US011684869B2

(12) **United States Patent**
Chen et al.

(10) **Patent No.: US 11,684,869 B2**
(45) **Date of Patent: Jun. 27, 2023**

(54) **CONSTRUCTION TOY INCLUDING TUBES AND CONNECTORS, AND DEVICE FOR CUTTING AND BENDING TUBES THEREFOR**

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(72) Inventors: **Shay Chen**, Neve Yarak (IL); **Shachar Limor**, Givat Shapira (IL)

(73) Assignee: **FLYCATCHER CORP LTD**, London (GB)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 68 days.

(21) Appl. No.: **17/509,129**

(22) Filed: **Oct. 25, 2021**

(65) **Prior Publication Data**

US 2022/0126218 A1 Apr. 28, 2022

Related U.S. Application Data

(60) Provisional application No. 63/105,937, filed on Oct. 27, 2020.

(51) **Int. Cl.**

A63H 33/10	(2006.01)
A63H 33/30	(2006.01)
A63H 29/24	(2006.01)
A63H 33/00	(2006.01)
A63H 33/06	(2006.01)
B21D 43/28	(2006.01)
B23D 21/06	(2006.01)
B25F 1/00	(2006.01)
A63H 9/00	(2006.01)

(52) **U.S. Cl.**

CPC ***A63H 33/3072*** (2013.01); ***A63H 29/24*** (2013.01); ***A63H 33/003*** (2013.01); ***A63H 33/065*** (2013.01); ***A63H 33/10*** (2013.01); ***B21D 43/28*** (2013.01); ***B23D 21/06*** (2013.01); ***B25F 1/00*** (2013.01); *A63H 9/00* (2013.01)

(58) **Field of Classification Search**

CPC A63H 33/10; B21D 43/28; B23D 21/06; B25F 1/00

See application file for complete search history.

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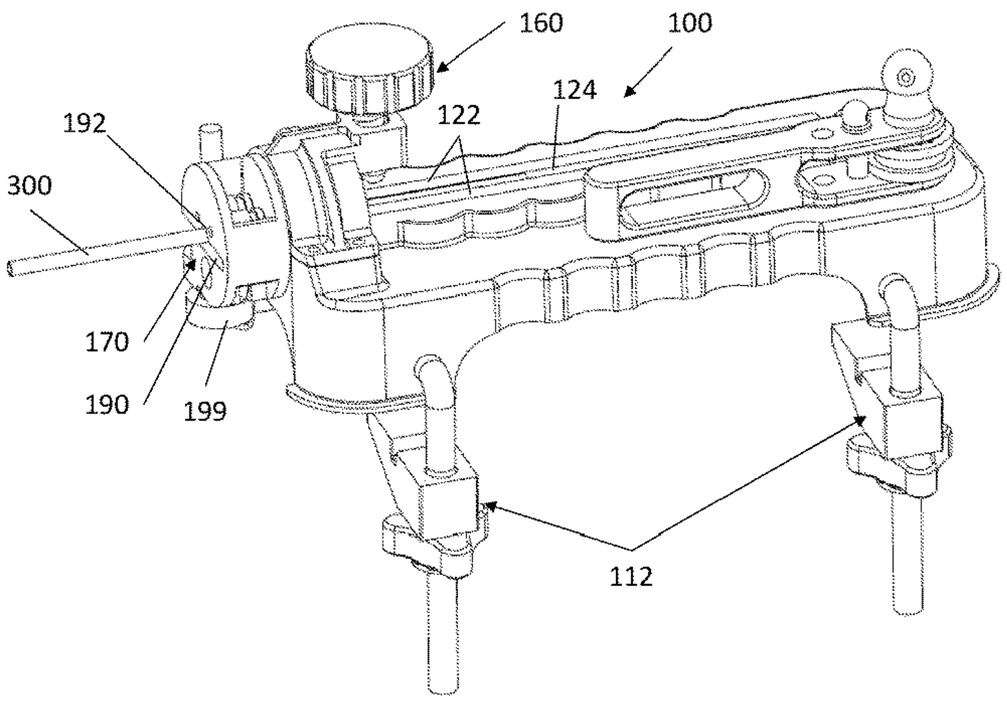
Primary Examiner — John A Ricci

(74) *Attorney, Agent, or Firm* — Michael J. Feigin, Esq.; Feigin and Fridman LLC

(57) **ABSTRACT**

A device for cutting and bending a hollow elongate tube. A measuring subassembly is adapted for measuring a desired size of the tube. A cutting subassembly is adapted for cutting the tube to the desired size. A bending subassembly is adapted for bending the cut tube to a desired angular orientation. The bending subassembly includes a base controlling a radius of a bend to be formed in the cut hollow elongate tube, and a user grippable handle. The user grippable handle is configured to enable a user to rotate the cut hollow elongate tube, relative to the round base, to form the bend in the cut hollow elongate tube.

19 Claims, 34 Drawing Sheets



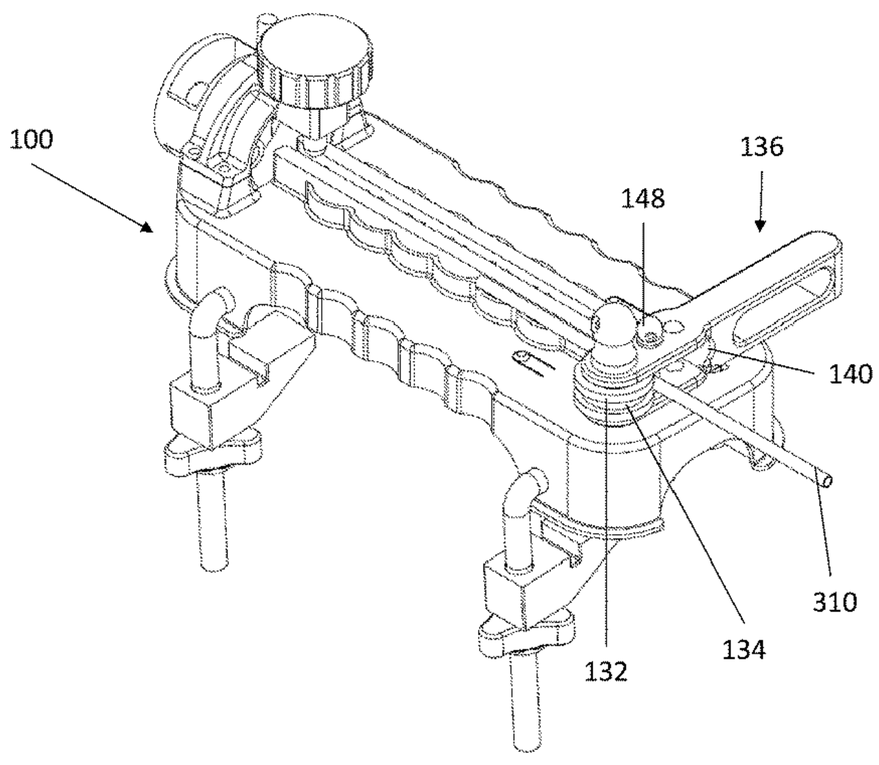


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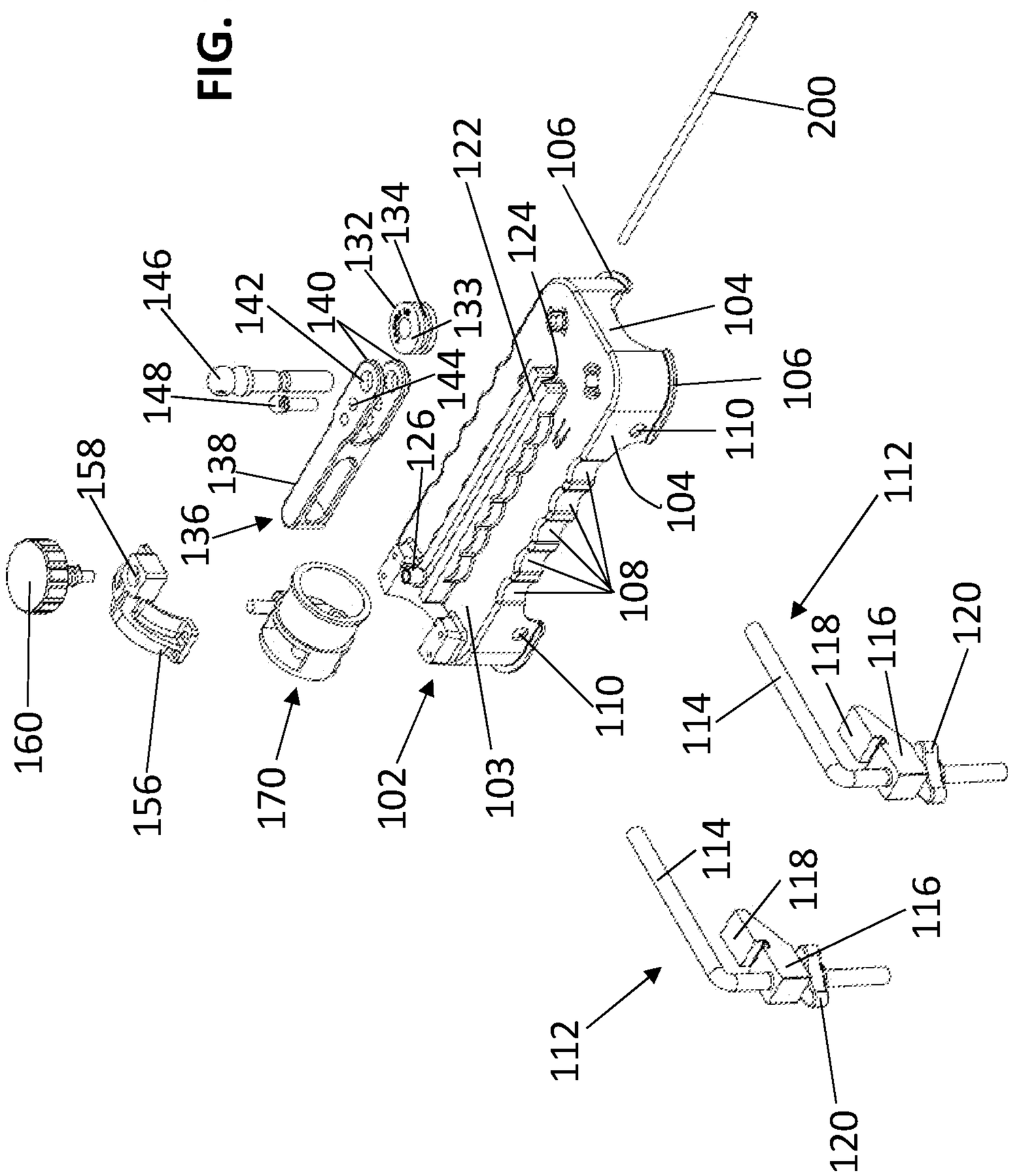
FIG. 1A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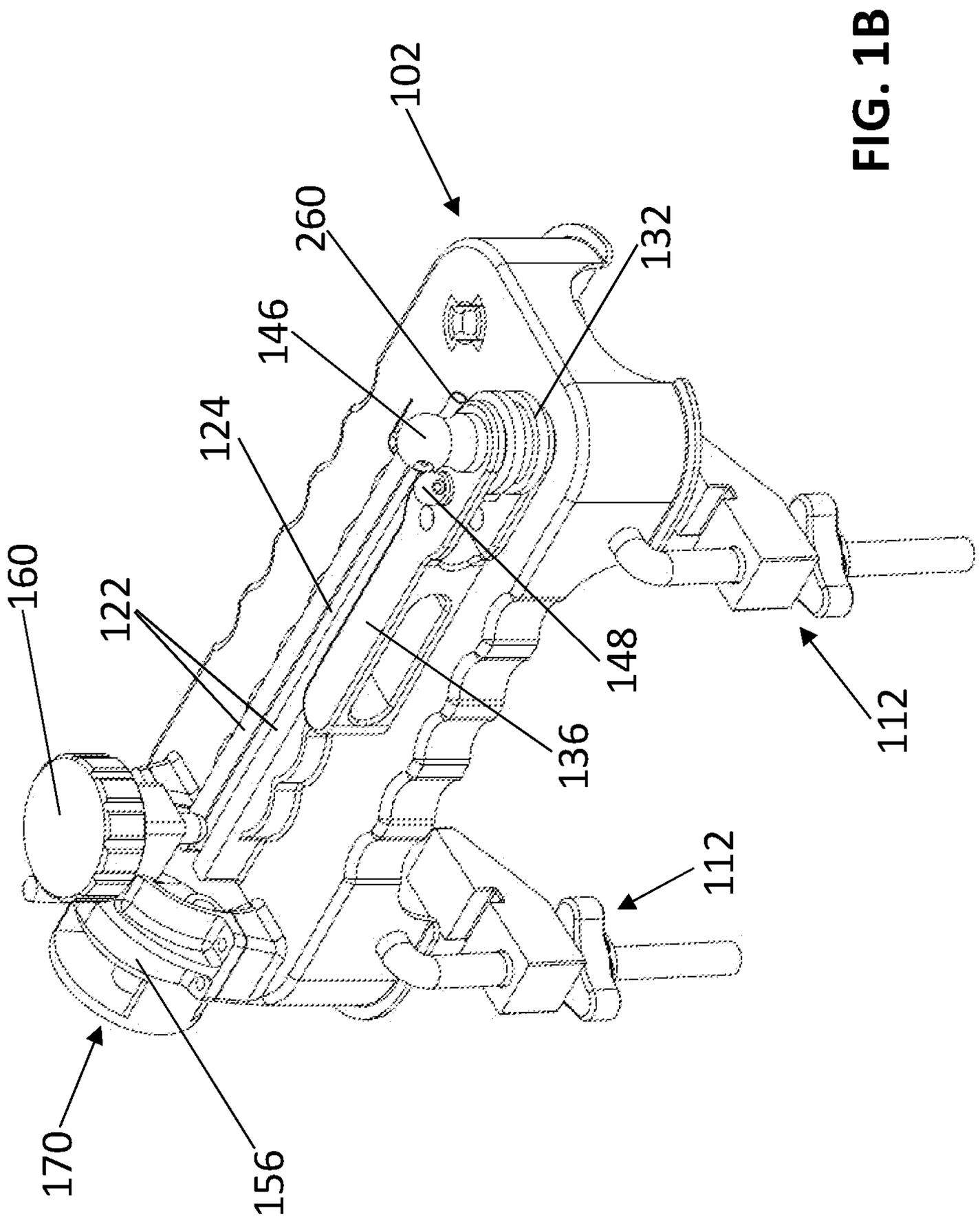

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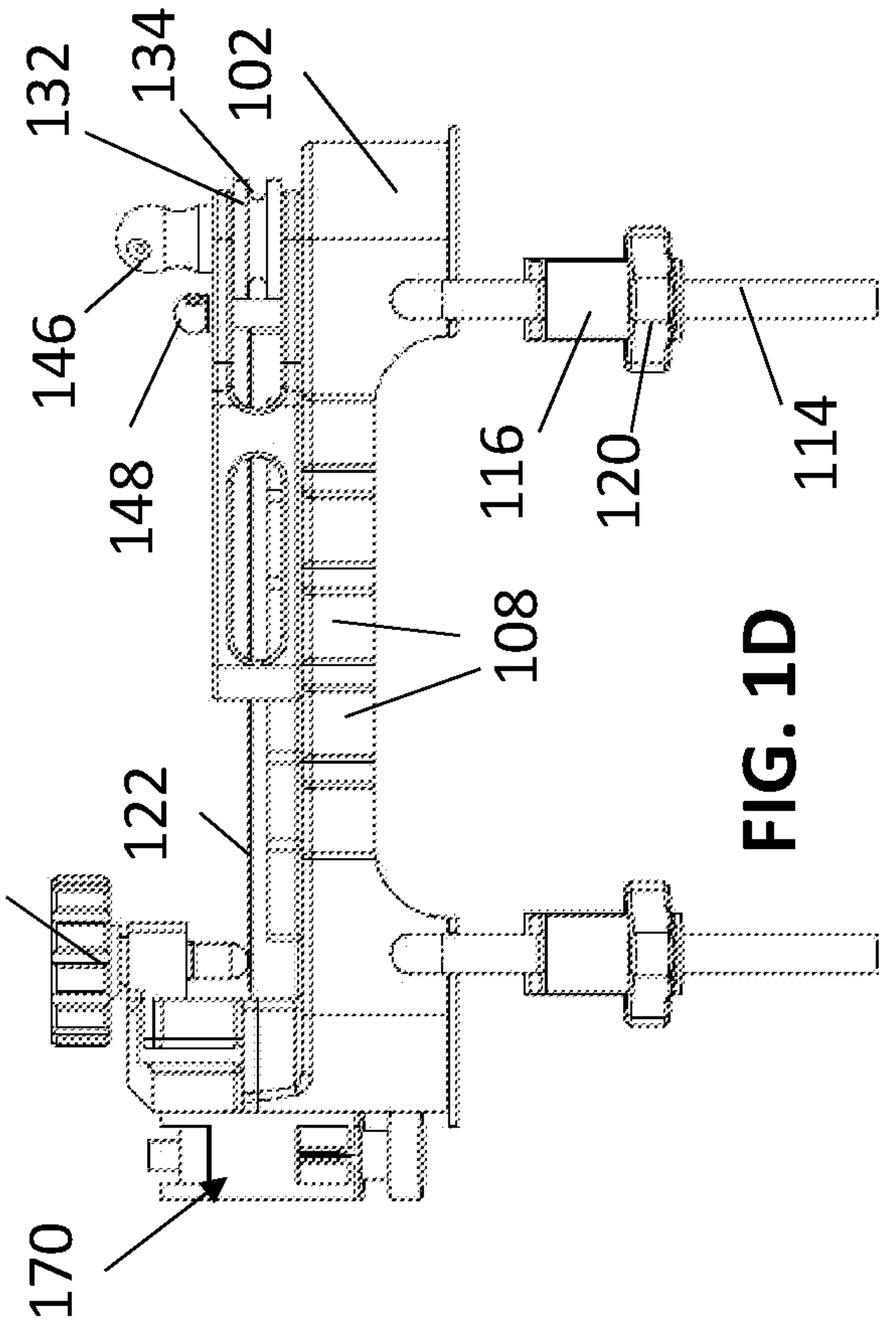

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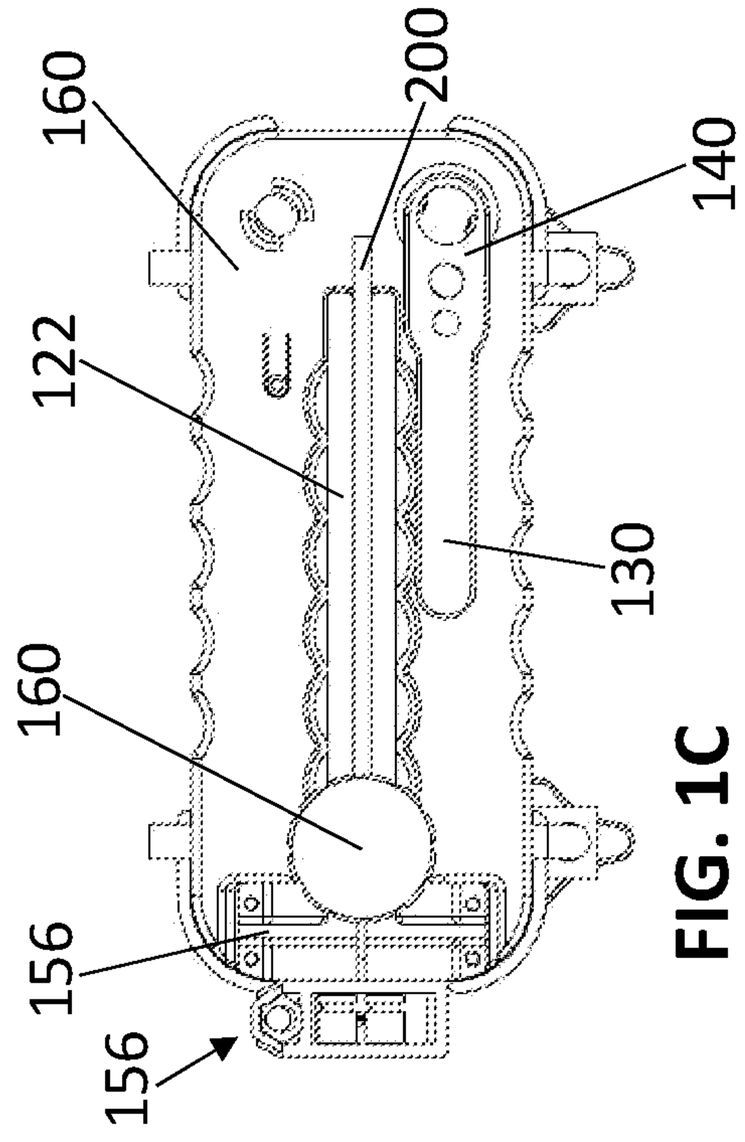

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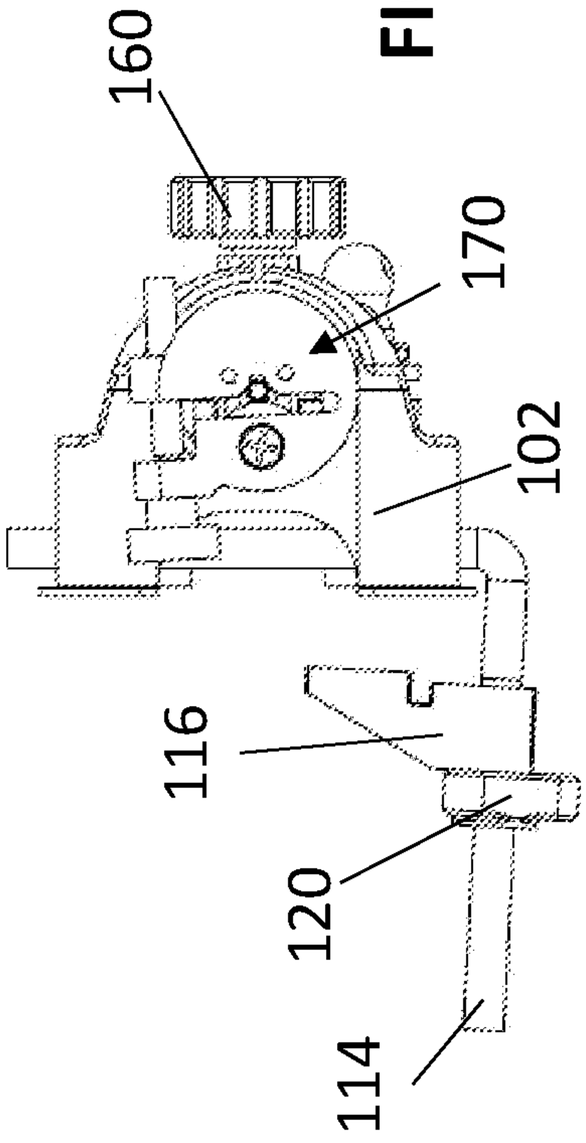

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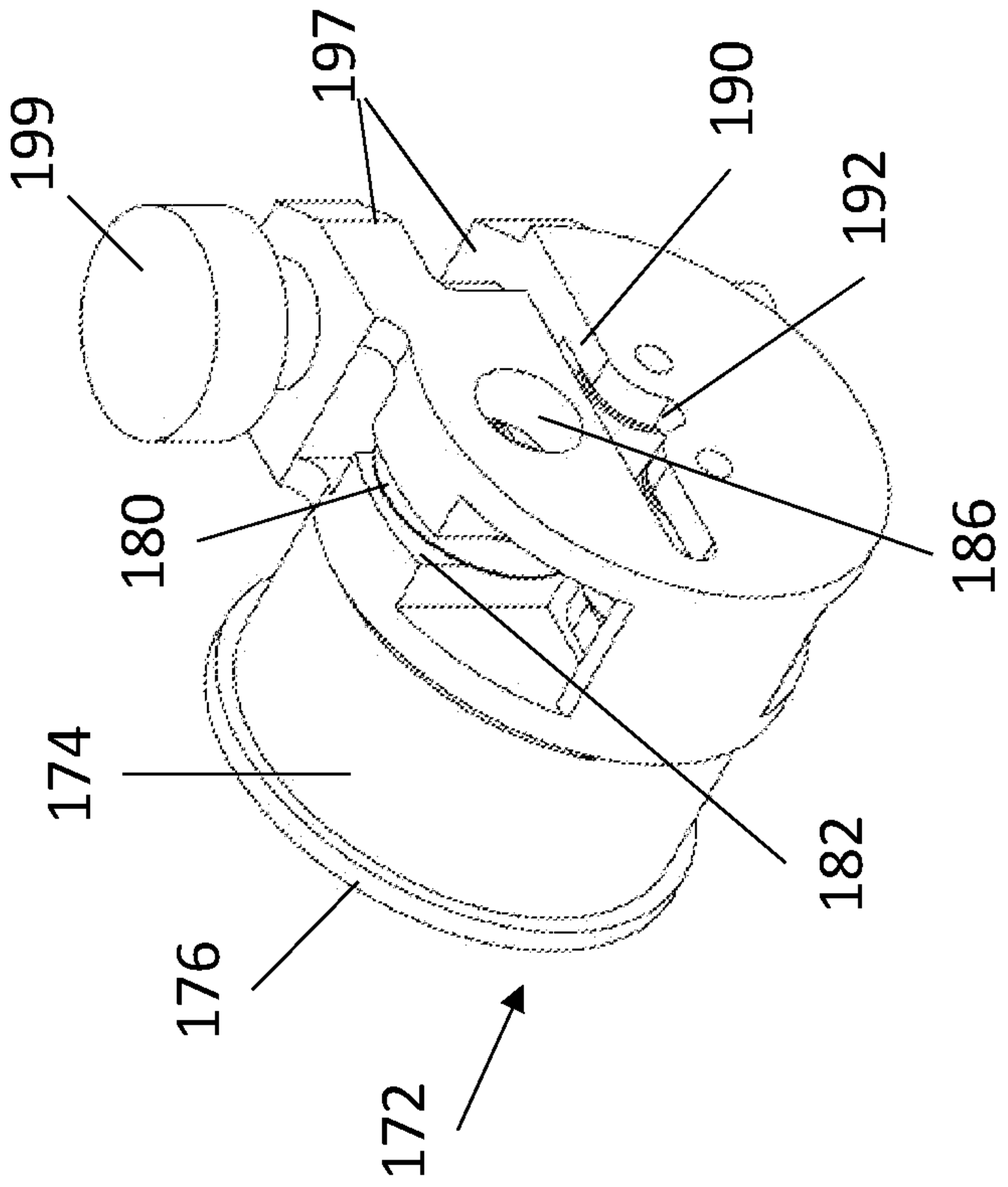
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FIG. 2B

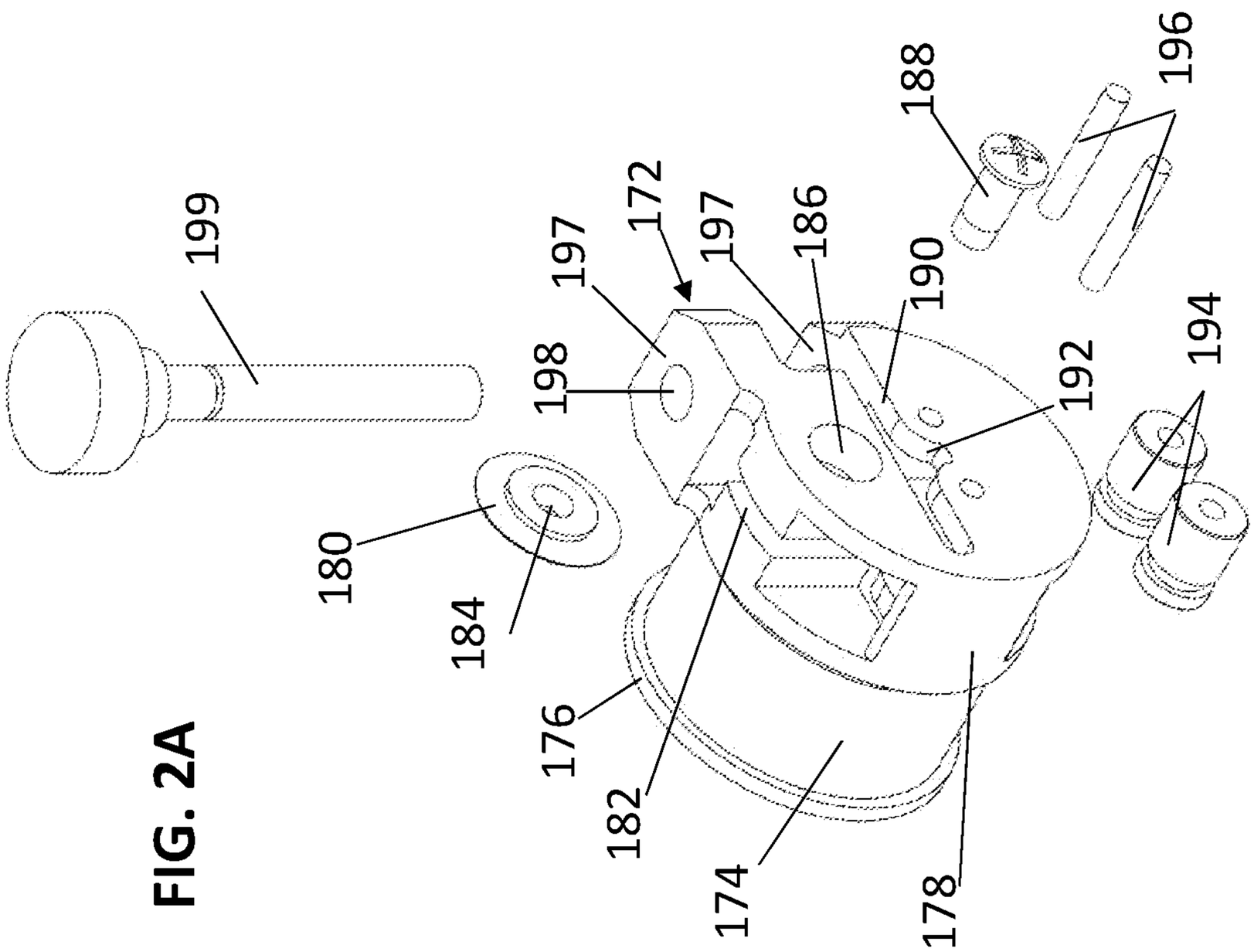
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FIG. 2A

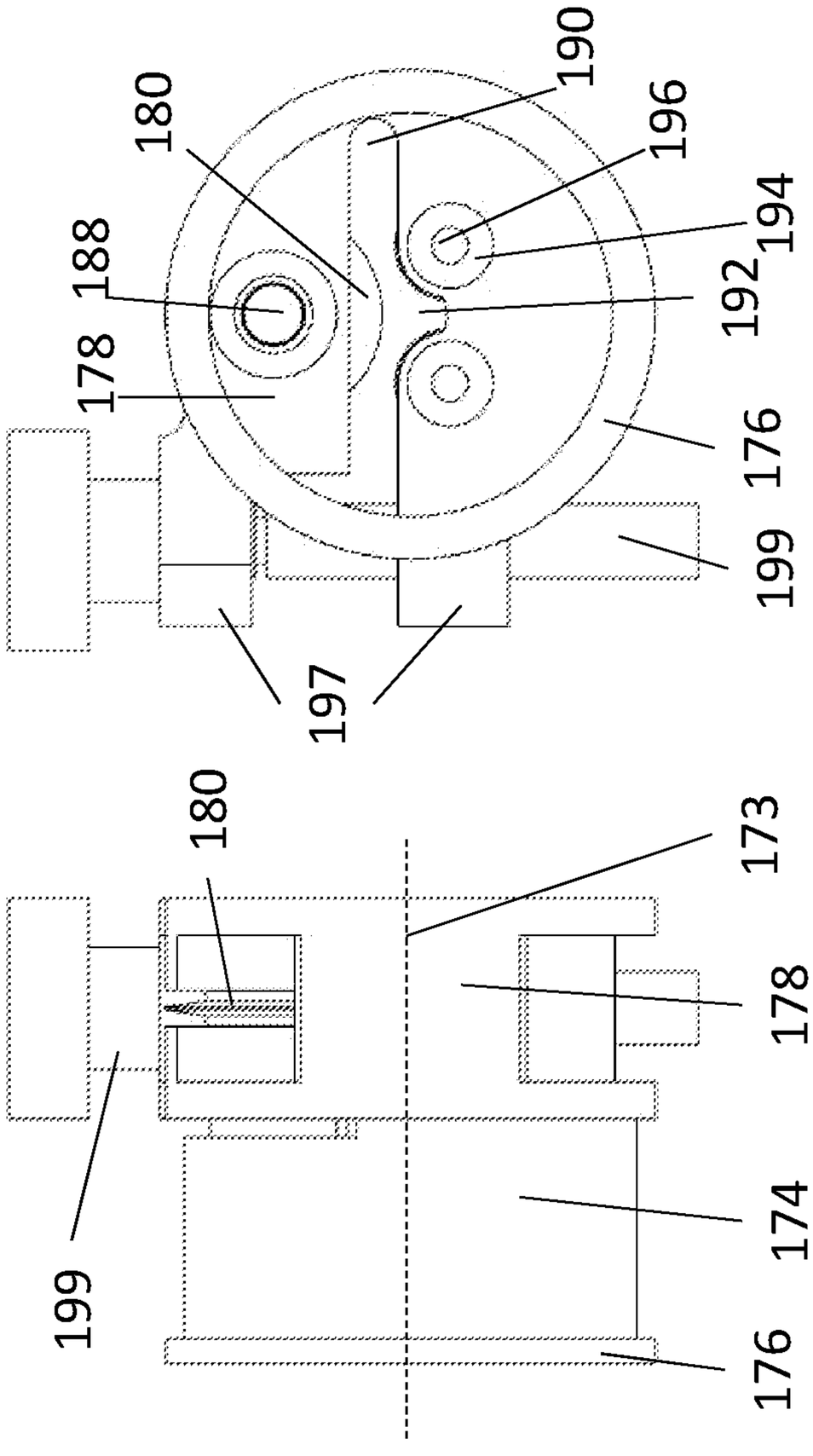

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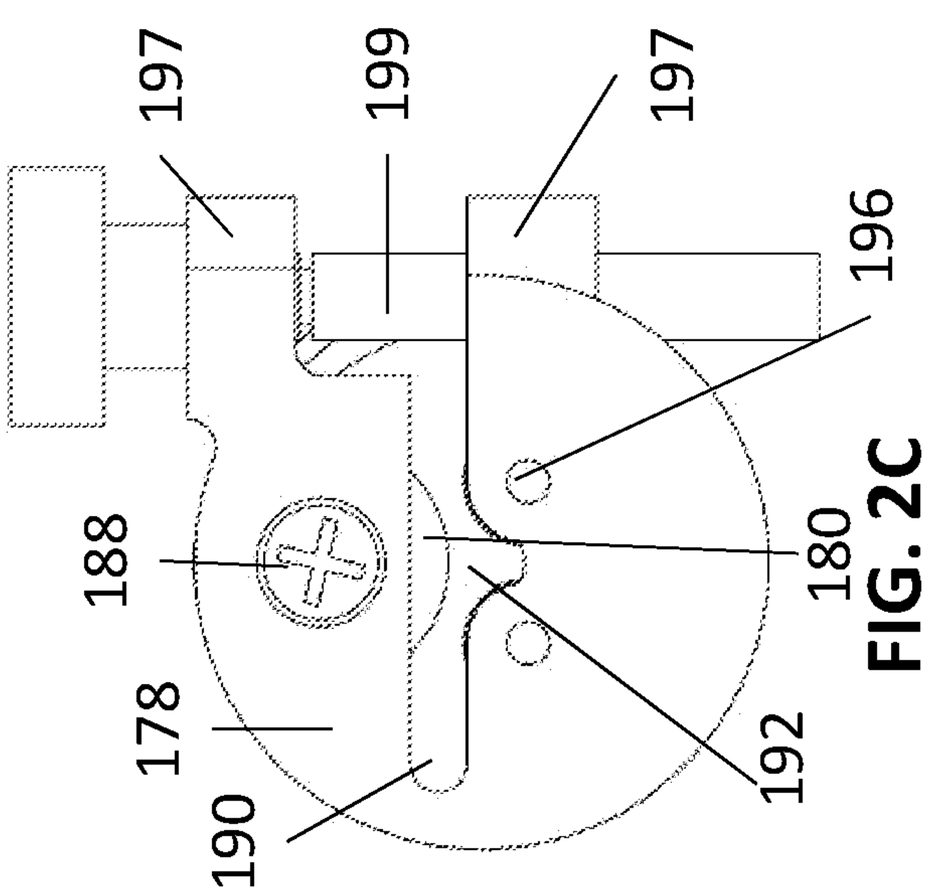
FIG. 2D



