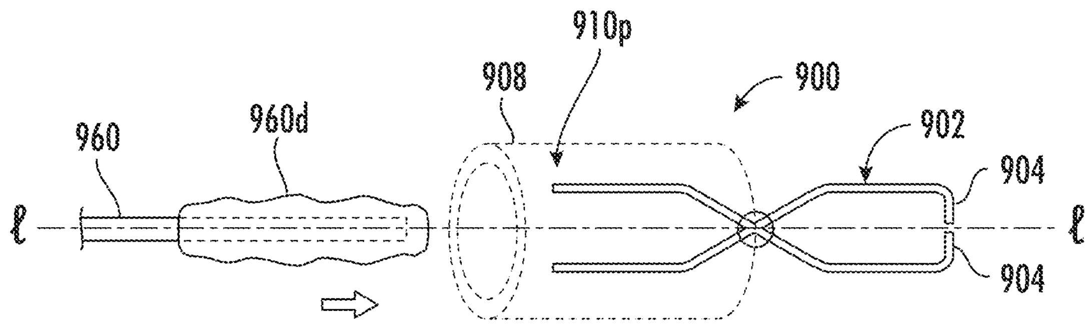

FIG. 9A

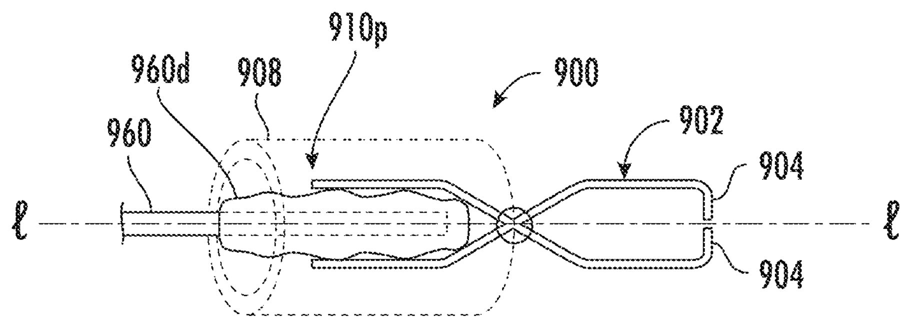

FIG. 9B

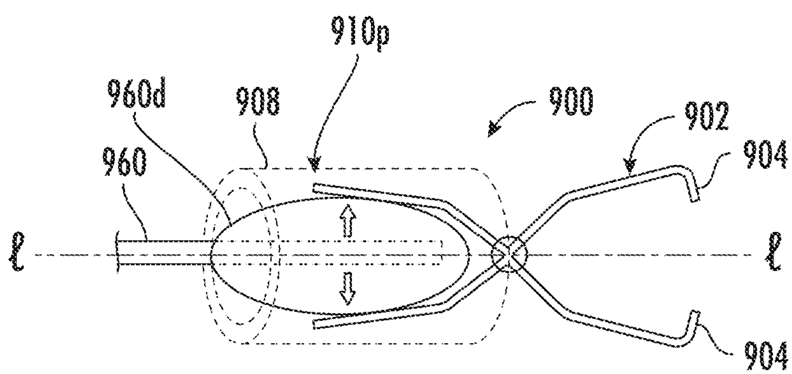

FIG. 9C

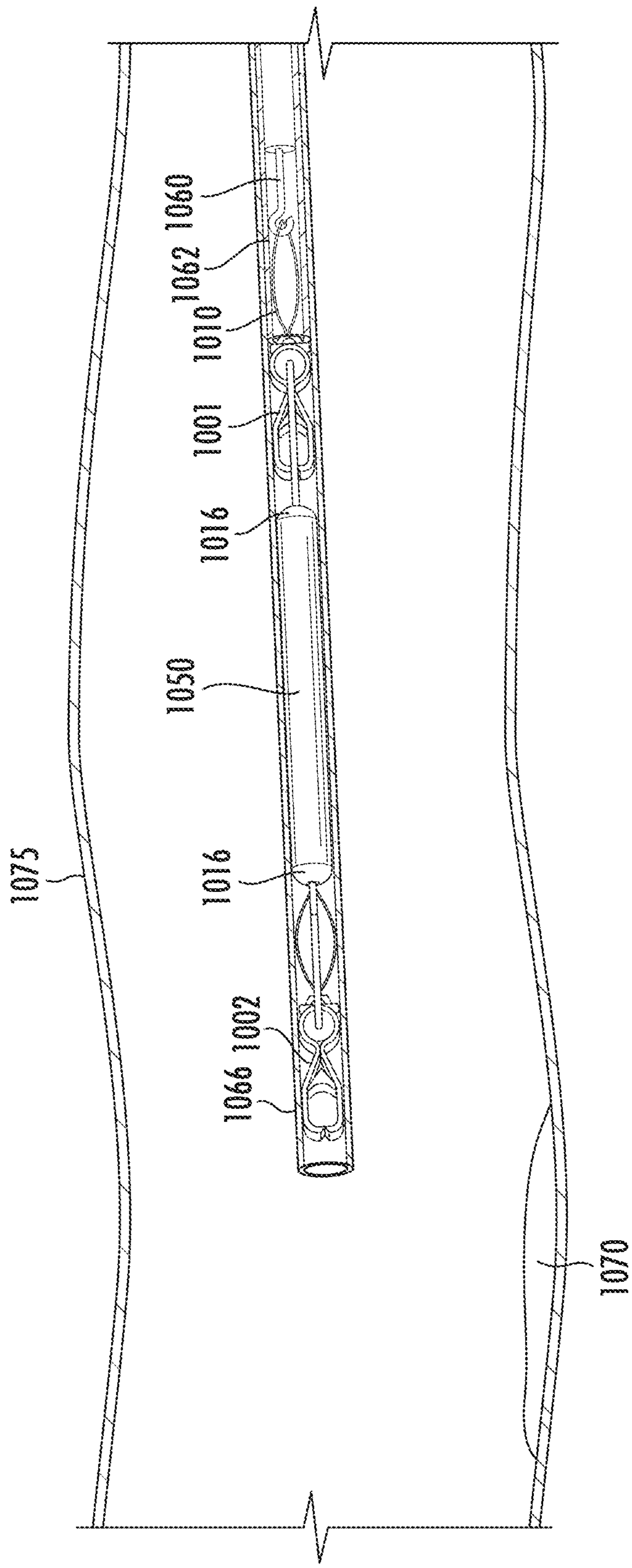

FIG. 10A

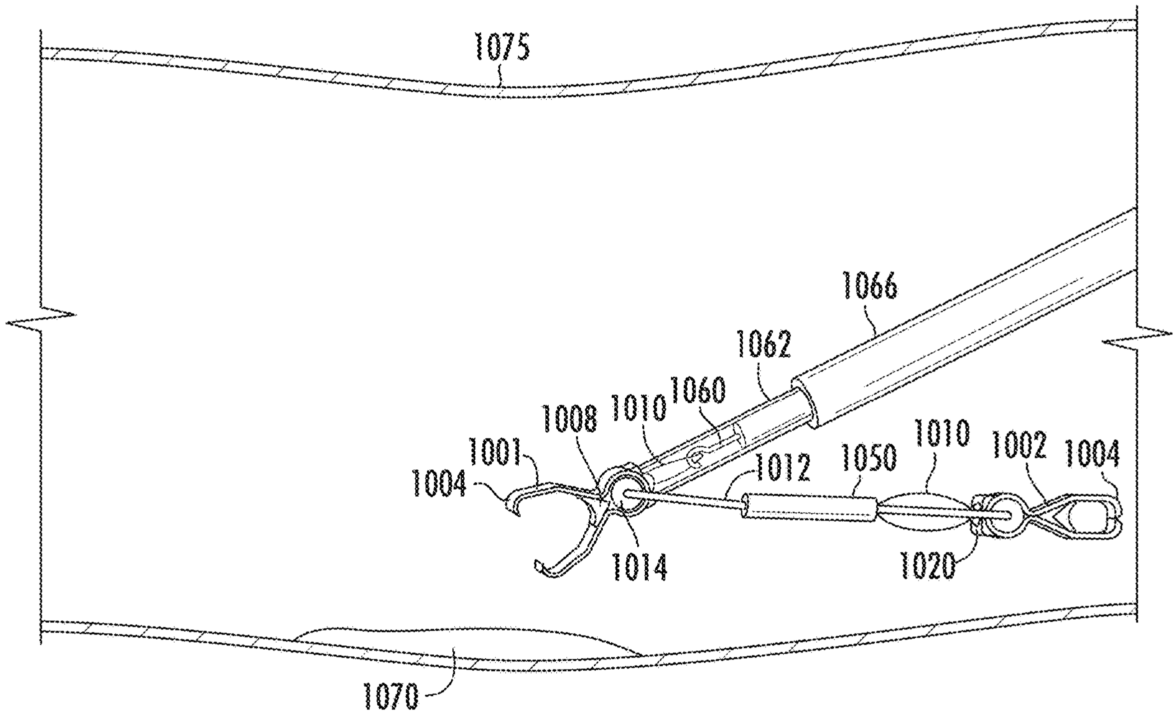

FIG. 10B

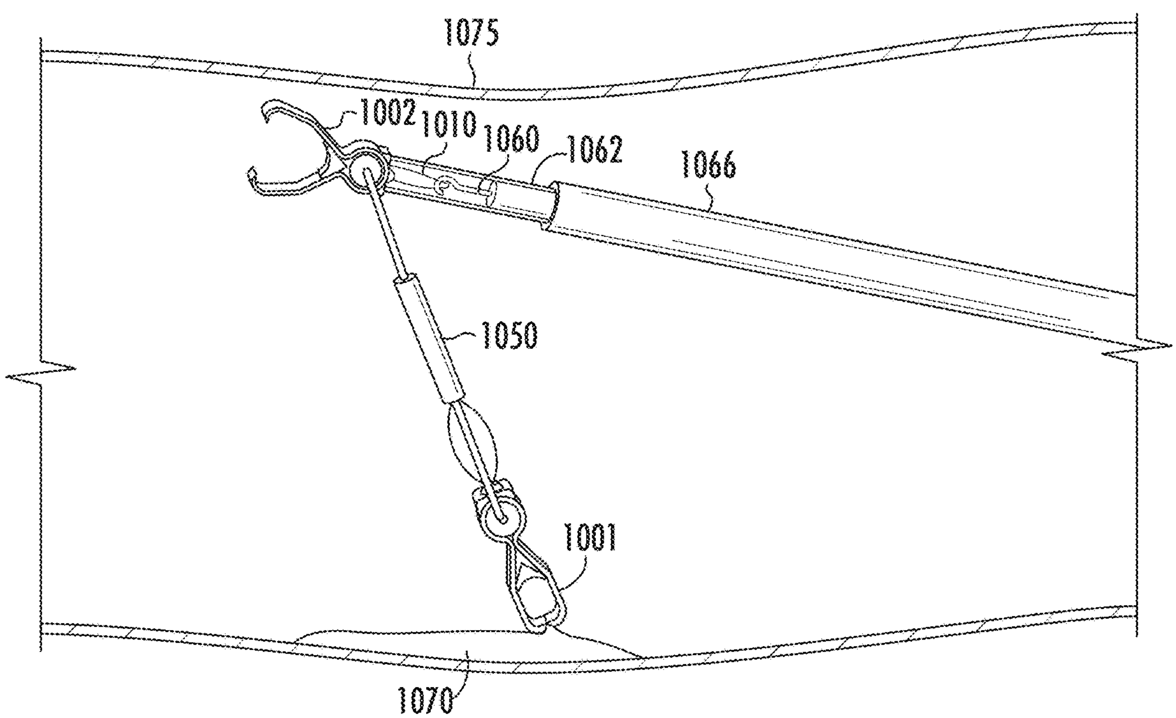

FIG. 10C

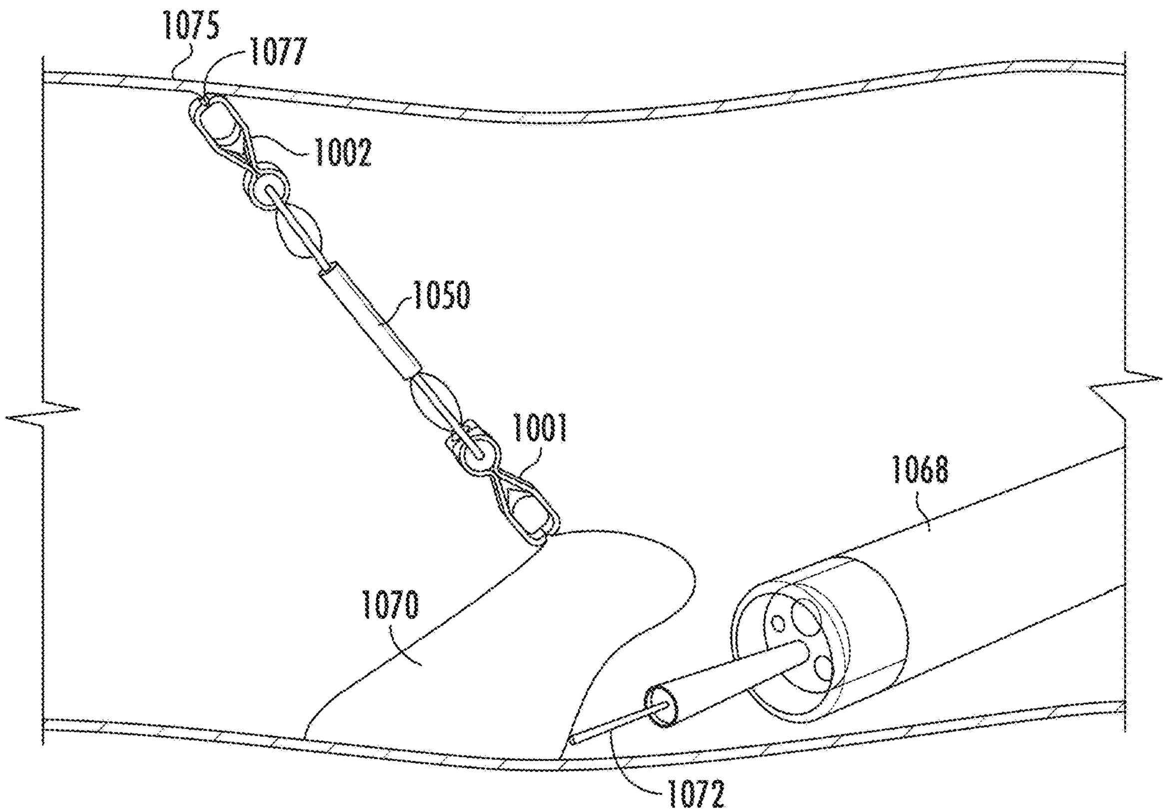

FIG. 10D

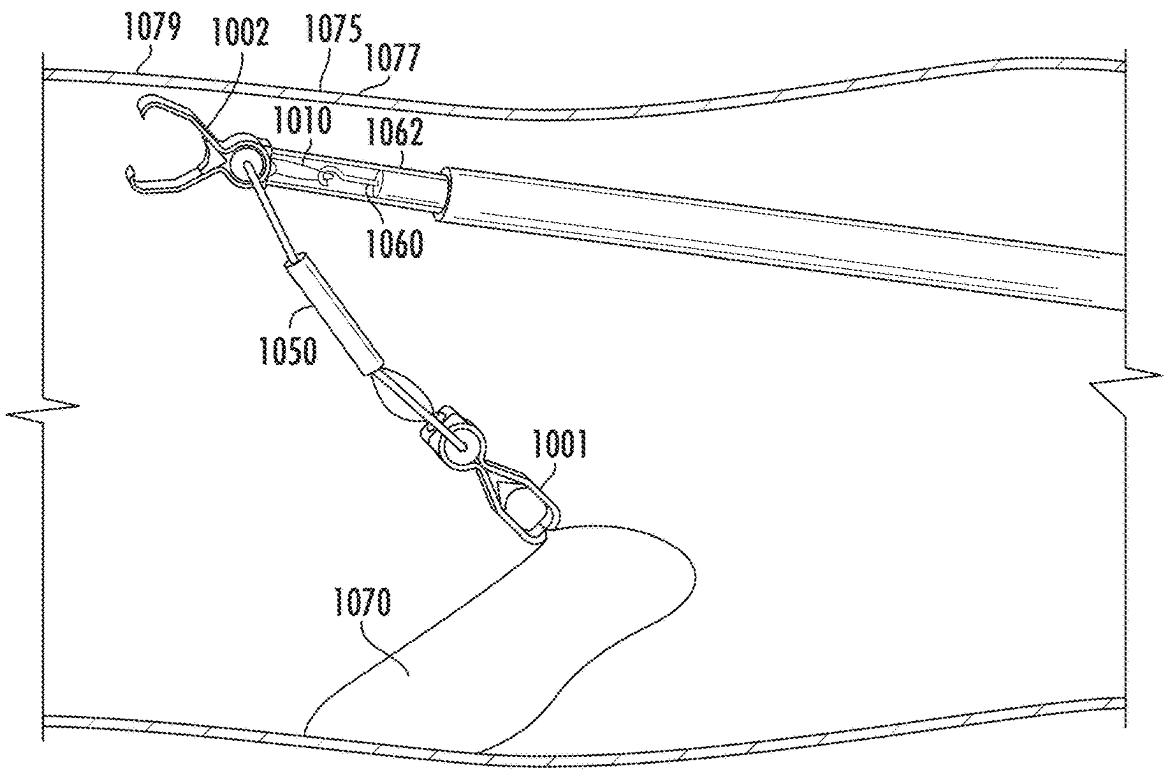

FIG. 10E

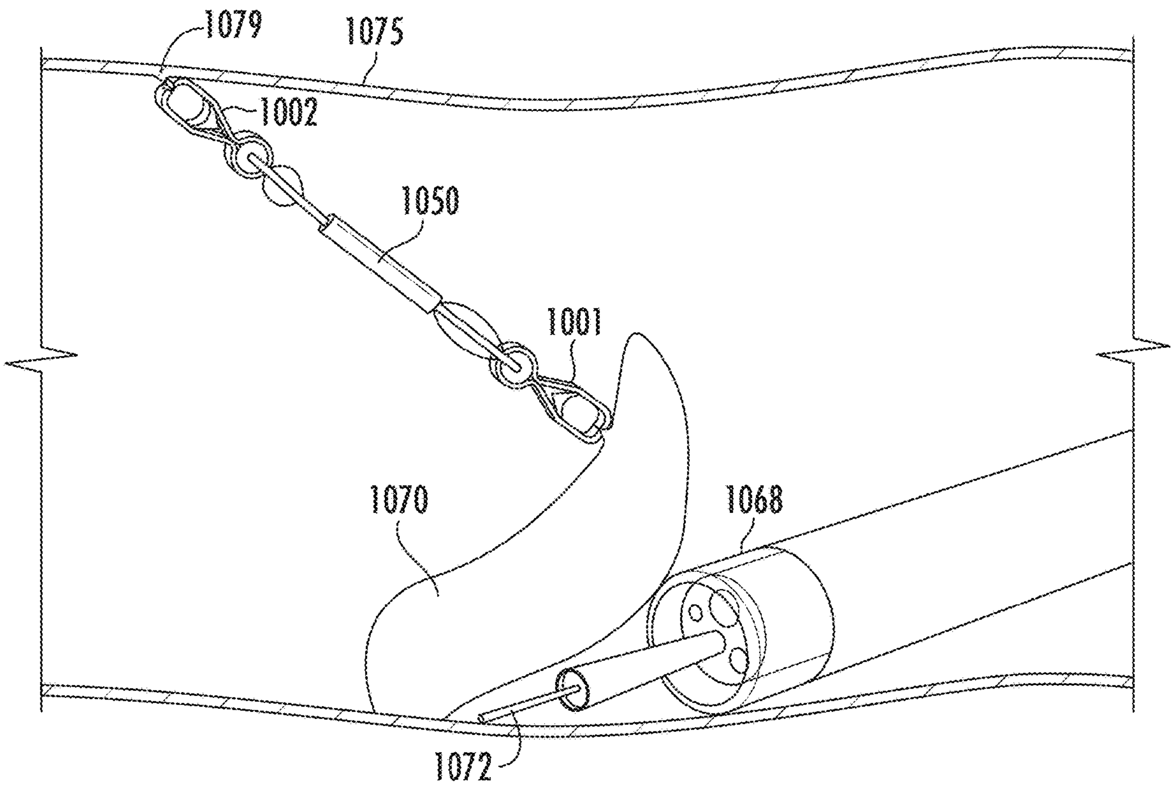

FIG. 10F

TISSUE CLIP DEVICES, SYSTEMS, AND TRACTION METHODS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of and claims the benefit of the earlier filing date of U.S. patent application Ser. No. 17/475,852, filed Sep. 15, 2021, which is a continuation and claims the benefit of the earlier filing date of U.S. patent application Ser. No. 15/930,604, filed May 13, 2020, now U.S. Pat. No. 11,147,564, issued Oct. 19, 2021, which claims the benefit of priority under 35 U.S.C. § 119 to U.S. Provisional Patent Application No. 62/847,599, filed May 14, 2019, and which applications are incorporated herein by reference in their entireties for all purposes. Any and all priority claims identified in the Application Data Sheet, or any correction thereto, are hereby incorporated by reference under 37 C.F.R. 1.57.

FIELD

[0002] The present disclosure pertains to medical devices. More particularly, the present disclosure pertains to tissue clip devices and related retraction/traction systems and methods.

BACKGROUND

[0003] Physicians are becoming more proficient at removing lesions from the gastrointestinal tract. However, with currently available technologies, conducting more complex procedures, such as endoscopic submucosal dissection (ESD), can be difficult and time consuming. Manipulating devices for clipping tissue may require procedurally complicated and/or time-intensive techniques for positioning and orienting the devices and associated medical instruments. For example, endoscopic submucosal dissection (ESD) is a procedure that enables tissue resection within the gastrointestinal tract. In addition, non-ideal visualization and lack of tissue tension also make the procedures difficult and time consuming. Having a means to create more significant traction force on the tissue would be desirable to improve the visualization of the cutting plane.

[0004] It is with the above considerations in mind that the improvements of the present disclosure may be useful.

SUMMARY

[0005] The present disclosure, in its various aspects, is directed generally to medical devices, and more specifically to tissue clip devices, retraction/traction methods, and related delivery systems. Embodiments according to the present disclosure, including as described herein, may decrease complications around tissue resection procedures, such as visualization, procedure time, and procedure complexity.

