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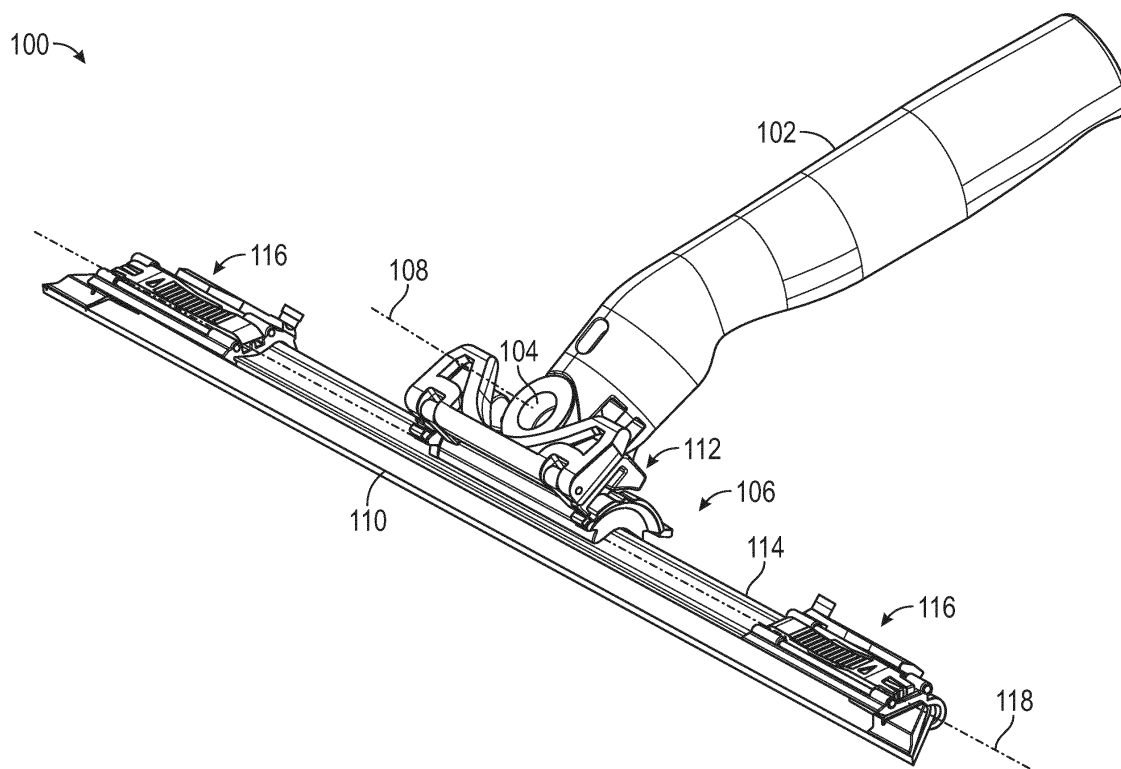
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(54) ADJUSTABLE SQUEEGEE WITH SCRUBBER BAR

(57) A cleaning device is provided. The cleaning device includes a handle and a channel member operably coupled to the handle. A blade is replaceably coupled to the channel member. A lock assembly that includes an end cap, a lock switch member and a support member. The end cap is coupled to the channel member. The lock switch member is slidably coupled to the end

cap, the lock switch member being movable between an unlocked, a locked and an extended position. The support member is moveably coupled to the end cap and having a support surface adjacent a surface of the blade, the support member having a ramp portion that is engagable by the lock switch member to translate the support surface into contact with the surface of the blade.

**FIG. 1A****EP 4 541 242 A1**

Description

BACKGROUND

[0001] Exemplary embodiments of the disclosure relate to devices such as cleaning devices for windows, including scrapers. More particularly, the present disclosure is related to cleaning devices having an adjustable configuration.

[0002] Surface cleaning devices, such as squeegee devices, typically include a handle having a cleaning implement, such as a wiper or squeegee blade secured thereto. Many such devices have been developed for use with windows or large flat surfaces. Here, the handle is then used in a known manner to move the blade along a vertical surface, or any other substantially flat surface to push liquid and/or solid debris to a desired location. The cleaning implement of existing tools are typically fixedly positioned relative to the handle, thereby limiting the ease of access by a user to non-uniformly shaped or difficult to reach areas.

[0003] Accordingly, while existing squeegee devices are suitable for their intended purposes the need for improvement remains, particularly in providing a squeegee having the features described herein.

BRIEF DESCRIPTION

[0004] According to one aspect of the disclosure, a cleaning device is provided. The cleaning device includes a handle and a channel member operably coupled to the handle. A blade is replaceably coupled to the channel member. A lock assembly that includes an end cap, a lock switch member and a support member. The end cap is coupled to the channel member. The lock switch member is slidably coupled to the end cap, the lock switch member being movable between an unlocked, a locked and an extended position. The support member is moveably coupled to the end cap and having a support surface adjacent a surface of the blade, the support member having a ramp portion that is engagable by the lock switch member to translate the support surface into contact with the surface of the blade.

[0005] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include the lock switch member further having an angled surface that engages the ramp portion when the lock switch member is moved from the locked to the extended position.

[0006] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include the support member having a pair of pins extending on opposite sides of the ramp portion; and the lock switch member further includes a pair of spaced apart ribs, the pair of ribs each having a slot sized to receive one of the pair of pins.

[0007] In addition to one or more of the features described herein, or as an alternative, further embodiments

of the cleaning device may include each slot having an angled surface, the angled surface engaging the pair of pins and translating the support member away from the blade in response to the lock switch member moving from the extended to the locked position.

[0008] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include the support member having a support arm that extends laterally in the direction of a wiping edge of the blade.

[0009] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include a clip spring coupled between the end cap and the lock switch member.

[0010] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include the lock switch member further having a relief area on a side facing the end cap; and the clip spring is shaped to receive the relief area when the lock switch member is in the unlocked position.

[0011] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include a pad post coupled to the end cap.

[0012] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include a rotational assembly comprising: a frame coupled to the blade, the frame having a first slot and at least one cantilevered arm with a tooth disposed on one end; and a support body rotationally coupled to the first slot, the support body having a flange with a plurality of second slots, the plurality of second slots sized to receive the tooth.

[0013] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include a handle lever pivotally coupled to the frame, the handle lever having a cam surface positioned and shaped to engage the cantilever arm in response to the handle lever being moved from an open to a locked position.

[0014] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include the support body having at least one feature extending parallel with a longitudinal axis of the blade.

[0015] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include the at least one feature has a contrasting color to the rest of the support body.

[0016] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include a button slidably coupled to an aperture in the handle, the button being movable between a first position and a second position.

[0017] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include the frame having a

portion extending towards the handle, the portion having a third slot; and the button has a projection sized and positioned to be disposed in the third slot when the button is in the first position and spaced apart from the third slot when the button is in the second position.

[0018] In addition to one or more of the features described herein, or as an alternative, further embodiments of the cleaning device may include the blade being in a fixed position relative to the handle when the button is in the first position; and the blade freely rotating about an axis when the button is in the second position.