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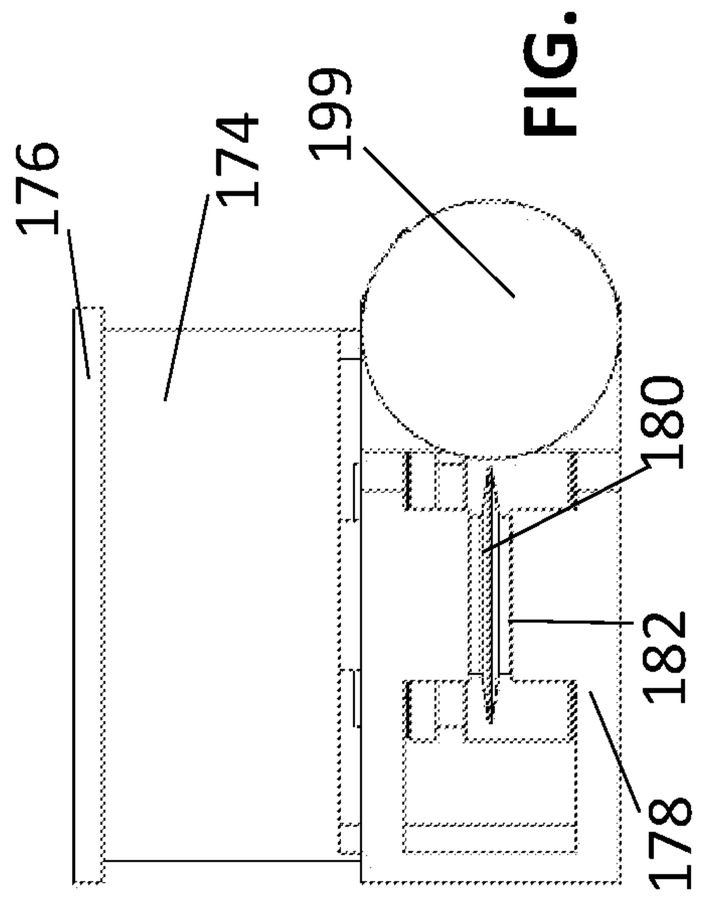

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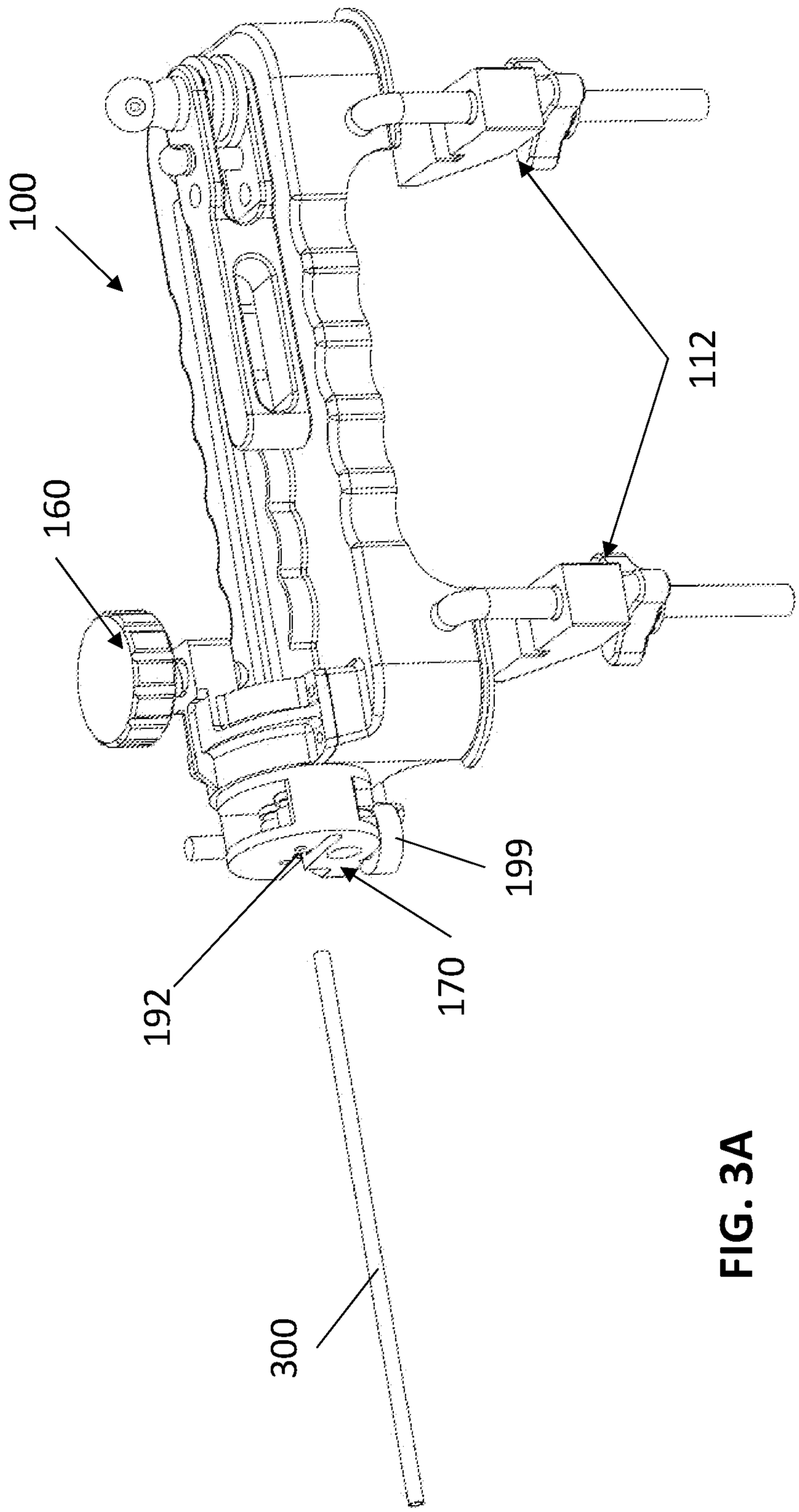
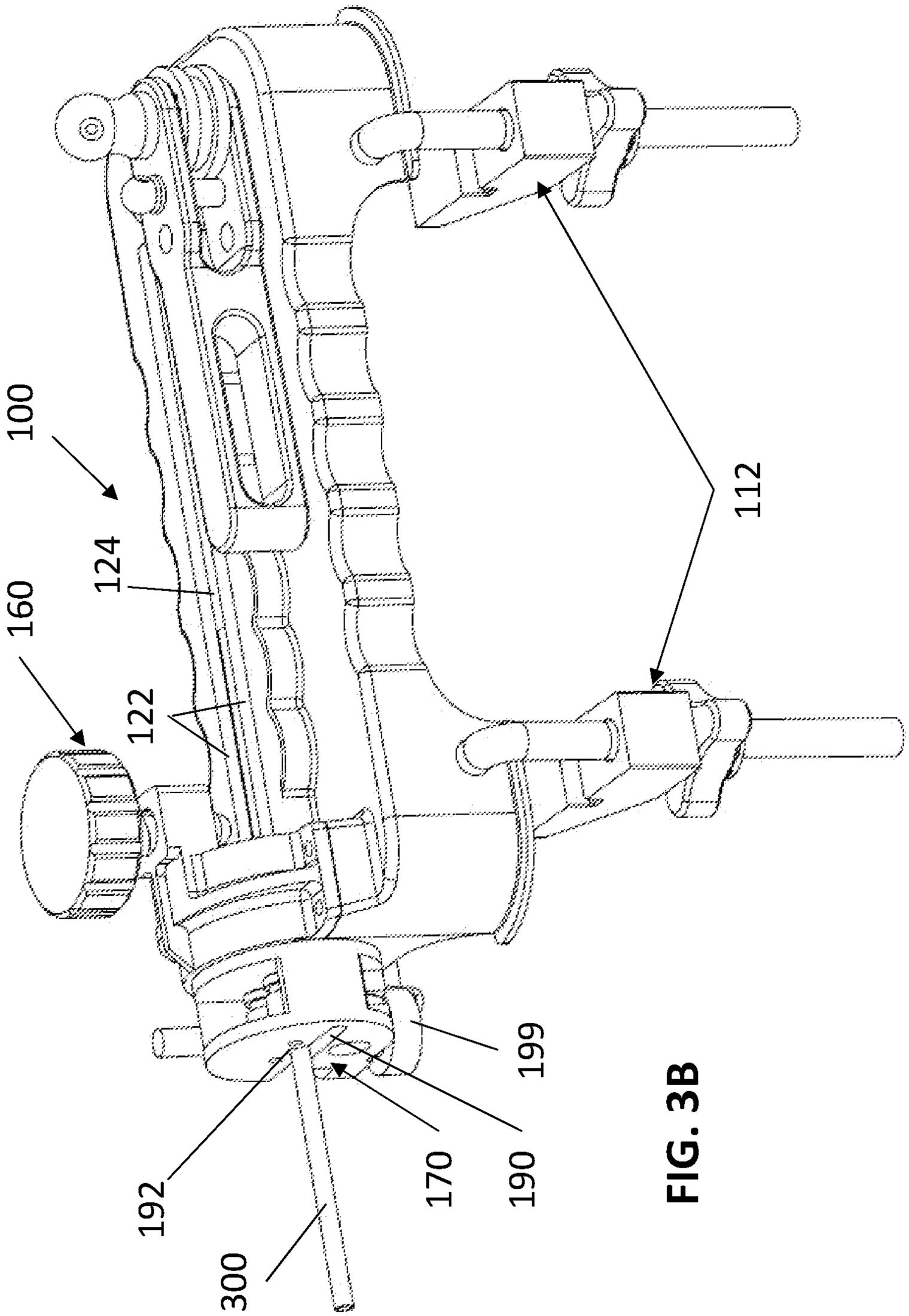


FIG. 3A



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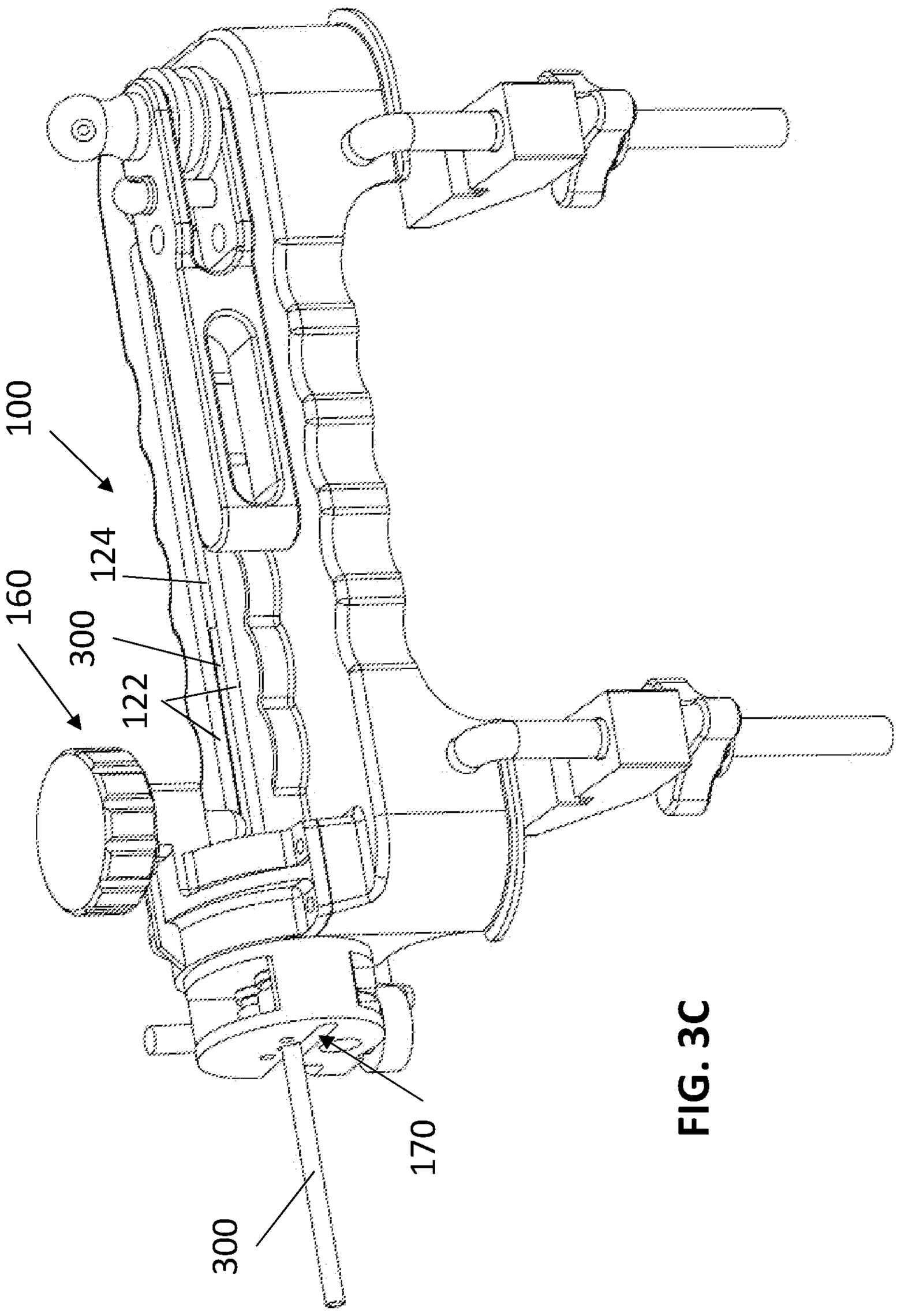

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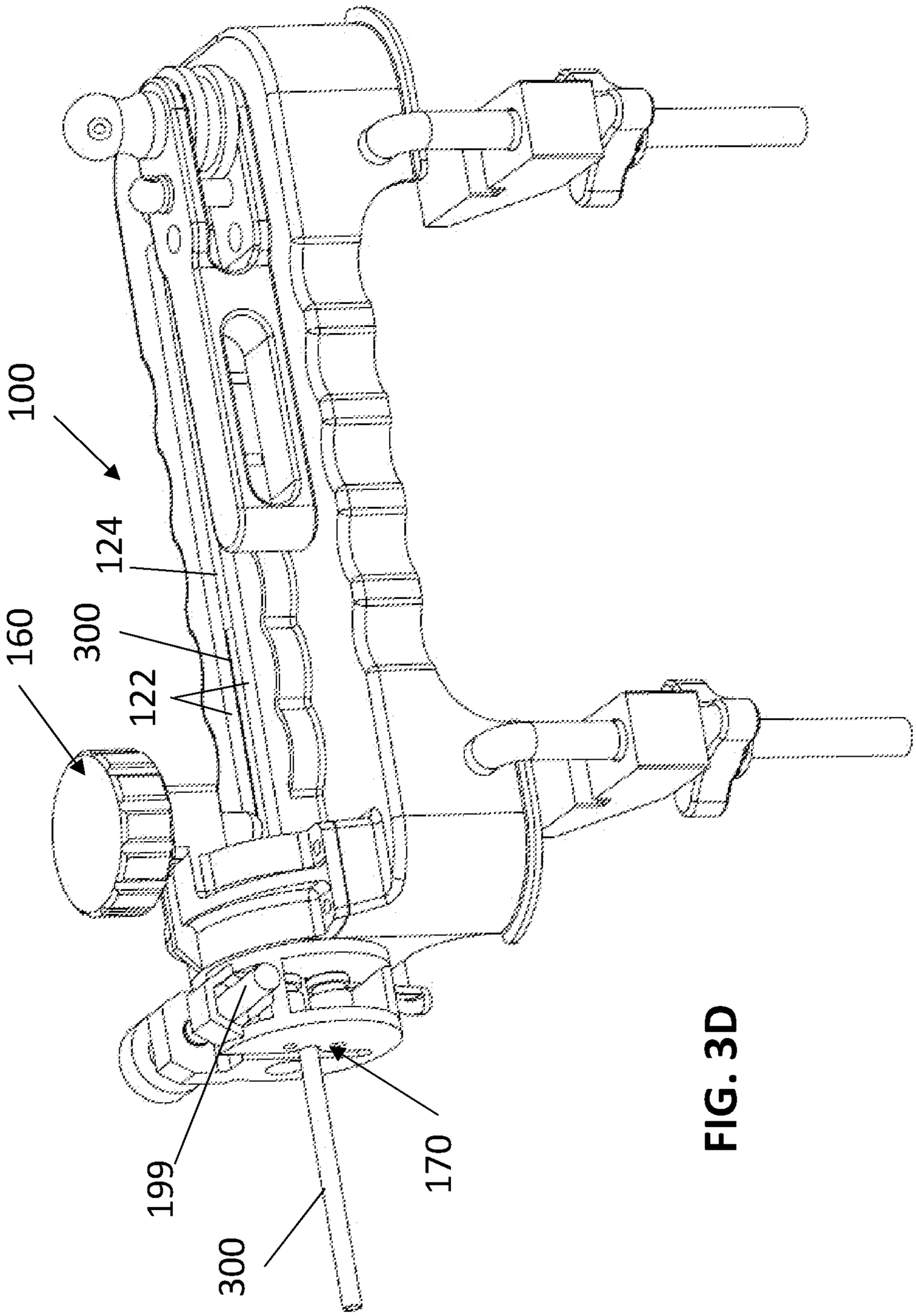

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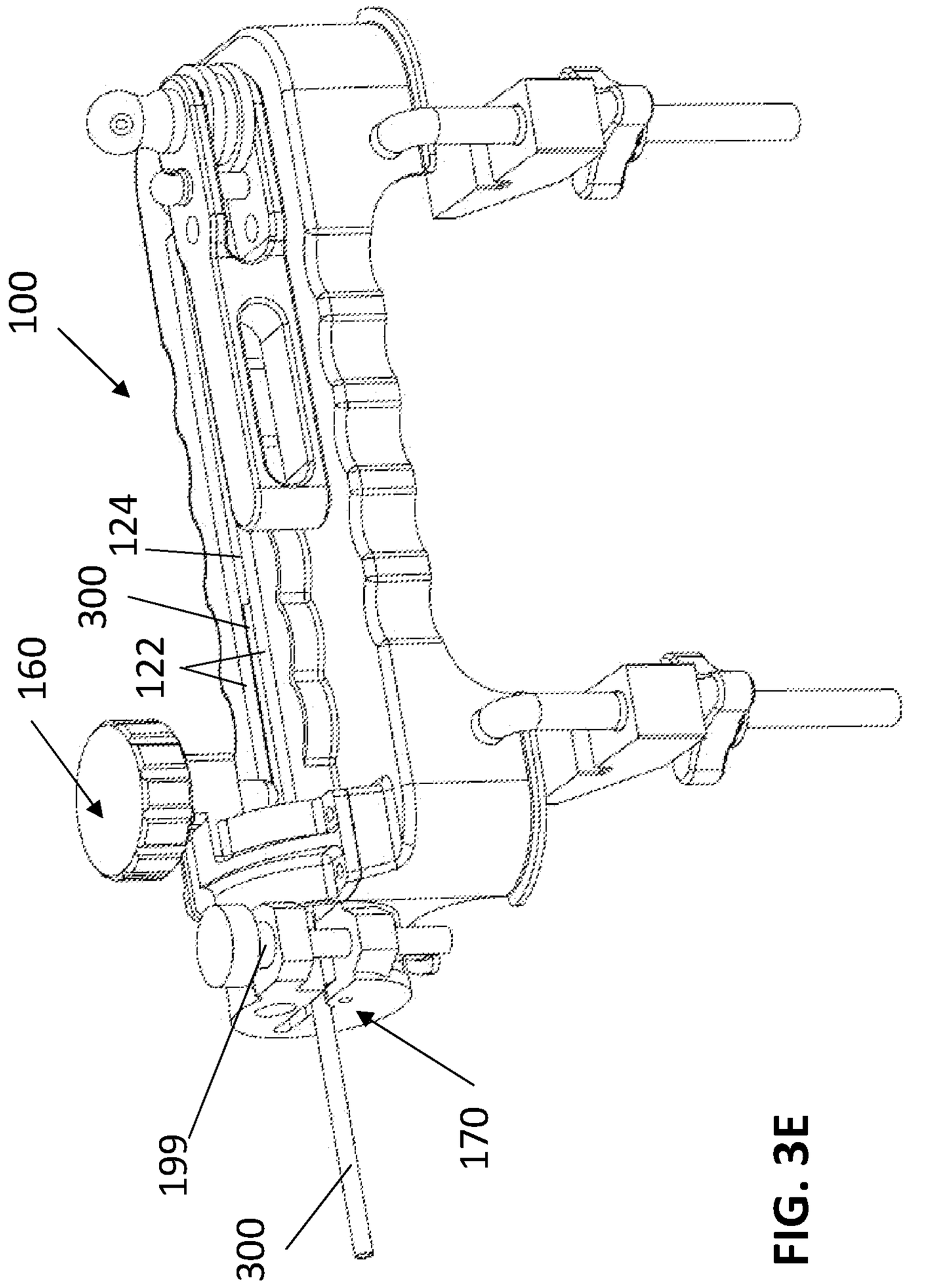

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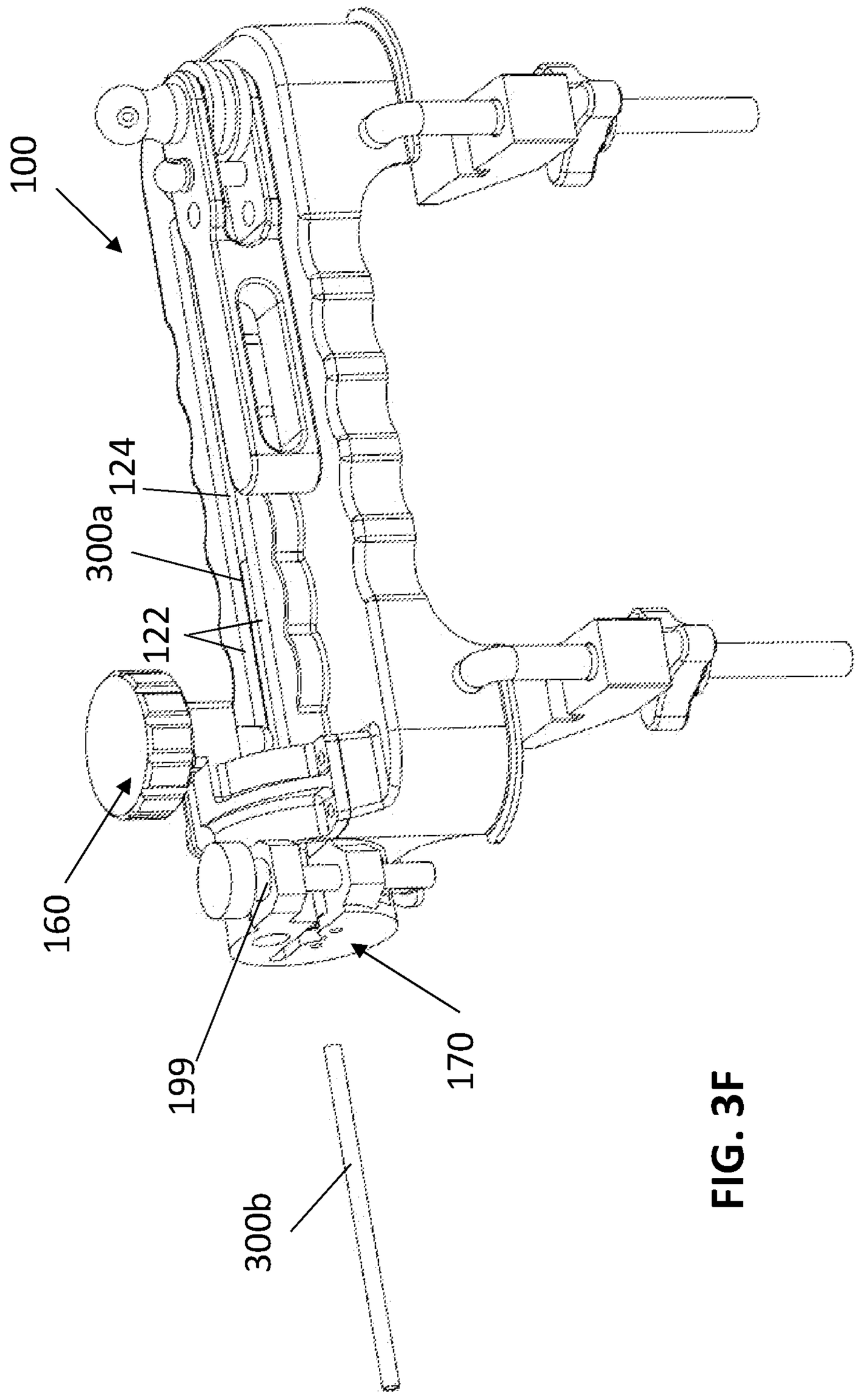
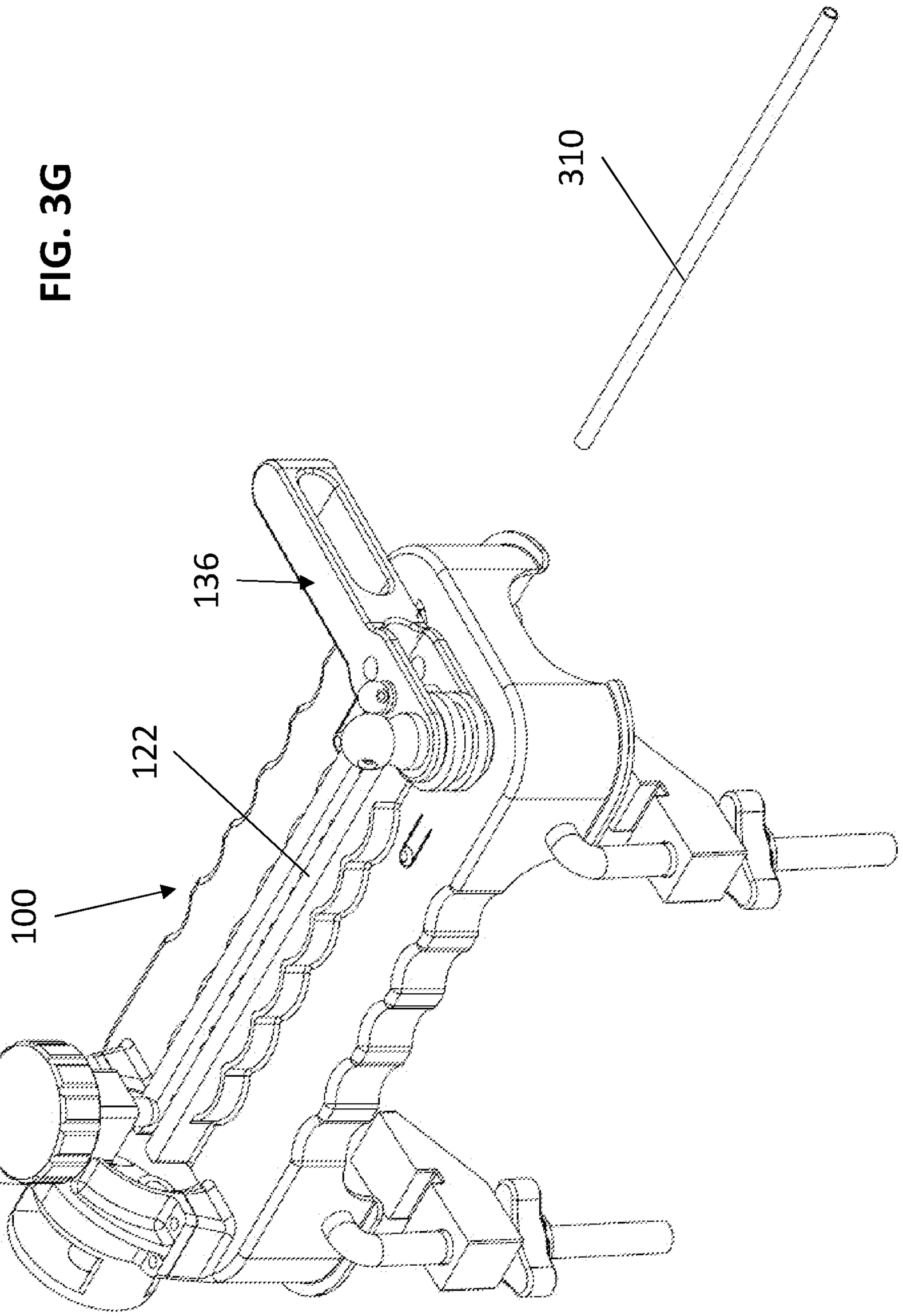


FIG. 3F

FIG. 3G



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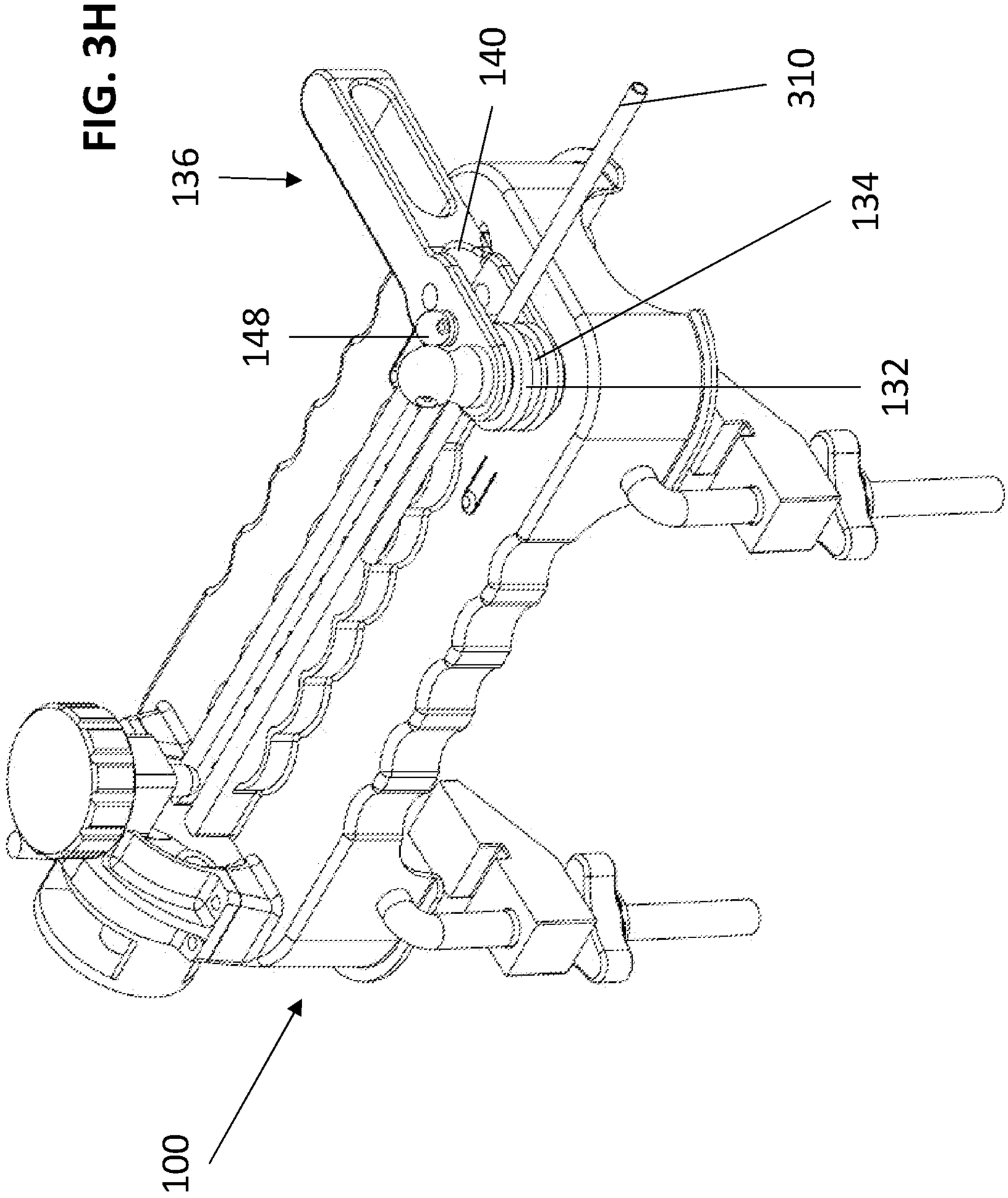
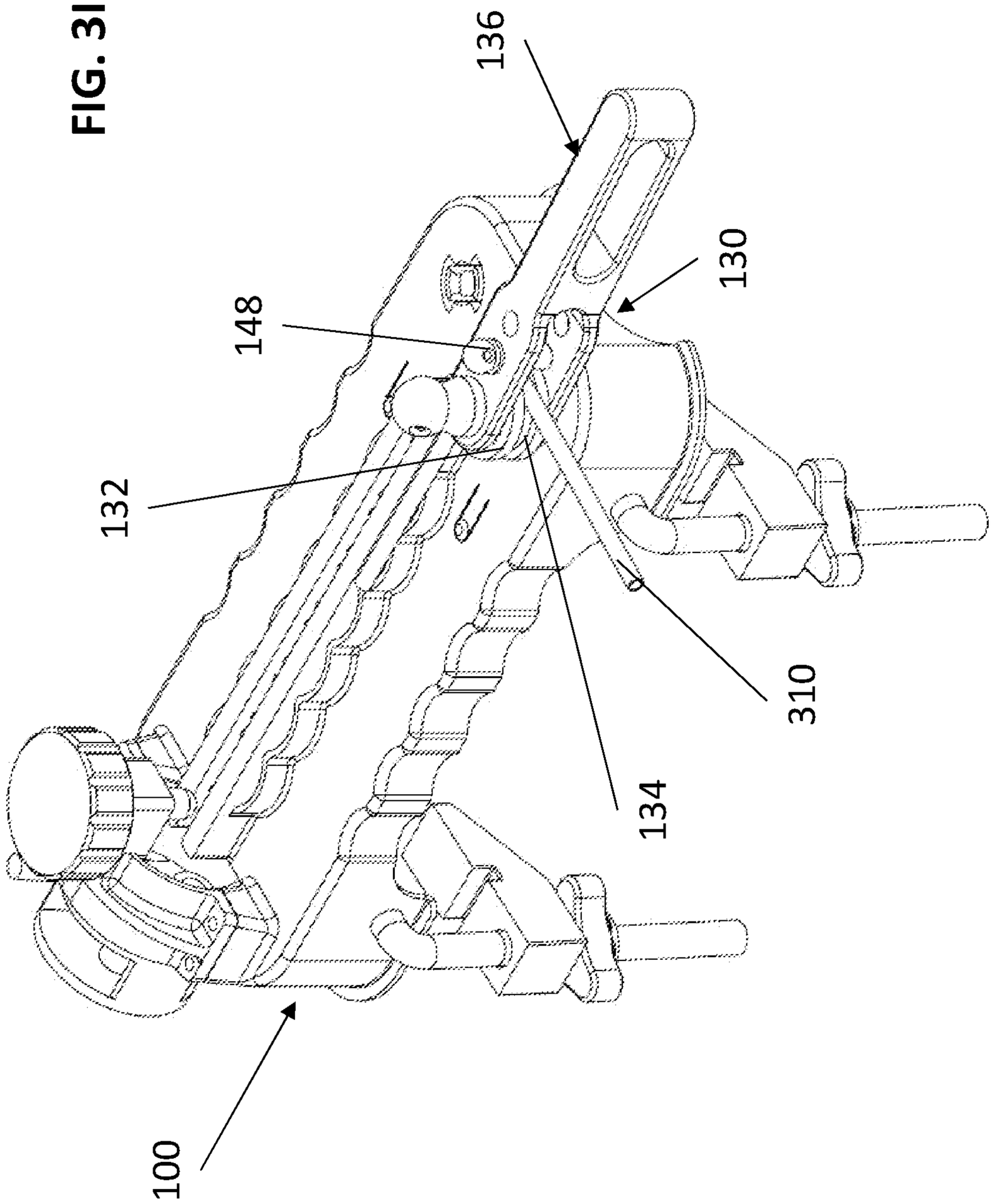