[0006] Various embodiments of a tissue clip are disclosed comprising a grasper including jaws at a first end. A spring portion may be at a second end. The grasper may extend a length from the first end to the second end along a longitudinal axis. The spring portion may be configured to bias the jaws toward each other. In some embodiments, a wedge may be slidably disposed between the jaws. An apex of the wedge may be oriented toward the spring portion. A filament may be coupled to the wedge at a first end of the filament. The filament may extend through a channel of the spring portion of the grasper to a second end of the filament. In alternate embodiments, a spring actuator and the spring portion are movable substantially axially relative to each other to cause the spring portion to move the jaws apart. The spring portion may have one or more ramps engaging the spring actuator to cause the jaws to move apart. The spring actuator may be a capsule or cylinder or collar.

[0007] In various embodiments a retainer may be disposed within the second end of the grasper. A hinge may be at least partially extending through the retainer. A retainer may be rotatable about the hinge. A first end of the hinge may be disposed within the retainer. A second end of the hinge may include an attachment member configured to attach to a tether. A plurality of channels may extend through the retainer parallel to the longitudinal axis. Portions of the filament may be extendable through the plurality of channels. A tab may be disposed on the wedge. The tab may be slidable within a slot that extends along at least a portion of the length of the grasper parallel to the longitudinal axis. The filament may form a loop at the second end. The filament loop may include a first end and a second end of a wire fixed within the wedge. The hinge may extend about a plane substantially perpendicular to the loop of the filament. An alignment member may be at the second end of the grasper. The filament may extend through a channel of the alignment member. The alignment member may be configured to align the grasper with a lumen of an instrument sheath.

[0008] In various embodiments, a tissue clip system may include an elongate tether member. The system may include a first tissue clip. The system may include a second tissue clip. Each tissue clip may be disposed at an opposite end of the elongate tether member. A tissue clip may comprise a grasper including jaws at a first end of the grasper. A spring portion may be at a second end. The grasper may extend a length from the first end to the second end along a longitudinal axis. The spring portion may be configured to bias the