[0019] These and other advantages and features will become more apparent from the following description taken in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The subject matter, which is regarded as the disclosure, is particularly pointed out and distinctly claimed in the claims at the conclusion of the specification. The foregoing and other features, and advantages of the disclosure are apparent from the following detailed description taken in conjunction with the accompanying drawings. With reference to the accompanying drawings, like elements are numbered alike:

FIG. 1A - FIG. 1H illustrate different views of a cleaning device in a first position according to an embodiment;

FIG. 2A is a side view of the cleaning device of FIG. 1A in a second position according to another embodiment;

FIG. 2B is an enlarged view of a portion of the cleaning device of FIG. 2A

FIG. 3A is a side view of the cleaning device of FIG. 1A in a third position according to another embodiment;

FIG. 3B is an enlarged view of a portion of the cleaning device of FIG. 2A;

FIG. 4A is a partial perspective view of the cleaning tool of FIG. 1A showing a blade rotation mechanism in accordance with an embodiment;

FIG. 4B is a partial perspective view, partially in section of the cleaning tool of FIG. 4A according to an embodiment;

FIG. 4C is an unassembled view of the blade rotation mechanism of FIG. 4A according to an embodiment;

FIG. 4D is a perspective view of a frame member for the rotation mechanism of FIG. 4A according to an embodiment;

FIG. 4E is a perspective view of a support body for the rotation mechanism of FIG. 4A according to an embodiment;

FIG. 5A is a partial plan view of a cleaning device of FIG. 1A illustrating a locking mechanism in an extended position according to an embodiment;

FIG. 5B is a partial plan view of a cleaning device of FIG. 1A illustrating a locking mechanism in an unlocked position according to an embodiment;

FIG. 5C is a partial perspective view of the cleaning device of FIG. 1A with a locking mechanism in an extended position according to an embodiment;

FIG. 5D is a unassembled perspective view of the cleaning device of FIG. 1A according to an embodiment;

FIG. 5E is a partial sectional view of the cleaning device of FIG. 1A with the locking mechanism in an unlocked position according to an embodiment;

FIG. 5F is a partial sectional view of the cleaning device of FIG. 1A with the locking mechanism in an extended position according to an embodiment;

FIG. 6 is a perspective view of a cleaning device according to another embodiment;

FIG. 7A and FIG. 7B are perspective views of a blade rotation assembly for the cleaning device of FIG. 6 in accordance with an embodiment;

FIG. 8A and FIG. 8B are perspective views of the cleaning device of FIG. 6 with a lock lever member removed;

FIG. 8C is a sectional view of a handle rotation assembly in accordance with an embodiment;

FIG. 8D is a partial perspective view of the handle rotation assembly of FIG. 8A in accordance with an embodiment;

FIG. 8E is a partial perspective unassembled view of the handle rotation assembly FIG. 8D in accordance with an embodiment;

FIG. 9A- 9C are partial perspective views of a blade locking assembly for the cleaning device of FIG. 6;

FIG. 9D and FIG. 9E are perspective views of an end cap member for the blade locking assembly of FIG. 9A;

FIG. 9F is a perspective view of a plate member for

the blade locking assembly of FIG. 9A; and

FIG. 9G and FIG. 9H are partial sectional views of an blade locking assembly in a locked and an unlocked state.

[0021] The detailed description explains embodiments of the disclosure, together with advantages and features, by way of example with reference to the drawings.

DETAILED DESCRIPTION

[0022] Embodiments of the present disclosure provide for a cleaning device, such as a squeegee having a support assembly for selectively supporting the blade during operation. Embodiments of the present disclosure provide for a cleaning device where the blade may be selectively rotated about an axis parallel with a longitudinal axis of the blade. Further embodiments of the present disclosure provide for a cleaning device where the blade assembly may be selectively locked in a fixed position relative to the handle or allowed to freely rotate.

[0023] With reference to the Figures 1A-1G, an exemplary embodiment of a cleaning tool 100 according to the present disclosure is shown. Cleaning tool 100 has a handle assembly 102, a pivoting assembly 104, and a blade assembly 106. The pivoting assembly 104 receives the blade assembly 106 and allows the blade assembly 106 to rotate or pivot about an axis 108.

[0024] The blade assembly 106 includes a blade 110 that is coupled to a rotation mechanism 112 by a channel member 114. Disposed on opposite ends of the channel member 114 is a blade locking assembly 116. As will be discussed in more detail herein, the pivoting assembly 104 is configured to rotate the blade assembly 106 about an axis 118. As will further be discussed herein, the blade locking assembly 116 releasably couples the blade 110 to the channel member 114 and also provides variable support for portions of the blade 110.

[0025] In the exemplary embodiment, the blade 110 is made from an elastomeric or rubber material and is configured to slide across a surface, such as a glass surface for example, and remove fluids therefrom.

[0026] Referring now to FIGs. 1F - 1H, FIGs. 2A -2B, and FIGs. 3A-3B, an embodiment is shown of the operation of rotation mechanism 112. It should be appreciated that cleaning tool 100 may be used in a variety of applications and in different orientations. As such, the operator may desire to change the angle of the blade 110 about the axis 118. In an embodiment, the rotation mechanism 112 includes a handle 120 that may be rotated between a locked (FIG. 1H, FIG. 2B, FIG. 3B) and an unlocked position by rotating about a pivot 122. The rotation of the handle 120 releases a support body assembly 124 to rotate about the axis 118.

[0027] Advantageously, cleaning tool 100 is configured, by way of rotation mechanism 112, to easily allow blade assembly 106 to be rotated with respect to handle

102 about the axis 118 to at least a first, and second position, as shown in FIGs. 1F and FIG. 2A, and also lock the blade holder in these positions. Cleaning tool 100 has been designed so that pivoting assembly 104 has a reduced number of components that can be easily molded and assembled. In an embodiment, the blade assembly 106 may be rotated between three different angular positions shown in FIG. 1F, FIG. 2A and FIG. 3A. However, it should be appreciated that the pivoting assembly 104 may be configured to allow rotation between more or fewer discrete positions, or may be continuously positioned, without deviating from the teachings provided herein.

[0028] Referring now to FIGs. 4A - 4E, an embodiment is shown of the rotation mechanism 112. The rotation mechanism 112 includes a frame member 126 that couples to the pivoting assembly 104, such as via opening 128 for example. The frame member 126 includes a body 130 that defines a semi-circular or C-shaped channel 132. In the illustrated embodiment, the channel 132 extends greater than 180 degrees. Extending from the body 130 is a projection 134 having a cantilevered arm 136. Disposed on an end of the arm 136 is a tooth 138 that projects in a direction towards the channel 132. In the illustrated embodiment the frame member 126 includes two projections 134, arms 136 and teeth 138 arranged at opposite ends of the body 130. In the illustrated embodiment, the pivots 122 also extend from the top side of the body 130.

[0029] Rotationally coupled to the frame member 126 is a support body assembly 124. In an embodiment, the support body assembly 124 includes a first collar 140 and a second collar 142. In an embodiment, the collars 140, 142 are coupled together by a snap fit. The collars 140, 142 cooperate to define a slot 144 that is sized and shaped to receive the channel member 114 to secure the blade 110 to the handle 102. The support body assembly 124 has a generally cylindrical outer surface that cooperates with the channel 132 to define the axis 118 of rotation for the blade 110.

[0030] Each of the collars 140, 142 each includes a flange 146, 148 having a plurality of slots 150A, 150B, 150C arranged parallel with the axis 118. The flanges 146, 148 are curved and have a center of curvature that lies on the axis 118. The flanges 146, 148 are positioned such that the teeth 138 will engage the slots 150A, 150B, 150C. In an embodiment, the cantilevered arm 136 is made from a material with an elasticity that biases the arms 136 such that the arms 136 deflect the teeth 138 away from the flanges 146, 148. As discussed in more detail below, the arms 136 cooperate with the handle 120 to engage the teeth 138 with the slots 150A, 150B, 150C.

[0031] The rotation mechanism 112 further includes the handle 120 that rotates about and is retained to the pivots 122 by a pin 152. The handle includes a cam surface having a first portion 154 that engages an upper surface of the arms 136 and is shaped to deflect the arms 136 to engage the teeth 138 with the slots 150A, 150B,

150C. The cam surface further includes a second portion 156 that is shaped to allow the arms 136 to deflect away from the flanges 146, 148 when the handle 120 is rotated to an open position. In the illustrated embodiment, the first portion 154 is a curved surface having a center of curvature that is offset from the axis of the pin 152.

[0032] Referring now to FIGs. 5A - 5F, embodiments of the blade locking assembly 116 are shown. The blade locking assembly 116 provides a number of functions for the cleaning tool 100, including the removably coupling of the blade 110 to the channel member 114. The locking assembly further includes a support member 160 that adjustably supports the side of the blade 110 to improve performance in some embodiments. It should be appreciated that while only one of the blade locking assemblies 116 is described, in an embodiment, the cleaning tool 100 includes two blade locking assemblies 116 located at opposite ends of the channel member 114.