FIG. 3I



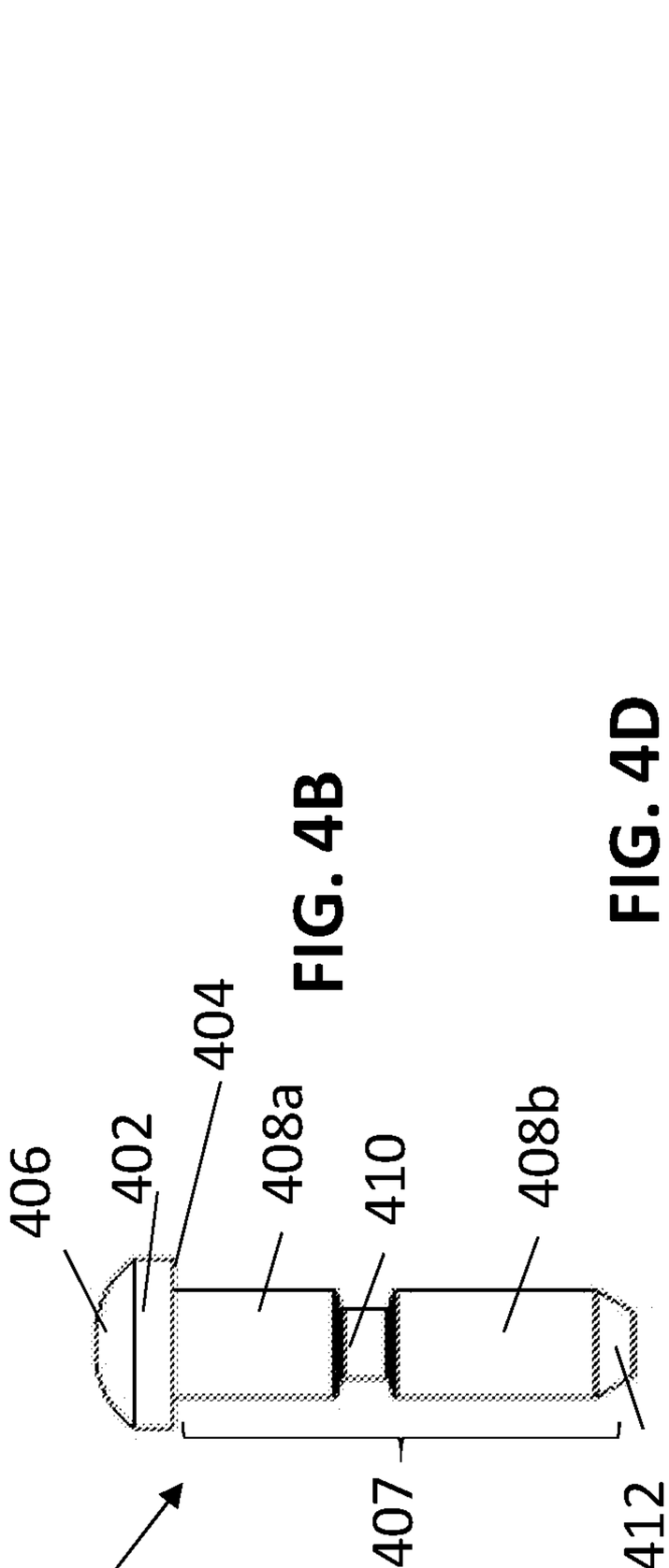
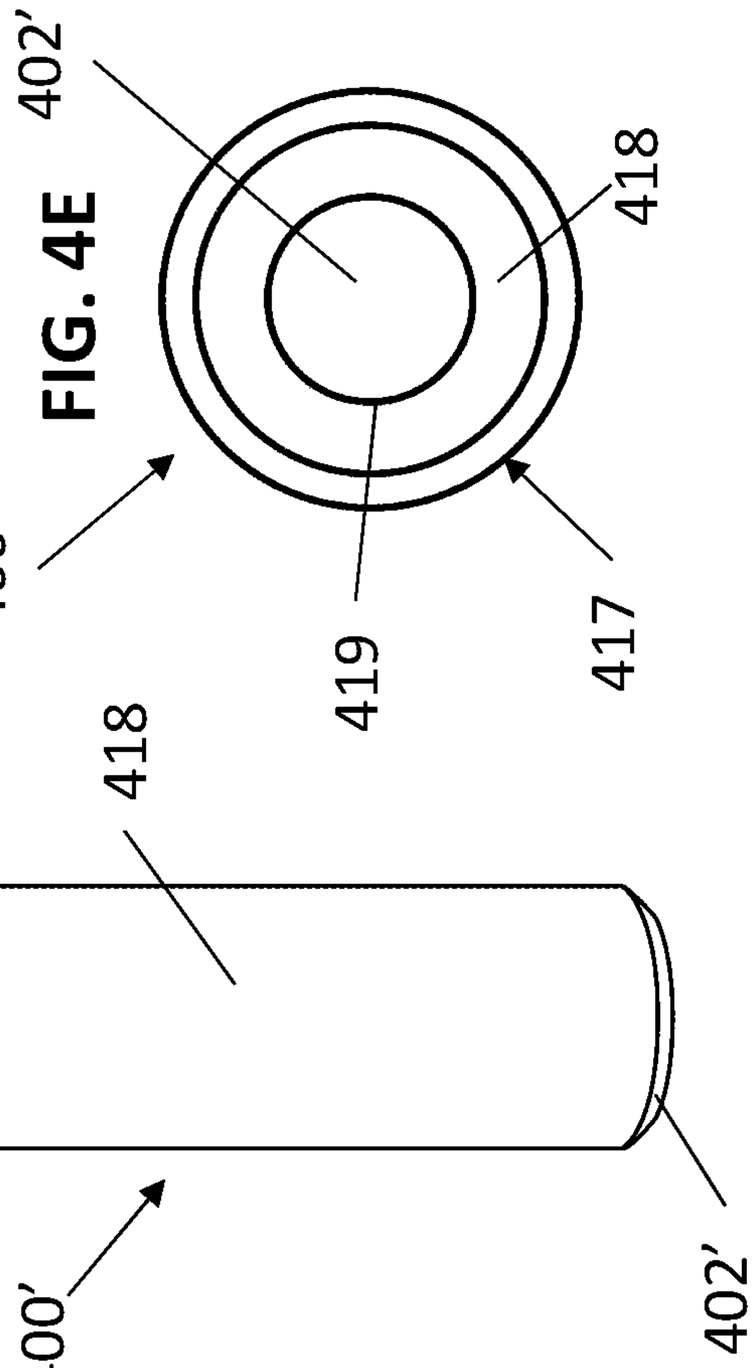


FIG. 4B

FIG. 4A



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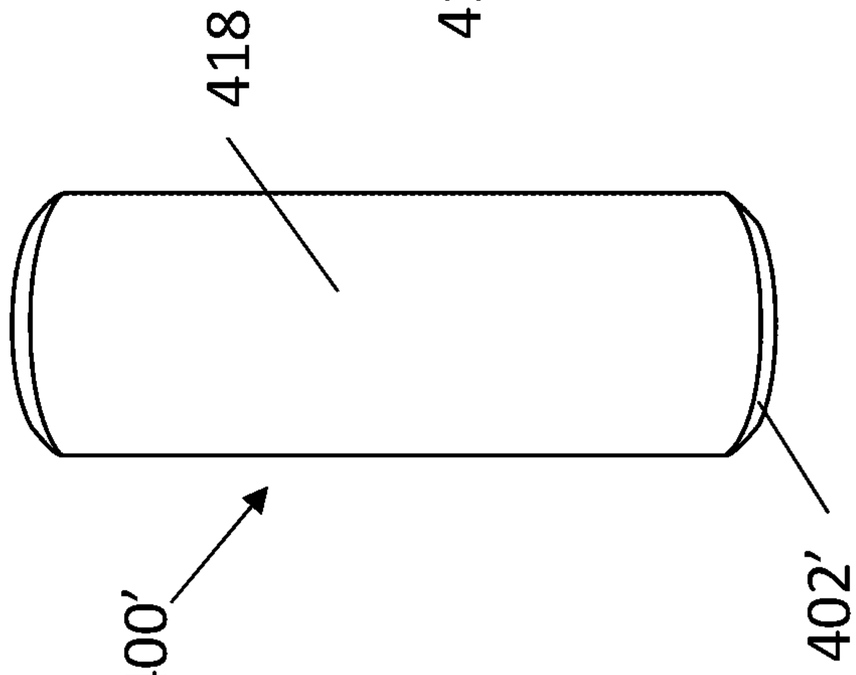

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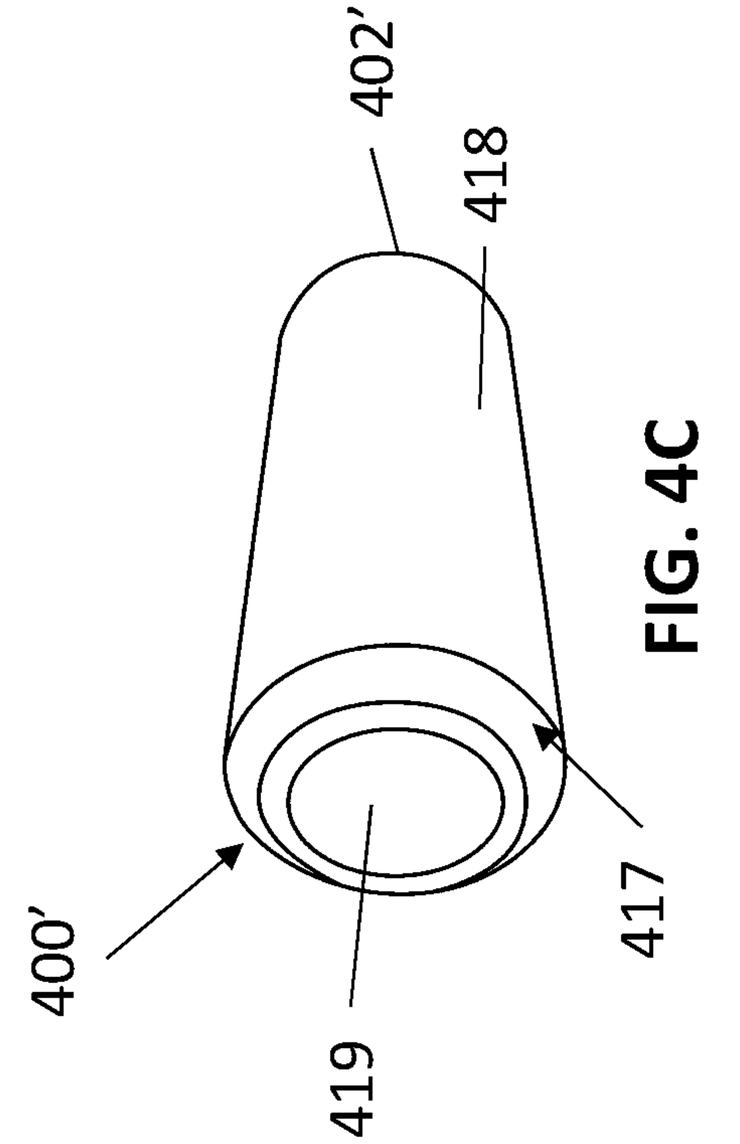

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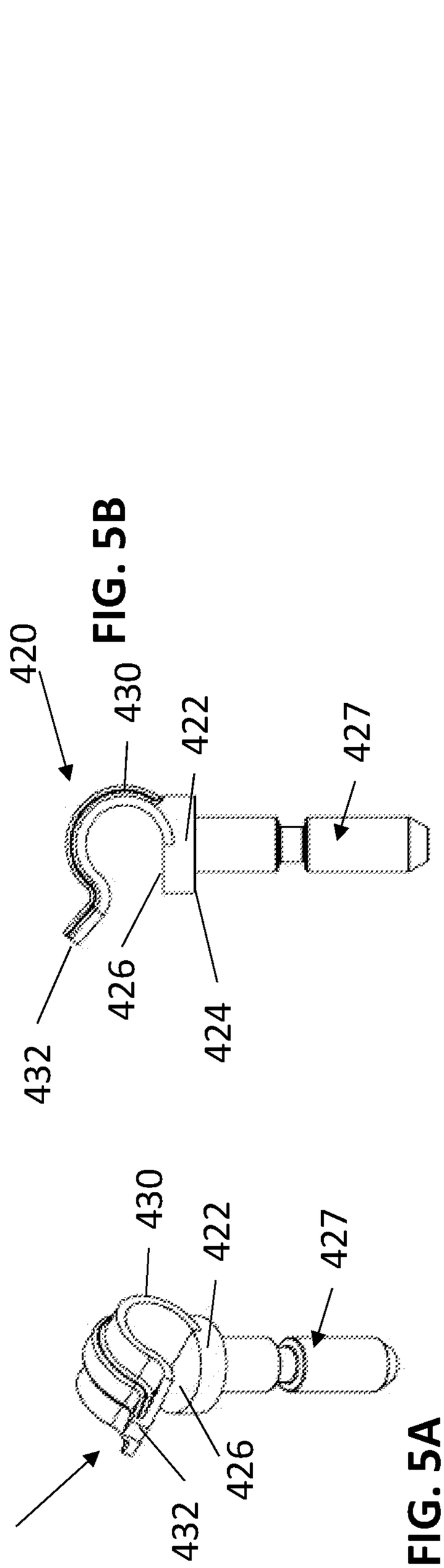

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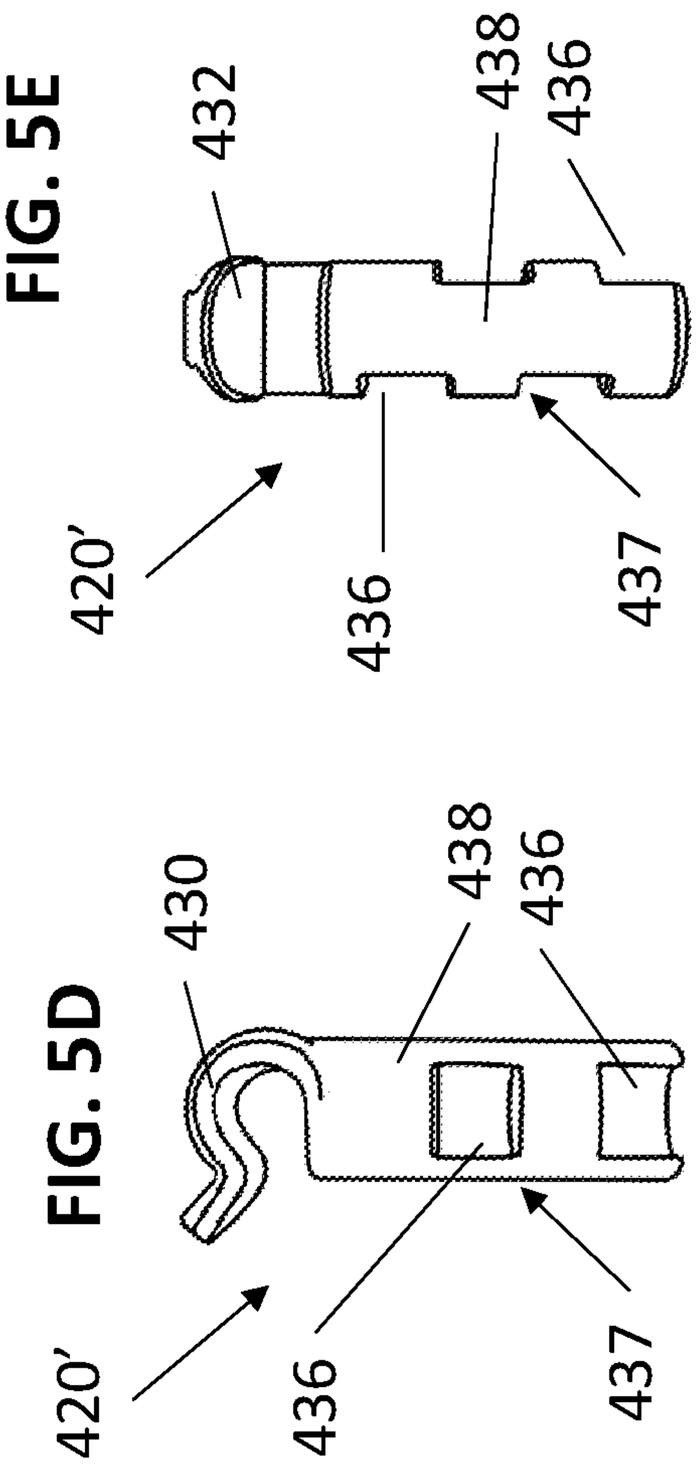

FIG. 5E

FIG. 5D

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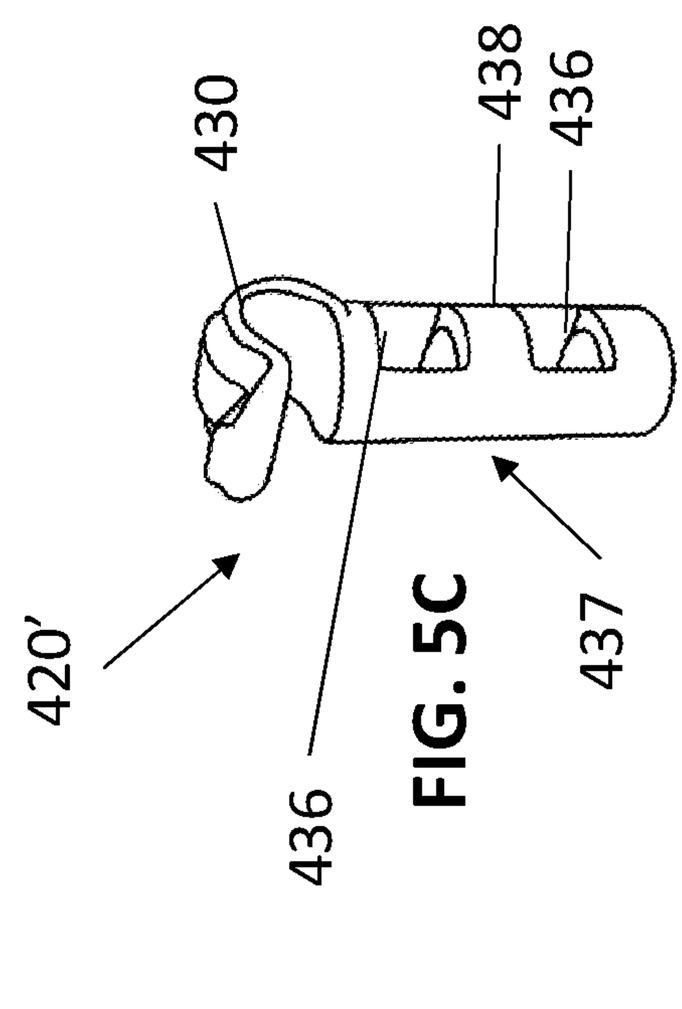

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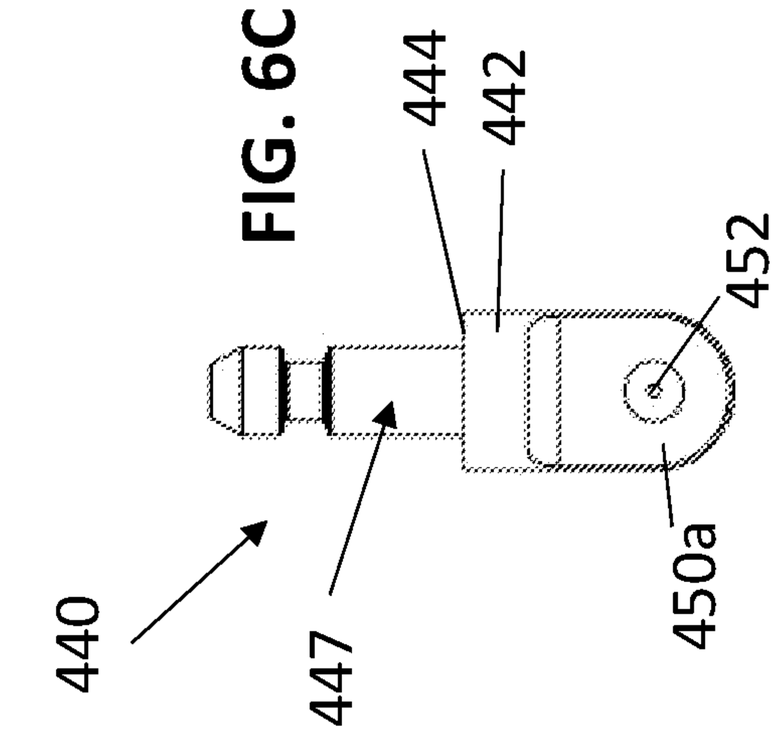

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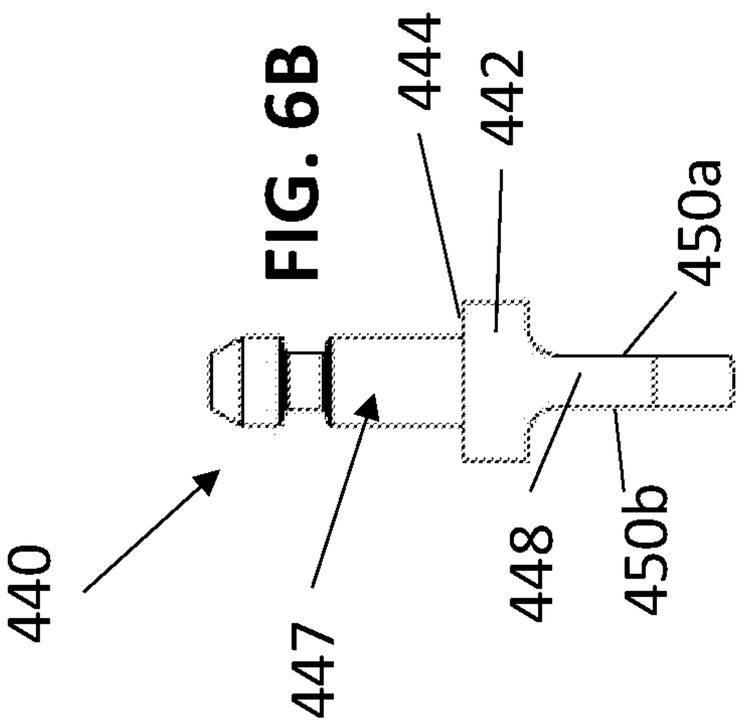

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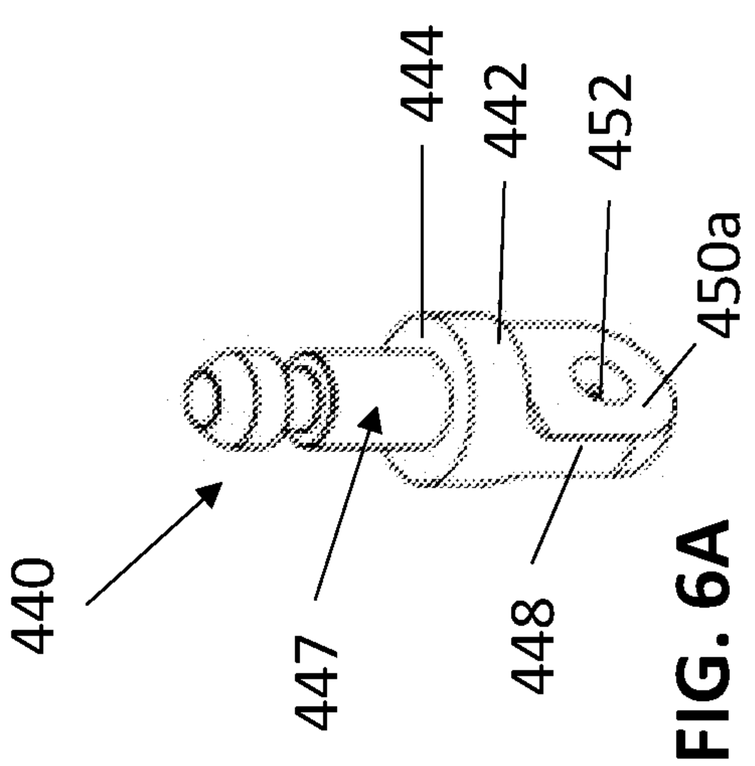

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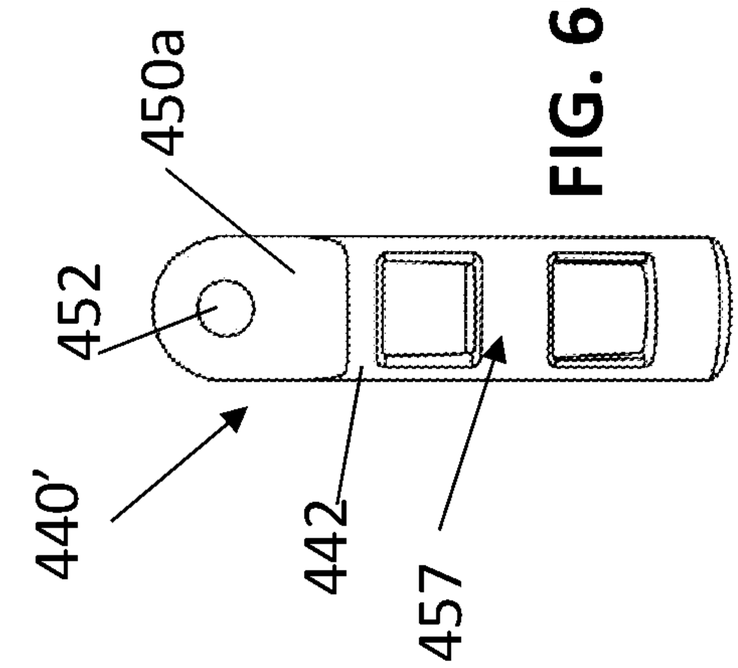

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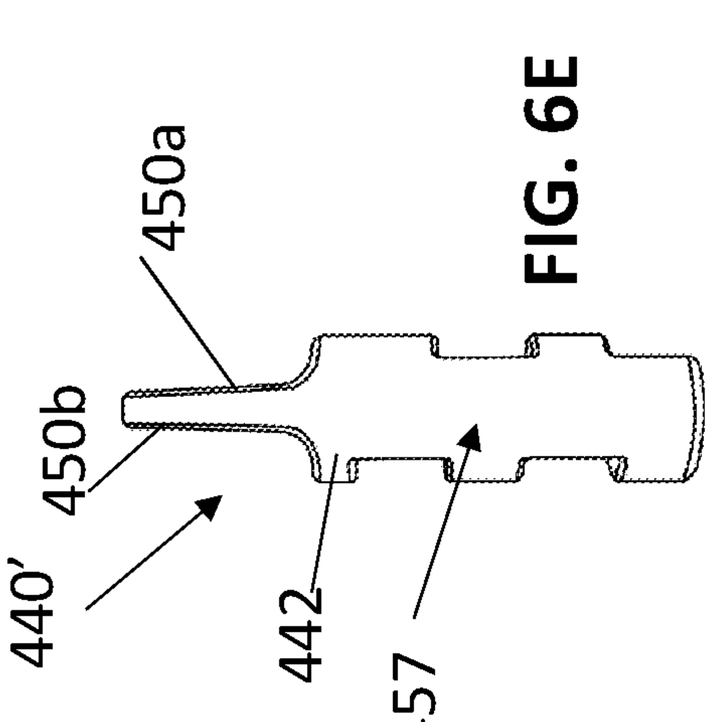

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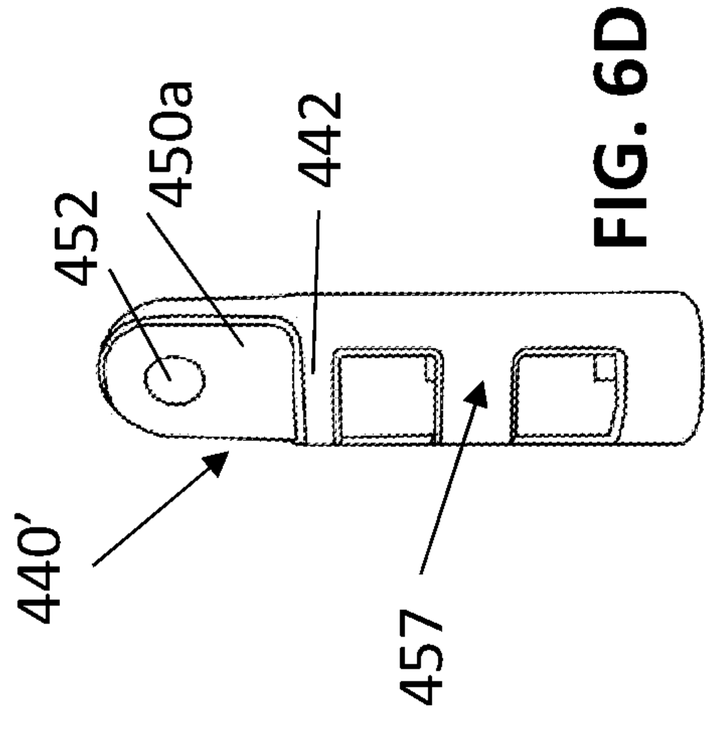

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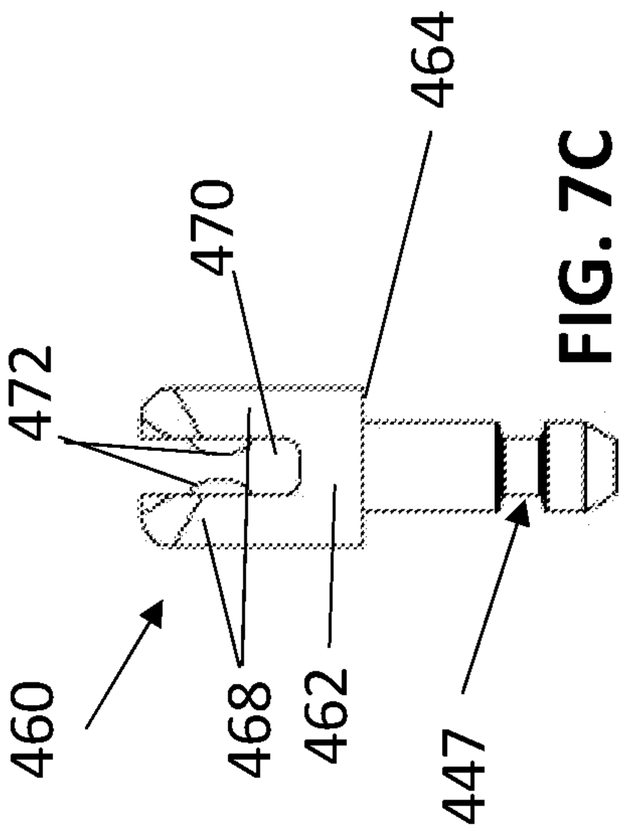

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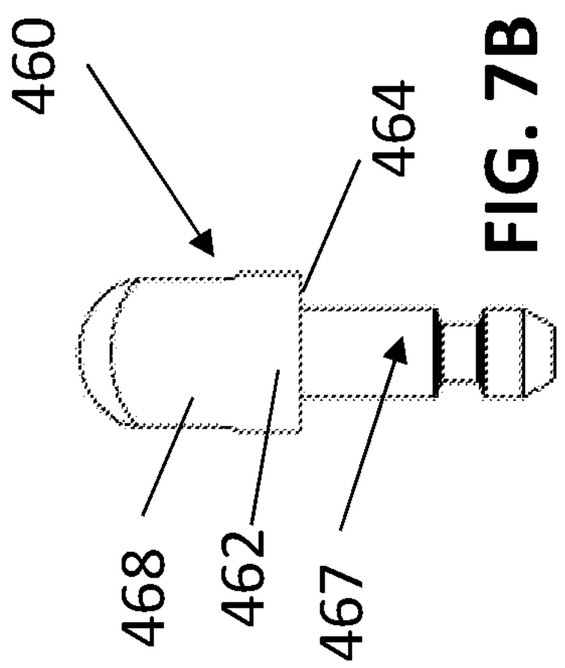

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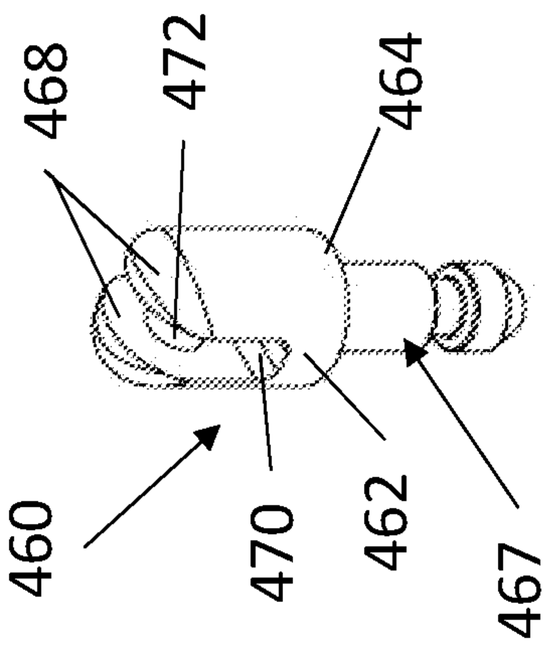

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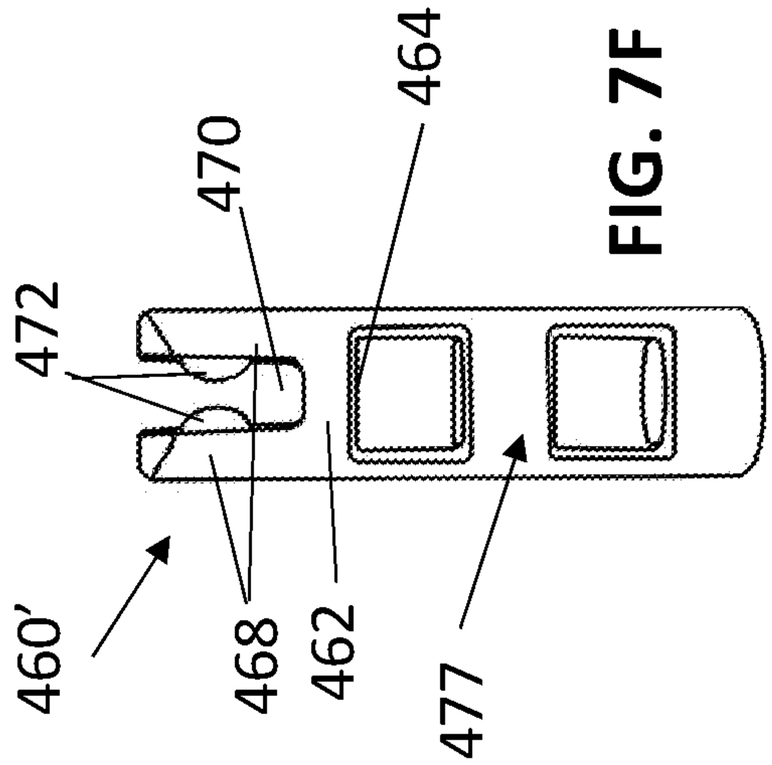

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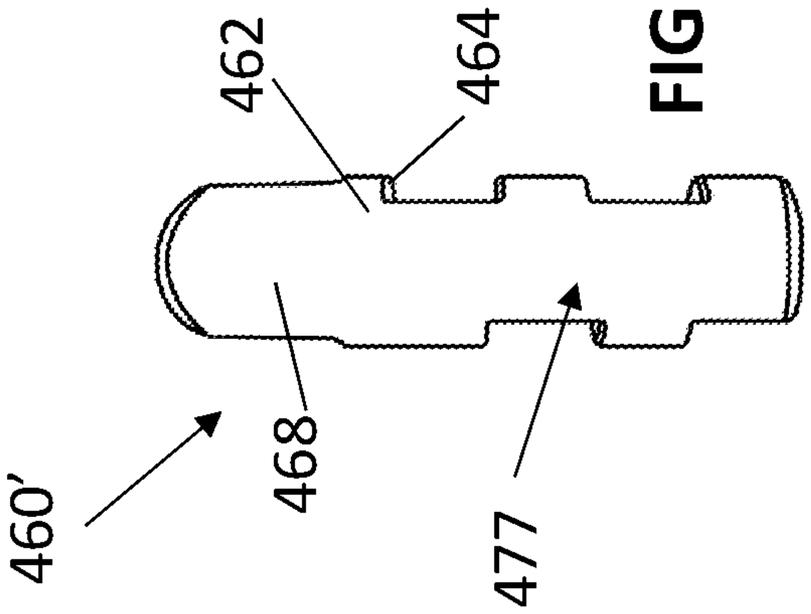