jaws toward each other. In some embodiments, a wedge may be slidably disposed between the jaws such that an apex of the wedge is oriented toward the spring portion. A filament may be coupled to the wedge. A deployment catheter having an engagement end may be slidably disposed within a lumen of an instrument sheath and configured to engage the filament. In alternate embodiments, a spring actuator and the spring portion are movable substantially axially relative to each other to cause the spring portion to move the jaws apart. The spring portion may have one or more ramps engaging the spring actuator to cause the jaws to move apart. The spring actuator may be a capsule or cylinder or collar.

[0009] In various embodiments, a retainer may be disposed within the second end of the grasper. A hinge may be at least partially extending through the retainer. The retainer may be rotatable about the hinge. A first end of the hinge may be disposed within the retainer. A second end of the hinge may include an attachment member configured to attach to a tether member. A tab may be disposed on the wedge. The tab may be slidably disposed within a slot that extends along at least a portion of the length of the grasper. Each tissue clip may include an alignment member at the second end of the grasper. A first end of the filament may be connected to the wedge. The filament may extend through a channel of the spring portion of the grasper.

[0010] In various embodiments, a method of clipping tissue may include delivering a first tissue clip. The method may include delivering a second tissue clip. Each tissue clip may be disposed at an opposite end of an elongate tether member. A tissue clip may be delivered to a first target location of the tissue in a body lumen. Each tissue clip may comprise a grasper including jaws at a first end. A spring portion may be at a second end. The grasper may extend a length from the first end to the second end along a longitudinal axis. The spring portion may be configured to bias the jaws toward each other. In some embodiments, a wedge may be slidably disposed between the jaws such that an apex of the wedge is oriented toward the spring portion. A filament may be coupled to the wedge. A deployment catheter wedge may engage the filament of the first tissue clip to open and engage the jaws of the grasper of first clip at the first target location of the tissue in the body lumen. In alternate embodiments, a spring actuator and the spring portion are moved substantially axially relative to each other to cause the spring portion to move the jaws apart. The spring portion may have one or more ramps engaging the spring actuator to cause the jaws to move apart. The spring actuator may be a capsule or cylinder or collar.