[0033] The blade locking assembly 116 includes an end cap 162 having a semi-circular portion 164 defining a slot 166 sized to receive the channel member 114. The end cap 162 further includes a recessed area 168 that is sized to slidably receive a lock switch member 170. The lock switch member 170 is slidably coupled to the end cap 162 by a pair of pins 172. The end cap 162 further includes an opening 174 that is sized to receive a ramp portion 176 of the support member 160. In an embodiment, the lock switch member 170 includes a pair of arms 178 that define a slot 180. During operation, the ramp portion 176 fits at least partially within the slot 180. The engagement of the edge of the slot 180 opposite the open end causes the support member 160 to move in a direction transverse to a plane defined by the pins 172. A clip spring 182 is disposed between the lock switch member 170 and a bottom surface of the recessed area 168. As discussed in more detail below, the clip spring 182 secures the blade 110 in place.

[0034] In the illustrated embodiment, the slide lock has three discrete positions as indicated by indicia 184 printed or formed on a surface of the end cap 162. When viewed from the side of FIG. 5A and 5B, the positions include an unlocked position (FIG. 5B) with the lock switch member 170 slid to an inward position, such as when an arrow indicia 186 aligns with an open lock symbol for example. In this position, a support surface 188 of the support member 160 is offset from a top surface 190 of the blade 110 (FIG. 5E). Further, in this position, a bend portion of the clip spring 182 moves into a relief area 192 on the underside of the lock switch member 170. When in this position, the clip spring 182 moves away from and disengages from the top surface 190 which allows the operator to slide the blade 110 relative to the channel member 114 to remove and replace the blade 110 on the cleaning tool 100.

[0035] In an embodiment, when the lock switch member 170 is slid to the middle position, such that the arrow indicia 186 is aligned with the closed lock symbol, the clip spring 182 is forced out of the relief area 192 to engage

the top surface 190 of the blade 110 and prevent lateral movement of the blade relative to the channel member 114.

[0036] The third or final position is when the lock switch member 170 is slid furthest to the outside (to the right in FIG. 5A). In an embodiment, the ramp portion 176 includes an angled end surface such that the depth or height of the ramp portion 176 increases from the inner side to the outer side of the ramp portion. As a result, when the lock switch member 170 is moved towards the third position, the edge of the slot 194 engages the angled end surface. Due to the angle of the end surface, the support member 160 will laterally move towards the blade 110. The contact of the support surface 188 with the top surface 190 will displace the blade and provide constant support for a portion of the blade 110 along the entire length of the support member as shown in FIG. 5F.

[0037] Referring now to FIG. 6 another embodiment is shown of a cleaning tool 600. The cleaning tool 600 has a handle assembly 602, a handle rotation or pivoting assembly 604, and a blade assembly 606. The pivoting assembly 604 receives the blade assembly 606 and allows the blade assembly 606 to rotate or pivot about an axis 608.

[0038] The blade assembly 606 includes a blade 610 that is coupled to a rotation mechanism 612 by a channel member 614. Disposed on opposite ends of the channel member 614 is a blade locking assembly 616. The pivoting assembly 604 is similar to the pivoting assembly 104 and is configured to rotate the blade assembly 606 about an axis 618. Like the blade locking assembly 116, the blade locking assembly 616 releasably couples the blade 110 to the channel member 614 and also provides variable support of portions of the blade 610.

[0039] Referring now to FIG. 7A and FIG. 7B, an embodiment is shown of the pivoting assembly 604. In an embodiment, the pivoting functionality of the pivoting assembly 604 is the same as assembly 104 and will not be further described for brevity. In this embodiment, the functionality of the handle 120 is performed by or is integrated into the cam lock handle 620. In this embodiment, the collar 640 include features 641, such as ridges, slots, or grooves that extend parallel with the axis 618. In some embodiments, one or more of the features 641 may have a contrasting color from the rest of the collars 640, 642. As the blade assembly 606 is rotated, the more or fewer of the features 641 (or portions thereof) may be visible. It should be appreciated that the features 641 provide advantages in giving the user a visual feedback on the angle that the blade assembly 606 is rotated relative to the handle 602.

[0040] Referring now to FIG. 8A - 8E an embodiment is shown of the handle rotation or pivoting assembly 604. The pivoting assembly 604 is configured to selectively rotate the blade assembly 606 about an axis 608. In this embodiment, the handle 602 includes a u-shaped slot 603 that is sized to receive a portion 627 of frame member 126. As discussed herein, the portion 627 includes an

opening 128 that cooperates with an opening in the handle 602 to receive an axle 629. The portion 627, includes a slot 631 on a peripheral surface facing the handle 602. The slot 631 cooperates with a button 633.

[0041] The button 633 is sized to engage and slide within an aperture 605. The button 633 includes a body 635 having a first projection 637 and a second projection 639. The first projection 637 is sized and shaped to removably engage the slot 631 depending on the position of the button 633 within the aperture 605. When the button 633 is slid in the down position (e.g. pushed from the top side of the handle 602), the first projection 637 engages the slot 631 and the blade assembly 606 is rotationally fixed relative to the handle 602. In an embodiment the portion 627 may include multiple slots 631 allowing the blade assembly 606 in a fixed rotational position relative to the handle 602.

[0042] When the button 633 is slid within the aperture 605 in the opposite direction (e.g. pushed from the bottom side of the handle 602), the first projection 637 disengages from the slot 631 and the blade assembly 606 is free to rotate relative to the handle 602. In an embodiment, the second projection 639 contacts a surface on the portion 627 when the first projection 637 is disengaged.

[0043] In an embodiment, the button 633 includes an arm 647 having a feature 643 that engages a projection 645 (FIG. 8C) in the aperture 605 to selectively hold the button 633 in the unlocked position so the blade assembly 606 can freely rotate.

[0044] Referring now to FIG. 9A - 9H, an embodiment is shown of the blade locking assembly 616. The blade locking assembly 616 includes an end cap 662 that is coupled to the channel member 614. The end cap 662 further includes a recessed area 668 that is sized to slidably receive a lock switch member 670. The lock switch member 670 is slidably coupled to the end cap 662 by a pair of pins 672. The end cap 662 includes an opening 674 that is sized to receive a ramp portion 676 of support member 660. In an embodiment, a pad post 663 is coupled to a rear edge of the end cap 662. The pad post 663 allows for an optional cloth member to be attached to the blade assembly 606. In an embodiment, the pad post 663 includes a cylindrical portion with a larger cylindrical end. In an embodiment, the pad post 663 is rotationally coupled to the end cap. In another embodiment, the pad post 663 is integrated into the end cap. A biasing member 665 is coupled between the end cap 662 and the lock switch member 670.

[0045] The lock switch member 670 includes a projection 671 that extends in a direction away from the blade 610 to provide a feature for the user to push against to slide the lock switch member 670 between a detailing or extended position (closest to the end of the blade 610, FIG. 9G), a locked position (FIG. 9H), and an unlocked position (furthest from the end of the blade 610, the blade 610 may be removed from the blade assembly). In this embodiment, the side of the lock switch member 670

opposite the projection 671 includes a pair of ribs 673 (FIG. 9E) and a relief area 692. The relief area 692 cooperates with the biasing member 665. The ribs 673 each include a slot 675 having an angled surface 677.

5 The slot 675 cooperates with pins 661 on the support member 660 in causing the support member 660 to translate into and out of engagement with a side surface of the blade 610. The lock switch member 670 further includes an angled surface 679 that is at least partially disposed between the ribs 673. The angled surface 679 engages and cooperates with the ramp portion 676 to translate the support member 660 towards the blade when the lock switch member is moved from the locked to the extended position.

10 **[0046]** An embodiment of the support member 660 includes a body 659 from which the ramp portion 676 extends. A stop member 658 also extends from the body 659. The stop member 658 contacts the end cap 662 when the lock switch member 670 is slide to the unlocked position. The body 659 further includes a support arm 667 that extends laterally in a direction towards the wiping edge of the blade. As best seen in FIG. 9G and FIG. 9H, the side 669 of the body 659 facing the blade 610 is substantially flat such that when the lock switch member 670 is in the extended position (FIG. 9G), the side 669 supports the blade 610. In an embodiment, this support extends evenly along the length of the support member 660 (e.g. for a predetermined distance away from the end of the blade).

20 **[0047]** The term "about" is intended to include the degree of error associated with measurement of the particular quantity based upon the equipment available at the time of filing the application.

25 **[0048]** The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the present disclosure. As used herein, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, element components, and/or groups thereof.