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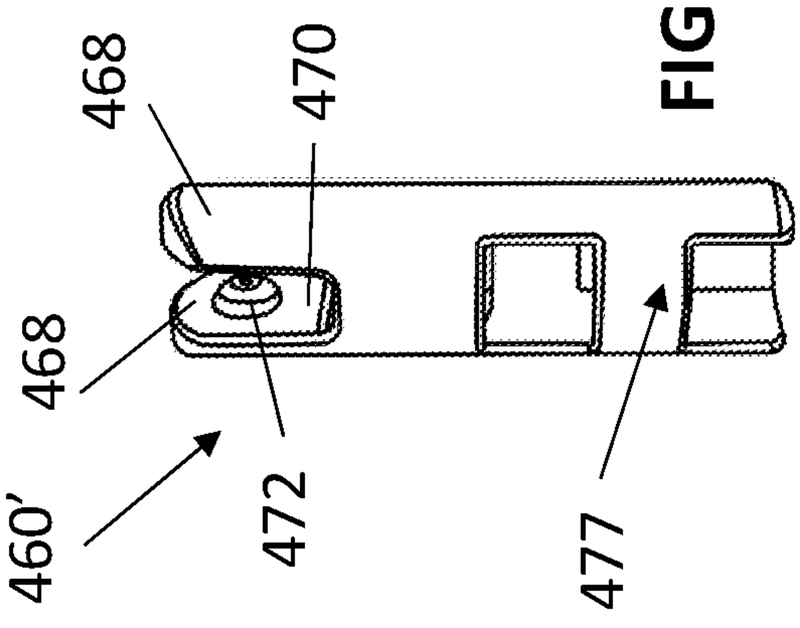

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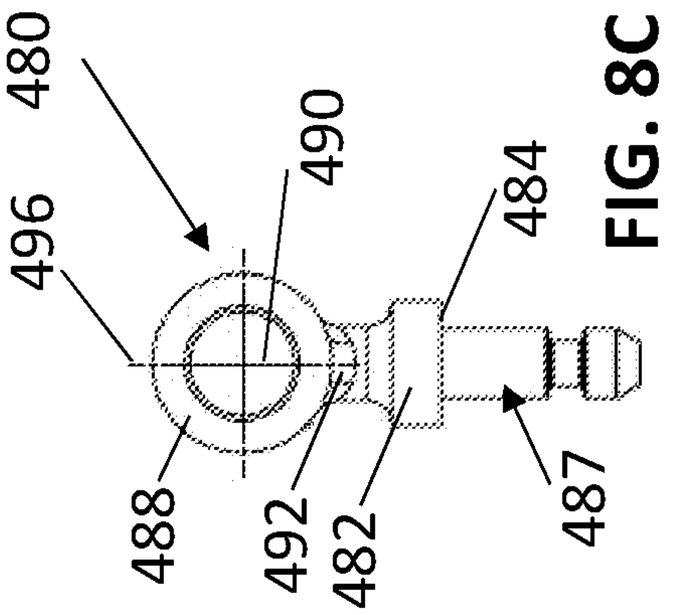
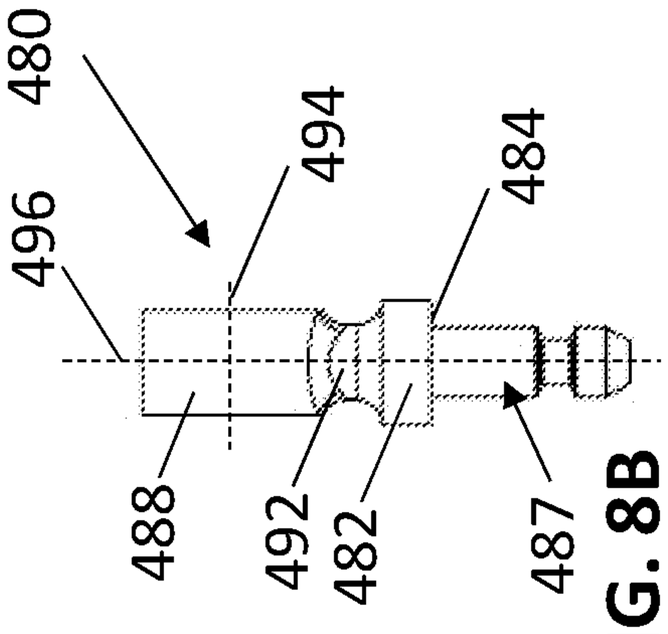


FIG. 8C



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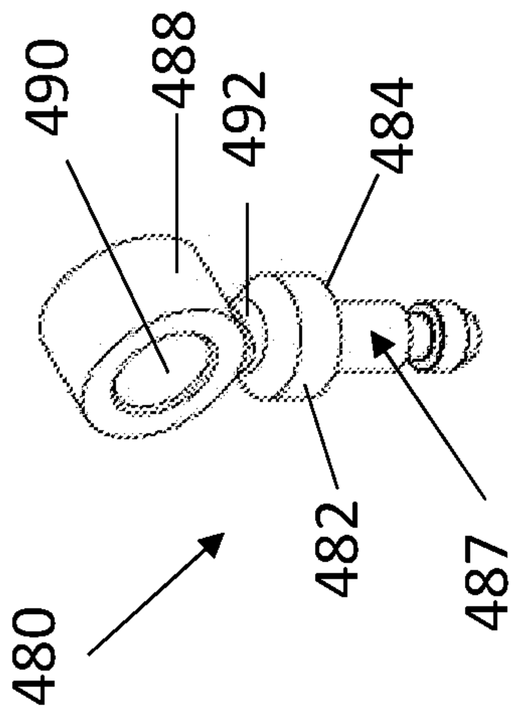
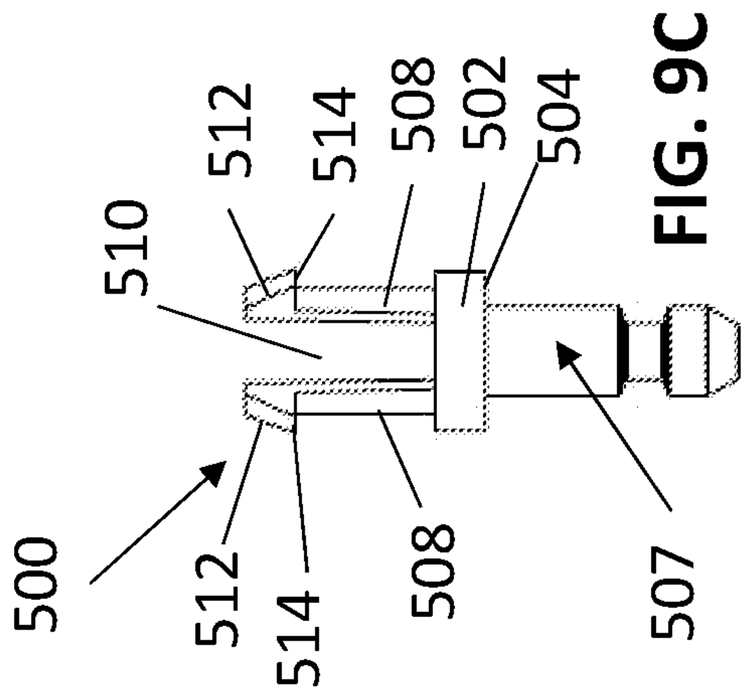


FIG. 8A



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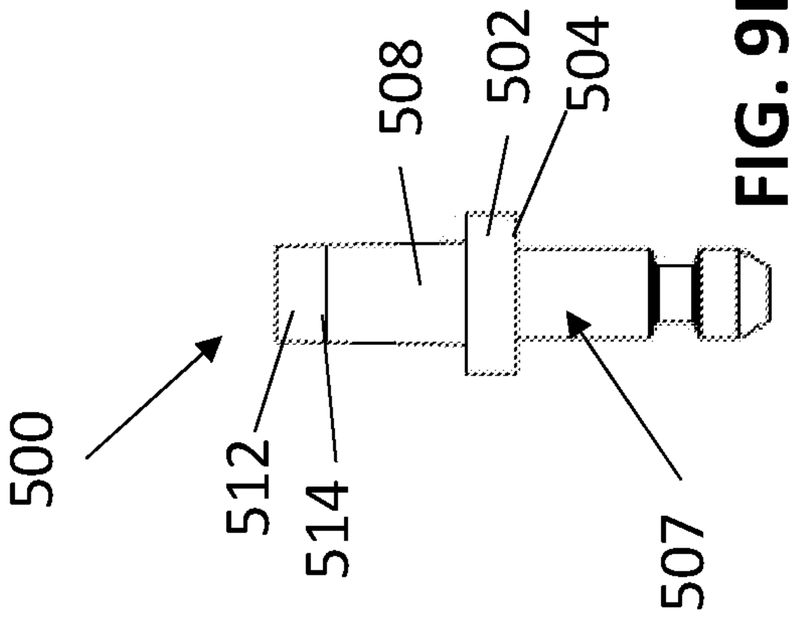

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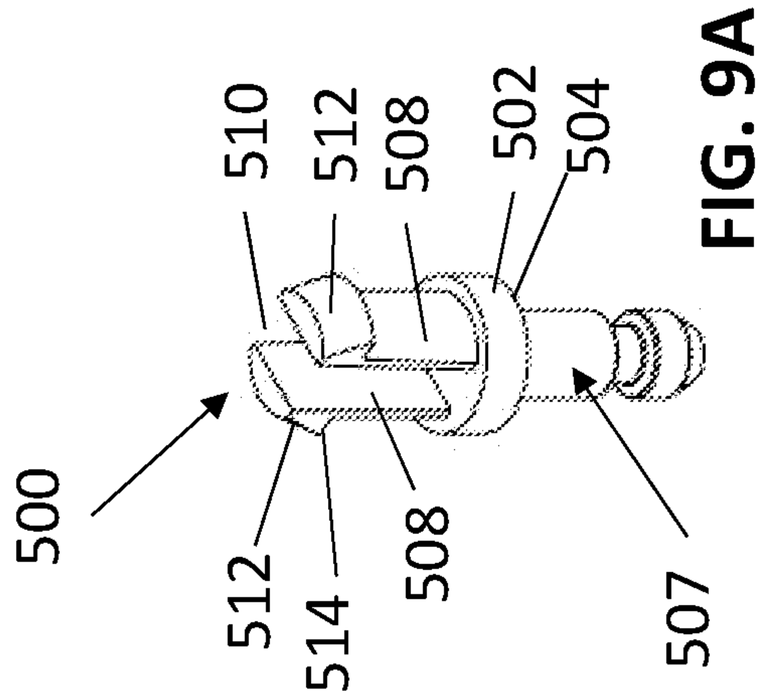