[0011] In various embodiments, the filament of the second tissue clip may be engaged to open and engage the jaws of the grasper second clip at a second target location of tissue in the body lumen, such that the tissue may be held in a selected position. The second tissue clip may be repositioned from the second target location of tissue in the body lumen to a third target location of tissue in the body lumen. A distance between the first tissue clip and the second portion may be longer than a distance between the first tissue clip and the first portion. The method may include engaging an end of the filament of the second tissue clip with a delivery catheter and removing the second tissue clip, the elongate tether member, and the first tissue clip engaging the first target location of the tissue from a patient. A longitudinal axis of the first tissue clip may be aligned with a lumen of an instrument sheath of the delivery catheter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Non-limiting examples of the present disclosure are described by way of example with reference to the accompanying figures, which are schematic and not intended to be drawn to scale. In the figures, each identical or nearly identical component illustrated is typically represented by a single numeral. For purposes of clarity, not every component is labeled in every figure, nor is every component of each embodiment of the disclosure shown where illustration is not necessary to allow those of skill in the art to understand the disclosure. In the figures:

[0013] FIG. **1**A illustrates an isometric view of a tissue retraction/traction system including an elongate tether and two tissue clips, in accordance with an embodiment of the present disclosure.

[0014] FIG. **1**B illustrates an isometric view of one of the clips of FIG. **1**A.

[0015] FIG. **1**C illustrates a cross-sectional view of the clip of FIG. **1**B.

[0016] FIG. **2**A illustrates a right partial cross-sectional view of a deployment catheter having an engagement end, in accordance with an embodiment of the present disclosure.

[0017] FIG. **2**B illustrates a partial cross-sectional view of the deployment catheter of FIG. **2**A including a tissue clip in a closed configuration, in accordance with an embodiment of the present disclosure.

[0018] FIG. **2**C illustrates a partial cross-sectional view of the deployment catheter of FIGS. **2**A and **2**B including the tissue clip of FIG. **2**B in an open configuration.

[0019] FIG. **2**D illustrates a partial cross-sectional view of the deployment catheter of FIGS. **2**A-**2**C including the tissue clip of FIGS. **2**B and **2**C and also including an elongate tether and an additional tissue clip, in accordance with an embodiment of the present disclosure.

[0020] FIG. **3**A illustrates a cross-sectional view of a tissue clip, in accordance with an embodiment of the present disclosure.

[0021] FIG. **3**B illustrates a cross-sectional view of the tissue clip of FIG. **3**A.

[0022] FIG. **4**A illustrates an isometric view of a tissue clip, in accordance with an embodiment of the present disclosure.

[0023] FIG. **4**B. illustrates a cross-sectional view of the clip of FIG. **4**A.

[0024] FIG. **5**A illustrates an isometric view of an alternate tissue clip, in accordance with an embodiment of the present disclosure.

[0025] FIG. **5**B is a cross-sectional view of the tissue clip of FIG. **5**A.

[0026] FIG. **5**C illustrates a section of a deployment catheter including a tissue clip as in FIGS. **5**A and **5**B in a closed configuration, in accordance with an embodiment of the present disclosure.

[0027] FIG. **5**D illustrates a section view of the deployment catheter of FIG. **5**C including an isometric view of the tissue clip of FIGS. **5**A and **5**B in an open configuration.

[0028] FIG. **6** illustrates a cross-sectional view of a tissue clip similar to that of FIGS. **5**A-**5**D with a modified structure for actuating the clip jaws.

[0029] FIG. **7** illustrates a cross-sectional view of a tissue clip similar to that of FIGS. **5**A-**5**D and **6** with a modified structure for actuating the clip jaws.

[0030] FIGS. **8**A and **8**B illustrate an alternative deployment catheter and instrument with a modified clip in accordance with an embodiment of the present disclosure.

[0031] FIGS. **9**A-**9**C illustrate an alternative clip and deployment instrument in accordance with an embodiment of the present disclosure.

[0032] FIGS. **10**A-**10**F illustrate a tissue clip system and retraction/traction procedure within a body lumen of a patient, in accordance with an embodiment of the present disclosure.

[0033] It is noted that the drawings are intended to depict only typical or exemplary embodiments of the disclosure. Accordingly, the drawings should not be considered as limiting the scope of the disclosure. The disclosure will now be described in greater detail with reference to the accompanying drawings.

DETAILED DESCRIPTION

[0034] Various embodiments according to the present disclosure are described below. As used herein, “proximal end” refers to the end of a device that lies closest to the medical professional along the device when introducing the device into a patient, and “distal end” refers to the end of a device or object that lies furthest from the medical professional along the device during implantation, positioning, or delivery.

[0035] As used in this specification and the appended claims, the singular forms “a”, “an”, and “the” include plural referents unless the content clearly dictates otherwise. As used in this specification and the appended claims, the term “or” is generally employed in its sense including “and/or” unless the content clearly dictates otherwise.

[0036] It is noted that references in the specification to “an embodiment”, “some embodiments”, “other embodiments”, etc., indicate that the embodiment described may include one or more particular features, structures, and/or characteristics. However, such recitations do not necessarily mean that all embodiments include the particular features, structures, and/or characteristics. Additionally, when particular features, structures, and/or characteristics are described in connection with one embodiment, it should be understood that such features, structures, and/or characteristics may also be used in connection with other embodiments whether or not explicitly described unless clearly stated to the contrary.

[0037] The detailed description should be read with reference to the drawings, which are not necessarily to scale, depict illustrative embodiments and are not intended to limit the scope of the invention.

[0038] A number of medical procedures, including intravascular procedures, procedures along the digestive and/or biliary tract, thoracic procedures, etc. utilize medical devices to access tissue intended for removal (e.g., “target tissue”) within the body. For example, in some current medical procedures (e.g., ESD, Peroral Endoscopic Myotomy (POEM), cholecystectomy, Video-Assisted Thoracoscopic Surgery (VATS)), physicians may utilize an endoscope or similar medical device to access and remove diseased lesions. Further, as part of the procedure, the physician may utilize an endoscope capable of both accessing the target tissue site while also permitting a resecting device to be deployed therethrough to resect target tissue. Additionally, in some instances, an endoscope may incorporate features which assist the physician in visualizing and performing the tissue dissection/resection procedure. For example, some endoscopes may include a light and/or camera designed to illuminate and/or visualize the body lumen as the endoscope is navigated and positioned adjacent to the target tissue site. Additionally, some endoscopes may also include a lumen (e.g., a working channel) through which a resecting device, grasping member, or other accessory devices may be deployed and utilized. Additional visualization methods may be alternatively or additionally employed, e.g., fluoroscopy.

[0039] While physicians are becoming more proficient at resecting diseased lesions from within the body (e.g., within the digestive tract, abdominal cavity, thoracic cavity, etc.), present retraction/traction methods continue to be inefficient and frustrating to the physician. For example, in some instances poor visualization and poor ability to engage and manipulate and traction tissue may result in a prolonged tissue dissection procedure. One aspect of ESD that may be difficult is the positioning and maneuvering (e.g., retraction) of a resected tissue flap during and after cutting. In ESD procedures, physicians may use devices to provide a means of tissue traction/retraction. Such procedures may include multiple device exchanges and extended procedure times. Often when traction/retraction is provided by an endoscopic cap, a physician’s view may be obstructed and cause the physician to lose his or her bearings in relation to the target tissue margins. In another example, the target tissue that the physician is attempting to dissect may obstruct the pathway of the tools that the physician is using during the procedure.

[0040] Other clip devices may be difficult to open, close, and/or position, because the clip devices may require gripping along a specific angle or plane. Operating such devices may be difficult for a medical professional because of the viewing angle, devices or anatomies blocking the field of view, size of the operating tools, or strict angles of proper engagement with respect to the devices, as examples. Attempts to manipulate tissue traction devices at various angles may fail to control the device properly, cause procedural errors, delay, or frustrate the medical professional.

[0041] Disclosed herein are medical devices such as tissue clip devices and delivery systems that are designed to efficiently engage, lift, and/or retract the target tissue. Some other example devices which may complement devices and methods of the present disclosure are disclosed in United States Patent Application Publication number 2018/0263614, filed Mar. 19, 2018, and titled, “Tissue Retraction Device and Delivery System”; United States Patent Publication No. 2021/0186480, published on Jun. 24, 2021, and issued as U.S. Pat. No. 11,890,001, on Feb. 6, 2024, and titled “Tissue Traction Bands And Methods Of Use Thereof”; United States Patent Application Publication No. 2020/0360006, published on Nov. 19, 2020, and issued as U.S. Pat. No. 11,980,355, on May 14, 2024, and titled “Tissue Traction Bands And Methods For Tissue Traction”; United States Patent Application Publication No. 2020/0390446, published on Dec. 17, 2020, and issued as U.S. Pat. No. 11,464,520, on Oct. 11, 2022, and titled “Tether Traction Systems And Methods Of Use Thereof”; United States Patent Application Publication number 2020/0129181, filed Oct. 30, 2019, and titled “Clip Devices, Systems, and Methods for Engaging Tissue”; and U.S. Pat. No. 8,062,311, issued Nov. 22, 2011, and titled “Endoscopic Hemostatic Clipping Apparatus”, each of which is herein incorporated by reference in its entirety for all purposes.