30 **[0049]** The following definitions and abbreviations are to be used for the interpretation of the claims and the specification. As used herein, the terms "comprises," "comprising," "includes," "including," "has," "having," "contains" or "containing," or any other variation thereof, are intended to cover a non-exclusive inclusion. For example, a composition, a mixture, process, method, article, or apparatus that comprises a list of elements is not necessarily limited to only those elements but can include other elements not expressly listed or inherent to such composition, mixture, process, method, article, or apparatus.

35 **[0050]** Additionally, the term "exemplary" is used here-

in to mean "serving as an example, instance or illustration." Any embodiment or design described herein as "exemplary" is not necessarily to be construed as preferred or advantageous over other embodiments or designs. The terms "at least one" and "one or more" may be understood to include any integer number greater than or equal to one, i.e. one, two, three, four, etc. The terms "a plurality" may be understood to include any integer number greater than or equal to two, i.e. two, three, four, five, etc. The term "connection" may include both an indirect "connection" and a direct "connection."

[0051] The terms "about," "substantially," "approximately," and variations thereof, are intended to include the degree of error associated with measurement of the particular quantity based upon the equipment available at the time of filing the application. For example, "about" can include a range of $\pm 8\%$ or 5% , or 2% of a given value.

[0052] The descriptions of the various embodiments of the present invention have been presented for purposes of illustration, but are not intended to be exhaustive or limited to the embodiments disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art without departing from the scope of the described embodiments. The terminology used herein was chosen to best explain the principles of the embodiments, the practical application or technical improvement over technologies found in the marketplace, or to enable others of ordinary skill in the art to understand the embodiments described herein.

[0053] While the present disclosure has been described with reference to an exemplary embodiment or embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the present disclosure. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the present disclosure without departing from the essential scope thereof. Therefore, it is intended that the present disclosure not be limited to the particular embodiment disclosed as the best mode contemplated for carrying out this present disclosure, but that the present disclosure will include all embodiments falling within the scope of the claims.

Claims

1. A cleaning device comprising:

a handle;
a channel member operably coupled to the handle;
a blade replaceably coupled to the channel member;
a lock assembly that includes:

an end cap coupled to the channel member;
a lock switch member slidably coupled to

the end cap, the lock switch member being movable between an unlocked position, a locked position and an extended position; and

a support member moveably coupled to the end cap and having a support surface adjacent a surface of the blade, the support member having a ramp portion that is engageable by the lock switch member to translate the support surface into contact with the surface of the blade.

2. The cleaning device of claim 1, wherein the lock switch member further includes an angled surface that engages the ramp portion when the lock switch member is moved from the locked position to the extended position.

3. The cleaning device of claim 2, wherein:

the support member includes a pair of pins extending on opposite sides of the ramp portion; and

the lock switch member further includes a pair of ribs, the pair of ribs each having a slot sized to receive one of the pair of pins.

4. The cleaning device of claim 3, wherein the slot includes an angled surface, the angled surface engaging the pair of pins and translating the support member away from the blade in response to the lock switch member moving from the extended position to the locked position.

5. The cleaning device of claim 1, wherein the support member includes a support arm that extends laterally in a direction of a wiping edge of the blade.

6. The cleaning device of claim 5, further comprising a clip spring coupled between the end cap and the lock switch member.

7. The cleaning device of claim 6, wherein:

the lock switch member further includes a relief area on a side facing the end cap; and
the clip spring is shaped to receive the relief area when the lock switch member is in the unlocked position.

8. The cleaning device of claim 1, further comprising a pad post coupled to the end cap.

9. The cleaning device of claim 1, further comprising a rotational assembly comprising:

a frame coupled to the blade, the frame having a first slot and at least one cantilevered arm with a

tooth disposed on one end; and
a support body rotationally coupled to the first
slot, the support body having a flange with a
plurality of second slots, the plurality of second
slots sized to receive the tooth.

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10. The cleaning device of claim 9, further comprising a
handle lever pivotally coupled to the frame, the han-
dle lever having a cam surface positioned and
shaped to engage at least one cantilever arm in
response to the handle lever being moved from an
open positioned to a closed position.

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11. The cleaning device of claim 9, wherein the support
body includes at least one feature extending parallel
with a longitudinal axis of the blade.

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12. The cleaning device of claim 11, wherein the at least
one feature has a contrasting color to a remaining
portion of the support body.

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13. The cleaning device of claim 9, further comprising a
button slidably coupled to an aperture in the handle,
the button being movable between a first position
and a second position.

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14. The cleaning device of claim 13, wherein:

the frame includes a portion extending towards
the handle, the portion having a third slot; and
the button includes a projection sized and posi-
tioned to be disposed in the third slot when the
button is in the first position and spaced apart
from the third slot when the button is in the
second position.

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15. The cleaning device of claim 14, wherein:

the blade is in a fixed position relative to the
handle when the button is in the first position;
and
the blade freely rotates about an axis when the
button is in the second position.