FIG. 9A

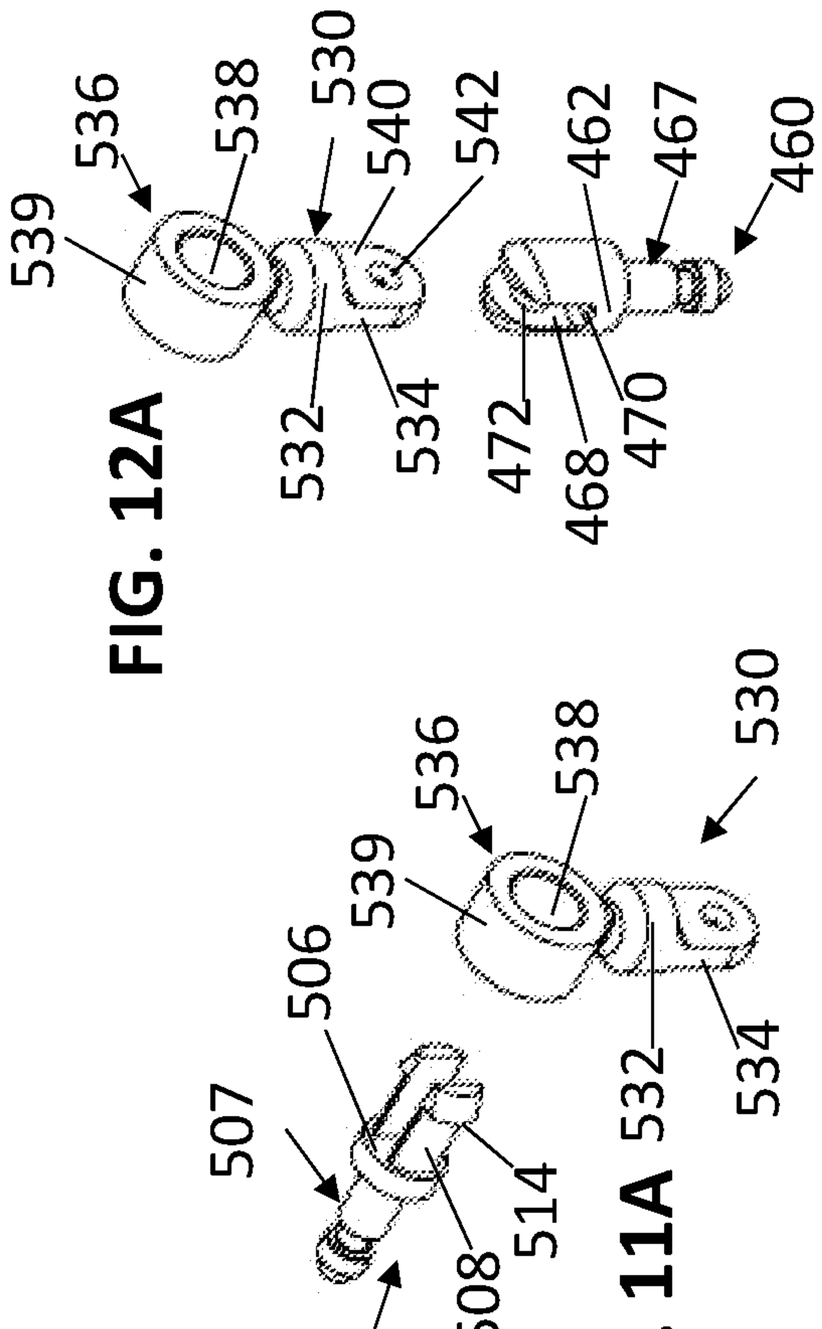

FIG. 12A

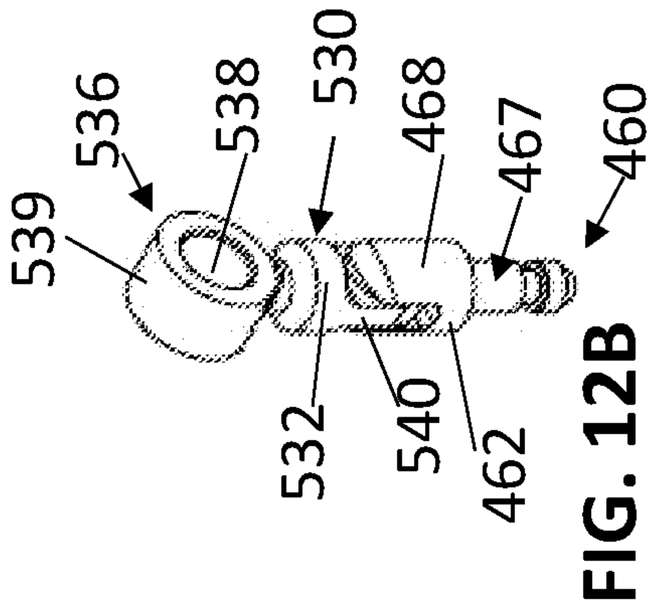

FIG. 12B

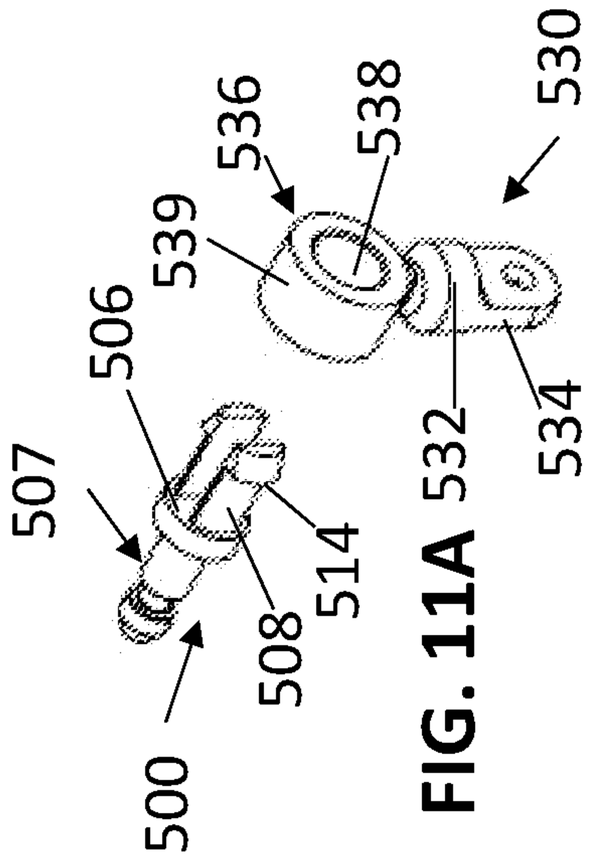

FIG. 11A

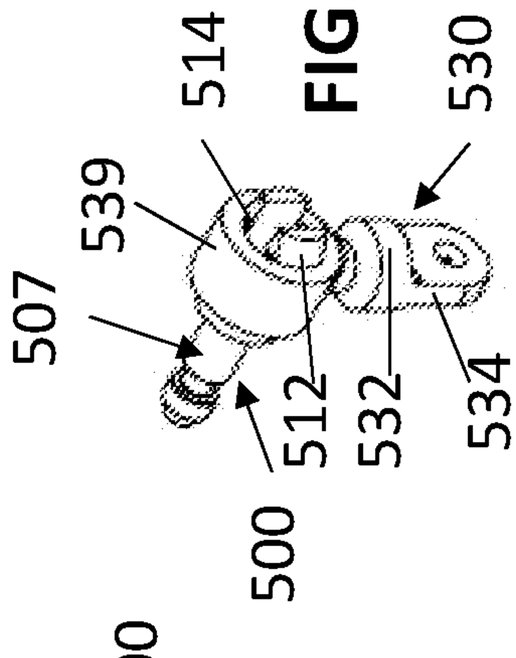

FIG. 11B

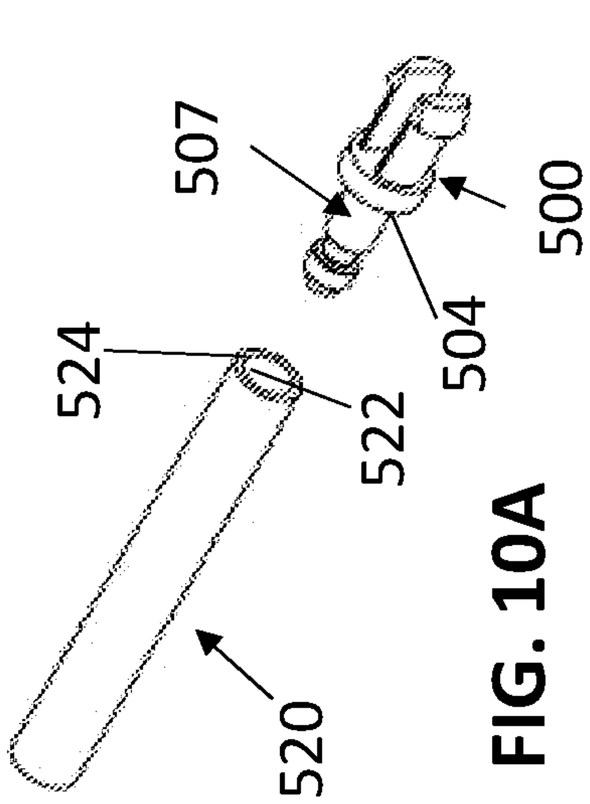

FIG. 10A

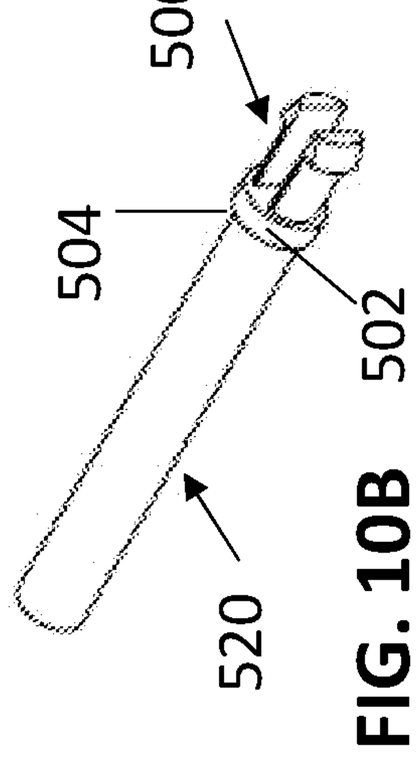

FIG. 10B

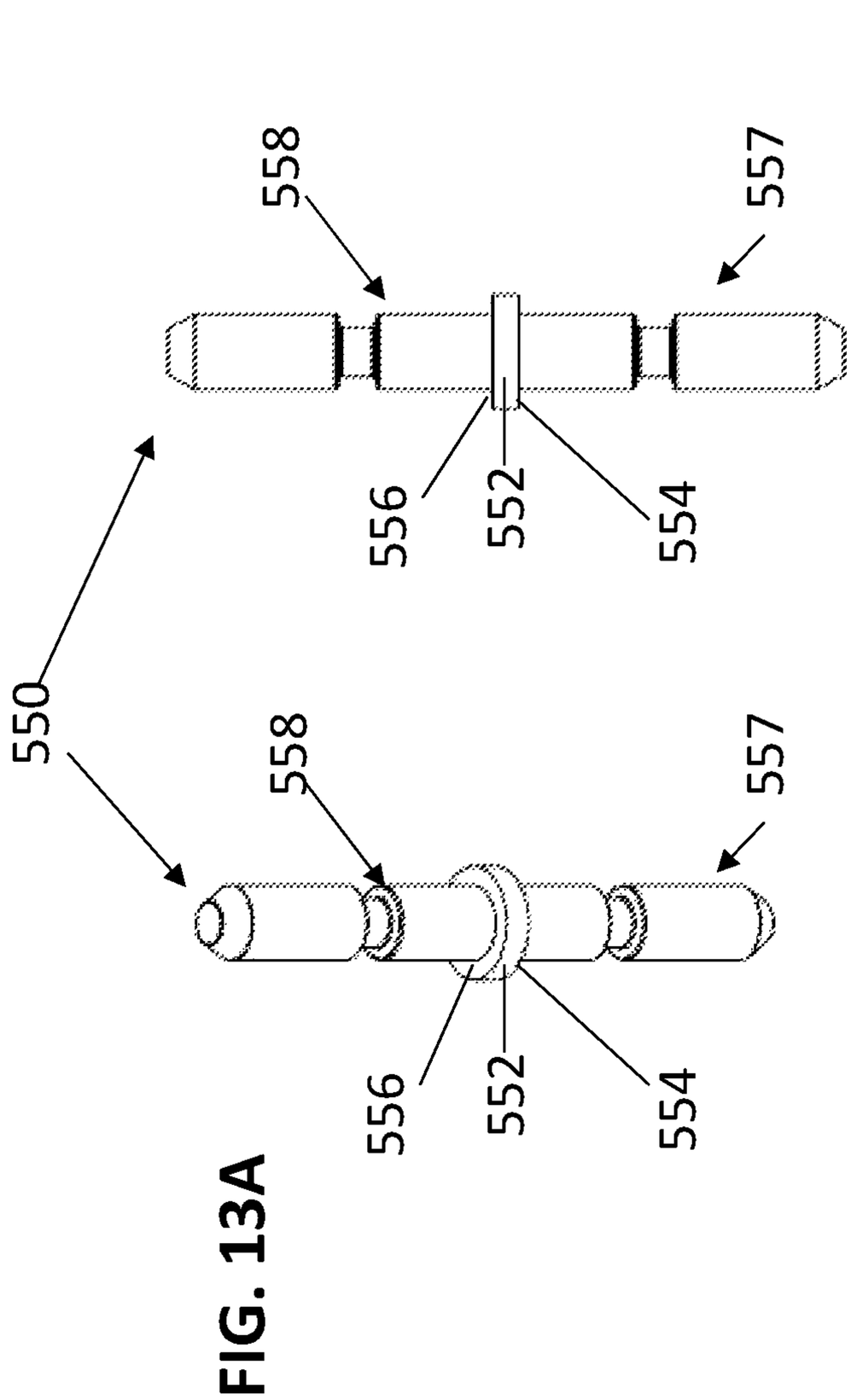

FIG. 13A

FIG. 13B

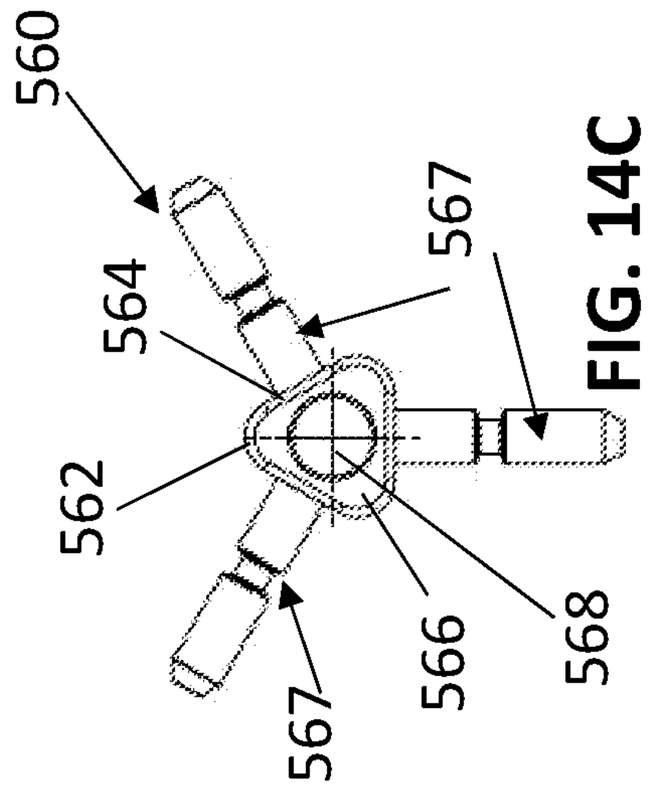

FIG. 14C

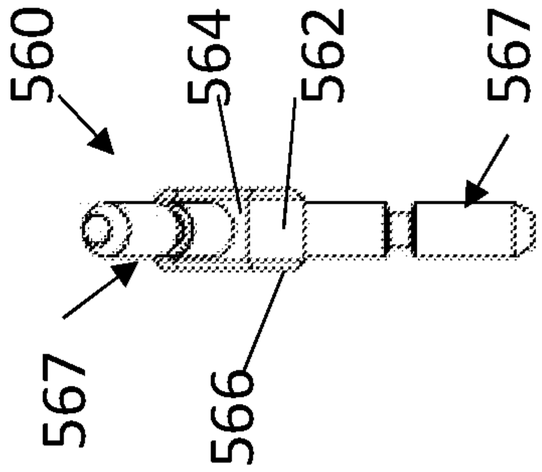

FIG. 14B

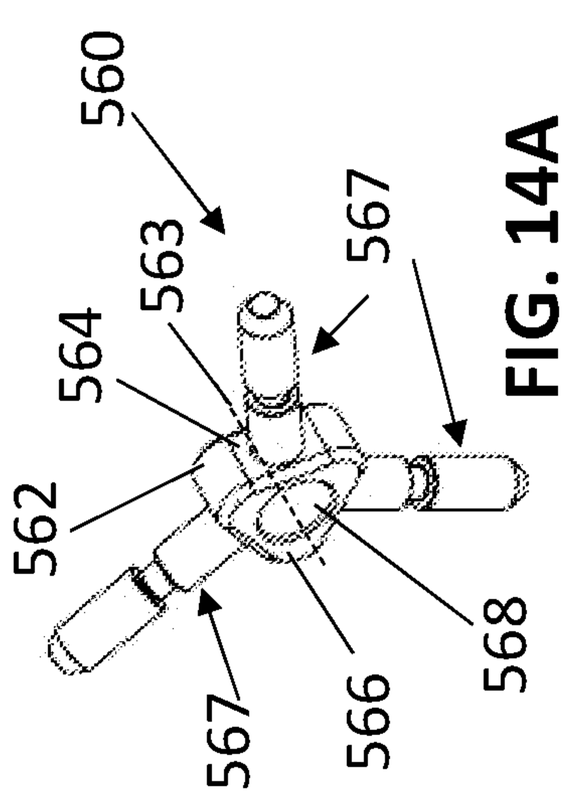

FIG. 14A

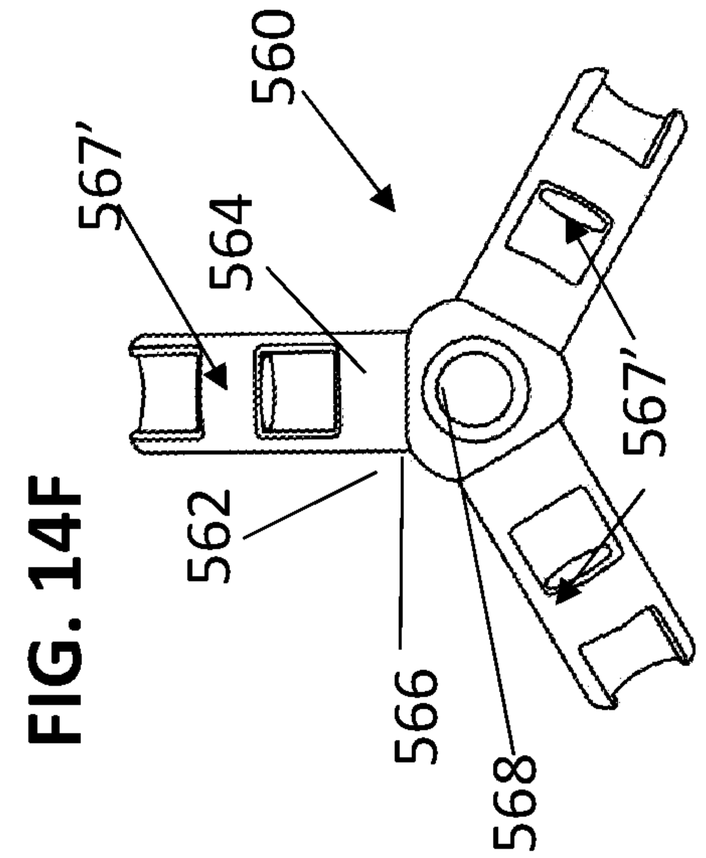

FIG. 14F

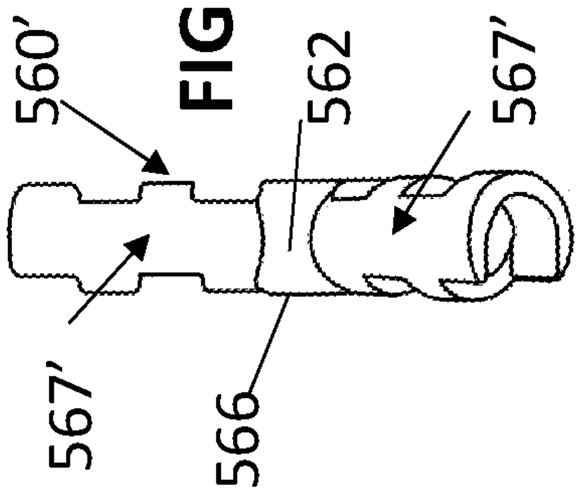

FIG. 14E

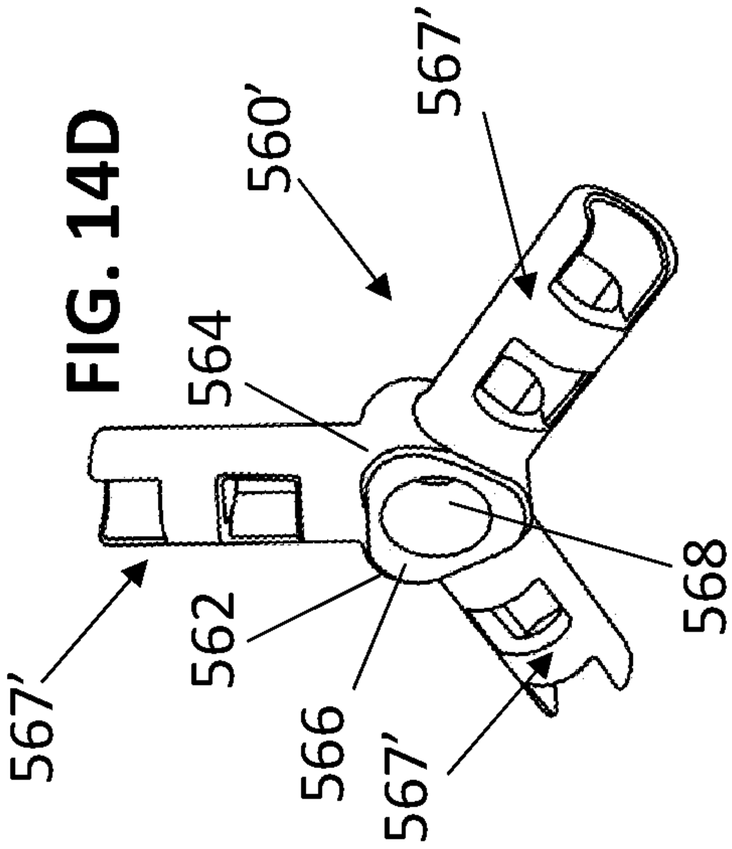

FIG. 14D

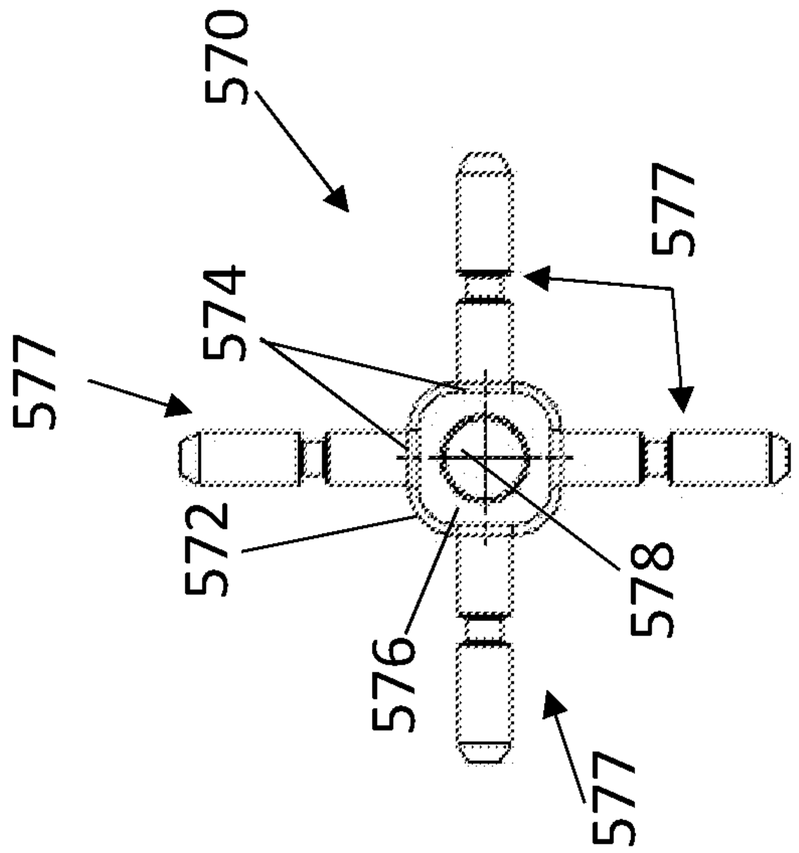

FIG. 15C

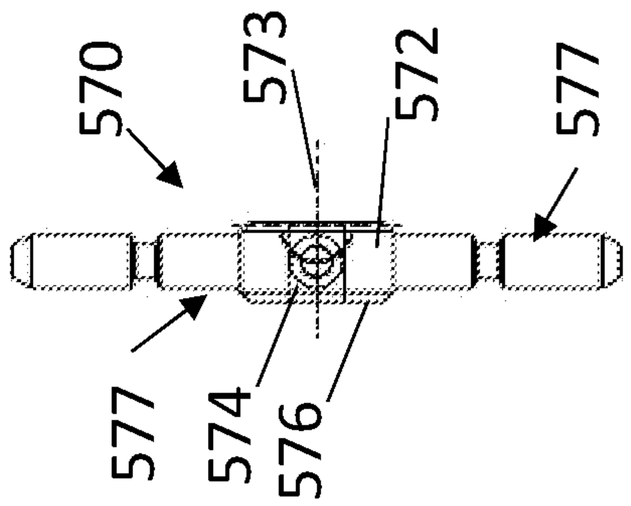

FIG. 15B

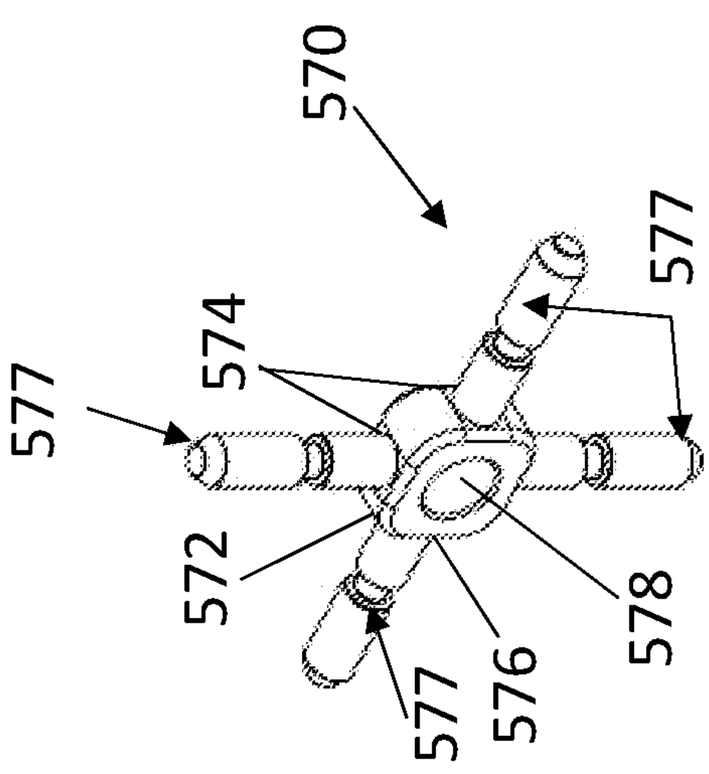

FIG. 15A

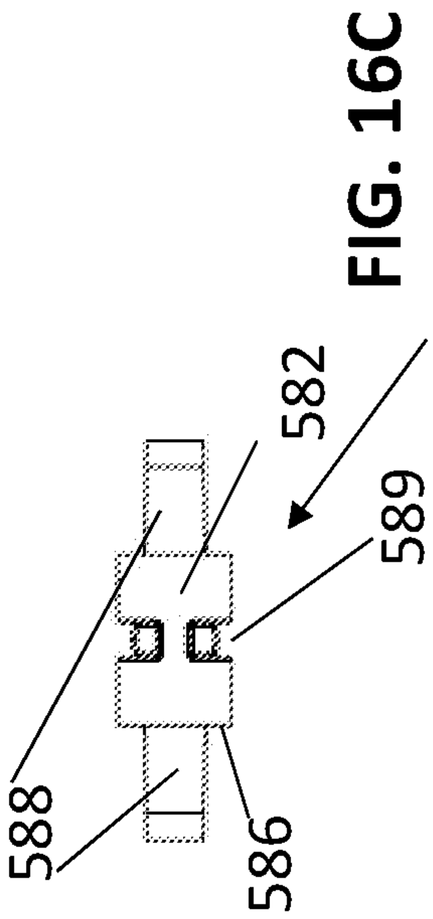

FIG. 16C

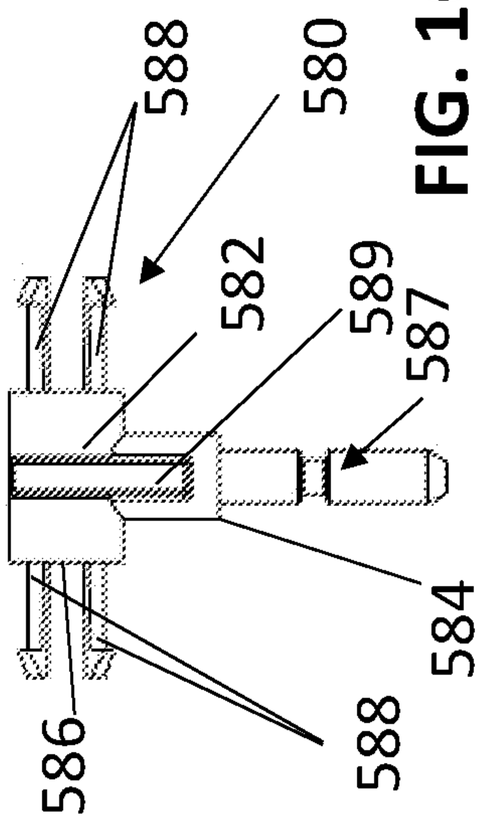

FIG. 16D

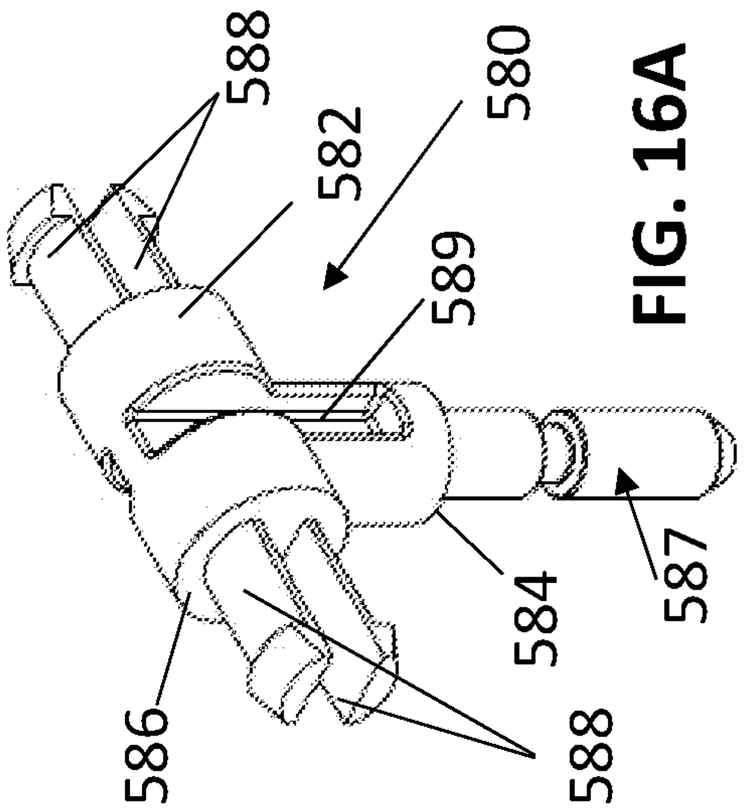

FIG. 16A

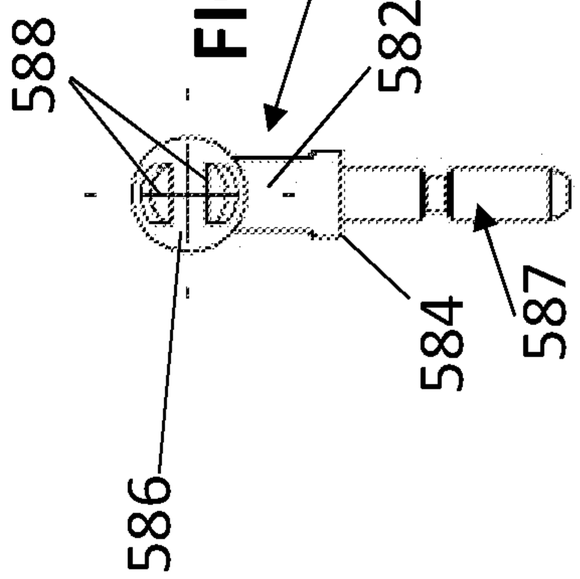

FIG. 16B

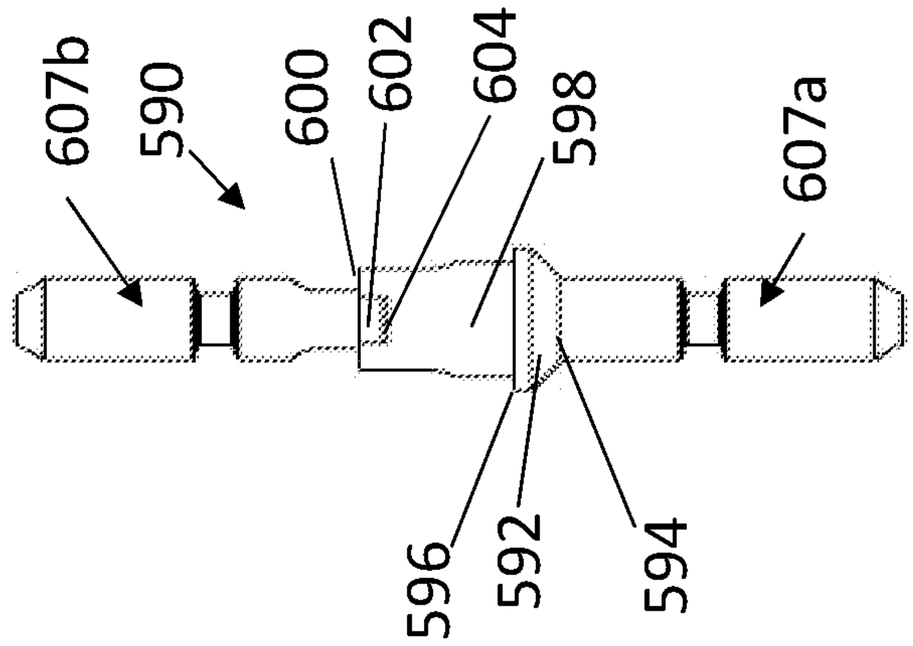

FIG. 17C

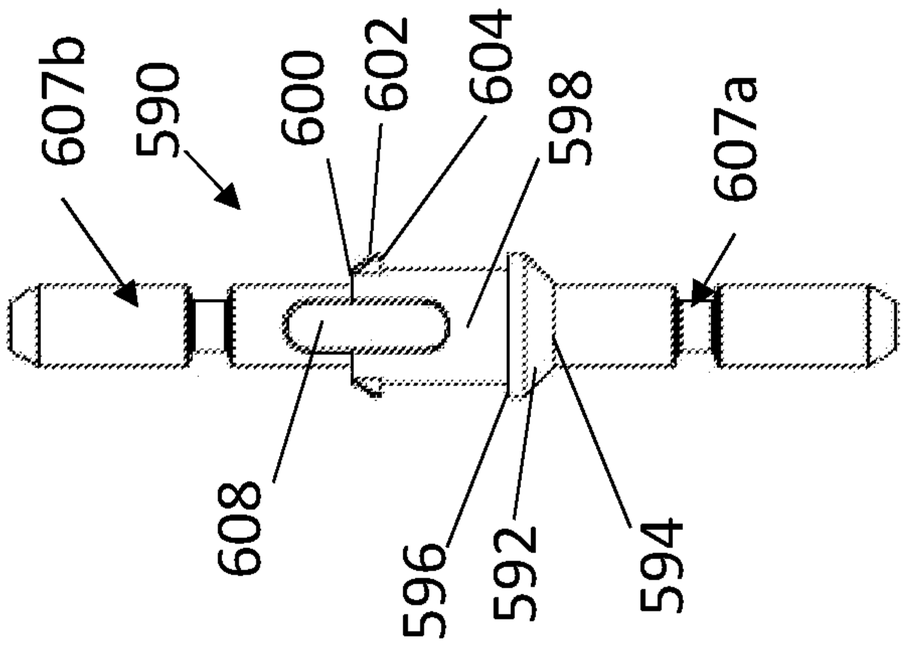

FIG. 17B

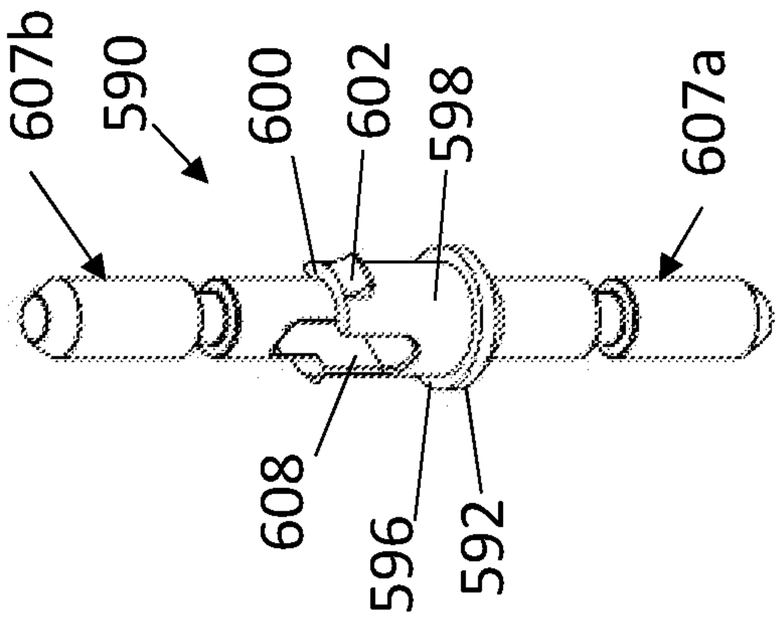

FIG. 17A

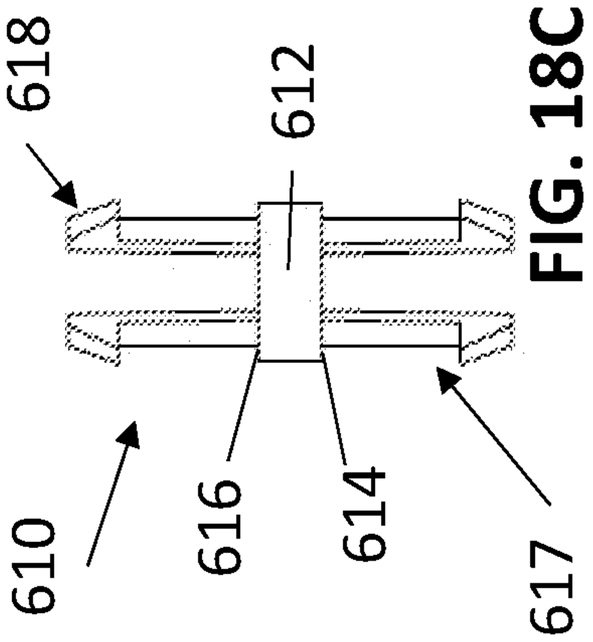

FIG. 18C

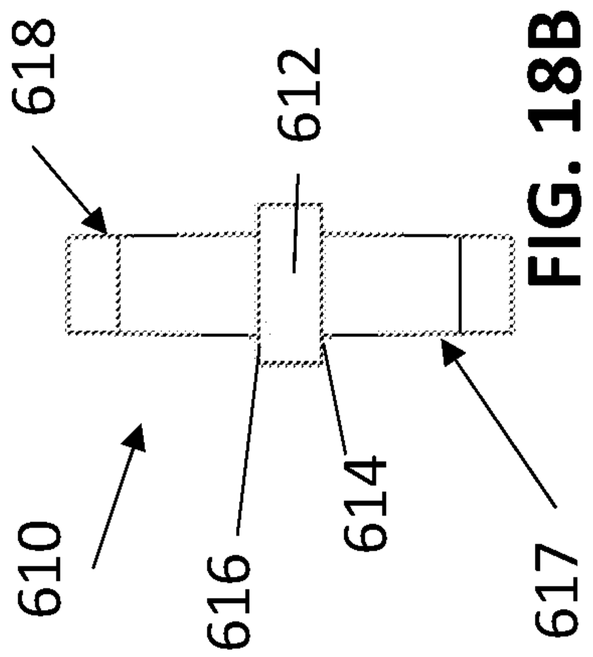

FIG. 18B

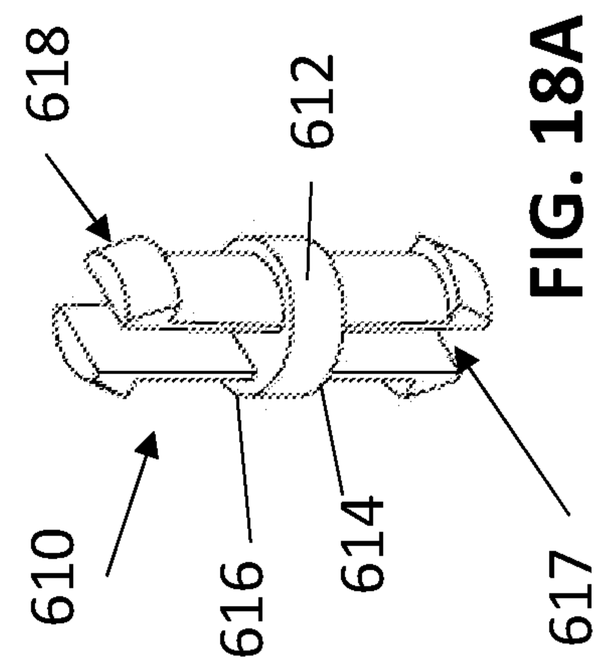

FIG. 18A

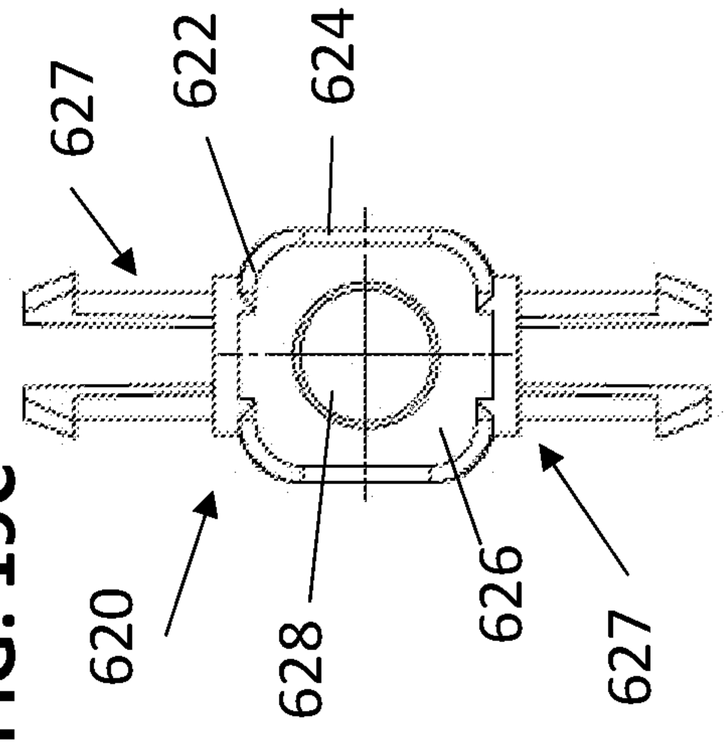

FIG. 19C

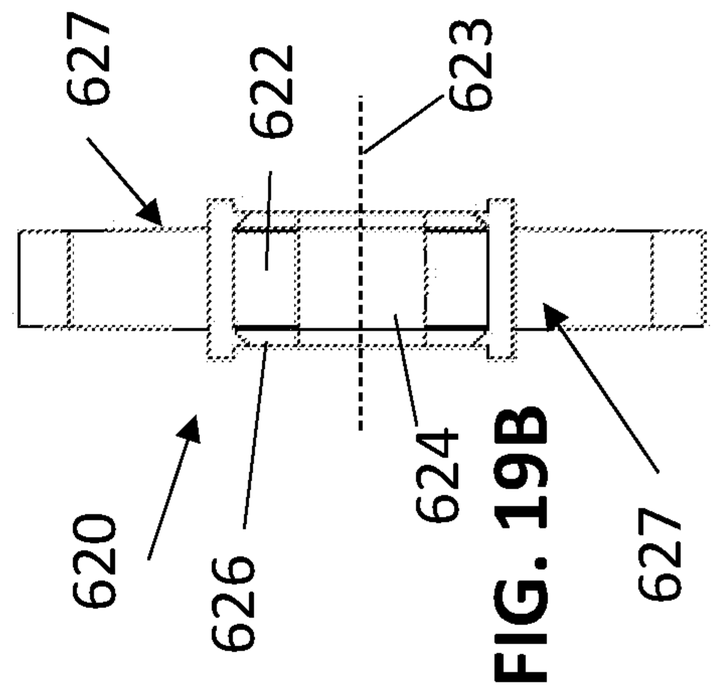

FIG. 19B

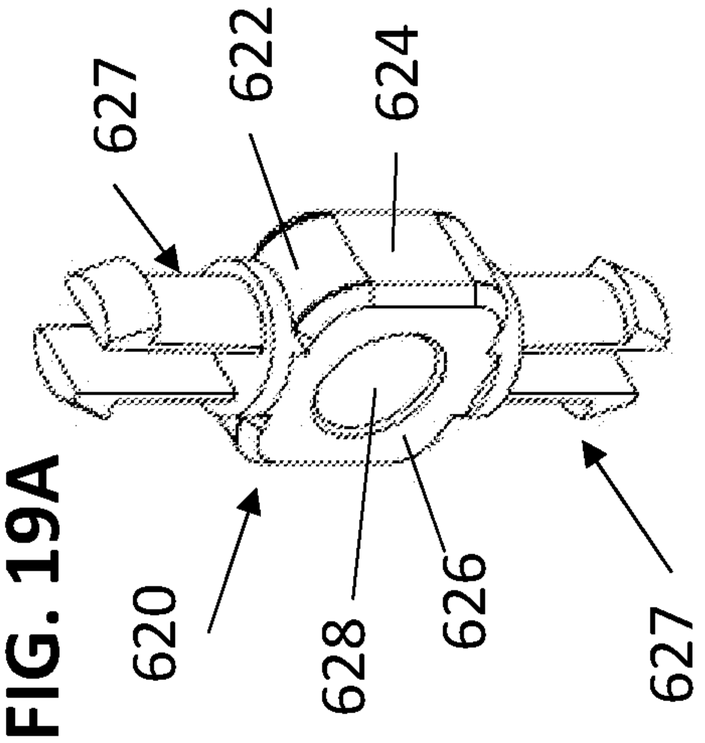

FIG. 19A

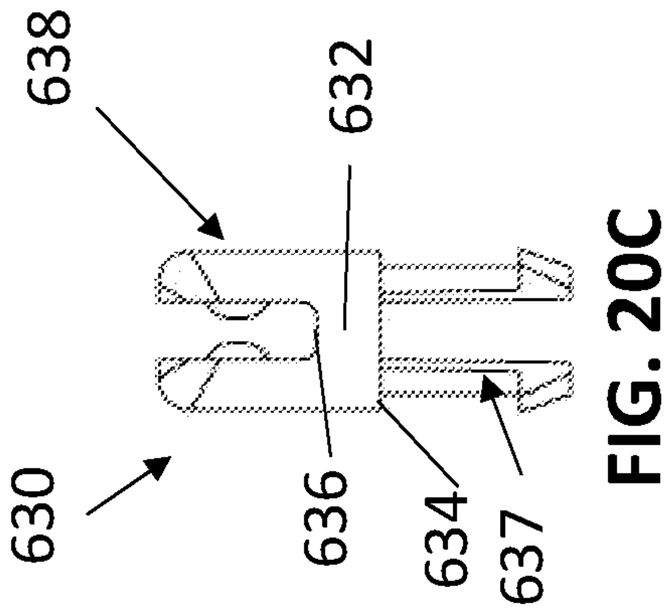

FIG. 20C

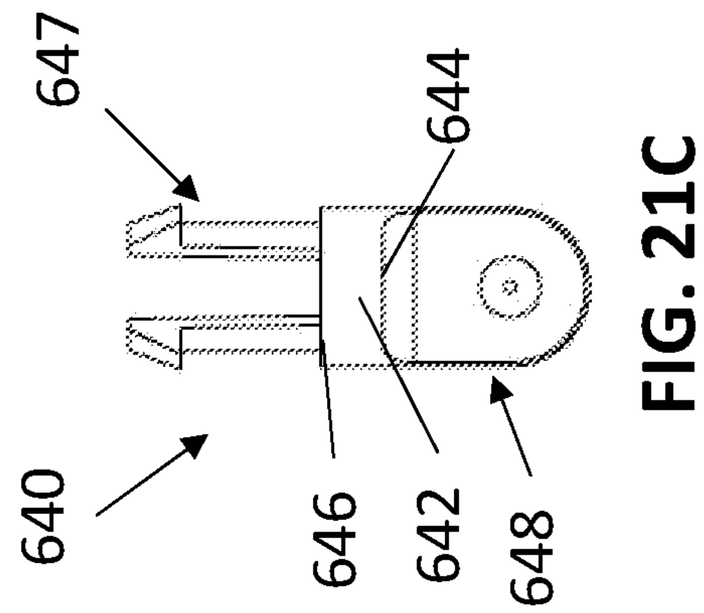

FIG. 21C

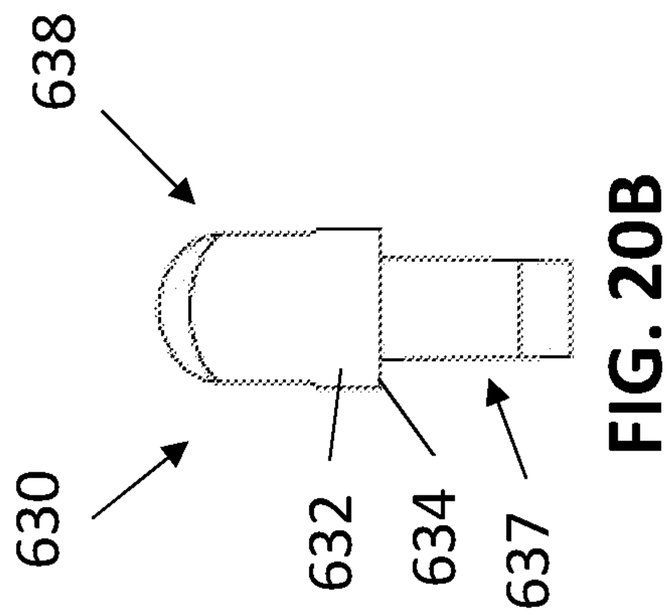

FIG. 20B

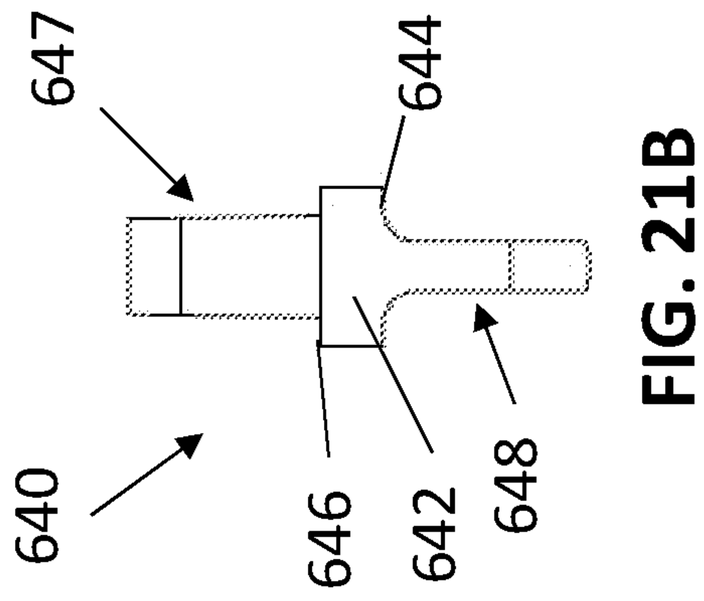

FIG. 21B

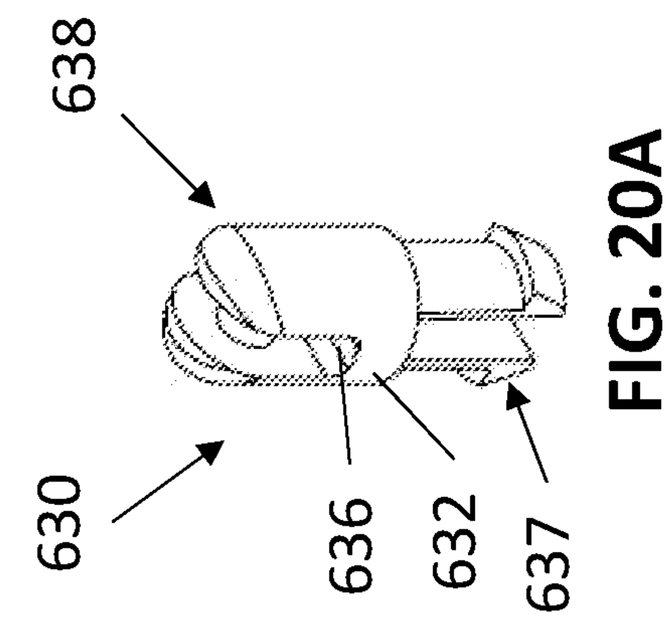

FIG. 20A

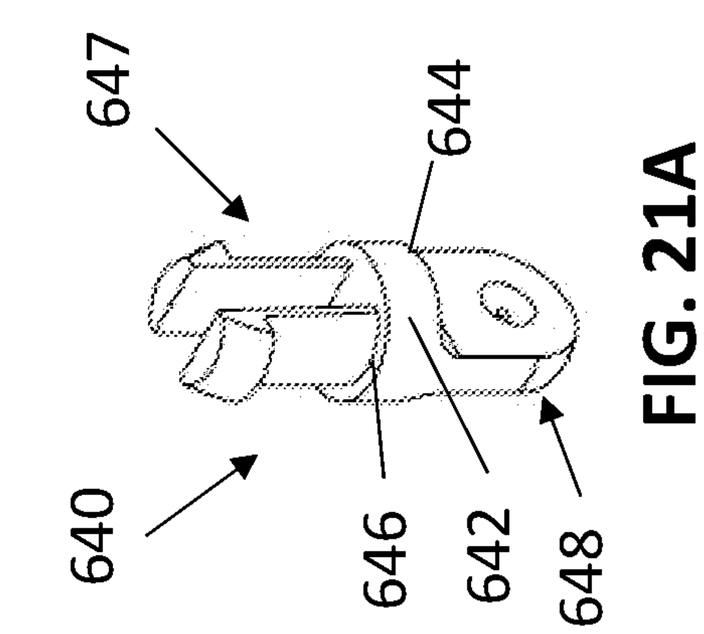

FIG. 21A

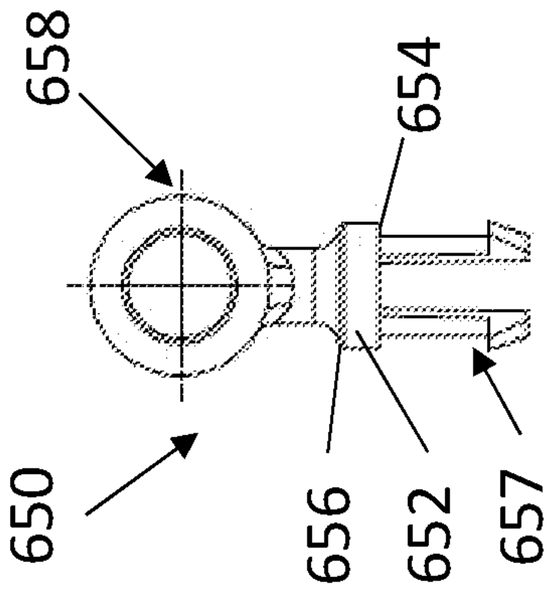

FIG. 22C

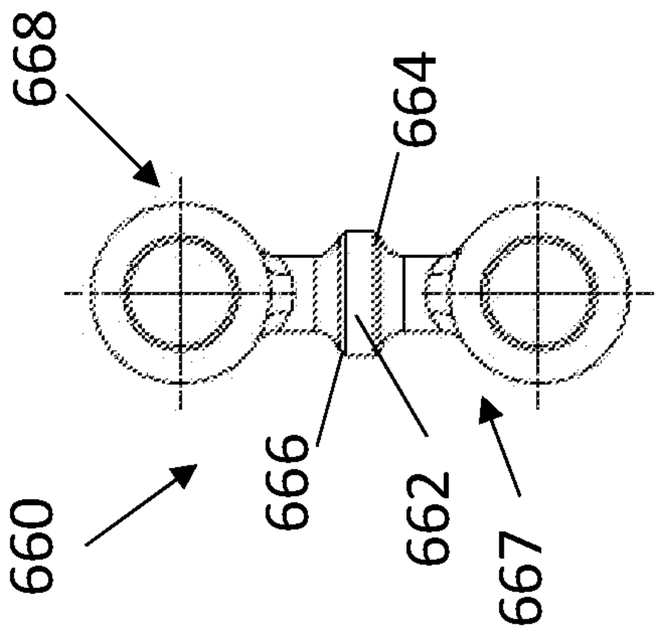

FIG. 23C

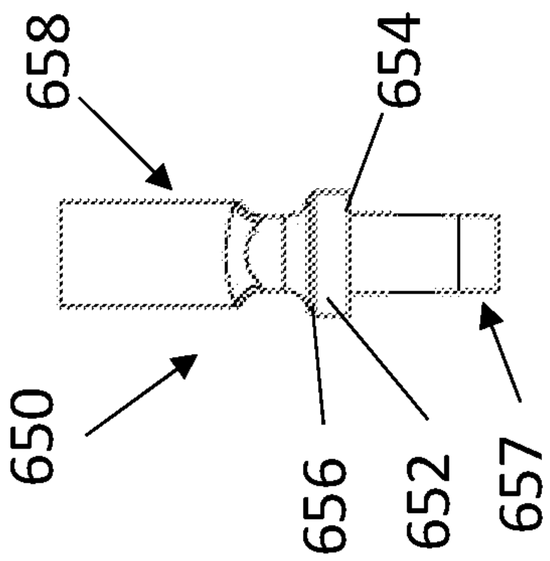

FIG. 22B

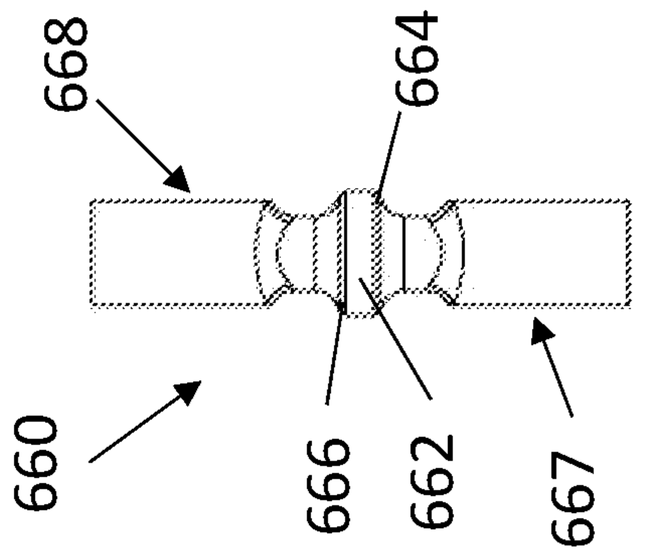

FIG. 23B