[0042] Referring to FIG. **1**A, an isometric view of a tissue retraction/traction (such terms being used in the alternative/interchangeably, or simply referenced as “traction” for the sake of simplicity and without intent to limit) device **100** of the present disclosure may include a traction band **110** (e.g., elastic band, tether, stretchable elongate member, etc.) system is illustrated according to an embodiment of the present disclosure, which includes an elongate tether member **150** with a first and second tissue clip **100** each disposed at opposite ends of the elongate tether member **150** (a first clip at one end and a second clip at the opposite end of the elongate tether). The tissue clips **100** are each fixed to the elongate tether member **150** by an attachment member **116**. Each clip **100**, as further illustrated by the isometric view of FIG. **1**B and the cross-sectional view of FIG. **1**C, includes a grasper **102**. The grasper **102** has two jaws **104** at a first end **102***d* of the grasper **102** and a spring portion **106** at a second end **102***p* of the grasper **102**. A longitudinal axis ℓ extends along the length of the grasper **102** through the first end **102***d* and the second end **102***p*. The spring portion **106** is configured to bias the jaws **104** toward each other in the closed configuration as illustrated in FIGS. **1**A-**1**C. A wedge **108** is slidably disposed between the jaws **104** such that an apex **108***p* of the wedge is oriented toward the spring portion **106** along the longitudinal axis ℓ. The wedge **108** may be configured to slide toward the second end **102***p* of the grasper along the longitudinal axis ℓ to open the jaws **104** such that the clip **100** is in the open configuration (e.g., as illustrated in FIG. **2**C, discussed below). A tab **118** may be disposed on and fixedly coupled to each of the inclined planes of the wedge **108**, with the tab slidable within a slot **122** extending along a portion of the grasper **102** along the longitudinal axis ℓ. The tab **118** extends partially into and along the slot **122** such that the wedge **108** cannot readily be dislodged from between the jaws **104** of the grasper **102**. A filament **110** is connected to the wedge **108** at a first end **110***d* of the filament. The filament **110** extends through a channel **106***p* of the spring portion **106** of the grasper **102** to a second end **110***p* of the filament **110**. The second end **110***p* of the filament **110** forms a loop in a plane that extends substantially through and radially away from the longitudinal axis ℓ. The loop may be fixed in position with respect to wedge **108**, i.e., not rotatable about the longitudinal axis ℓ, or the loop may be rotatable. The loop may be formed from the material of the filament **110** and may be other shapes, as discussed below. At least a portion of the filament **110** may be formed of a shape memory material (e.g., nitinol), such that the second end **110***p* may repeatably re-form into a set shape (e.g., loop-form) for manipulation with an accessory tool to articulate or actuate the jaws **104** of the grasper **102**. Because the first end **110***d* of the filament **110** is attached to the wedge **108**, the loop at the second end **110***p* may be moved away from the grasper **104** generally along the longitudinal axis ℓ to also move the wedge **108** toward the second end **102***p* of the grasper **102** to open the jaws **104** such that the clip **100** is in the open configuration. A retainer **114** is disposed within the second end **102***p* of the grasper **102**. In some embodiments, a retainer may be one piece with channel(s) for a filament to extend through. In other embodiments a retainer may be two pieces with a filament extending between the two pieces of the retainer. A hinge **112** is disposed through the retainer **114**, and the retainer **114** is rotatable about the hinge **112** along an axis r, which extends through the retainer **114** and perpendicularly to the longitudinal axis ℓ. The first end **112***d* of the hinge **112** extends through the retainer **114** and the second end **112***p* of the hinge **112** is attached to the attachment member **116**. An alignment member **120** is adjacent the second end **102***p* of the grasper **102**. The filament **110** extends through the alignment member **120** such that the alignment member **120** is bounded substantially along the longitudinal axis ℓ on one side by the grasper **102** and is bounded on another side by the second end **110***p* of the filament **110** that is the loop. The alignment member **120** may assist with operating the jaws **104** and general manipulation of the clip **100** (e.g., as will be discussed with reference to FIGS. **2**B-**3**B below).

[0043] Referring to FIG. **2**A, a right view of a deployment catheter **170** is illustrated as part of a tissue retraction/traction system according to an embodiment of the present disclosure. The deployment catheter **170** includes an engagement portion **160***d* of an instrument **160**, an instrument sheath **162**, and an optional outer sheath **166**. In some embodiments, the deployment catheter **170**, with or without the tissue clips **100** and a tether member **150** engaged, may be manipulated into and out of a working channel of an endoscope without the catheter having an outer sheath **166**. Use of the outer sheath **166** may advantageous, e.g., to protect against any edges of the tissue retraction system from catching, scratching, or otherwise adversely interacting with the working channel of the endoscope. The engagement portion **160***d* of the instrument **160** may be a hook, but the engagement portion **160***d* may be an alternative shape or manner of connection that is configured to engage a filament **110** (e.g., the loop of the proximal end **110***p* of a filament **110**), such as, e.g., a grasper, a clamp, a basket, a clip, a gripper, a magnet, an adhesive, or the like. The deployment catheter **170** may be deployable through a working channel of a scope with or without the outer sheath **166**. The instrument **160** is slidably disposed within the instrument sheath **162**. The instrument sheath **162** and the instrument **160** extend into the outer sheath **166**, which may be an introducer catheter. The instrument **160** includes a centering member **164** about the instrument **160** that extends along the longitudinal axis ℓ. The centering member **164** has an outer diameter substantially matching an internal diameter of a lumen of the instrument sheath **162** such that the centering member **164** and the medical instrument **160** extending therethrough are substantially centered within the lumen of the instrument sheath **162**. In some embodiments, the outer diameter of the centering member **164** may be smaller than the internal diameter of the lumen of the instrument sheath **162** to allow the centering member **164** to slide along the sheath **162**.

[0044] FIGS. **2**B and **2**C illustrate right partial cross-sectional views of the system of FIG. **2**A including a tissue clip **100**. The engagement portion **160***d* of the medical instrument **160** is engaged with the loop of the second end **110***p* of the filament **110**. The instrument **160** is orienting the clip **100** substantially along the longitudinal axis ℓ by maintaining the second end **110***p* of the filament **110** within the sheath **162** such that the alignment member **120** at least partially seats within a distal end **162***d* of the sheath **162**. The alignment member **120** has a first portion **120***d* that has an outer diameter that is wider than an inner diameter of the lumen of the sheath **162**, and the alignment member **120** has a second portion **120***p* (e.g, in the shape of a frustum) that has a maximum outer diameter that is smaller than the inner diameter of the lumen of the sheath **162**. When the instrument **160** moves the alignment member **120** toward the distal end **162***d* of the sheath **162** via the filament **110**, the second portion **120***p* enters the lumen of the distal end **162***d* of the sheath **162**. The frustum shape of the second portion **120***p* may engage the inside edge of the distal end **162***d* so that the alignment member **120** is oriented in a manner such that a central axis through the center of the alignment member **120** is substantially aligned with the longitudinal axis ℓ. The first portion **120***d* of the alignment member **120** has an outer diameter that does not fit within the lumen of the distal end **162***d*. A surface of the first portion **120***d* that extends about the second portion **120***p* is flat such that when the instrument **160** moves the first portion **120***d* of the alignment member **120** into contact with the distal end **162***d* of the sheath **162**, the majority of the inner edge of the distal end **162***d* is in substantial contact with the alignment member **120**, fixing the alignment member **120**, the grasper **102**, and the sheath **162** with respect to the filament **110**. In this position of FIG. **2**B, the alignment member **120** and the clip **100** are oriented (i.e., centered) substantially along the longitudinal axis ℓ. Maintaining the position of FIG. **2**B may require some proximal tension (e.g., pulling) on the filament. The clip **100** is illustrated as aligned with the longitudinal axis ℓ in the closed configuration in FIG. **2**B. From the aligned and closed configuration, the second end

110_p_ of the filament **110** may be further pulled by the instrument **160** within the sheath **162** in a direction away from the distal end **162**_d_ of the sheath so that the clip **100** transitions from the closed configuration to the open configuration, as illustrated in FIG. **2**C. In the open configuration, the jaws **104** are moved farther apart from each other than in the closed configuration. As the instrument **160** pulls on the second end **110**_p_, the first portion **120**_d_ of the alignment member **120** abuts the distal end **162**_d_ of the sheath **162** and fixes the grasper **102** with respect to the filament **110**. Applying further tension on the filament **110** from the instrument **160** moves the wedge **108** along the longitudinal axis l toward the retainer **114** and forces the jaws **104** apart from each other into the open configuration. The retainer **114** and grasper **102** freely rotate about the portion of the hinge **112** extending through the retainer **114** (i.e., axis r through the center of the hinge **112**) during operation of the clip **100** so that the jaws **104** may be oriented toward a target tissue for engagement without hinderance from the hinge **112**. Hinge **112** is illustrated in phantom lines along the longitudinal axis ℄ and is illustrated in solid lines in another position about the retainer **114**. The grasper **102** may freely rotate about the hinge **112** while in the closed configuration or in the open configuration. FIG. **2**D illustrates a partial cross-sectional view of the systems of FIGS. **2**A-**2**C with the instrument **160**, the sheath **162**, and the clips **100** connected by attachment members **116** to an elongate tether member **150** within the outer sheath **166**. The clips **100** and elongate tether member **150** (other than the second end **110**_p_ of a filament **110** of the proximal clip **100**) are outside of and distal to the sheath **162**. The filament **110** of the proximal clip **100** is positioned proximally to the grasper **102** such that the instrument **160** may engage the filament **110**. Tissue retraction/traction systems herein may be preloaded, e.g., substantially as illustrated in FIG. **2**D for procedures such as those described with respect to FIGS. **5**A-**5**F. Because the filament **110** of the proximal clip **100** is engaged by the medical instrument **160** before the clips **100** are deployed into a patient, the proximal clip **100** will immediately be ready for use, reducing procedure time and likelihood of error when compared to other systems that do not have a clip engaged in the preloaded state before deployment.