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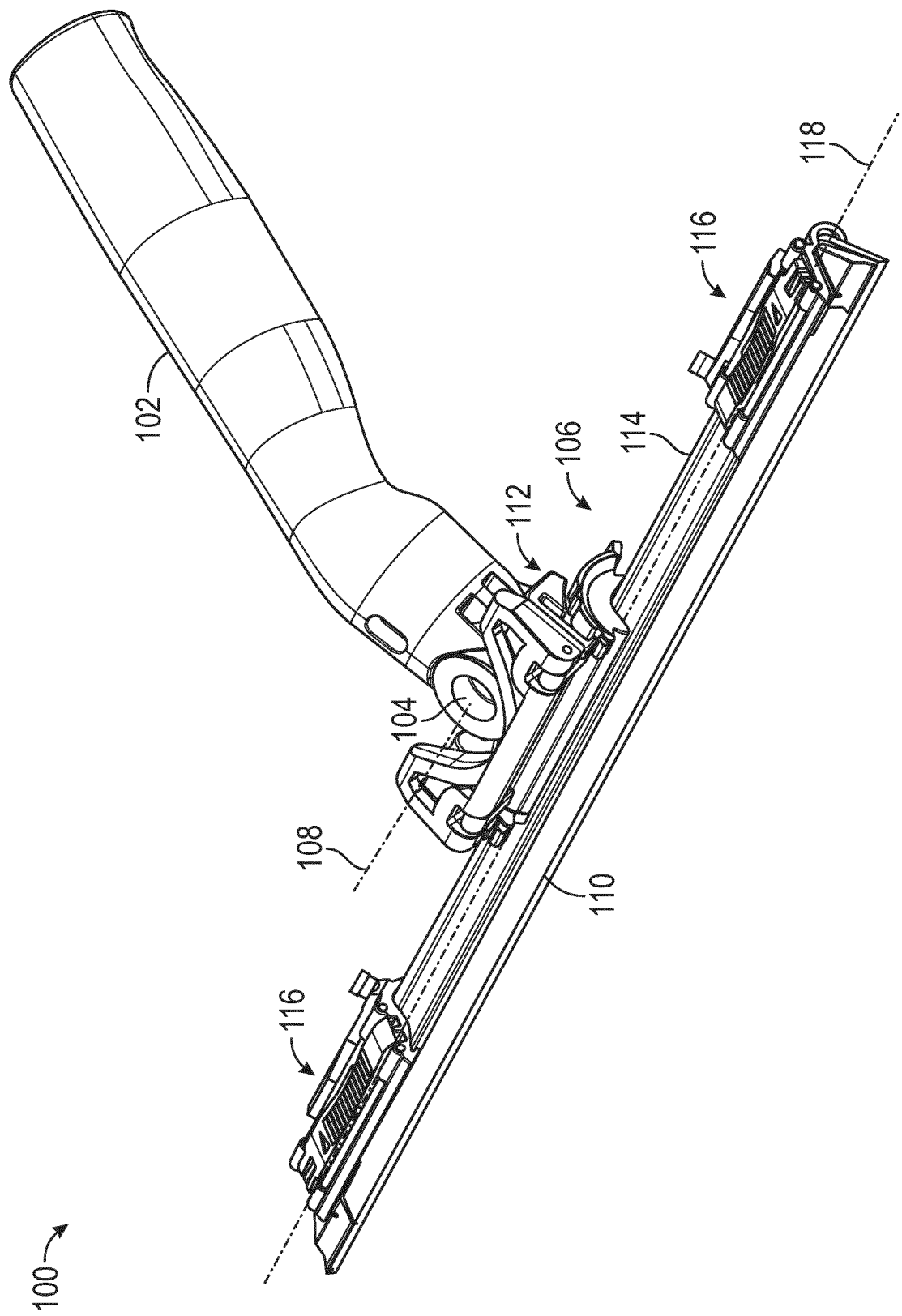
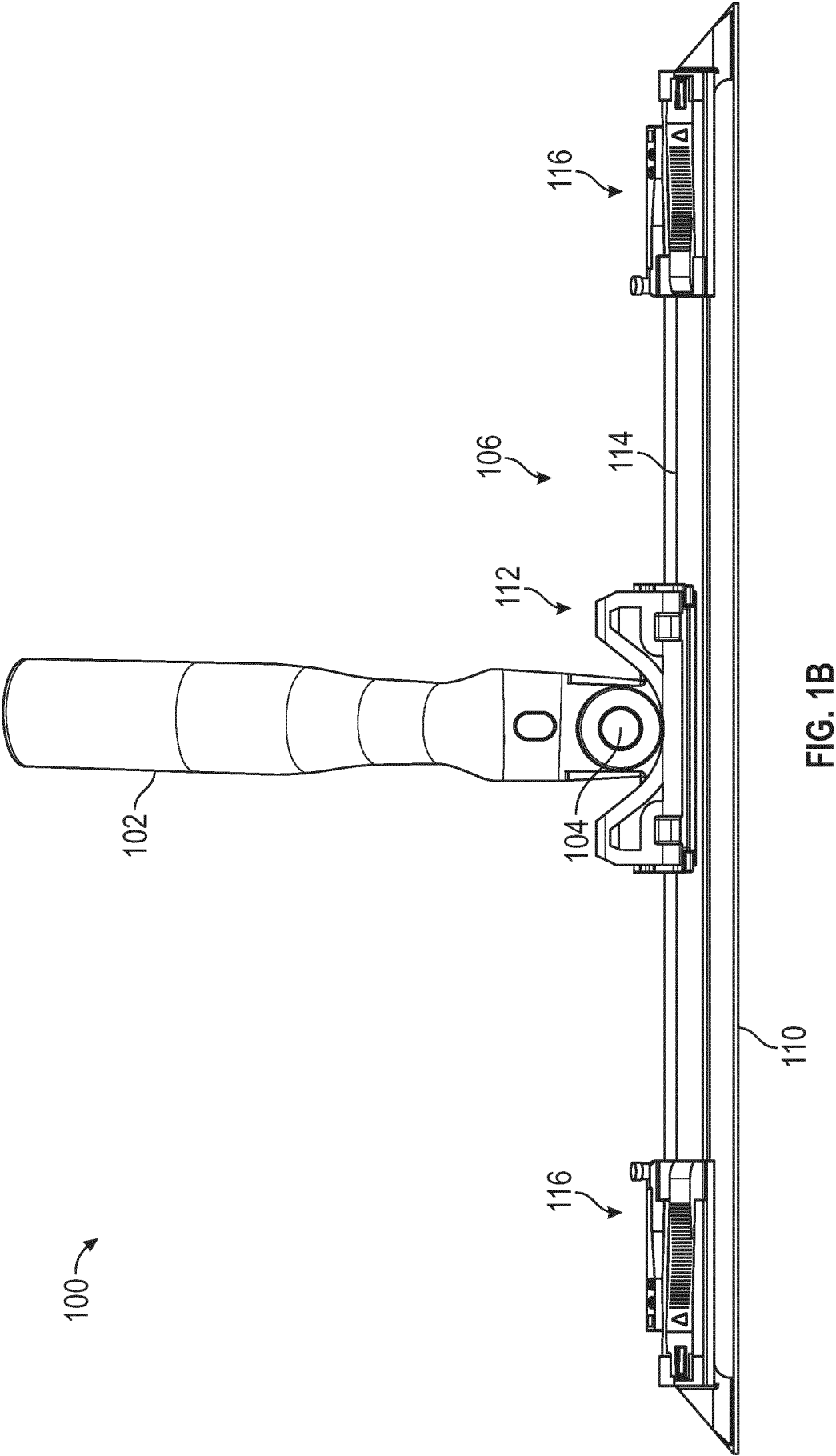