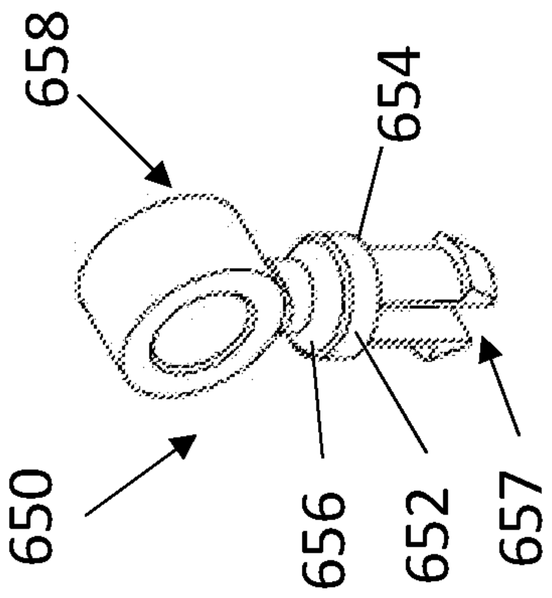

FIG. 22A

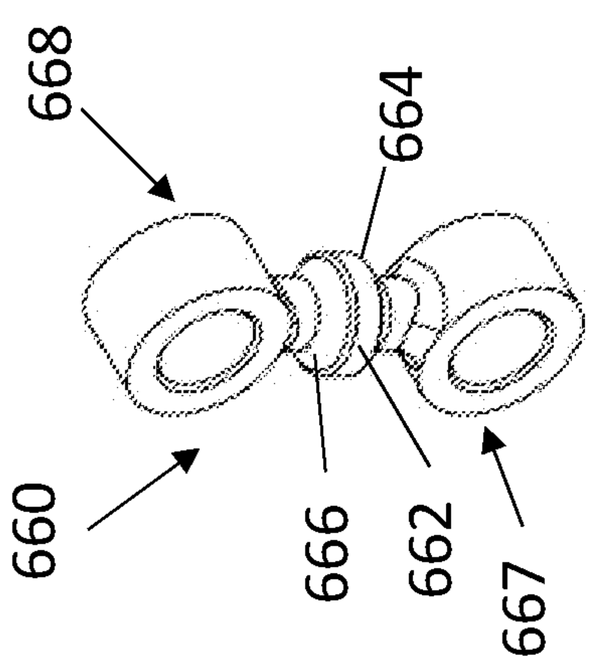

FIG. 23A

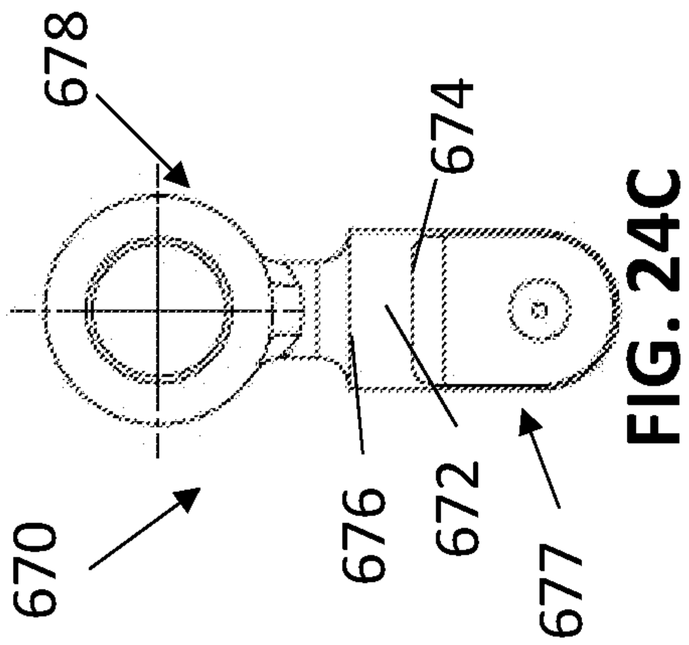

FIG. 24C

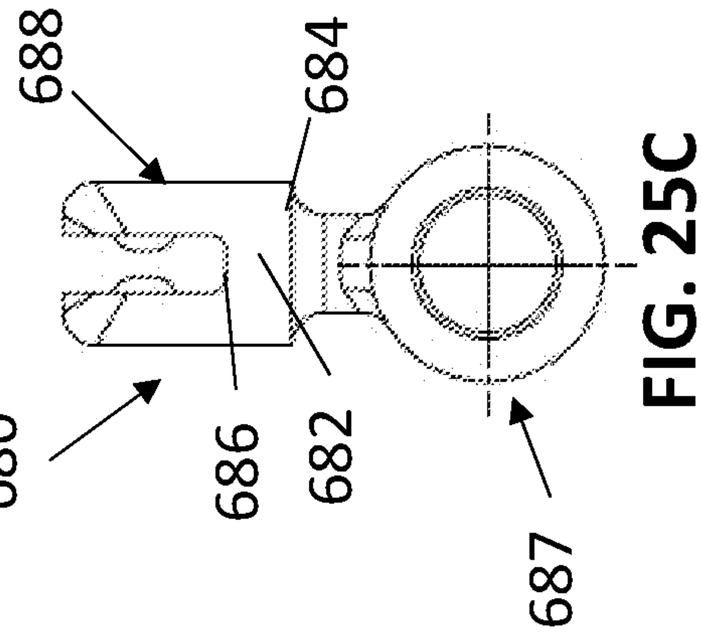

FIG. 25C

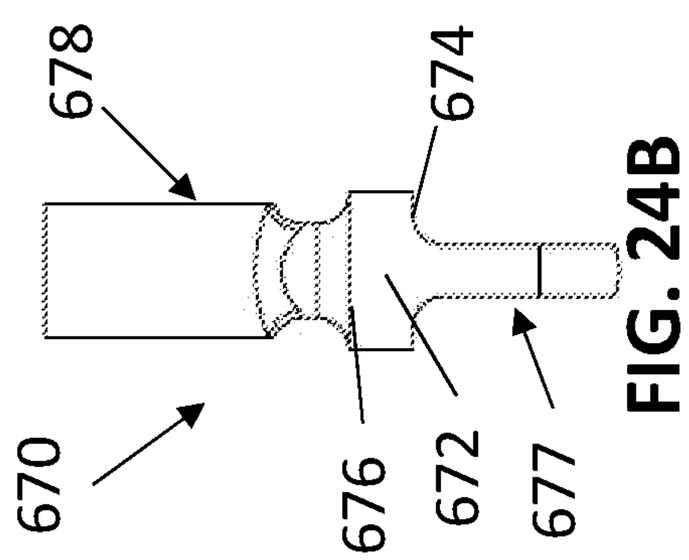

FIG. 24B

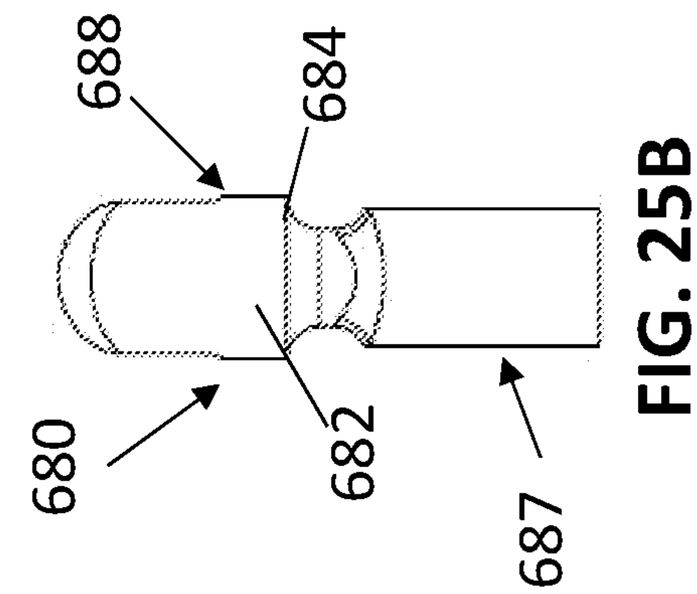

FIG. 25B

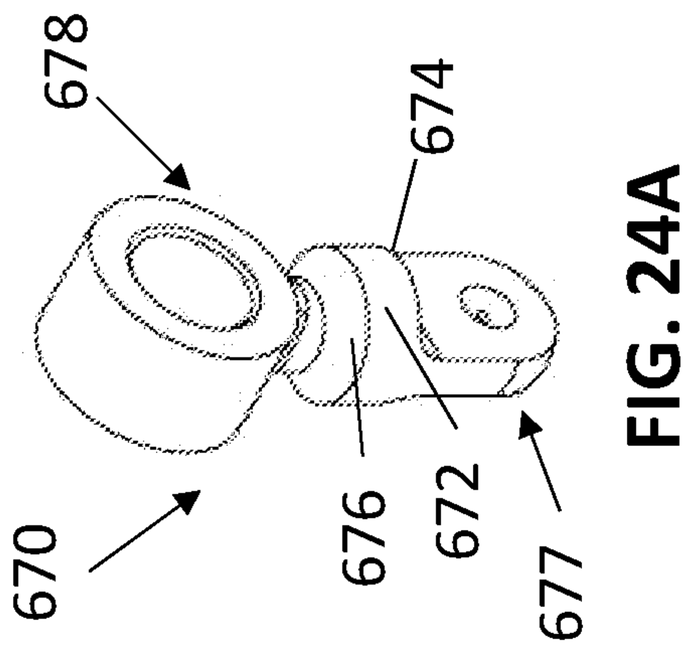

FIG. 24A

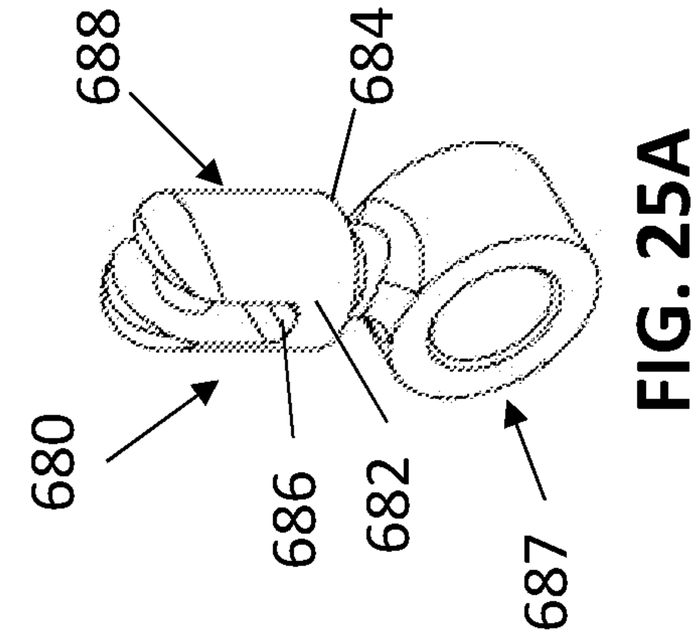

FIG. 25A

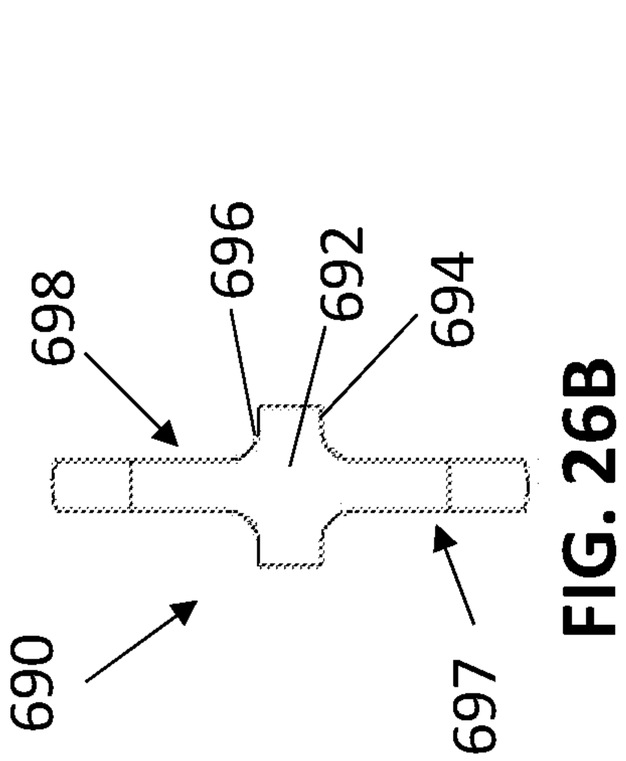

FIG. 26B

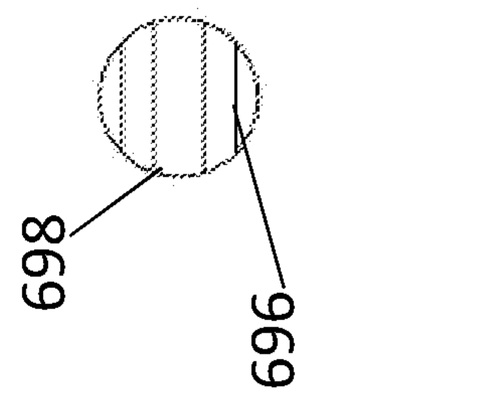

FIG. 26D

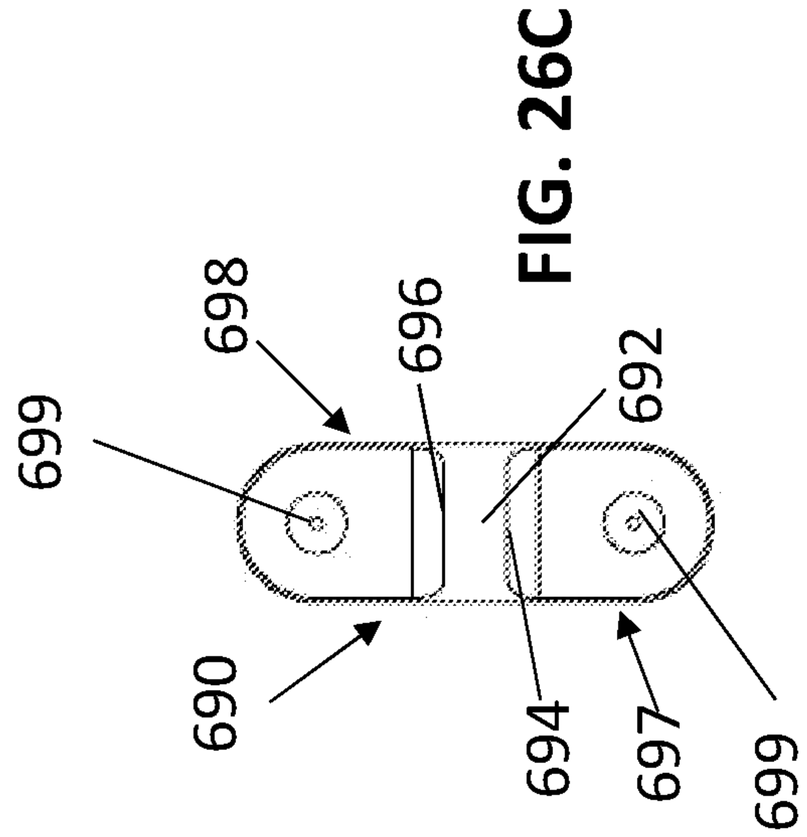

FIG. 26C

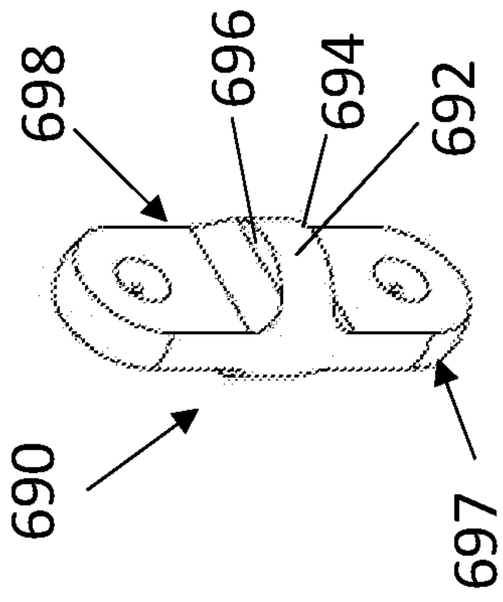

FIG. 26A

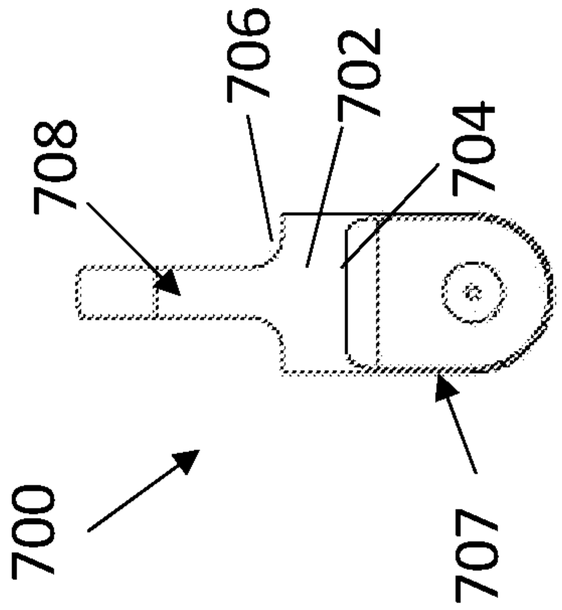

FIG. 27A

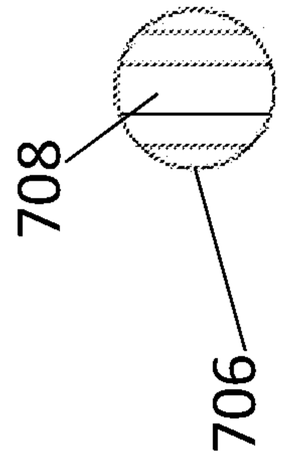

FIG. 27C

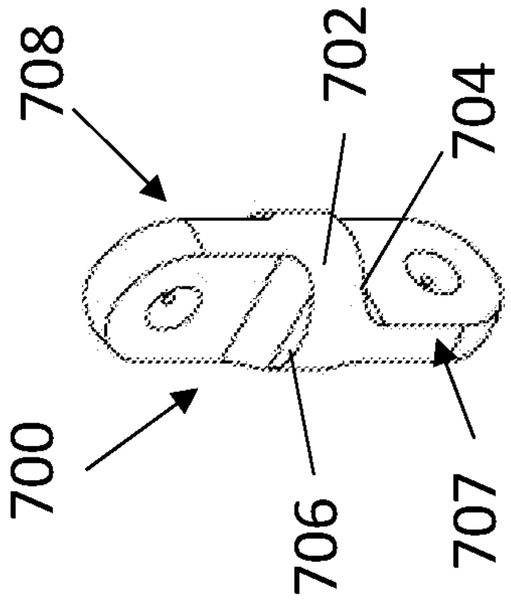

FIG. 27B

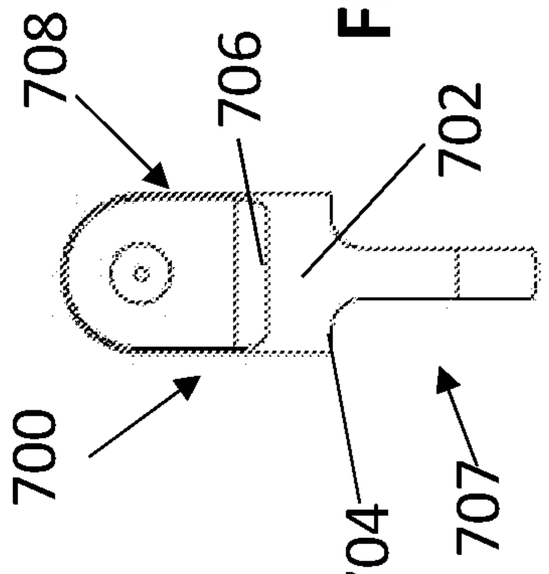

FIG. 27D

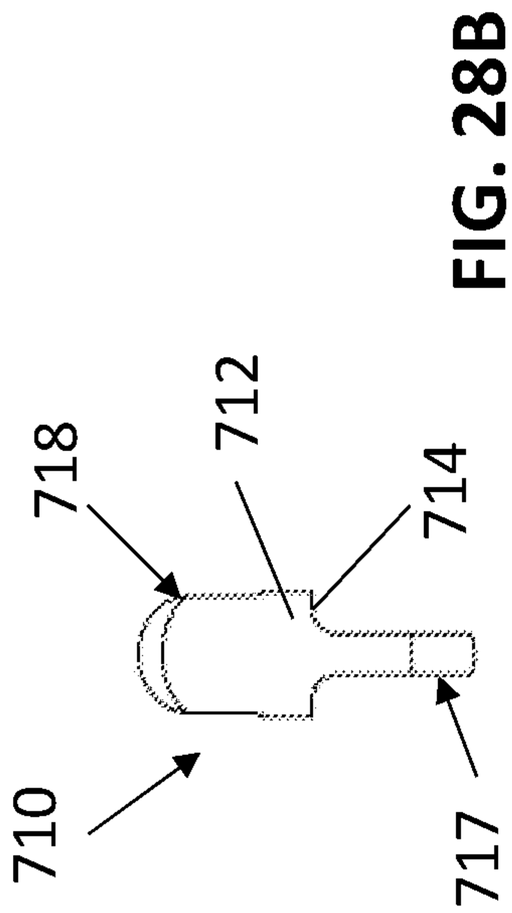

FIG. 28B

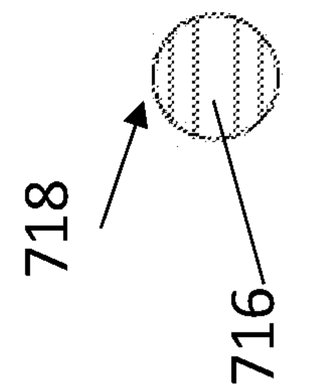

FIG. 28D

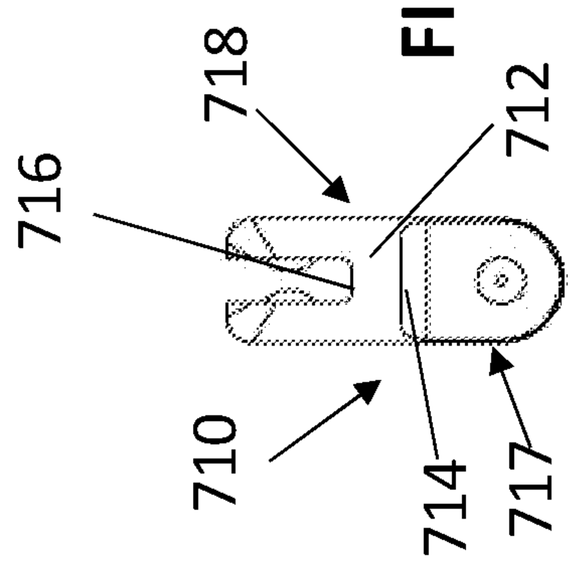

FIG. 28C

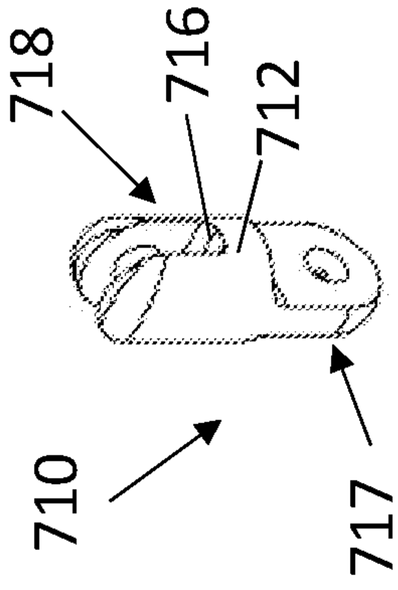

FIG. 28A

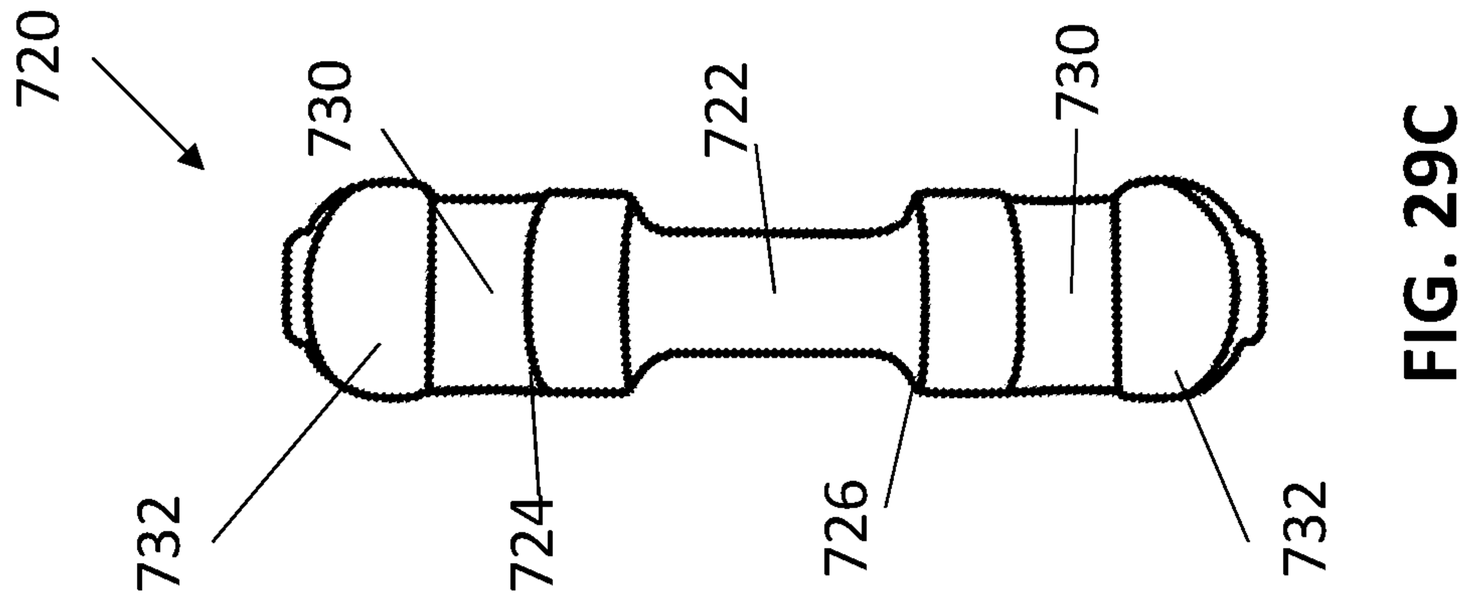

FIG. 29C

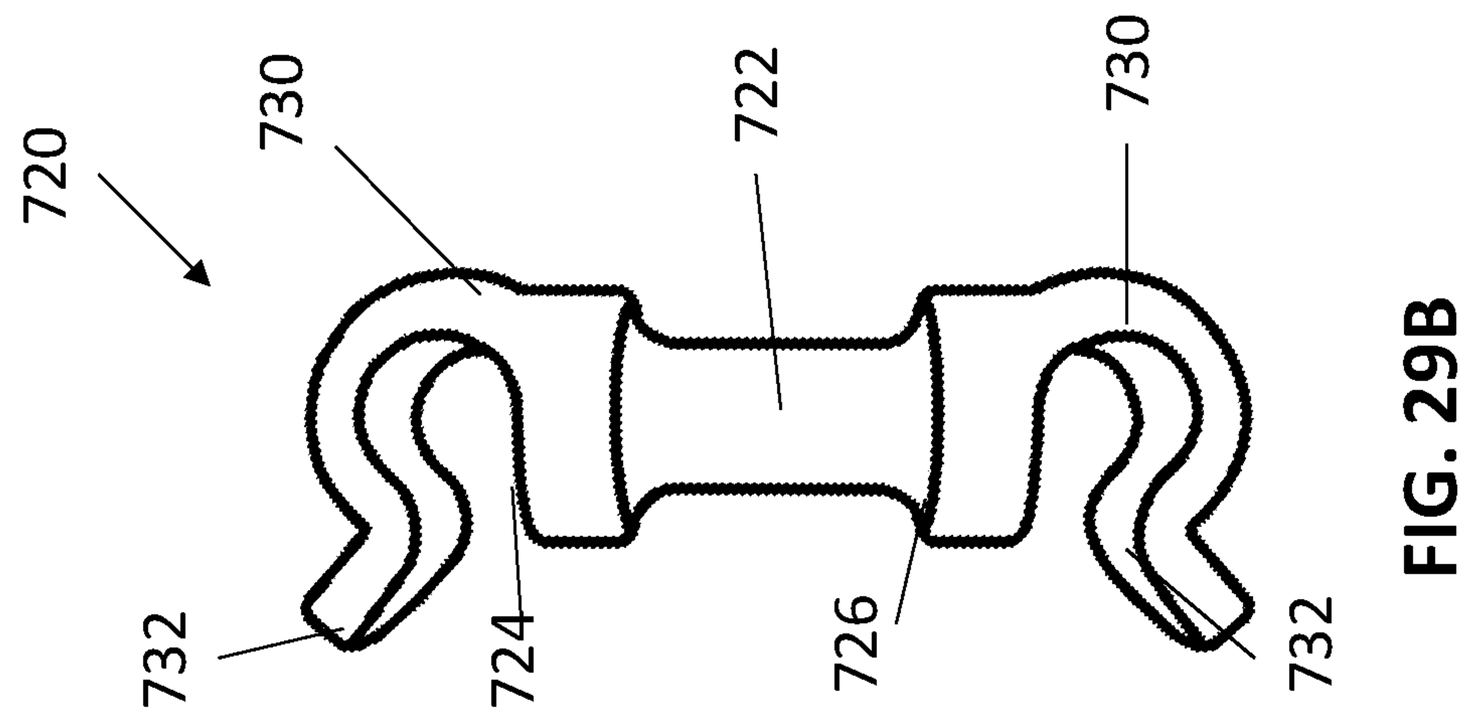

FIG. 29B

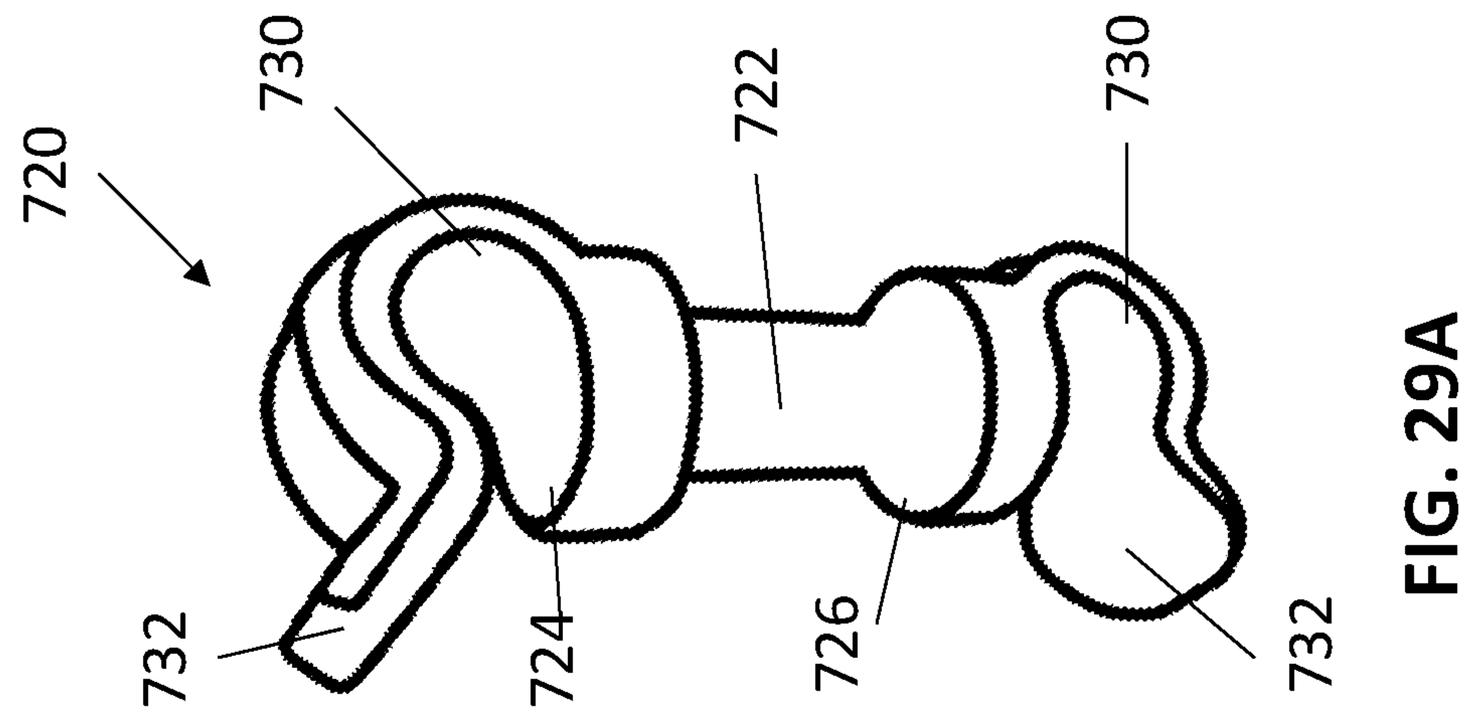

FIG. 29A

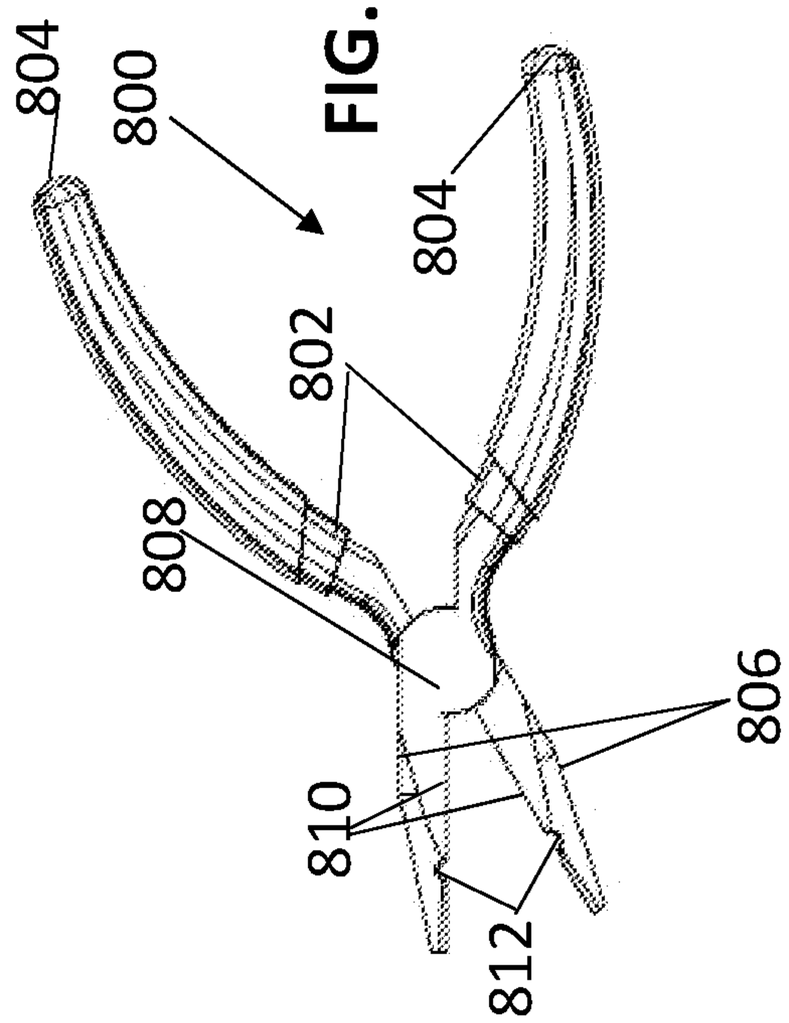

FIG. 30B

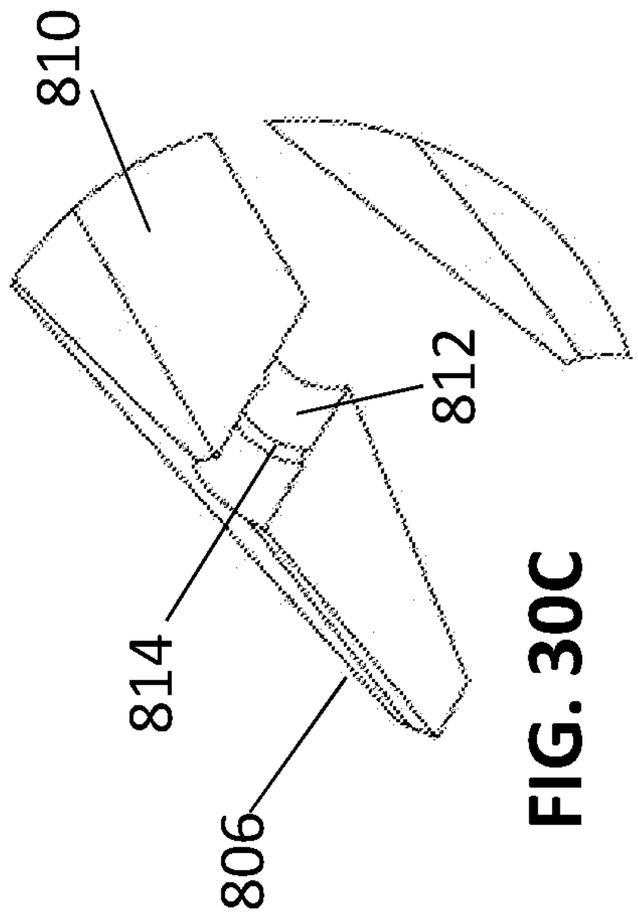

FIG. 30C

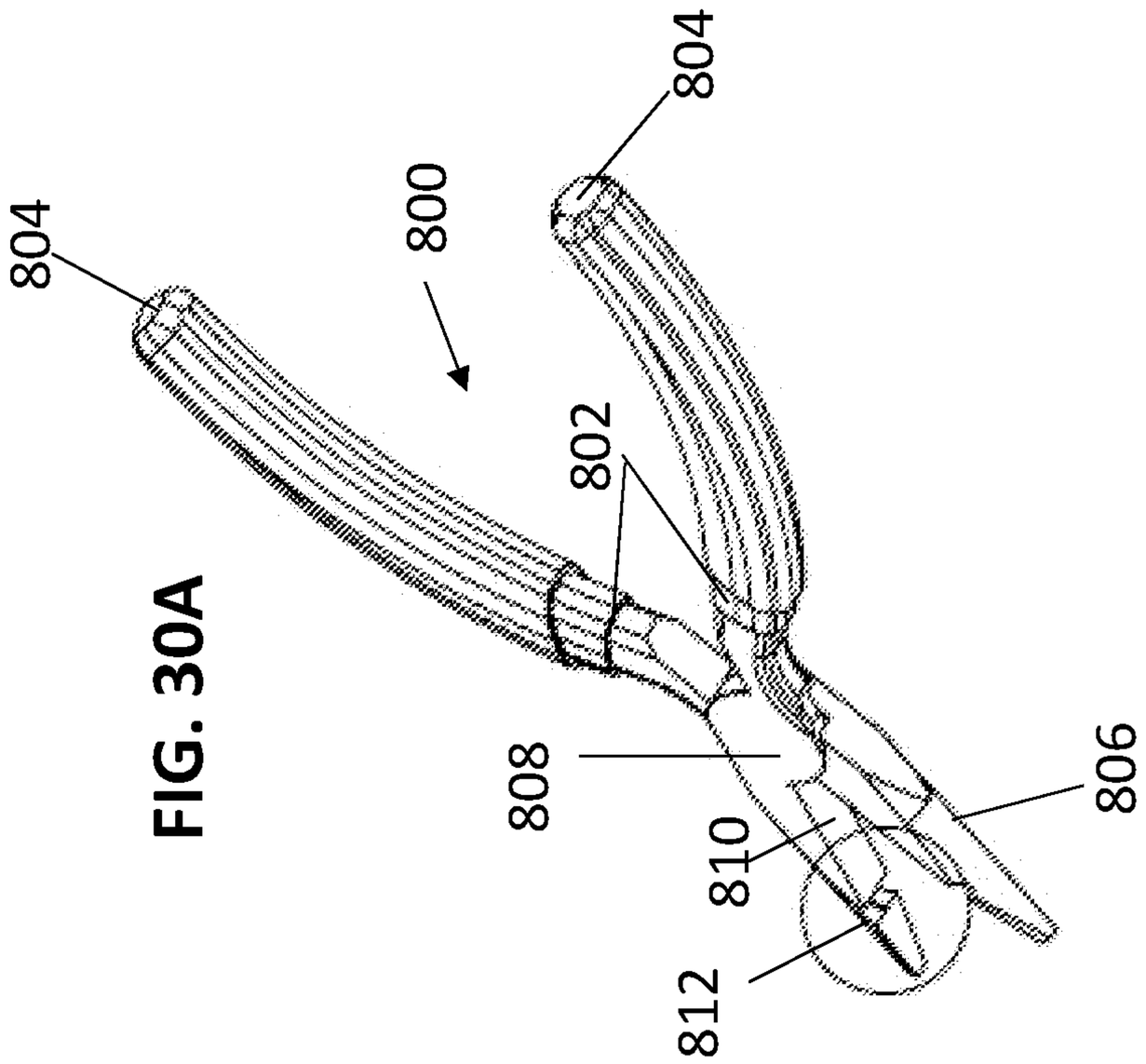

FIG. 30A

CONSTRUCTION TOY INCLUDING TUBES AND CONNECTORS, AND DEVICE FOR CUTTING AND BENDING TUBES THEREFOR

FIELD AND BACKGROUND OF THE INVENTION

The invention, in some embodiments, relates to the field of construction toys, and more specifically to a construction toy including hollow elongate tubes and connectors for connecting the tubes. The present invention further relates to a tube shaping device, which the user can use to cut and/or bend hollow elongate tubes for the construction toy of the present invention, in the comfort of their own home. The present invention further relates to a reinforcing tool used to reinforce the connection between tubes and connectors according to the present invention.