[0045] With reference to FIG. **3**A, a tissue clip **300** according to an embodiment of the present disclosure is illustrated, which is similar to the clips **100** described in FIGS. **1**A-**2**D. However, first end **309** and second end **311** of a wire of the filament **310** extend through separate lumens of the clip **300** rather than through a shared lumen. The tissue clip **300** includes a first lumen **305** of a wedge **308** and a second lumen **307** of the wedge **308** that are both parallel to a longitudinal axis ℄ that extends through the clip **300**. A first lumen **313** of a retainer **314** is substantially aligned with the first lumen **305** of the wedge **308** and a second lumen **315** of the retainer **314** is substantially aligned with the second lumen **307** of the wedge **308**. A first lumen **319** of an alignment member **320** is substantially aligned with the first lumen **313** of the retainer **314** and a second lumen **321** of alignment member **320** is substantially aligned with the second lumen **315** of the retainer **314**. The first end **309** of the wire of the filament **310** extends from a first end **310**_d_ of the filament **310**, at the first lumen **305** of the wedge **308**, through the first lumen **313** of the retainer **314**, and through the first lumen **319** of the alignment member **320**. The filament **310** may form a loop at an opposite second end **310**_p_, so that the second end **311** of the wire of the filament **310** extends from the second lumen **307** of the wedge **308**, through the second lumen **315** of the retainer **314**, and through the second lumen **321** of the alignment member **320**. The ends **309**, **311** are fixed with respect to the wedge **308** and may move through the first and second lumens **313**, **315** of the retainer **314**. The spaced apart ends **309**, **311** of the wire of the filament **310** that are offset from the longitudinal axis ℄ may require less tension force on the second end **310**_p_ of the filament **310** to slide the wedge **308** to the open configuration of the grasper, as compared to the clips **100** of FIGS. **1**A-**2**D, because the wire of the filament **310** does not need to overcome a frictional force of the hinge **312** in the center of the retainer **314**, intersecting the longitudinal axis ℄. In FIG. **3**B, which illustrates a cross-sectional view of the tissue clip **300** of FIG. **3**A, without an alignment member, the first end **309** of the wire of the filament **310** extends from the first lumen **305** of the wedge **308**, through the first lumen **313** of the retainer **314**, and the second end **311** of the wire of the filament **310** extends from the second lumen **307** of the wedge **308** through the second lumen **315** of the retainer **314**. As the grasper **302** is pulled toward the sheath **362** by an instrument **160** via the filament **310**, the grasper **302** may not be aligned with the longitudinal axis ℄. If the grasper **302** is not aligned with the longitudinal axis ℄, tension in the wire of the filament **310** from a pulling force within the sheath **362** may create a moment about the hinge **312** that causes one of the ends **309**, **311** of the wire of the filament **310** to rotate the grasper **302** about the hinge **312** at the distal end **362**_d_ of the sheath **362**. For example, if the grasper **302** is not aligned with the longitudinal axis ℄, such that the jaws **304** are below the longitudinal axis ℄ in FIG. **3**B, pulling on the filament **310** in the sheath **362** would cause the first end **309** of the wire of the filament **310** to create a moment within the first lumen **313** about the hinge **312** such that the first and second lumens **313**, **315** of the retainer **314** would orient parallel to the longitudinal axis ℄.

[0046] With reference to FIGS. **4**A and **4**B, a tissue clip **400** according to an embodiment of the present disclosure is illustrated, which is similar to the clips **100** described in FIGS. **1**A-**2**D, but has an alignment member **420** fixed to a retainer **414** via extensions **425**. With the alignment member **420** fixed to the retainer **414**, a filament **410** may better align with the longitudinal axis ℄ when compared to an embodiment with the alignment member **420** not fixed to the retainer **414**. For example, the alignment member **420** may be fixed to the retainer **422**, and a lumen **421** may extend through both the alignment member **420** and the retainer **414**, so that the filament **410** may extend straight through the alignment member **420** and the retainer **414** via the lumen **421**, as depicted in FIG. **4**B. The extensions **425** are disposed in a slot **423** of the grasper **402**. A ferrule **426** is deformed (e.g., crimped) about a first end of the filament **410** of the clip **400**, extended into a lumen **428** of a wedge **408**, and the ferrule **426** is attached (e.g., press fit or welded) to the wedge **408**. The ferrule **426** may provide an assembly that is easier to manufacture when compared to welding the filament **410** if the materials are dissimilar metals.

[0047] Yet another tissue clip **500** formed in accordance with principles of the present disclosure is illustrated in FIGS. **5**A-D. Referring to FIG. **5**A, an isometric view of a tissue clip **500** is illustrated according to an embodiment of the present disclosure. The grasper **502** of the tissue clip **500** has two jaws **504** at a first end **502***d* of the grasper **502** and a spring portion **506** proximal to the first end **502***d* of the grasper **502**, at an intermediate position **502***i* along the grasper **502**. The spring portion **506** may be more readily viewed with reference to the cross-sectional view of FIG. **5**B. A longitudinal axis ℄ extends along the length of the grasper **502** through the first end **502***d* and the second end **502***p*. The spring portion **506** is configured to maintain the jaws **504** in a closed configuration, as illustrated in FIGS. **5**A-**5**C, until the spring portion **506** is actuated to bias the jaws **504** apart. Actuation of the jaws **504** may be achieved in any of a variety of manners to separate the jaws **504** (e.g., such that tissue may be located between the jaws **504** and the jaws **504** brought together again to clip the tissue therebetween). For instance, the spring portion **506** may be shaped and configured to engage or be engaged by another element, such as a spring actuator **508**, which actuates the spring portion **506**. In the embodiments of FIGS. **5**A-**5**D, the spring actuator **508** and the spring portion **506** are configured to move substantially axially relative to each other to cause the spring portion **506** to move the jaws **504** apart. In the illustrated embodiment, the spring portion **506** has two opposed ramps **506***a*, **506***b* which engage a spring actuator **508** in the form of capsule or cylinder or collar (hereinafter "capsule" for the sake of convenience and without intent to limit). In the embodiment of FIGS. **5**A-**5**D, a snare **510***p* is provided on a proximal end of the clip **500**, such as being formed by proximal ends of the wire or other material forming the grasper **502**, or by otherwise being coupled to the proximal end of the grasper **502**. The snare **510***p* may be pulled proximally by an instrument such as an instrument **160** as described above, and as illustrated in FIGS. **5**C and **5**D in use with the clip **500**. More particularly, the engagement portion **160***d* of the instrument **160** may engage the snare **510***p* to move the grasper **502** and the spring actuator **508** proximally. Once the proximal end **508***p* of the spring actuator **508** abuts the distal end **162***d* of the instrument sheath **162** (such as shown in FIG. **5**D), or otherwise does not advance further proximally, the ramps **506***a*, **506***b* of the spring portion **506** continue to move toward the distal end **508***d* of the spring actuator **508** as the instrument **160** is moved proximally. As the ramps **506***a*, **506***b* continue to move proximally, they engage the distal end **508***d* of the spring actuator **508**, and advance proximally within the spring actuator **508** to cause the ramps **506***a*, **506***b* to be increasing drawn closer together, thereby causing the jaws **504** (given the configuration in which the jaws **504** are coupled or formed with the ramps **506***a*, **506***b*) to move apart. The clip **500** is thereby opened.