FIG. 1A



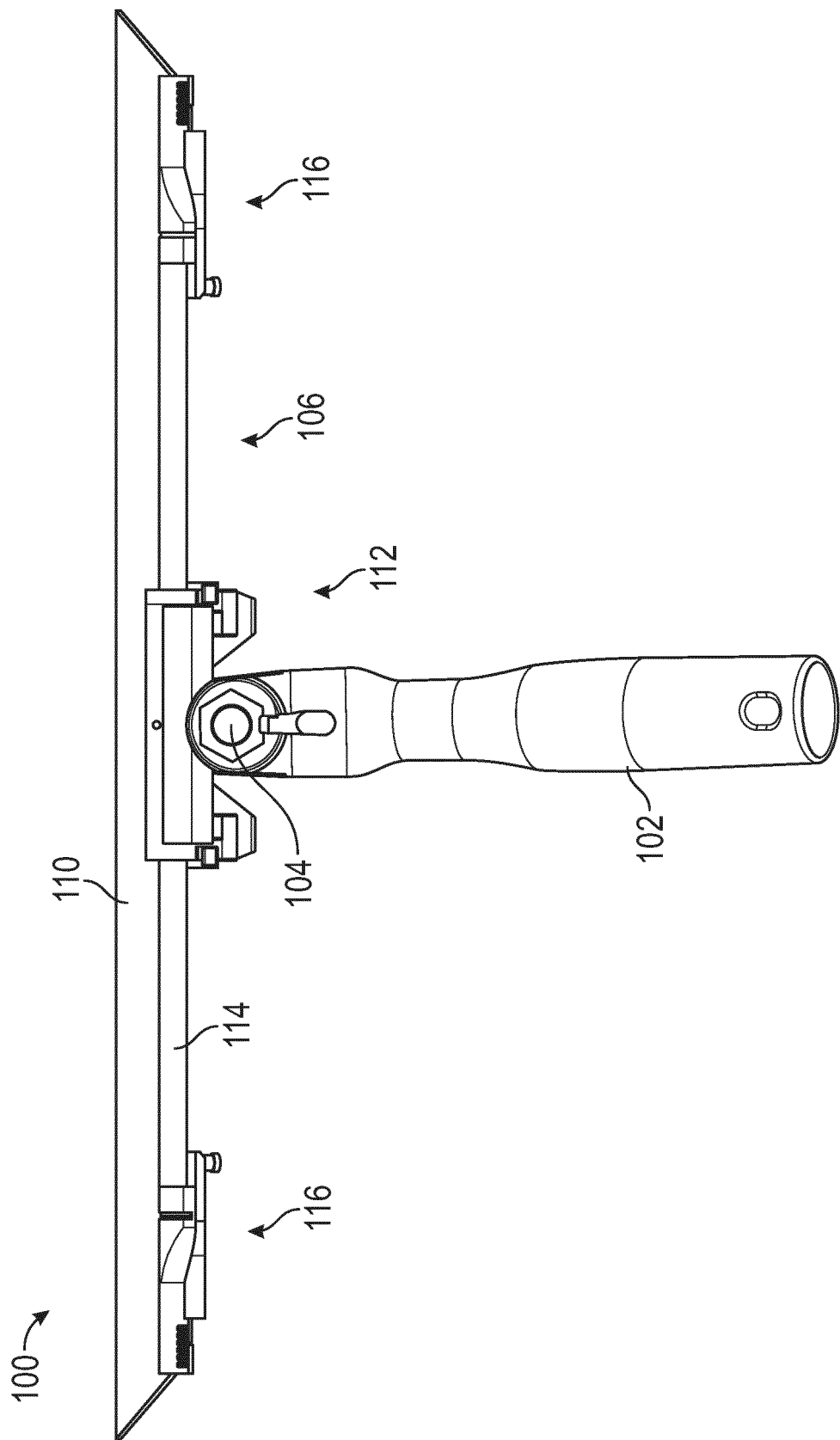


FIG. 1C

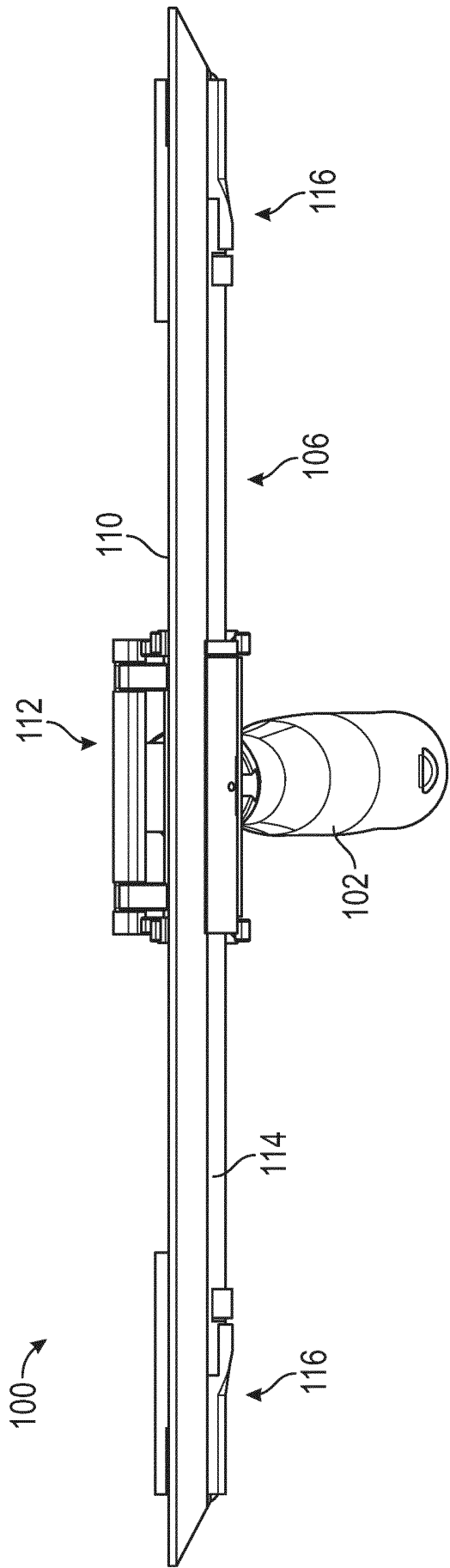


FIG. 1D

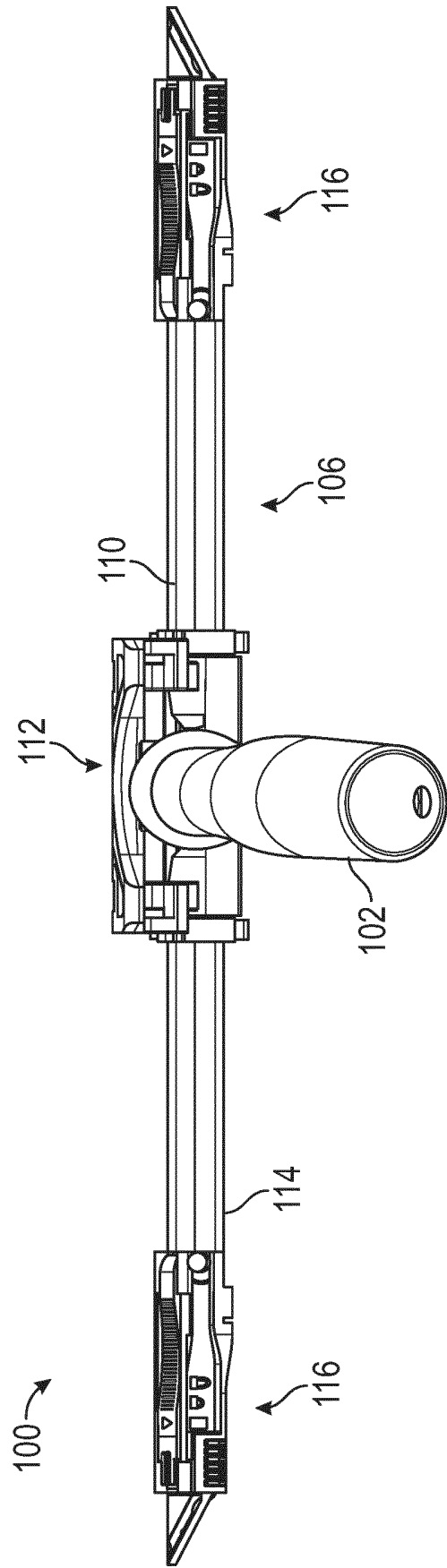


FIG. 1E