Many construction toys exist which include elongate elements connected to one another by connectors, such as, for example, K'nex®. However, in these toys, the elongate elements come in fixed sizes and colors, and the user can only choose between elongate elements of specific lengths, which typically come in a single color. Furthermore, a user typically buys a kit including a specific number of elongate elements and a specific number of connectors, and can only obtain additional elongate elements by purchasing another full kit. Furthermore, many construction toys do not facilitate building of dynamic structures, which can be moved, or which include electronic components.

As such, there is a need in the art for a construction toy, for which the user can cut and bend tube pieces as the user sees fit, in whichever colors and dimensions the user chooses.

SUMMARY OF THE INVENTION

The invention, in some embodiments, relates to the field of construction toys, and more specifically to a construction toy including hollow elongate tubes and connectors for connecting the tubes. The present invention further relates to a tube shaping device, which the user can use to cut and/or bend hollow elongate tubes for the construction toy of the present invention, in the comfort of their own home. The present invention further relates to a reinforcing tool used to reinforce the connection between tubes and connectors according to the present invention.

There is thus provided, in accordance with an embodiment of the present invention, a device for cutting and bending a hollow elongate tube, the device including:

a measuring subassembly adapted for measuring a desired size of the hollow elongate tube;

a cutting subassembly adapted for cutting the hollow elongate tube to the desired size, the cutting subassembly including an anchoring element adapted to anchor the hollow elongate tube and a rotational blade adapted to rotate relative to the anchored hollow elongate tube, thereby to cut the hollow elongate tube; and

a bending subassembly adapted for bending the cut hollow elongate tube to a desired angular orientation, the bending subassembly including:

a base controlling a radius of a bend to be formed in the cut hollow elongate tube; and

a user grippable handle configured to enable a user to rotate the cut hollow elongate tube, relative to the round base, to form the bend in the cut hollow elongate tube.

In some embodiments, the device further includes one or more storage compartments, adapted for storing at least one hollow elongate tube prior to or following, cutting and/or bending of the at least one hollow elongate tube.

In some embodiments, the measuring subassembly, the cutting subassembly, and the bending subassembly are all mounted onto a unitary body. In some such embodiments, the device further includes a clamping subassembly, adapted for clamping the unitary body onto a surface of a working station.

There is additionally provided, in accordance with embodiments of the present invention, a connector adapted for connection to at least one hollow elongate tube, the connector including:

a base defining at least one base surface;

at least one prong extending outwardly from the at least one base surface, the at least one prong adapted for secure connection thereto of the at least one hollow elongate tube.

In some embodiments, a first prong of the at least one prong has a first longitudinal section and a second longitudinal section, both having a first circumference, and an indented longitudinal section, between the first and second longitudinal sections, having a second circumference, the second circumference is smaller than the first circumference, and the first prong is adapted to be inserted into a hollow of the hollow elongate tube thereby to secure the hollow elongate tube to the connector.

In some embodiments, each of the first and second longitudinal sections is substantially longer than the third longitudinal section. In some embodiments, a ratio between a length of the first longitudinal section and a length of the third longitudinal section is at least 2:1. In some embodiments, a ratio between a length of the second longitudinal section and a length of the third longitudinal section is at least 2:1.

In some embodiments, a second prong of the at least one prong includes a hollow tubular prong including a longitudinal prong hollow, wherein the second prong is adapted to receive an end of the hollow elongate tube in the prong hollow to frictionally secure the hollow elongate tube to the connector.

In some embodiments, the connector further includes a snap fit connection region for snap fit connection in a bore of a second connector. In some embodiments, the connector further includes a bore configured for at least one of snap fit connection of another connector and slidable placement of a hollow elongate tube therethrough.

In some embodiments, the connector further includes a male or female pivoting connection region, for connection to a corresponding region of another connector, such that connection of the connector with the another connector enables pivoting of the connector relative to the another connector.

In some embodiments, the connector further includes a clasping element adapted for clasping a hollow elongate tube therein.

There is further provided, in accordance with embodiments of the present invention, a supporting connector adapted to be associated with a first and second connectors according to the present invention, the supporting connector having a first portion adapted for connection thereto of the first connector and a second portion adapted for connection thereto of the second connector.

There is also provided, in accordance with embodiments of the present invention, a clasping connector adapted to be associated with first and second hollow elongate tubes, the clasping connector including:

a base having first and second end surfaces;

a first clasping portion extending from the first end surface of the base, the first clasping portion adapted for clasping therein of a first hollow elongate tube; and

a second clasping portion extending from the second end surface of the base, the second clasping portion adapted for clasping therein of a second hollow elongate tube.

There is additionally provided, in accordance with some embodiments of the present invention, a reinforcing tool, including a pair of tool portion, each including a gripping end and a working end, the pair of tool portions being pivotally connected to each other such that the working ends thereof are adapted, in a closed orientation of the reinforcing tool, to engage one another, wherein the working end of each of the tool portions includes a hemispherical recess extending along a width thereof, the hemispherical recess having a circumferential protrusion disposed at a longitudinal center thereof.

In some embodiments, the circumferential protrusions formed in the hemispherical recesses of the two working ends are sized and configured to apply pressure at the indented longitudinal section of a connector according to the present invention.

There is further provided, in accordance with embodiments of the present invention, a kit for creating a structure, the kit including:

the device according to the present invention;

a plurality of hollow elongate tubes, suitable for cutting and bending using the device; and

a plurality of connectors according to the present invention, for connecting the hollow elongate tubes following cutting and/or bending thereof, thereby to form a two dimensional or a three-dimensional structure.

In some embodiments, the kit further includes at least one supporting connector according to the present invention. In some embodiments, the kit further includes at least one clasping connector according to the present invention. In some embodiments, the kit further includes a reinforcing tool according to the present invention.

There is also provided, in accordance with embodiments of the present invention, a method of cutting a hollow elongate tube to a desired length using the device of the present invention or the kit of the present invention, the method including:

inserting the hollow elongate tube into the measuring subassembly of the device, to an extent equivalent to the desired length;

anchoring the hollow elongate tube to the device; and

rotating the rotational blade of the cutting subassembly relative to the hollow elongate tube, thereby to cut the hollow elongate tube to the desired length.

In some embodiments, the method further includes, prior to the inserting, anchoring the device to a working station.

There is further provided, in accordance with embodiments of the present invention, a method of bending a hollow elongate tube to a desired angle using the device of the present invention or the kit of the present invention, the method including:

inserting the hollow elongate tube into the bending subassembly of the device, between the base and a securing pin, thereby securing the hollow elongate tube relative to the device; and

rotating the user grippable handle, together with the securing pin, relative to a body of the device and to the base, thereby causing the securing pin to push the hollow elongate tube about the base and bending the hollow elongate tube to the desired angle.

In some embodiments, the method further includes, prior to the inserting, inserting into the device a base having a desired radius for bending of the hollow elongate tube.

In some embodiments, the method further includes, prior to the inserting, anchoring the device to a working station.

There is further provided, in accordance with embodiments of the present invention, a method for constructing a two-dimensional structure or a three-dimensional structure using a plurality of hollow elongate tubes and a plurality of connectors according to the present invention, the method including:

connecting a first end of each of the plurality of hollow elongate tubes to the prong of one of the plurality of connectors;

connecting a second end of at least some of the plurality of hollow elongate tubes to one of the plurality of connectors,

wherein, following the connecting of the first end and the connecting of the second end, the plurality of hollow elongate tubes and the plurality of connectors form a single structure.

In some embodiments, at least one of the plurality of hollow elongate tubes is a cut hollow elongate tube, the method further includes, prior to the connecting of the first end and the connecting of the second end, cutting a long hollow elongate tube to a desired size using the method of the present invention, thereby to form the cut hollow elongate tube.

In some embodiments, at least one of the plurality of hollow elongate tubes is a bent hollow elongate tube, and the method further includes, prior to the connecting of the first end and the connecting of the second end, bending a hollow elongate tube to a desired angle using the method of the present invention, thereby to form the bent hollow elongate tube.

BRIEF DESCRIPTION OF THE FIGURES

Some embodiments of the invention are described herein with reference to the accompanying figures. The description, together with the figures, makes apparent to a person having ordinary skill in the art how some embodiments of the invention may be practiced. The figures are for the purpose of illustrative discussion and no attempt is made to show structural details of an embodiment in more detail than is necessary for a fundamental understanding of the invention. For the sake of clarity, some objects depicted in the figures are not to scale.

In the Figures:

FIGS. **1**A, **1**B, **1**C, **1**D, and **1**E are, respectively, an exploded view illustration, a perspective view illustration, and top, front, and side view planar illustrations of a device for cutting and bending hollow elongate tubes for a construction toy, the device being according to an embodiment of the teachings herein;

FIGS. **2**A, **2**B, **2**C, **2**D, **2**E, and **2**F are, respectively, an exploded view illustration, a perspective view illustration, and front, side, back, and top view planar illustrations of a tube cutting subassembly according to an embodiment of the teachings herein, the tube cutting subassembly forming part of the device of FIGS. **1**A to **1**E;

FIGS. **3**A, **3**B, **3**C, **3**D, **3**E, and **3**F are perspective view illustrations of steps of cutting a tube using the tube cutting subassembly forming part of the device of FIGS. **1**A to **1**E;

FIGS. **3**G, **3**H, and **3**I are perspective view illustrations of steps of bending a tube using a tube bending subassembly forming part of the device of FIGS. **1**A to **1**E;

FIGS. **4**A and **4**B, are, respectively, a perspective view illustration and a side view planar illustration of an end connector according to an embodiment of the disclosed technology;

FIGS. **4**C, **4**D, and **4**E are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of an end connector according to another embodiment of the disclosed technology;

FIGS. **5**A and **5**B, are, respectively, a perspective view illustration and a side view planar illustration of a clasping end connector according to an embodiment of the disclosed technology;

FIGS. **5**C, **5**D, and **5**E are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a clasping end connector according to another embodiment of the disclosed technology;

FIGS. **6**A, **6**B, and **6**C, are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration, of a male pivoting end connector according to an embodiment of the disclosed technology;

FIGS. **6**D, **6**E, and **6**F, are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration, of a male pivoting end connector according to another embodiment of the disclosed technology;

FIGS. **7**A, **7**B, and **7**C, are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration, of a female pivoting end connector according to an embodiment of the disclosed technology;

FIGS. **7**D, **7**E, and **7**F, are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration, of a female pivoting end connector according to another embodiment of the disclosed technology;

FIGS. **8**A, **8**B, and **8**C, are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration, of a sliding end connector according to an embodiment of the disclosed technology;

FIGS. **9**A, **9**B, and **9**C, are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration, of a snap-fit end connector according to an embodiment of the disclosed technology;

FIGS. **10**A and **10**B are, respectively, perspective view illustrations of a first exemplary use of the snap-fit end connector of FIGS. **9**A and **9**B according to an embodiment of the disclosed technology;

FIGS. **11**A and **11**B are, respectively, perspective view illustrations of a second exemplary use of the snap-fit end connector of FIGS. **9**A and **9**B according to an embodiment of the disclosed technology;

FIGS. **12**A and **12**B are, respectively, perspective view illustrations of a second exemplary use of the female pivoting end connector of FIGS. **7**A and **7**B according to an embodiment of the disclosed technology;

FIGS. **13**A and **13**B, are, respectively, a perspective view illustration and a front view planar illustration of an extending connector according to an embodiment of the disclosed technology;

FIGS. **14**A, **14**B, and **14**C, are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a three-directional sliding connector according to an embodiment of the disclosed technology;

FIGS. **14**D, **14**E, and **14**F, are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a three-directional sliding connector according to another embodiment of the disclosed technology;

FIGS. **15**A, **15**B, and **15**C, are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a four-directional sliding connector according to an embodiment of the disclosed technology;

FIGS. **16**A, **16**B, **16**C, and **16**D are, respectively, a perspective view illustration, a side view planar illustration, a front view planar illustration and a top view planar illustration of a double snap-fit connector according to an embodiment of the disclosed technology;

FIGS. **17**A, **17**B, and **17**C are, respectively, a perspective view illustration, a front view planar illustration, and a side view planar illustration of an extending snap fit connector according to an embodiment of the disclosed technology;

FIGS. **18**A, **18**B, and **18**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a double snap-fit supporting connector according to an embodiment of the disclosed technology;

FIGS. **19**A, **19**B, and **19**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a double snap-fit sliding supporting connector according to an embodiment of the disclosed technology;

FIGS. **20**A, **20**B, and **20**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a female pivoting snap-fit supporting connector according to an embodiment of the disclosed technology;

FIGS. **21**A, **21**B, and **21**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a male pivoting snap-fit supporting connector according to an embodiment of the disclosed technology;

FIGS. **22**A, **22**B, and **22**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a sliding snap-fit supporting connector according to an embodiment of the disclosed technology;

FIGS. **23**A, **23**B, and **23**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a double sliding supporting connector according to an embodiment of the disclosed technology;

FIGS. **24**A, **24**B, and **24**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a sliding male pivoting supporting connector according to an embodiment of the disclosed technology;

FIGS. **25**A, **25**B, and **25**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a sliding female pivoting supporting connector according to an embodiment of the disclosed technology;

FIGS. **26**A, **26**B, **26**C, and **26**D are, respectively, a perspective view illustration, a side view planar illustration, a front view planar illustration, and a top view planar illustration of a linear double male pivoting supporting connector according to an embodiment of the disclosed technology;

FIGS. **27**A, **27**B, **27**C, and **27**D are, respectively, a perspective view illustration, a side view planar illustration, a front view planar illustration, and a top view planar

illustration of an angled double male pivoting supporting connector according to an embodiment of the disclosed technology;

FIGS. **28**A, **28**B, **28**C, and **28**D are, respectively, a perspective view illustration, a side view planar illustration, a front view planar illustration, and a top view planar illustration of an angled male and female pivoting supporting connector according to an embodiment of the disclosed technology;

FIGS. **29**A, **29**B, and **29**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a double clasping supporting connector according to an embodiment of the disclosed technology; and

FIGS. **30**A, **30**B, and **30**C, are, respectively, a perspective view illustration, a side view planar illustration, and an enlargement of a portion of a reinforcing tool for crimping a hollow elongate foil tube onto a connector according to an embodiment of the disclosed technology, so as to reinforce a structure formed thereby.

DESCRIPTION OF SOME EMBODIMENTS OF THE INVENTION

The invention, in some embodiments, relates to the field of construction toys, and more specifically to a construction toy including hollow elongate tubes and connectors for connecting the tubes.

The invention, in some embodiments, relates to a device for cutting and bending elongate tubes, which the user can use to cut and bend hollow elongate tubes for use as part of the construction toy of the present invention.

The invention, in some embodiments, relates to a reinforcing tool used to reinforce the connection between tubes and connectors according to the present invention.

The invention, in some embodiments, relates to kits including at least two of a device for cutting and bending tubes, tubes, connectors for connecting the tubes, and a reinforcing tool.

The principles, uses and implementations of the teachings herein may be better understood with reference to the accompanying description and figures. Upon perusal of the description and figures present herein, one skilled in the art is able to implement the invention without undue effort or experimentation.

Before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its applications to the details of construction and the arrangement of the components and/or methods set forth in the following description and/or illustrated in the drawings and/or the Examples. The invention can be implemented with other embodiments and can be practiced or carried out in various ways. It is also understood that the phraseology and terminology employed herein is for descriptive purpose and should not be regarded as limiting.

The construction toy described herein employs tubes and connectors to build two- or three-dimensional structures. One particular aspect of the present invention is that the device of the present invention enables the user to form tubes for the construction toy, in dimensions and angular orientations, as desired by the user, thereby enhancing the user's flexibility in using the toy.

In accordance with an embodiment of the present invention, there is provided a device for cutting and bending a hollow elongate tube, the device including:

a measuring subassembly adapted for measuring a desired size of the hollow elongate tube;

a cutting subassembly adapted for cutting the hollow elongate tube to the desired size, the cutting subassembly including a rotational blade adapted to rotate relative to the anchored hollow elongate tube, thereby to cut the hollow elongate tube; and

a bending subassembly adapted for bending the cut hollow elongate tube to a desired angular orientation, said bending subassembly including:

a round base controlling a radius of a bend to be formed in the cut hollow elongate tube; and

a user grippable handle enabling the user to rotate the cut hollow elongate tube, relative to the round base, to form the bend in the cut hollow elongate tube.

In some embodiments, the device further includes a one or more storage compartments, adapted for storing at least one hollow elongate tube, prior to, and/or following, cutting and/or bending thereof.

In accordance with another embodiment of the present invention, there is provided a connector adapted for connection to at least one hollow elongate tube, the connector including:

a base defining at least one base surface;

at least one prong extending outwardly from the at least one base surface, the at least one prong having a first longitudinal section and a second longitudinal section, both having a first circumference, and an indented longitudinal section, between the first and second longitudinal sections, having a second circumference,

wherein the second circumference is smaller than the first circumference.

In some embodiments, each of the first and second longitudinal sections is substantially longer than the third longitudinal section. In some embodiments, a ratio between a length of the first longitudinal section and a length of the third longitudinal section is at least 2:1. In some embodiments, a ratio between a length of the second longitudinal section and a length of the third longitudinal section is at least 2:1.

In some embodiments, the connector further includes a snap fit connection region for snap fit connection in a bore of another such connector.

In some embodiments the connector further includes a bore suitable for snap fit connection of another such connector, or for slidable placement of a hollow elongate tube therethrough.

In some embodiments the connector further includes a male or female pivoting connection region, for connection to a corresponding region of another connector enabling pivoting of the connector relative to the another connector.

In accordance with another embodiment of the present invention, there is provided a supporting connector having a first portion adapted for connection thereto of a first connector as described hereinabove and a second portion adapted for connection thereto of a second connector as described hereinabove.

In accordance with yet another embodiment of the present invention, there is provided a reinforcing tool, including a pair of tool portion, each including a gripping end and a working end, the pair of tool portions being pivotally connected to each other such that said working ends thereof are adapted, in a closed orientation of the reinforcing tool, to engage one another, wherein the working end of each of said tool portions includes a hemispherical recess extending along a width thereof, said hemispherical recess having a circumferential protrusion disposed at a longitudinal center thereof.

In some embodiments, the hemispherical recesses of the two working ends are sized and configured such that in the closed operative orientation a diameter of the tubular recess formed is not smaller than a diameter of a cut and/or bent hollow elongate tube formed using the device of the present invention.

In some embodiments, the circumferential protrusions formed in the hemispherical recesses of the two working ends are sized and configured to apply pressure at an indented longitudinal portion indentation of a connector according to the present invention.

In accordance with a further embodiment of the present invention, there is provided a kit including a device according to the present invention as described herein, and a plurality of connectors according to the present invention as described herein. In some embodiments the kit further includes at least one reinforcing tool as according to the present invention described herein. In some embodiments the kit further includes at least one hollow elongate tube suitable for cutting and/or bending using the device.

Reference is now made to FIGS. **1**A, **1**B, **1**C, **1**D, and **1**E, which are, respectively, an exploded view illustration, a perspective view illustration, and top, front, and side view planar illustrations of a device **100** for cutting and bending hollow elongate tubes for a construction toy, the device being according to an embodiment of the teachings herein. Device **100** is sized and configured to be used by children in their home environment. In some embodiments, device **100** is sized and configured to be hand-held.

As seen, device **100** includes a main body **102** including a top surface **103** and partial side walls **104**, each terminating in a base portion **106**. Two of side walls **104** may include a plurality of indentations **108**, suitable for a user's fingers, and enabling a user to hold the device comfortably in their hand.

Side walls **104** may further include bores **110**, each adapted to receive a clamping subassembly **112** for clamping device **102** onto a surface of a table or any other workstation, such as a counter or workbench. In some embodiments, clamping subassembly **112** includes a bent metal rod **114** having a horizontal portion substantially parallel to the top surface **103** of device **100**, and a vertical portion substantially parallel to a side wall **104** of the device. Slidably mounted onto the vertical portion of rod **114** are an anchoring element **116** having an anchoring surface **118**, and a locking screw **120**.

In use, device **100** is placed on a table such that base portion **106** engages an upper surface of the table. The horizontal portion of rod **114** is seated within bore **110**, and to extend beyond the edge of a table, with the vertical portion extending downward along the edge of the table. Anchoring element **116** is moves slidably upward toward the table, until anchoring surface **118** thereof engages a lower surface of the table. Anchoring element **116** is then locked in place on rod **114** by locking screw **120**, thus ensuring continued engagement of the table.

Disposed on top surface **103** is a measuring subassembly for measuring a desired size of the hollow elongate tube. The measuring subassembly includes a pair of elongate protrusions **122**, extending outwardly upward from top surface **103** and forming an elongate channel **124** therebetween, the channel being sized and configured to receive a hollow elongate tube **200**, as explained in further detail hereinbelow. Each of protrusions **122** typically has a plurality of length indicators marked thereon, such as by etching, printing, or embossing of the top end of the protrusion. The length indicators may be in any suitable measuring unit, and may be in several measuring units, such as inches and cm.

A circular cylindrical protrusion **126** extends outwardly upward from protrusions **122**. Protrusion **126** is adapted for connection of the cutting subassembly thereto.

Mounted onto to surface **103** is a bending subassembly **130** adapted for bending a cut hollow elongate tube to a desired angular orientation. The bending subassembly includes a disc shaped base **132** including a central bore **133** and having a circumferential groove **134** adapted to receive a (cut) hollow elongate tube therein. The radius of groove **134** controls a radius of the bend that will be formed in the tube. A user grippable handle **136** has a gripping portion **138**, and a receiving portion **140** including two parallel planar surfaces, each including a first bore **142** and at least a second bore **144**. Base **132** is disposed between the planar surfaces of receiving portion **140**, such that central bore **133** is aligned with first bores **142** thereof. A first pin **146** extends through bores **133** and **142**, such that base **132** is fixed relative to first pin **146**, while handle **136** is rotatable relative to pin **146**. A second pin **148** is disposed within second bore **144**, and is fixed relative to handle **136**. The use of bending subassembly **130** is described in further detail hereinbelow, with respect to FIGS. **3**G to **21**.

At a lateral end thereof, top surface **103** including a hemi-cylindrical indentation **150**, surrounded by a pair of protrusions **152**. Indentation **150** adapted to receive a cutting subassembly **170**, as described in further detail hereinbelow. An anchoring element **154** is adapted to be fixedly attached to protrusions **152** and to hold cutting subassembly **170** to the main body **102**, while enabling the cutting subassembly to rotate relative to main body **102**, within indentation **150**, as explained herein. Anchoring element **156** further includes a threaded bore **158**, adapted to receive therein a correspondingly threaded anchoring screw **160**. Anchoring element **156** is adapted to be arranged such that bore **158** and anchoring screw **160** are disposed above elongate channel **124**, such that an end of anchoring screw **160** is adapted to engage and anchor, or fix the position of, hollow elongate tube **200** during cutting thereof.

Reference is additionally made to FIGS. **2**A, **2**B, **2**C, **2**D, **2**E, and **2**F, which are, respectively, an exploded view illustration, a perspective view illustration, and front, side, back, and top view planar illustrations of cutting subassembly **170** according to an embodiment of the teachings herein.

As seen, cutting subassembly **170** includes a housing **172** arranged about a longitudinal axis **173** (see FIG. **2**D) and having a cowl portion **174** terminating at a distal lip **176**, the cowl portion adapted to be rotatably disposed within indentation **150**. Extending forward from cowl portion **174**, is a main body portion **178**, adapted to have a disc-shaped blade **180** seated in a dedicated slot **182** therein. Slot **182** is formed in the circumference of main body portion **178**. Blade **180** includes a central bore **184**, which is adapted to be aligned with an axial bore **186** formed in main body portion, and to be fixedly held within slot **182** by a screw or pin **188**, extending through axial bore **186** and through central bore **184** of blade **180**. A diameter of blade **180** is smaller than the radius of main body portion **178**, such that when the blade is held within the main body portion, the blade is disposed above the center point of the main body portion, as seen clearly in FIG. **2**C.

Main body portion **178** further has a second slot **190**, extending through the entire length of the body portion and through most of the diameter thereof, such that an end of blade **180** extends into slot **190**, as seen clearly in FIG. **2**C. Slot **190** has extending therefrom a tube-receiving recess

192, which extends away from blade 180, between a pair of wheels 194 held by pins 196. As explained in further detail hereinbelow, in use, a tube to be cut is slid into main body portion 178 via recess 192, such that rotation of the housing 172 together with blade 180 results in cutting of the tube.

Main body portion 178 further includes two protrusions 197, extending substantially tangentially to the circumference of the main body portion, each protrusion being disposed on a different end of slot 190 and including a bore 198. A tightening pin or screw 199 is adapted to extend through bores 198 of protrusions 197, and, in use, to apply pressure to the protrusions thereby to reduce the width of slot 190 and to force blade 180 to apply suitable pressure to the tube being cut, as explained in detail hereinbelow.

Reference is now made to FIGS. 3A, 3B, 3C, 3D, 3E, and 3F, which are perspective view illustrations of steps of cutting a tube using the tube cutting subassembly forming part of the device of FIGS. 1A to 1E.

As seen in FIG. 3A, a hollow elongate tube 300 is disposed outside of device 100, and is aligned with recess 192 of slot 190 of the cutting subassembly 170.

The elongate tube 300 may be formed of any suitable material, and is typically formed of metal, such as aluminum, or of a pliable plastic.

In some embodiments, the exterior diameter of the elongate tube is in the range of 3 mm to 5 mm.

In some embodiments, the diameter of the hollow of the elongate tube is in the range of 2 mm to 4 mm.

In some embodiments, the thickness of the wall of the elongate tube is in the range of 0.25 mm to 1 mm.

In some embodiments, at step 3A, prior to insertion of the tube into the device 100, the user may anchor the device to a working surface, such as a table, using anchoring elements 112, substantially as described hereinabove.

As seen, the tip of anchoring screw 160 is raised above protrusions 122 and slot 124, and the cutting subassembly is oriented such that the head of tightening screw 199 is directed downward, away from top surface 103.

In FIG. 3B, the elongate tube 300 has been inserted, via recess 192 of slot 190 and the hollow of the cowl of cutting subassembly 170 into slot 124 between protrusions 122, to a desired degree. In some embodiments, the user may use the indications, marked on protrusions 122, to know the length of the tube 300 disposed within slot 124, between the location of blade 180 and the end of the tube. As seen, the orientation of anchoring screw 160, of cutting subassembly 170, and of tightening screw 199, remains unchanged relative to FIG. 3A.

In FIG. 3C, the user has rotated anchoring screw 160 to engage the section of elongate tube 300 disposed within slot 124, and to anchor the elongate tube 300 in position prior to cutting thereof. In this arrangement, blade 180 engages tube 300.

Once the elongate tube 300 is anchored, the user rotates cutting subassembly 170, within indentation 150 and relative to the remainder of device 100 and to tube 300, as illustrated in FIGS. 3D and 3E. Each of FIGS. 3D and 3E which shows a 90-degree rotation of cutting subassembly 170. Rotation of cutting subassembly 170 causes corresponding rotation of blade 180 about tube 300. Due to the engagement of blade 180 with tube 300, rotation of cutting subassembly 170 results in partial cutting of the tube.

As the user continues to rotate the cutting subassembly, the blade cuts deeper and deeper into the tube, until the tube is fully cut into a first portion 300*a* anchored within device 100, and a second portion 300*b* outside of the device, as illustrated in FIG. 3F.

In some embodiments, following one or more full rotations of cutting assembly 170, the user may twist and tighten screw 199, causing protrusions 197 to become closer to each other, thereby increasing the pressure applied by the blade to the tube, to facilitate cutting of more internal portions of the tube. This is particularly useful when the tube is formed of a relatively thick material.

Following cutting of the tube, the user may remove the cut tube portion from slot 124 by releasing anchoring screw 160 and sliding the cut tube portion out of slot 124 away from cutting subassembly 170, or through cutting subassembly 170.

In some embodiments, the pressure applied by blade 180 to tube 300 causes deformation of the shape of the tube at the cutting point. In some such embodiments, device 100 may further include a re-shaping protrusion, onto which cut tube 300*a* may be placed in order to return the end thereof to circular shape.

Reference is now made to FIGS. 3G, 3H, and 3I, which are perspective view illustrations of steps of bending a tube 310, which may be a tube previously cut as described with respect to FIGS. 3A to 3F, or a complete tube as provided by a manufacturer or retailer, using a tube bending subassembly 130 forming part of the device 100.

As seen in FIG. 3G, the device 100 is prepared for bending of tube 310, by rotating handle 136 from being parallel to the protrusions 122, to being perpendicular thereto. The tube 310 is not yet placed in the device 100.

At a next step, shown in FIG. 3H, tube 310 is inserted into the bending assembly 130, between disc shaped base 132 and second pin 148, such that the tube 310 engages groove 134 and is disposed between the arms of receiving portion 140.

FIG. 3I shows the next step of the bending process, in which handle 136 is rotated relative to main body 102 and relative to disc shaped base 132. The pin 148 rotates together with handle 136, and pushes the tube 310 to bend about base 132. The degree of bending of the tube 310 may be controlled by the angle to which the user rotates the handle 136. Rotating the handle 45 degrees, will result in the tube 310 being bent 45 degrees from the initial state (straight line or 180-degree angle), and thus the tube will have an angle of 135 degrees. Rotating the handle 120 degrees, will result in the tube 310 being bent 120 degrees from its initial, straight line, state, and in the tube having an angle of 60 degrees. Rotating the handle 90 degrees, as illustrated, results in the tube 310 having a bend of 90 degrees.

When using the tubes and connectors described herein, typically the user prepares multiple hollow elongate tubes, by cutting and/or bending the tubes to be in a desired configuration, for construction of a structure using the construction toy of the present invention. In the construction toy according to the present invention, hollow elongate tubes are connected to one another using connectors according to embodiments of the present invention.

Some connectors, such as those described herein with respect to FIGS. 4A to 17C, are designed for connection to at least one tube. Such connectors include a base defining at least one base surface, at least one prong extending outwardly from the at least one base surface.

In some embodiments, the at least one prong has a first longitudinal section and a second longitudinal section, both having a first circumference, and an indented longitudinal section, between the first and second longitudinal sections, having a second circumference, wherein the second circumference is smaller than the first circumference.

In some such embodiments, at least one of, or each of, the first and second longitudinal sections is substantially longer than the third longitudinal section. In some embodiments, a ratio between a length of the first longitudinal section and a length of the third longitudinal section is at least 2:1. In some embodiments, a ratio between a length of the second longitudinal section and a length of the third longitudinal section is at least 2:1.

In other embodiments, the at least one prong is a cylindrical prong defining a tubular hollow, adapted to receive a tube therein. The at least one tube may be held within the tubular hollow by friction.

As seen hereinbelow, many different types of connectors meet these requirements. Some connectors include multiple prongs and are connectable to multiple different tubes. In some cases, multiple prongs extend from a single base surface, whereas in other cases the prongs extend from a base having multiple base surfaces.

Some connectors are connectable to one another, so as to form pivotable connectors, rotatable connectors, or otherwise movable connectors. Some connectors include a hollow bore through which an elongate foil tube may extend, such that the connector may slide along the elongate tube. The bore may further be suitable for snap fit connection of another connector thereto, using a suitable snap fit connection mechanism as described hereinbelow.

Some connectors, such as those described hereinbelow with respect to FIGS. **18**A to **27**D, are interim connectors, or supporting connectors, adapted for connection thereto of two other connectors. Such supporting connectors allow for creation of more complex and intricate structures, and enable additional degrees of freedom between connectors and/or tubes.

Some connectors may include electronic components, such as LED lights for example attached to or disposed within the base of the connector. In some such embodiments, power for operating the electronic components may be provided via at least one electrically conductive tube connected to the connector.

Some connectors may be fixedly or rotatably attached to a motor, such as a servo motor or a rotating motor, and facilitate construction of structures which can move dynamically and autonomously, without the user providing force for moving components of the constructed structure. In some embodiments, such motors may be coded by the user to carry out a specific sequence of movements or actions, for example by communication with a suitable app installed on a mobile computing device.

Some examples of connectors suitable for use as part of the construction toy of the present invention are described specifically hereinbelow. Some structural elements are similar for all the connectors described. For brevity, these structural elements are described once with respect to the first drawing in which they appear, and the description is referenced when these structural elements appear again, by explicitly stating that the structure of one element is equivalent to the structure of a previously described element.

Reference is now made to FIGS. **4**A and **4**B, which are, respectively, a perspective view illustration and a side view planar illustration of an end connector **400** according to an embodiment of the disclosed technology.