[0048] A tissue clip **600** similar to the clip illustrated in FIGS. **5**A-**5**D, but with a modified structure for actuating the clip jaws to move with respect to each other, is illustrated in FIG. **6**. As illustrated, the spring portion **606** has only one ramp **606***a* which rides along a spring actuator ramp **608***r* in the spring actuator **608** as the grasper **602** is moved proximally (such as by being engaged and moved proximally by an instrument **160** as previously described). As the spring ramp **606***a* moves proximally over the spring actuator ramp **608***r* towards the proximal end **608***p* of the spring actuator **608**, the upper jaw **604***a* of the grasper **602** is moved away from the lower jaw **604***b* to open the clip **600**. In one embodiment, the proximal end of the lower jaw **604***b* may be coupled (e.g., fixed to) the distal end **608***d* of the spring actuator **608**. A snare **610***p* may be coupled to the proximal end of the clip, such as being formed by a proximal end of the wire or other material forming the upper jaw **604***a* and the spring ramp **606***a*, or by otherwise being coupled to the proximal end of the grasper **602**. An end of the snare **610** may be coupled (e.g., fixed to) the proximal end **608***p* of the spring actuator **608**, such as for stability.

[0049] Yet another tissue clip **700** is illustrated in FIG. **7**. Similar to the tissue clip **600** of FIG. **6**, the tissue clip **700** has a spring portion **706** with only one spring ramp **706***a*. As the grasper **702** is moved proximally relative to the spring actuator **708** (such as by being engaged and moved proximally by an instrument **160**, such as by engagement of an instrument engagement portion **160***d* with a snare **710***p* on the proximal end of the grasper **702**, in a manner as previously described), the spring actuator **708** may be moved into abutment with a distal end **162***d* of the instrument sheath **162** as described with reference to the clip **500** and as illustrated in FIGS. **5**C and **5**D. Once the spring actuator **708** abuts the distal end **162***d* of the instrument sheath **162** (in a similar manner as shown in FIG. **5**D), or otherwise does not advance further proximally, the ramp **706***a* continues to move toward the proximal end **708***p* of the spring actuator **708** as the instrument **160** is moved proximally. As the ramp **706***a* continues to move proximally, it engages the distal end **708***d* of the spring actuator **708**, and advances proximally within the spring actuator **708** to cause the ramp **706***a* to be increasing drawn downward, thereby causing the lower jaw **704***b* (given the configuration in which the jaw **704***b* is coupled or formed with the ramp **706***a*) to move downwardly and away from the upper jaw **704***a*. The clip **700** is thereby opened.

[0050] As described above, in the above-described embodiments illustrated in FIGS. **1**A-**1**C, **2**A-**2**D, **3**A-**3**B, **4**A-**4**B, **5**A-**5**D, **6**, and **7**, a clip may be provided with a filament or snare or other element through which an engagement portion of an instrument is passed and moved proximally to move the clip proximally to actuate the grasper thereof to open. It will be appreciated that alternatives are within the scope of the present disclosure. For instance, instead of an engagement portion of an instrument passing through a proximal portion or element of a clip or grasper, an engagement portion of an instrument may be engaged over a portion or element of a clip or grasper. In one embodiment, illustrated in FIGS. **8**A and **8**B, a proximal end **102***p* of a grasper **802** of a clip **800** may be provided with an engagement element **810***p* over which an engagement portion **860***d* of an instrument **860** is engaged to actuate the grasper **802** to open. The engagement portion **860***d* may be in the form of a grasper, a clamp, a basket, a clip, a gripper, a magnet, an adhesive, or the like which engages with (e.g., is fitted over) a substantially three-dimensional (solid or hollow) engagement element **810***p* such as a sphere/ball or polyhedron. The instrument **860** is moved proximally to move the engagement portion **860***d* thereof along with the engagement element **810***p*, thereby proximally moving the grasper **802** to actuate the jaws **804** to open. Actuation of the jaws **804** of a grasper **802** may be achieved as described above depending on the configuration of the jaws. In the embodiment of FIGS. **8**A and **8**B, a grasper **802** similar to the grasper **502** of the embodiments illustrated in FIGS. **5**A-**5**D is shown for the sake of illustration (and without intent to limit). It will be appreciated that the engagement element **810***p* need not be limited to use with the particular configuration of a grasper and jaws and ramps as illustrated. As may be appreciated, proximal movement of the instrument **860** moves the instrument engagement portion **860***d* and the clip engagement element **810***p* to move the clip **800** along with the spring actuator **808** proximally. Once the spring actuator **808** abuts the distal end **862***d* of the instrument sheath **862** (such as shown in FIG. **8**B), or otherwise does not advance further proximally, the ramps **806***a*, **806***b* of the spring portion **806** continue to move toward the proximal end **808***p* of the spring actuator **808**. As the ramps **806***a*, **806***b* continue to move proximally, they engage the distal end **808***d* of the spring actuator **808**, and advance proximally within the spring actuator **808** to cause the ramps **806***a*, **806***b* to be increasing drawn closer together, thereby causing the jaws **804** to move apart. The clip **800** is thereby opened. It will be appreciated that the other configurations of jaws shown and described herein may be used instead of the jaws depicted in FIGS. **8**A and **8**B in connection with the instrument engagement portion **860***d* and grasper engagement element **810***p* illustrated therein.

[0051] In the clip and grasper embodiments described thus far, the grasper jaws have been actuated into an open position generally by relative advancement of an instrument and grasper. For instance, the actuation may be generally described as being achieved by proximal advancement of an instrument to advance the grasper proximally into engagement with another element to actuate the grasper jaws to open, such as by engaging a spring portion of the grasper with a spring actuator to open the grasper jaws. Alternative grasper jaw actuation mechanism and methods are within the scope of the present disclosure as well.

[0052] For instance, with reference to FIGS. **9**A-**9**C, actuation of a grasper **902** of a clip **900** may be achieved by relative radial movement/engagement between a proximal engagement element **910***p* of the grasper **902** with an engagement portion **960***d* of an instrument **960**. In the illustrated example of FIGS. **9**A-**9**C, the instrument engagement portion **960***d* is in the form of an expandable element, such as an inflatable balloon, inserted into an engagement element or end **910***p* of the grasper **902**. As the instrument engagement portion **960***d* expands, the jaws **904** of the grasper **902** are drawn apart (given the configuration in which the jaws **904** are coupled with the engagement element **910***p*). The clip **900** is thereby opened.

[0053] Returning to discussion of a tissue retraction/traction system in which a clip is disposed at ends of an elongate tether member, in various embodiments, an elongate tether member may be a rigid member or an elastic member, or combinations thereof. An elongate tether member having a length may stretch to an additional length that is about 50% to about 500% longer than the original length. An elongate tether member may comprise rubber, silicone, polymer, metal, alloy, thermoplastic elastomer, liquid silicone rubber, natural rubber, or the like. An elongate tether member may be tubular or solid. Attachment members may be permanently or removably fixed to an elongate tether member in various ways such as snap-fitted, welded, tied, glued, linked, or the like. An elongate tether member may include depressions and/or apertures for a medical instrument to engage.

[0054] In various embodiments, a first end of a filament may be connected to a wedge in various ways. For example, the filament may be welded, soldered, brazed, bonded, glued, adhered, or otherwise fixedly attached, to the wedge. The filament may be knotted or crimped such that it has a wider outer diameter than an inner diameter of a lumen extending through the wedge. The filament may be press-fit into a wedge. The filament may be attached to a ferrule and the ferrule may be press-fit into a lumen of a wedge.

[0055] In various embodiments, a filament may have a pre-formed shape forming an end of the filament into a shape when released from the outer sheath of the deployment catheter, e.g., a loop, an ovoid, an ellipse, a slot, a rectangle, a combination thereof, or the like. The filament end may be any shape for a user to engage an instrument with the tether. A filament may comprise any material, e.g., nitinol, a polymer, a rubber, nylon, stainless steel, nickel titanium, combinations thereof, or the like.

[0056] In various embodiments, a grasper may comprise stamped and bent sheet metal or plastic. The grasper may comprise a single piece or multiple pieces, e.g., two symmetrical pieces extending along a longitudinal axis of a clip. The jaws of a grasper may have protrusions at a distal end of the grasper configured to engage tissue. The jaws of a grasper may touch each other in the closed configuration or there may be a space between the jaws in the closed configuration. The ends of the jaws may spread apart from each other about 1 millimeter to about 5 millimeters, e.g., about 2 millimeters to about 3 millimeters, in the open configuration, although the open configuration may be any width desired based on the grasper and the wedge configuration.

[0057] With reference to FIGS. **10**A-**10**F, a method of clipping a target tissue **1070** within a patient according to an embodiment of the disclosure is illustrated including a delivery catheter that includes an outer sheath **1066** (which may optionally be an introducer catheter) containing a tissue retraction/traction system. It will be appreciated that any of the above-described clip configurations or embodiments, or alternate clips, may be used in the following method. The outer sheath **1066** is insertable within a body lumen **1075** of the patient and positionable toward a target location of the target tissue **1070** for retraction and dissection. The outer sheath **1066** of the deployment catheter contains an instrument sheath **1062**. The instrument sheath **1062** contains a medical instrument **1060** that is engaging a filament **1010** of a first tissue clip **1001**. The first clip **1001** is attached to an elongate tether member **1050** via an attachment member **1016**. A second clip **1002** is also attached to the elongate tether member **1050** via an attachment member **1016** at an end of the tether member **1050** opposite the end to which the first clip **1001** is attached. This system may be pre-loaded into the outer sheath **1066** as described with reference to FIG. **2**D.