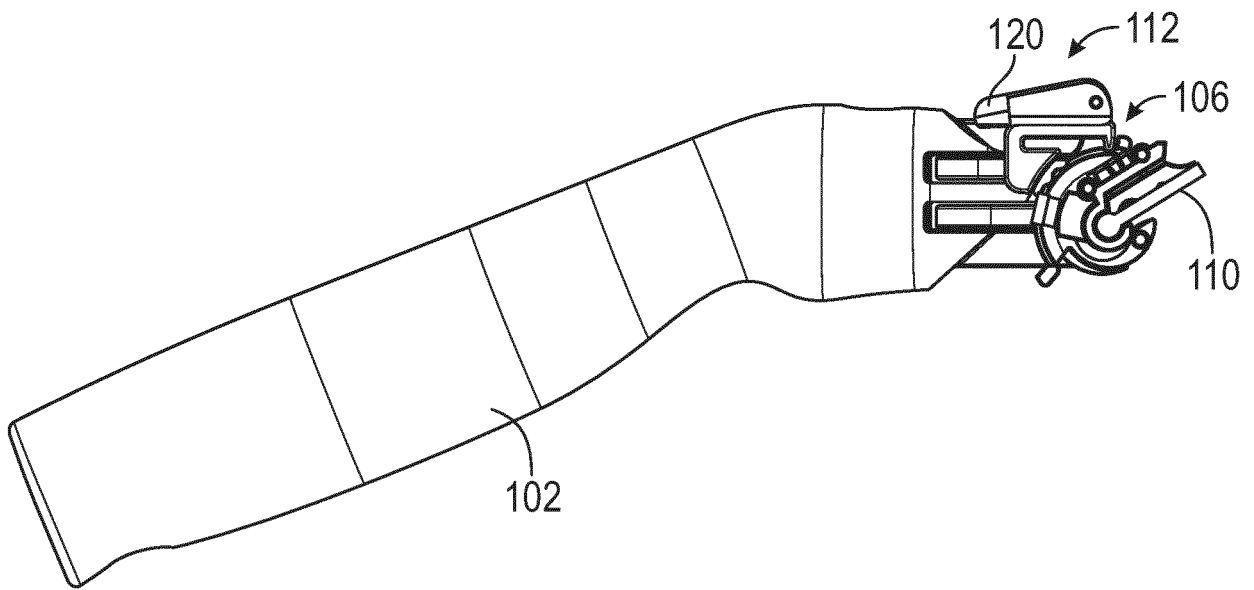


FIG. 1F

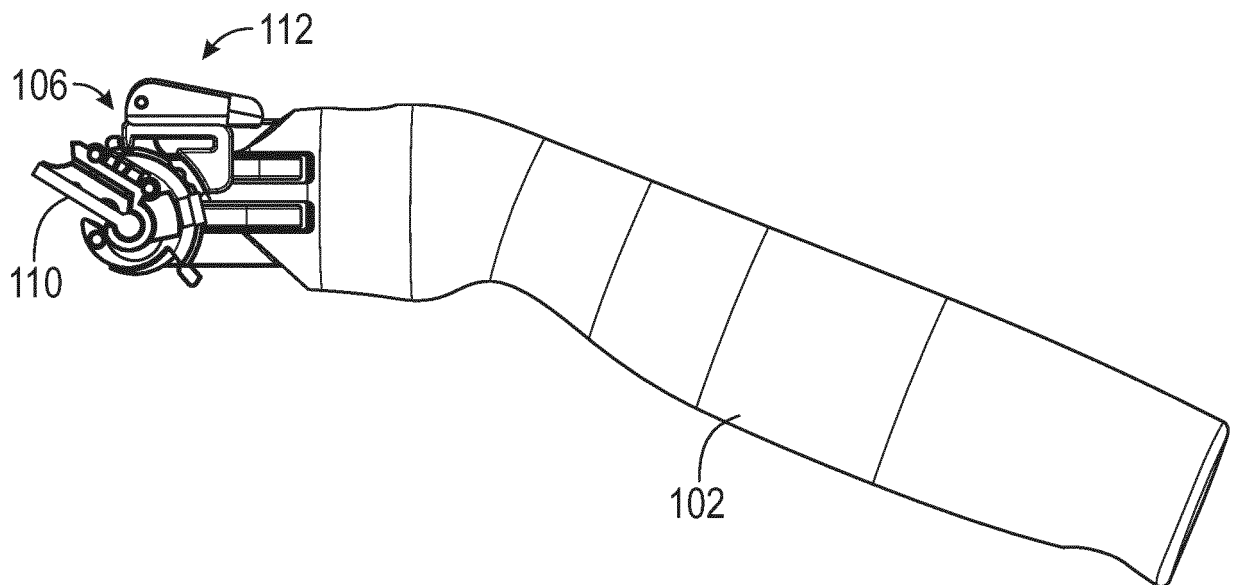


FIG. 1G

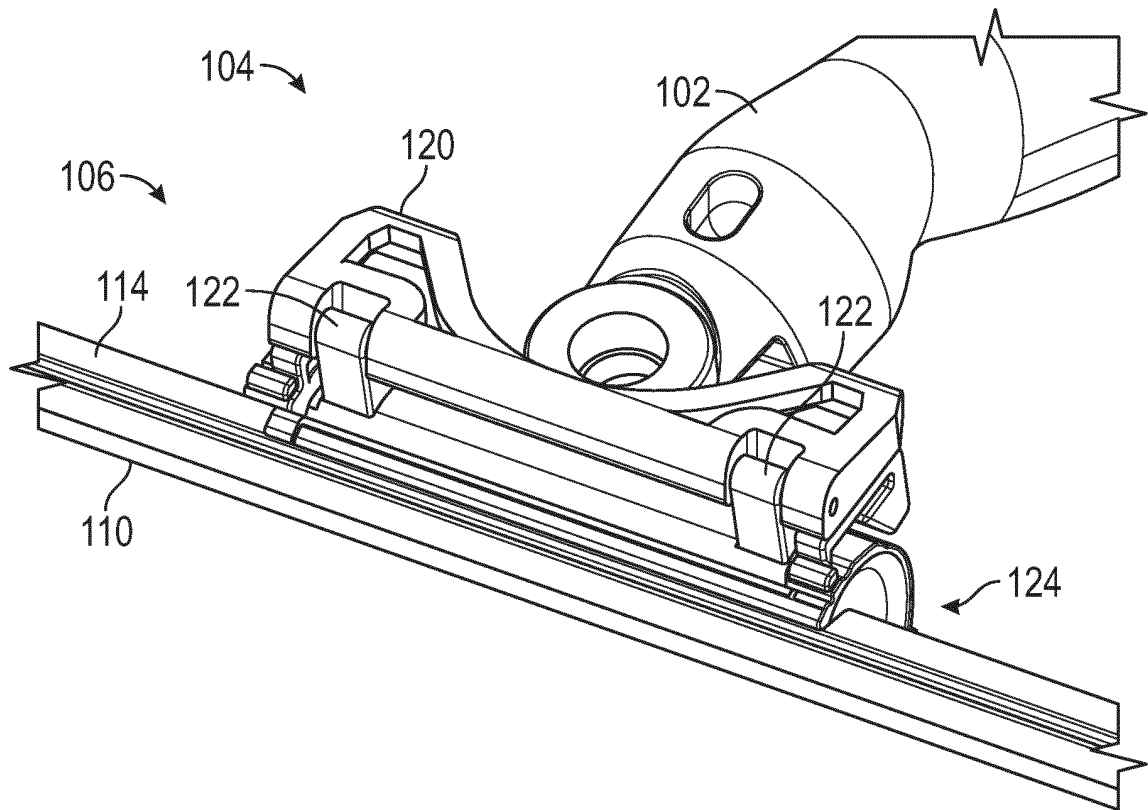


FIG. 1H

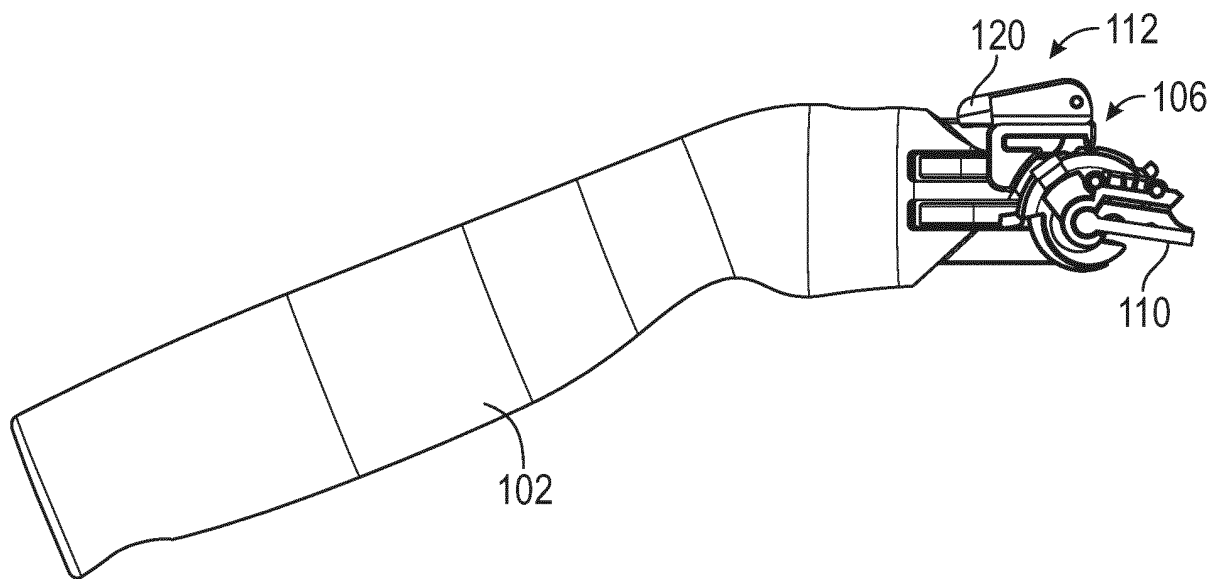