As seen, end connector **400** includes a base **402** having a planar surface **404** and a curved surface **406**. Extending outwardly from planar surface **404** is a prong **407**. Prong **704** includes a first longitudinal section **408***a* and a second longitudinal section **408***b*, separated by an indented longitudinal section **410**. Second section **408***b* terminates in a partly tapered end **412**.

In some embodiments, first and second longitudinal sections **408***a* and **408***b* have a first circumference, and indented longitudinal section **410** has a second circumference, wherein the second circumference being smaller than the first circumference.

In some embodiments, at least one of, or each of, first and second longitudinal sections **408***a* and **408***b* is substantially longer than indented longitudinal section **410**. In some embodiments, a ratio between a length of the first longitudinal section **408***a* and a length of indented longitudinal section **410** is at least 2:1. In some embodiments, a ratio between a length of the second longitudinal section **408***b* and the length of indented longitudinal section **410** is at least 2:1.

In use, a tube, such as cut tube **300** and/or bent tube **310** described hereinabove, may be placed onto prong **407**, to connect the tube to connector **400**. In such embodiments, prong **407** may be inserted into the hollow of tube **300** or **310**. In some embodiments, tube **300** or **310** may be crimped onto prong **407**, as described hereinbelow with respect to FIGS. **30**A to **30**C.

Reference is additionally made to FIGS. **4**C, **4**D, and **4**E, which are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of an end connector **400'** according to another embodiment of the disclosed technology.

End connector **400'** includes a base **402'** defining a base surface. Extending outwardly from the base surface is a tubular prong **417**, including a tubular body **418** defining an internal hollow **419**. In use, a tube, such as cut tube **300** and/or bent tube **310** described hereinabove, may be placed into hollow **419** of prong **417**, to connect the tube to connector **400**. In such embodiments, an external surface of the tube may frictionally engage an inner surface of tubular body **418**, with no need for crimping of the tube.

FIGS. **5**A and **5**B show a clasping end connector **420** according to an embodiment of the disclosed technology. Clasping end connector **420** includes a base **422** having a first planar surface **424** and a second planar surface **426**. A prong **427**, similar to, or identical to, prong **407** of FIG. **4**A, extends from first planar surface **424**. Extending from second planar surface **426**, away from prong **427**, is a curved clasping surface **430** terminating in a planar handle portion **432**. Curved clasping surface **430** forms more than half of a circle, and is adapted to receive, and to clasp around the exterior circumference of a tube such as cut tube **300** or bent tube **310** of FIGS. **3**A to **3**I. Handle portion **432** may be used by a user to remove the tube from the interior of clasping surface **430**.

Reference is now additionally made to FIGS. **5**C, **5**D, and **5**E, which are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a clasping end connector **420'** according to another embodiment of the disclosed technology. Clasping end connector **420'** is substantially similar to clasping end connector **420**, with prong **427** being replaced by a tubular prong **437**, substantially similar to tubular prong **417** of FIGS. **4**C to **4**E. In some embodiments, tubular body **438** of tubular prong **437** may include cut-out windows **436**, in fluid communication with the longitudinal hollow of prong **437**, which are not shown in FIGS. **4**C to **4**E.

Reference is now made to FIGS. **6**A, **6**B, and **6**C, which are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a

male pivoting end connector **440** according to an embodiment of the disclosed technology. As seen, male pivoting end connector **440** includes a base **442** having a surface **444**, from which extends a prong **447** similar to prong **407** of FIGS. **4**A and **4**B. A longitudinal planar protrusion **448**, forming the male pivoting portion of the connector, extends from an opposing surface of base **442**, away from prong **447**. Longitudinal planar protrusion includes two planar surface **450***a* and **450***b*, each including a recess **452**. Recess **452** is adapted to receive a corresponding protrusion of a female pivoting connector, as described herein, for example with respect to FIGS. **7**A to **7**C.

Reference is additionally made to FIGS. **6**D, **6**E, and **6**F, which are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration, of a male pivoting end connector **440'** according to another embodiment of the disclosed technology. Male pivoting end connector **440'** is substantially similar to male pivoting end connector **440**, with prong **447** being replaced by a tubular prong **457**, substantially similar to tubular prong **437** of FIGS. **5**C to **5**E, or to tubular prong **417** of FIGS. **4**C to **4**E.

FIGS. **7**A, **7**B, and **7**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration, of a female pivoting end connector **460** suitable for connection to connector **440** of FIGS. **6**A to **6**C or to connector **440'** of FIGS. **6**D to **6**F, according to an embodiment of the disclosed technology. As seen, female pivoting end connector **460** includes a base **462** having a surface **464**, from which extends a prong **467** similar to prong **407** of FIGS. **4**A and **4**B. A pair of longitudinal protrusion **468**, forming the female pivoting portion of the connector, extend from an opposing surface of base **462**, away from prong **467**. The protrusions **468** have a gap **470** therebetween. A substantially hemispherical protrusion **472** extends from each of longitudinal protrusions **460** into gap **470**.

Reference is additionally made to FIGS. **7**D, **7**E, and **7**F, which are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration, of a female pivoting end connector **460'** according to another embodiment of the disclosed technology. Female pivoting end connector **460'** is substantially similar to male pivoting end connector **460**, with prong **467** being replaced by a tubular prong **477**, substantially similar to tubular prong **437** of FIGS. **5**C to **5**E, or to tubular prong **417** of FIGS. **4**C to **4**E.

In use, the protrusions **472** of connectors **460** or **460'** are adapted to fit into recesses **452** of connector **440** of FIGS. **6**A to **6**C or of connector **440'** of FIGS. **6**D to **6**F, such that longitudinal protrusion **448** is disposed within gap **470**. In this arrangement, connectors **440**/**440'** and **460**/**460'** can pivot relative to each other, about an axis formed by protrusions **472** seated in recesses **452**.

FIGS. **8**A, **8**B, and **8**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a sliding end connector **480** according to an embodiment of the disclosed technology. As seen, sliding end connector **480** includes a base **482** having a surface **484**, from which extends a prong **487** similar to prong **407** of FIGS. **4**A and **4**B. A cylindrical portion **488** having a hollow **490** is connected to an opposing surface of base **482**, away from prong **487**, via a neck portion **492**. The cylindrical portion is arranged such that a longitudinal axis **494** thereof is perpendicular to a longitudinal axis **496** of the prong. The diameter of hollow **490** is slightly greater than the diameter of a tube, such as tube **200** of FIGS. **1**A to **1**E, such that the tube can be disposed within hollow **490**, and slidable therein relative to prong **487**.

In some embodiments, not explicitly shown, prong **487** may be replaced by a tubular prong, similar to or identical to tubular prong **437** of FIGS. **5**C to **5**E, or to tubular prong **417** of FIGS. **4**C to **4**E.

FIGS. **9**A, **9**B, and **9**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a snap-fit end connector **500** according to an embodiment of the disclosed technology. As seen, snap-fit end connector **500** includes a base **502** having a surface **504**, from which extends a prong **507** similar to prong **407** of FIGS. **4**A and **4**B. A pair of longitudinal protrusion **508**, forming the snap-fit portion of the connector, extend from an opposing surface of base **502**, away from prong **507**. The protrusions **508** have a gap **510** therebetween. Each of protrusions **508** terminates, at an end distal to prong **507**, in a radially outwardly facing protrusion **512** having a locking surface **514**.

In some embodiments, not explicitly shown, prong **507** may be replaced by a tubular prong, similar to or identical to tubular prong **437** of FIGS. **5**C to **5**E, or to tubular prong **417** of FIGS. **4**C to **4**E.

In use, the protrusions **508** of connector **500** are adapted to fit into hollow **490** of connector **480** of FIGS. **8**A to **8**C, and to snap fit therein, such that locking surfaces **514** engage a longitudinal perimeter of cylindrical portion **488**, substantially locking connectors **500** and **480**. In this arrangement, a 90-degree angle is formed between prongs **487** and **507**.

FIGS. **10**A and **10**B are, respectively, perspective view illustrations of a first exemplary use of the snap-fit end connector **500** of FIGS. **9**A and **9**B according to an embodiment of the disclosed technology. As seen in FIG. **10**A, a tube **520**, similar to the tube **200** of FIGS. **1**A to **1**E, is aligned with prong **507** of a snap-fit end connector **500**. The tube **520** may be a cut tube, such as tube **300***a* of FIG. **3**F, and/or may be a bent tube, such as tube **310** of FIG. **3**I. In FIG. **10**B, the tube **520** is connected to connector **500** by insertion of the prong **507** into the hollow **522** of tube **520**, until an end **524** of tube **520** engages surface **504** of the connector. In some embodiments, the tube may be further secured to the connector by crimping the tube into the indentation in the prong **500**, as described in further detail hereinbelow, with respect to FIGS. **30**A to **30**C.

In embodiments in which the prong is a tubular prong, such as tubular prong **317** of FIGS. **4**C to **4**E, tube **520** would be inserted into the hollow of the tubular prong, and held frictionally therein.

It is appreciated that while FIGS. **10**A and **10**B illustrate the connection between tube **520** and a specific type of connector, namely a snap-fit end connector **500**, the process of connecting a tube to a connector shown in FIGS. **10**A to **10**B is true for any tube and any connector having a prong similar to prong **507**. Similarly, the process of connecting a tube to a connector having a tubular prong, is equivalent regardless of the type of connector of which the tubular prong forms part.

FIGS. **11**A and **11**B are, respectively, perspective view illustrations of a second exemplary use of the snap-fit end connector **500** of FIGS. **9**A to **9**C according to an embodiment of the disclosed technology. As seen in FIG. **11**A, snap-fit end connector **500** is disposed adjacent, and is aligned with, a supporting connector **530**, which includes a base **532**. A male pivoting portion **534**, similar to the male pivoting portion described hereinabove with respect to FIGS. **6**A to **6**C, extends from one surface of base **532**. A sliding connection portion **536**, similar to the sliding con-

nection portion described hereinabove with respect to FIGS. **8**A to **8**C, extends from an opposing surface of base **532**.

As seen in FIG. **11**B, connectors **500** and **530** are connected to one another such that longitudinal protrusions **508** of snap-fit connector **500** extend through a hollow **538**, similar to hollow **490** of FIGS. **8**A to **8**C. In this arrangement, cylindrical portion **539** of connector **520** is disposed, and locked, between the base surface **506** and the locking surfaces **514** of connector **500**, with protrusions **512** extending out of cylindrical portion **539**.

It is appreciated that while FIGS. **11**A and **11**B illustrate the connection between a snap-fit end connector and a specific supporting connector, the process of connecting a snap-fit connection portion to a sliding connection portion is relevant for any pair of connectors including these connection components, regardless of the number or type of prongs such connectors include.

FIGS. **12**A and **12**B are, respectively, perspective view illustrations of a second exemplary use of the female pivoting end connector **460** of FIGS. **7**A to **7**C according to an embodiment of the disclosed technology. As seen in FIG. **12**A, female pivoting end connector **460** is disposed adjacent, and is aligned with, male pivoting portion **534** of supporting connector **530** (see also FIGS. **11**A and **11**B).

As seen in FIG. **12**B, connectors **460** and **530** are connected to one another such that longitudinal protrusion **540** of male pivoting portion **534** (similar to longitudinal protrusion **448** of FIGS. **6**A to **6**C) is disposed within gap **470** of female pivoting end connector **460**. Protrusions **472** are rotatably disposed within corresponding recesses **542** of male pivoting protrusion **534** (similar to recesses **452** of FIGS. **6**A to **6**C). In this arrangement, connectors **460** and **530** can pivot relative to one another about an axis extending through protrusions **472** and recesses **542**, so as to change the angular orientation between prong **467** and sliding connector portion **536**.

It is appreciated that while FIGS. **12**A and **12**B illustrate the connection between a female pivoting end connector and a specific supporting connector, the process of connecting male and female pivoting connection portions to one another is relevant for any pair of connectors including these connection components, regardless of the number or type of prongs such connectors include.

Reference is now made to FIGS. **13**A and **13**B, which are, respectively, a perspective view illustration and a front view planar illustration of an extending connector **550** according to an embodiment of the disclosed technology. As seen, extending connector **550** includes a base **552** having a first surface **554** and a second surface **556**. Prongs **557** and **558**, both similar to prong **407** of FIGS. **4**A and **4**B, extend longitudinally outwardly from first surface **554** and second surface **556** respectively. Extending connector **550** is suitable for extending the length of a tube, by connection of a first tube to prong **557** and a second tube to prong **558**, such that the resulting tube has the cumulative length of the first and second tubes.

In some embodiments, not explicitly shown, one or both of prongs **557** and **558** may be replaced by a tubular prong, similar to or identical to tubular prong **437** of FIGS. **5**C to **5**E, or to tubular prong **417** of FIGS. **4**C to **4**E.

FIGS. **14**A, **14**B, and **14**C, are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a three-directional sliding connector **560** according to an embodiment of the disclosed technology. As seen, three directional sliding connector **560** includes a triangular base **562**, here illustrated as an equilateral triangle, extending along a longitudinal axis **563**, and having three side surfaces **564** as well as front and back surfaces **566**. Each of side surfaces **564** has extending therefrom a prong **567**, all similar to prong **407** of FIGS. **4**A and **4**B.

Connector **560** further includes a longitudinal bore **568** extending longitudinally through base **562**, similar to bore **490** of FIGS. **8**A to **8**C. Bore **568** is adapted for a tube to be slidably placed therethrough, and/or for snap-fit connection of a suitable connector thereto, such as connector **500** of FIGS. **9**A to **9**C, substantially as described with respect to FIGS. **11**A and **11**B.

Reference is now additionally made to FIGS. **14**D, **14**E, and **14**F, which are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a three-directional sliding connector **560'** according to another embodiment of the disclosed technology. Three-directional sliding connector **560'** is substantially similar to three-dimensional sliding connector **560**, with each of prongs **567** being replaced by a tubular prong **567'**, substantially similar to tubular prong **437** of FIGS. **5**C to **5**E, or to tubular prong **417** of FIGS. **4**C to **4**E. In some embodiments (not explicitly shown), only some of prongs **567** may be replaced by tubular prongs **567'**, such that the resulting three-dimensional sliding connector may have a mixture of prongs and tubular prongs extending therefrom.

When a tube is connected to each of prongs **567** or **567'**, in the orientation of connector **560**, an angle of 120 degrees is formed between each two adjacent tubes, and all the tube connections lie in a single plane. If a fourth tube is slidably disposed in bore **568**, it has a 90-degree angle to each of the tubes on prongs **567** or in tubular prongs **567'**, and is perpendicular to the plane of prongs **567**/**567'**. However, it is appreciated that base **562** may be arranged differently, such that it is not an equilateral triangle, or the prongs are not disposed in a single plane, in which case the angular arrangement of prongs **567**/**567'** would be different. Additionally, in some embodiments, bore **568** may be obviated, such that the connector may only be used for connection of three tubes in a single plane.

FIGS. **15**A, **15**B, and **15**C, are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a four-directional sliding connector **570** according to an embodiment of the disclosed technology. As seen, four-directional sliding connector **570** includes a quadrilateral base **572**, here illustrated as a square, extending along a longitudinal axis **573**, and having four side surfaces **574** as well as front and back surfaces **576**. Each of side surfaces **574** has extending therefrom a prong **577**, all similar to prong **407** of FIGS. **4**A and **4**B. In some embodiments, some or all of prongs **577** may be replaced by tubular prongs, each similar to or identical to tubular prong **437** of FIGS. **5**C to **5**E, or to tubular prong **417** of FIGS. **4**C to **4**E.

Connector **570** further includes a longitudinal bore **578** extending longitudinally through base **572**, similar to bore **490** of FIGS. **8**A to **8**C. Bore **578** is adapted for a tube to be slidably placed therethrough, and/or for snap-fit connection of a suitable connector thereto, such as connector **500** of FIGS. **9**A to **9**C, substantially as described with respect to FIGS. **11**A and **11**B.

When a tube is connected to each of prongs **577**, in the orientation of connector **570**, an angle of 90 degrees is formed between each two adjacent tubes, and all the tube connections lie in a single plane. If a fifth tube is slidably disposed in bore **578**, it has a 90-degree angle to each of the tubes on prongs **577**, and is perpendicular to the plane of

prongs **577**. However, it is appreciated that base **572** may be arranged differently, such that it is not an equilateral square, or the prongs are not disposed in a single plane, in which case the angular arrangement of prongs **577** would be different. Additionally, in some embodiments, bore **578** may be obviated, such that the connector may only be used for connection of four tubes in a single plane.

FIGS. **16**A, **16**B, **16**C, and **16**D are, respectively, a perspective view illustration, a side view planar illustration, a front view planar illustration and a top view planar illustration of a double snap-fit connector **580** according to an embodiment of the disclosed technology. As seen, double snap-fit connector **580** includes a T-shaped base **582**, having a first surface **584** and two additional surfaces **586**. Surface **584** has extending therefrom a prong **587**, all similar to prong **407** of FIGS. **4**A and **4**B, and additional surfaces **586** have extending therefrom snap-fit connection portions **588**, similar to the snap-fit connection portion of connector **500** described with respect to FIGS. **9**A to **9**C. In some embodiments, base **582** may further include a pair of slots **589** disposed on either side thereof along a longitudinal axis of prong **587**, between additional surfaces **586**.

In some embodiments, prong **587** may be replaced by a tubular prong, similar to or identical to tubular prong **437** of FIGS. **5**C to **5**E, or to tubular prong **417** of FIGS. **4**C to **4**E.

FIGS. **17**A, **17**B, and **17**C are, respectively, a perspective view illustration, a front view planar illustration, and a side view planar illustration of an extending snap fit connector **590** according to an embodiment of the disclosed technology. As seen, extending snap-fit connector **590** includes a base portion **592**, having a first surface **594** and a second surface **596**. Extending longitudinally from second surface **596** is a cylindrical snap fit portion **598**, terminating at an end surface **600**. Cylindrical snap fit portion **598** has a smaller circumference than base portion **592**. Extending radially outwardly cylindrical snap fit portion **598**, adjacent end surface **600**, are a pair of protrusions **602** each having a locking surface **604** facing toward second surface **596**. First and second prongs **607***a* and **607***b*, both similar to prong **407** of FIGS. **4**A and **4**B, extend longitudinally outwardly from surfaces **594** and **600**, respectively. A through-going slot **608** extends through part of snap-fit portion **598** and part of prong **607***b*, the slot **608** facilitating slight clamping of snap fit portion **598** during snap-fit connection thereof. In some embodiments, one or both of prongs **607***a* and **607***b* may be replaced by a tubular prong, similar to or identical to tubular prong **437** of FIGS. **5**C to **5**E, or to tubular prong **417** of FIGS. **4**C to **4**E.

In use, connector **590** may be disposed longitudinally through a sliding connector portion, such as that described with respect to FIGS. **8**A to **8**C. In this arrangement, the cylindrical portion of the sliding connector would be locked between surfaces **596** and **604**.

FIGS. **18**A, **18**B, and **18**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a double snap-fit supporting connector **610** according to an embodiment of the disclosed technology. As seen, double snap-fit supporting connector **610** includes a base **612** having a first surface **614** and a second surface **616**. Snap-fit connection portions **617** and **618**, both similar to the snap-fit connection portions of FIGS. **9**A to **9**C, extend longitudinally outwardly from first surface **614** and second surface **616** respectively.

FIGS. **19**A, **19**B, and **19**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a double snap-fit sliding supporting connector **620** according to an embodiment of the disclosed technology. As seen, double snap-fit sliding connector **620** includes a quadrilateral base **622**, here illustrated as a square, extending along a longitudinal axis **623**, and having four side surfaces **624** as well as front and back surfaces **626**. Two opposing ones of side surfaces **624** have extending therefrom snap-fit connection portions **627**, similar to the snap-fit connection portion of FIGS. **9**A to **9**C.

Connector **620** further includes a longitudinal bore **628** extending longitudinally through base **622**, similar to bore **490** of FIGS. **8**A to **8**C. Bore **628** is adapted for a tube to be slidably placed therethrough, and/or for snap-fit connection of a suitable connector thereto, such as connector **500** of FIGS. **9**A to **9**C, substantially as described with respect to FIGS. **11**A and **11**B.

It is appreciated that in some embodiments, three or four of side surfaces **624** may include snap-fit connection portions.

In some embodiments, each side surface **624** not including a snap-fit connection portion may include another connection portion, such as a sliding connection portion, a male pivoting connection portion, or a female pivoting connection portion, a prong, or a tubular prong, all as described hereinabove.

In some embodiments, quadrilateral base **622** may not necessarily be a square, thus impacting the angular orientation between the snap fit portions. In other embodiments, quadrilateral base **622** may be replaced by a different polygonal base, such as a triangular base or a pentilateral base.

In some embodiments, bore **628** may be obviated.

FIGS. **20**A, **20**B, and **20**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a female pivoting snap-fit supporting connector **630** according to an embodiment of the disclosed technology. As seen, female pivoting snap-fit supporting connector **630** includes a base **632** having a first surface **634** and a second surface **636**. A Snap-fit connection portion **637**, similar to the snap-fit connection portions of FIGS. **9**A to **9**C, extends longitudinally outwardly from first surface **634**. A female pivoting connection portion **638**, similar to the female pivoting connection portion of FIGS. **7**A to **7**C, extends longitudinally outwardly from second surface **636**.

FIGS. **21**A, **21**B, and **21**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a male pivoting snap-fit supporting connector **640** according to an embodiment of the disclosed technology. As seen, male pivoting snap-fit supporting connector **640** includes a base **642** having a first surface **644** and a second surface **646**. A Snap-fit connection portion **647**, similar to the snap-fit connection portions of FIGS. **9**A to **9**C, extends longitudinally outwardly from second surface **636**. A male pivoting connection portion **648**, similar to the male pivoting connection portion of FIGS. **6**A to **6**C, extends longitudinally outwardly from first surface **644**.

FIGS. **22**A, **22**B, and **22**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a sliding snap-fit supporting connector **650** according to an embodiment of the disclosed technology. As seen, sliding snap-fit supporting connector **650** includes a base **652** having a first surface **654** and a second surface **656**. A Snap-fit connection portion **657**, similar to the snap-fit connection portions of FIGS. **9**A to **9**C, extends longitudinally outwardly from first surface **654**. A sliding connection portion, similar to the sliding connec-

tion portion of FIGS. **8**A to **8**C, extends longitudinally outwardly from second surface **656**.

FIGS. **23**A, **23**B, and **23**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a double sliding supporting connector **660** according to an embodiment of the disclosed technology. As seen, double sliding supporting connector **660** includes a base **662** having a first surface **664** and a second surface **666**. Sliding connection portions **667** and **668**, both similar to the sliding connection portions of FIGS. **8**A to **8**C, extend longitudinally outwardly from first surface **664** and second surface **666** respectively.

FIGS. **24**A, **24**B, and **24**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a sliding male pivoting supporting connector **670** according to an embodiment of the disclosed technology. As seen, sliding male pivoting supporting connector **670** includes a base **672** having a first surface **674** and a second surface **676**. A male pivoting connection portion **677**, similar to the male pivoting connection portion of FIGS. **6**A to **6**C, extends longitudinally outwardly from first surface **674**. A sliding connection portion **678**, similar to the sliding connection portion of FIGS. **8**A to **8**C, extend longitudinally outwardly from second surface **676**.

FIGS. **25**A, **25**B, and **25**C are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a sliding female pivoting supporting connector **680** according to an embodiment of the disclosed technology. As seen, sliding female pivoting supporting connector **680** includes a base **682** having a first surface **684** and a second surface **686**. A sliding connection portion **687**, similar to the sliding connection portion of FIGS. **8**A to **8**C, extend longitudinally outwardly from first surface **684**. A female pivoting connection portion **688**, similar to the male pivoting connection portion of FIGS. **7**A to **7**C, extends longitudinally outwardly from second surface **686**.

FIGS. **26**A, **26**B, **26**C, and **26**D are, respectively, a perspective view illustration, a side view planar illustration, a front view planar illustration, and a top view planar illustration of a linear double male pivoting supporting connector **690** according to an embodiment of the disclosed technology. As seen, linear double male pivoting supporting connector **690** includes a base **692** having a first surface **694** and a second surface **696**. Male pivoting connection portions **697** and **698**, both similar to the male pivoting connection portions of FIGS. **6**A to **6**C, extend longitudinally outwardly from first surface **694** and second surface **696** respectively. Male pivoting connection portions **697** and **698** form a single plane, with recesses **699** thereof facing the same directions.

FIGS. **27**A, **27**B, **27**C, and **27**D are, respectively, a perspective view illustration, a side view planar illustration, a front view planar illustration, and a top view planar illustration of an angled double male pivoting supporting connector **700** according to an embodiment of the disclosed technology. As seen, angled double male pivoting supporting connector **700** includes a base **702** having a first surface **704** and a second surface **706**. Male pivoting connection portions **707** and **708**, both similar to the male pivoting connection portions of FIGS. **6**A to **6**C, extend longitudinally outwardly from first surface **704** and second surface **706** respectively. Planes of male pivoting connection portions **707** and **708** form are angled at a 90-degree angle with respect to each other.

FIGS. **28**A, **28**B, **28**C, and **28**D are, respectively, a perspective view illustration, a side view planar illustration, a front view planar illustration, and a top view planar illustration of an angled male and female pivoting supporting connector **710** according to an embodiment of the disclosed technology. As seen, male and female pivoting supporting connector **710** includes a base **712** having a first surface **714** and a second surface **716**. A male pivoting connection portions **717**, similar to the male pivoting connection portion of FIGS. **6**A to **6**C, extends longitudinally outwardly from first surface **714**. A female pivoting connection portions **718**, similar to the female pivoting connection portion of FIGS. **7**A to **7**C, extends longitudinally outwardly from second surface **716**. Longitudinal planes of male pivoting connection portion **717** and female pivoting connection portion **718** form are angled at a 90-degree angle with respect to each other.

FIGS. **29**A, **29**B, and **29**C, are, respectively, a perspective view illustration, a side view planar illustration, and a front view planar illustration of a double clasping supporting connector **720** according to an embodiment of the disclosed technology. As seen, double clasping supporting connector **720** includes a base **722**, here shown as a longitudinal base rod, having a first surface **724** and a second surface **726**. Curved clasping surfaces **730**, both similar to the clasping surface **430** of FIGS. **5**A to **5**B, extend longitudinally outwardly from each of first surface **724** and second surface **726**. Each of clasping surfaces **730** may terminate in a handle portion **732**, which may be used by a user to remove the tube from the interior of clasping surface **730**.

Reference is now made to FIGS. **30**A, **30**B, and **30**C, which are, respectively, a perspective view illustration, a side view planar illustration, and an enlargement of a portion of a reinforcing tool **800** (shown circled in FIG. **30**A) for crimping a hollow elongate tube onto a connector according to an embodiment of the disclosed technology, so as to reinforce the connection between the tube and the connector.

As seen, reinforcing tool **800** is shaped like pliers, and includes two symmetrically arranged portions **802**. Each of portions **802** includes a gripping end **804**, adapted to be held by a user, and a working end **806**, where the tool portions **802** are pivotable relative to each other about a fulcrum **808**.

The working ends **806** of tool **800** each have a planar inward facing surface **810**, such that surfaces **810** are adapted to engage one another when force is applied to gripping ends **804**. Each of surfaces **810** has formed therein, along a width thereof, a hemispherical recess **812**, such that the hemispherical recesses **812** of the two working ends **806** form a bore when the surfaces **810** engage one another. Each hemispherical recess **812** has a circumferential protrusion **814** disposed at a longitudinal center thereof, which is also the center of the width of the working end.

Typically, the hemispherical recesses **812** are sized and configured such that the bore formed thereby has a diameter approximately equal to, and not smaller than, the diameter of an elongate tube cut and shaped using the device **100** of FIGS. **1**A to **1**E. The circumference formed by the protrusions **814**, when the surfaces **810** engage one another, is sized and configured to apply pressure to an indentation in a prong of a connector, such as indentation **410** of FIGS. **4**A and **4**B.

In use, after the user places a tube about a prong of a connector, such as prong **407** of end connector **400**, the user opens tool **800**, and closes it about the tube, such that the tube is disposed within indentations **812**, and protrusions **814** apply pressure that pushes part of the material of the tube into the indentation **410** of the prong **407**, thereby reinforcing the connection between the elongate tube and the prong, and reinforcing the structure being built.

It is appreciated that in some embodiments, multiple components used for construction of structures using the construction toy of the present invention may form a kit.

In some such embodiments, the kit may include a tube cutting and bending device as illustrated in FIGS. **1**A to **3**I, and at least one connector. Typically, kit includes a plurality of connectors, which may be of a single one of the types shown in FIGS. **4**A to **28**D, or of multiple types. In some embodiments, the kit may further include at least one reinforcing tool **800** of FIGS. **30**A to **30**C. In some embodiments, the kit may further include at least one elongate tube, suitable for being cut and/or bent using device **100**.

In use, the user would plan what structure they want to build, and then would cut and bend hollow elongate tubes using device **100** to the desired dimensions and angles. The user would then use a plurality of connectors, for example as described hereinabove, to connect the cut and/or bent tube in two or three dimensions, thereby to form a two- or three-dimensional structure. In some embodiments, for example when the connectors include a prong similar to prong **407** of FIGS. **4**A and **4**B, the user may reinforce the connection between tubes and connectors using the reinforcing tool **800**.

In some embodiments, the kit may further include, or be associated with, a software application, in which the user may select a desired structure to build, and may receive step-by-step instructions for cutting and bending tubes, and for connecting the tubes to one another to build the desired structure.

It is appreciated that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features of the invention, which are, for brevity, described in the context of a single embodiment, may also be provided separately or in any suitable subcombination or as suitable in any other described embodiment of the invention. Certain features described in the context of various embodiments are not to be considered essential features of those embodiments, unless the embodiment is inoperative without those elements.

It will be appreciated that certain features of the invention, which are, for clarity, described in the context of separate embodiments, may also be provided in combination in a single embodiment. Conversely, various features of the invention, which are, for brevity, described in the context of a single embodiment, may also be provided separately or in any suitable sub-combination.

Although the invention has been described in conjunction with specific embodiments thereof, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art. Accordingly, it is intended to embrace all such alternatives, modifications and variations that fall within the spirit and broad scope of the appended claims. All publications, patents and patent applications mentioned in this specification, are herein incorporated in their entirety by reference into the specification, to the same extent as if each individual publication, patent or patent application was specifically and individually indicated to be incorporated herein by reference. In addition, citation or identification of any reference in this application shall not be construed as an admission that such reference is available as prior art to the present invention.

What is claimed is:

1. A device for cutting and bending a hollow elongate tube, the device including:

a measuring subassembly adapted for measuring a desired size of the hollow elongate tube;

a cutting subassembly adapted for cutting the hollow elongate tube to said desired size, said cutting subassembly including an anchoring element adapted to anchor the hollow elongate tube, and a rotational blade adapted to rotate relative to the anchored hollow elongate tube, thereby to cut the hollow elongate tube; and

a bending subassembly adapted for bending the cut hollow elongate tube to a desired angular orientation, said bending subassembly including:

a base controlling a radius of a bend to be formed in the cut hollow elongate tube; and

a user grippable handle configured to enable a user to rotate the cut hollow elongate tube, relative to said base, to form said bend in the cut hollow elongate tube.

2. The device of claim **1**, further including one or more storage compartments, adapted for storing at least one hollow elongate tube prior to or following, cutting and/or bending of the at least one hollow elongate tube.

3. The device of claim **1**, wherein said measuring subassembly, said cutting subassembly, and said bending subassembly are all mounted onto a unitary body, the device further including a clamping subassembly, adapted for clamping said unitary body onto a surface of a working station.

4. A kit for creating a structure, the kit comprising:

the device according to claim **1**;

a plurality of hollow elongate tubes, suitable for cutting and bending using said device; and

a plurality of connectors, each of said plurality of connectors being adapted for connecting said hollow elongate tubes following cutting and/or bending thereof, thereby to form a two-dimensional or a three-dimensional structure, each of said plurality of connectors including:

a base defining at least one base surface; and

at least one prong extending outwardly from the at least one base surface, the at least one prong adapted for secure connection thereto of the at least one hollow elongate tube.

5. The kit of claim **4**, wherein at least one connector of said plurality of connectors comprises a first prong having a first longitudinal section and a second longitudinal section, both having a first circumference, and an indented longitudinal section, between the first and second longitudinal sections, having a second circumference,

wherein the second circumference is smaller than the first circumference, and

wherein the first prong is adapted to be inserted into a hollow of one of the plurality of hollow elongate tubes, thereby to secure the one of the plurality of hollow elongate tubes to the at least one connector.

6. The kit of claim **5**, wherein a first ratio between a length of the first longitudinal section and a length of the third longitudinal section is at least 2:1, and a second ratio between a length of the second longitudinal section and a length of the third longitudinal section is at least 2:1.

7. The kit of claim **4**, wherein at least one other connector of said plurality of connectors comprises a second prong comprising a tubular prong defining a longitudinal prong hollow, wherein the second prong is adapted to receive an end of one of the plurality of hollow elongate tubes in the prong hollow to frictionally secure the one of the plurality of hollow elongate tube to the at least one other connector.

8. The kit of claim 4, wherein at least one connector of said plurality of connectors further includes at least one of:

a snap fit connection region for snap fit connection in a bore of another connector of said plurality of connectors;

a bore configured for at least one of:

snap fit connection of said another connector; and

slidable placement of a hollow elongate tube therethrough;

a pivoting connection region, for connection to a corresponding pivoting region of said another connector, such that connection of said at least one connector with said another connector enables pivoting of said at least one connector relative to said another connector; and

a clasping element adapted for clasping one of said plurality of hollow elongate tubes therein.

9. The kit of claim 4, further comprising at least one supporting connector adapted to be associated with first and second connectors of said plurality of connectors, the supporting connector having a first portion adapted for connection to said first connector and a second portion adapted for connection to said second connector.

10. The kit of claim 4, further comprising at least one clasping connector adapted to be associated with first and second hollow elongate tubes of said plurality of hollow elongate tubes, the clasping connector including:

a base having first and second end surfaces;

a first clasping portion extending from the first end surface of the base, the first clasping portion adapted for clasping therein of a first hollow elongate tube; and

a second clasping portion extending from the second end surface of the base, the second clasping portion adapted for clasping therein of a second hollow elongate tube.

11. The kit of claim 4, further comprising a reinforcing tool including a pair of tool portion, each said tool portion including a gripping end and a working end, the pair of tool portions being pivotally connected to each other such that said working ends thereof are adapted, in a closed orientation of the reinforcing tool, to engage one another, wherein the working end of each of said tool portions includes a hemispherical recess extending along a width thereof, said hemispherical recess having a circumferential protrusion disposed at a longitudinal center thereof.

12. A method for constructing a two-dimensional structure or a three-dimensional structure using the kit of claim 4, the method comprising:

connecting a first end of each of the plurality of hollow elongate tubes to the prong of one of said plurality of connectors;

connecting a second end of at least some of the plurality of hollow elongate tubes to one of said plurality of connectors,

wherein, following the connecting of the first end and the connecting of the second end, the plurality of hollow elongate tubes and the plurality of connectors form a single structure.

13. The method of claim 12, wherein at least one of the plurality of hollow elongate tubes is a cut hollow elongate tube, the method further comprising prior to the connecting of the first end and the connecting of the second end, cutting a long hollow elongate tube to a desired size.

14. The method of claim 12, wherein at least one of the plurality of hollow elongate tubes is a bent hollow elongate tube, the method further comprising prior to the connecting of the first end and the connecting of the second end, bending a hollow elongate tube to a desired angle, thereby to form the bent hollow elongate tube.

15. A method of cutting a hollow elongate tube to a desired length using the device of claim 1, the method comprising:

inserting the hollow elongate tube into the measuring subassembly of the device, to an extent equivalent to the desired length;

anchoring the hollow elongate tube to the device; and

rotating the rotational blade of the cutting subassembly about relative to the hollow elongate tube, thereby to cut the hollow elongate tube to the desired length.

16. The method of claim 15, further comprising, prior to the inserting, anchoring the device to a working station.

17. A method of bending a hollow elongate tube to a desired angle using the device of claim 1, the method comprising:

inserting the hollow elongate tube into the bending subassembly of the device, between the base and a securing pin, thereby securing the hollow elongate tube relative to the device; and

rotating the user grippable handle, together with the securing pin, relative to a body of the device and to the base, thereby causing the securing pin to push the hollow elongate tube about the base and bending the hollow elongate tube to the desired angle.

18. The method of claim 17, further comprising, prior to the inserting, inserting into the device a said base having a desired radius for bending of the hollow elongate tube.

19. The method of claim 17, further comprising, prior to the inserting, anchoring the device to a working station.

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