[0058] With reference to FIG. **10**B, the instrument sheath **1062** is advanced distally through the outer sheath **1066** such that the second clip **1002**, elongate tether member **1050**, and first clip **1001** are pushed distally out of the outer sheath **1066** generally toward the target location of the target tissue **1070**. The first clip **1001** is held near the distal end of the instrument sheath **1062** by the instrument **1060** engaging the filament **1010** of the first clip **1001**. The retainer **1014** and jaws **1004** of the first clip **1001** are swung about the hinge **1012** such that the hinge is moved away from the area between the jaws **1004** of the first clip **1001** and the target tissue **1070**. The elongate tether member **1050** and second clip **1002** may also rotate away from the target location of the target tissue **1070**. The second clip **1004** is in the closed configuration because the filament **1010** of the second clip **1002** is not engaged by the medical instrument **1060**. The filament **1010** of the first clip **1001** is in tension from the medical instrument **1060** engaging the filament **1010** and pulling the first clip **1001** in a proximal direction toward the end of the instrument sheath **1062**. Additional force in a proximal direction by the instrument **1060** on the filament **1010** may move the wedge **1008** toward the retainer **1014**, opening the jaws **1004** such that the first clip **1001** is in the open configuration and is ready to engage the target tissue **1070**. The first clip **1001** in the open configuration may be moved toward the target location of the target tissue **1070** via the instrument sheath with or without the outer sheath **1066**, and the tension in the filament **1010** of the first clip **1001** may be released to transition the first clip **1001** into the closed configuration and fix it to the target tissue **1070** by engaging the jaws **1004** of the first clip **1001** with the target tissue **1070**, as illustrated in FIG. **10**C. The instrument **1060** may then release the filament **1010** of the first clip **1001** by extending distally out of the instrument sheath **1062**, and the instrument sheath **1062** may be moved such that the first clip **1001** is completely deployed from the instrument sheath **1062**. The instrument sheath **1062** is then moved toward the filament **1010** of the second clip **1002**. The instrument **1060** engages the filament **1010** of the second clip **1002** and retracts in a proximal direction, pulling the filament **1010** into the instrument sheath **1062**. Because the filament **1010** of the second clip **1002** has a shape memory loop that extends outwardly, the medical instrument **160** may more easily engage the filament **1010**. The filament **1010** of the second clip **1002** is pulled further into the instrument sheath **1062** until the alignment member **1020** is substantially axial with the lumen of the instrument sheath **1062**. The filament **1010** of the second clip **1002** is then pulled into tension by the instrument **1060** to transition the second clip **1002** from the closed configuration of FIG. **10**B into the open configuration of FIG. **10**C as the second clip **1002** is moved toward a portion of the wall of the body lumen **1075**. The jaws of the second clip **1002** are placed into engagement with the wall of the body lumen **1075** and the filament **1010** is released from tension such that the second clip **1002** transitions into the closed configuration, engaging the wall of the body lumen **1075**.

[0059] As illustrated in FIG. **10**D, with the first clip **1001** engaging the target tissue **1070** and the second clip **1002** engaging a second location **1077** of tissue of the wall of the body lumen **1075**, the elongate tether member **1050** is under tension that retracts the target tissue **1070** toward the second clip **1002** as a resecting tool **1072** resects the target tissue **1070** from a working channel of a scope **1068**, which may or may not be the same outer sheath **1066**. Once the tension in the elongate tether member **1050** is no longer desirable for further resecting the target tissue **1070** (e.g., the portion of the target tissue **1070** that needs to be resected is no longer visible because the target tissue **1070** is no longer being substantially lifted), the instrument **1060** and instrument sheath **1062** are reintroduced toward the second clip **1002**.

[0060] As illustrated in FIG. **10**E, the instrument **1060** re-engages the filament **1010** of the second clip **1002** as it did in FIG. **10**C to reposition the second clip **1002** to obtain tension in the elongate tether member **1050**. The second clip **1002** is transitioned to the open configuration by the instrument **1060** and instrument sheath **1062**, and the second clip **1002** is repositioned toward a third target location **1079** of tissue of the wall of the body lumen **1075** that is farther from the first clip **1001** than the second target location **1077** of tissue of the wall of the body lumen **1075**.

[0061] As illustrated in FIG. **10**F, with tension restored in the elongate tether member **1050**, the resecting tool **1072** may be reintroduced to continue resecting the target tissue **1070** such that the target tissue **1070** is dissected from the body lumen **1075**. The second clip **1002** may then be retrieved using the instrument **1060**, instrument sheath **1062**, and outer sheath **1066** with the dissected target tissue **1070** attached to the first clip **1001** to be removed from the patient. In some embodiments, the tether **1050** and clips **1001**, **1002** may additionally or alternatively be used to grasp a portion of a tissue or a portion of an organ and position it out of the way, e.g., of a working area for a medical professional, to access a target tissue area. For example, both clips **1001**, **1002** may be attached to the body lumen wall **1075** with a portion of a tissue held against the body lumen wall **1075** wall by tether **1050**.

[0062] Devices according to the embodiments described, and in accordance with other embodiments of the present disclosure, alone or in a system or kit or as part of a method or procedure, including with other accessories, may be used in cavities, lumens, tracts, vessels, and organs of the body, such as to access, treat, or diagnose conditions in the peritoneal, abdominal, bronchial, or thoracic cavities; vascular vessels; gastrointestinal or urinary tract; uterus, bladder, lung, or liver organs, etc.

[0063] Variations, modifications, and other implementations of the present disclosure in addition to the various embodiments described herein will occur to those of ordinary skill in the art. Accordingly, the present disclosure is to be defined not by the preceding illustrative description but instead by the following claims:

What is claimed is:

1. A tissue clip, comprising:

a grasper having a first end and a second end; and

an actuator mounted with respect to said grasper;

wherein:

said grasper defines first and second jaws at the first end of said grasper, and a spring portion configured to bias said first and second jaws toward each other into a closed configuration; and

said actuator is movable toward said spring portion to cause said spring portion to open said first and second jaws from the biased closed configuration to an open configuration.

2. The tissue clip of claim **1**, wherein said actuator is longitudinally movable toward said spring portion to cause said spring portion to open said first and second jaws.

3. The tissue clip of claim **1**, further comprising a filament extending from said actuator and configured for engagement by a medical instrument.

4. The tissue clip of claim **3**, wherein said filament includes a loop engageable by a hook of the medical instrument.

5. The tissue clip of claim **3**, wherein said filament is attached to said actuator to move said actuator proximally toward said spring portion.

6. The tissue clip of claim **1**, wherein said grasper is formed of a wire forming said first and second jaws, and said spring portion.

7. The tissue clip of claim **1**, wherein said grasper defines a snare at the second end of said grasper configured for engagement by a medical instrument.

8. The tissue clip of claim **7**, wherein said grasper is formed of a wire forming said first and second jaws, said spring portion, and said snare.

9. A tissue clip, comprising:

a grasper having a first end and a second end, said grasper including a spring portion at the second end, and jaws at the first end biased toward each other by said spring portion into a closed configuration to grasp tissue;

an actuator having a first end and a second end and movably mounted with respect to said grasper; and

a filament extending from the second end of said actuator to be movable to move said actuator toward said spring portion of said grasper to actuate said spring portion to move from the closed configuration to an open configuration.

10. The tissue clip of claim **9**, wherein said filament is coupled to the second end of said actuator and is movable upon movement of a medical instrument engaged therewith.

11. The tissue clip of claim **10**, wherein said filament includes a loop releasably engageable by a hook of the medical instrument.

12. The tissue clip of claim **9**, wherein said grasper is movable into said actuator to cause said first and second jaws to move from the closed configuration to an open configuration and said filament is a snare formed by the first end of said grasper.

13. The tissue clip of claim **9**, wherein said actuator is mounted for longitudinal movement with respect to said grasper.

14. A tissue clip, comprising:

a first member having a first end forming first and second jaws, a second end having an engagement element configured to be engaged by a medical instrument, and a spring portion between the first end and the second end; and

an actuator movable with respect to said spring portion to cause said spring portion to open said first and second jaws from a biased closed configuration to an open configuration;

wherein said grasper is movable into said actuator to cause said first and second jaws to move from the closed configuration to an open configuration.

15. The tissue clip of claim **14**, wherein said first member is formed of a wire shaped into said first and second jaws, said engagement element, and said spring portion.

16. The tissue clip of claim **14**, wherein said engagement element is in the form of a loop or snare formed by a second end of said first member.

17. The tissue clip of claim **14**, wherein said engagement element is in the form of a sphere or ball or polyhedron.

18. The tissue clip of claim **14**, wherein said actuator is mounted for longitudinal movement with respect to said first member.

19. The tissue clip of claim **14**, wherein said actuator is positioned circumferentially around a portion of said first member.

20. The tissue clip of claim **14**, further comprising a hinge rotatable with respect to said first member and operably coupled with another tissue clip.

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