FIG. 2A

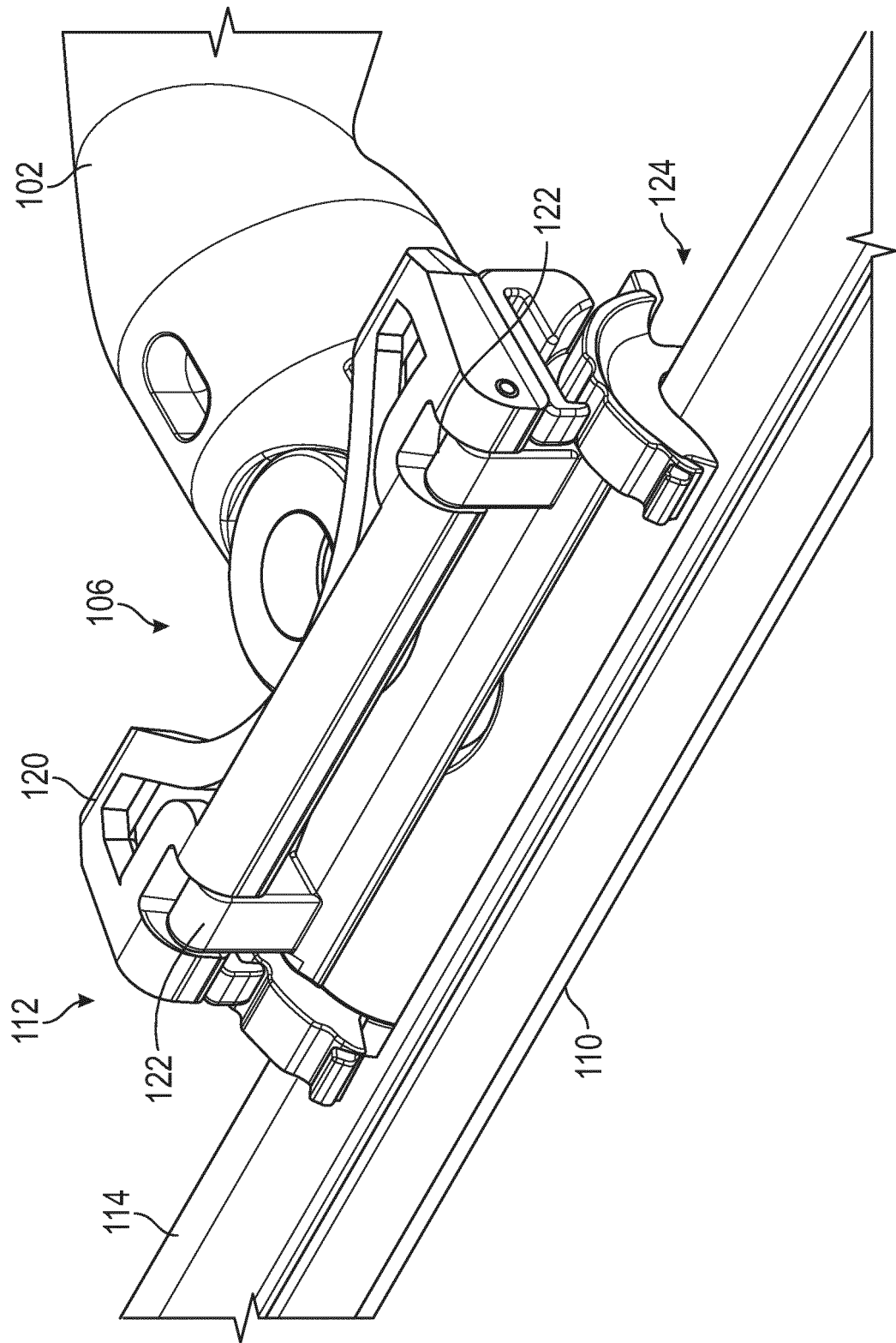


FIG. 2B

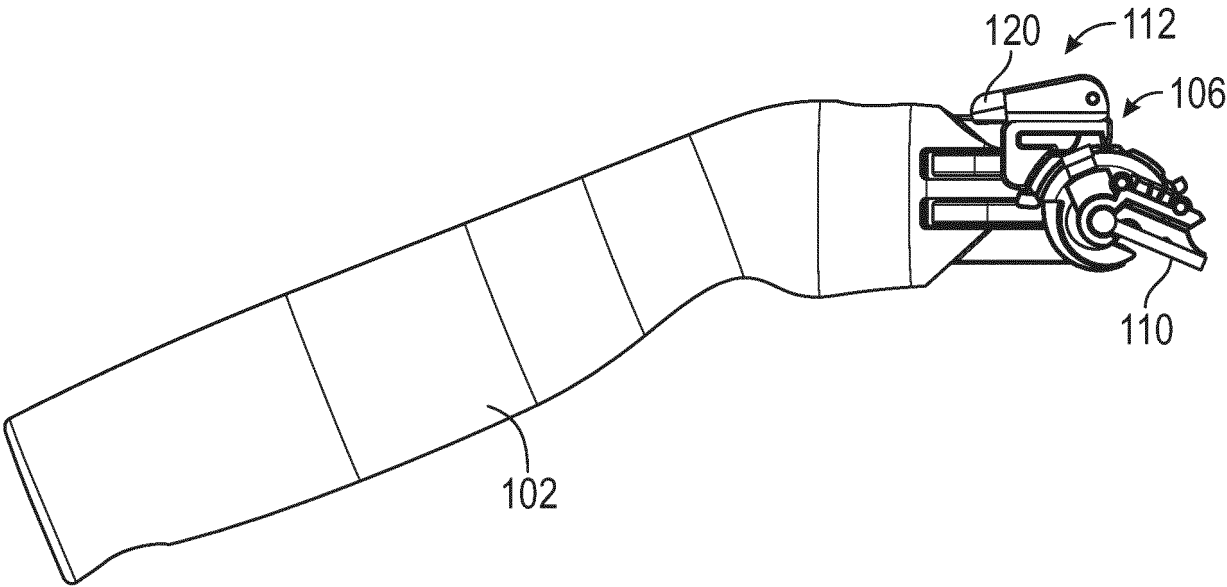


FIG. 3A

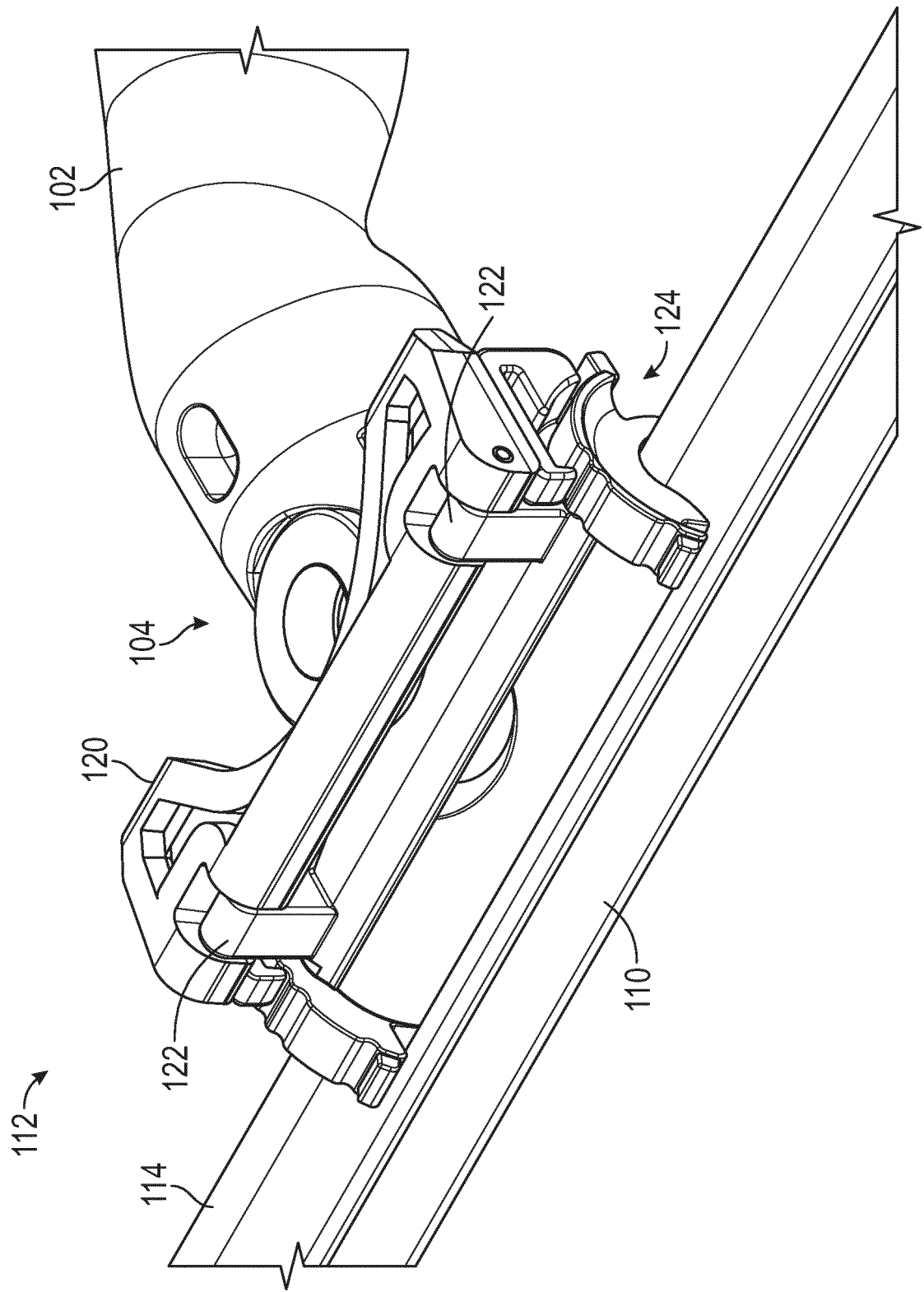


FIG. 3B

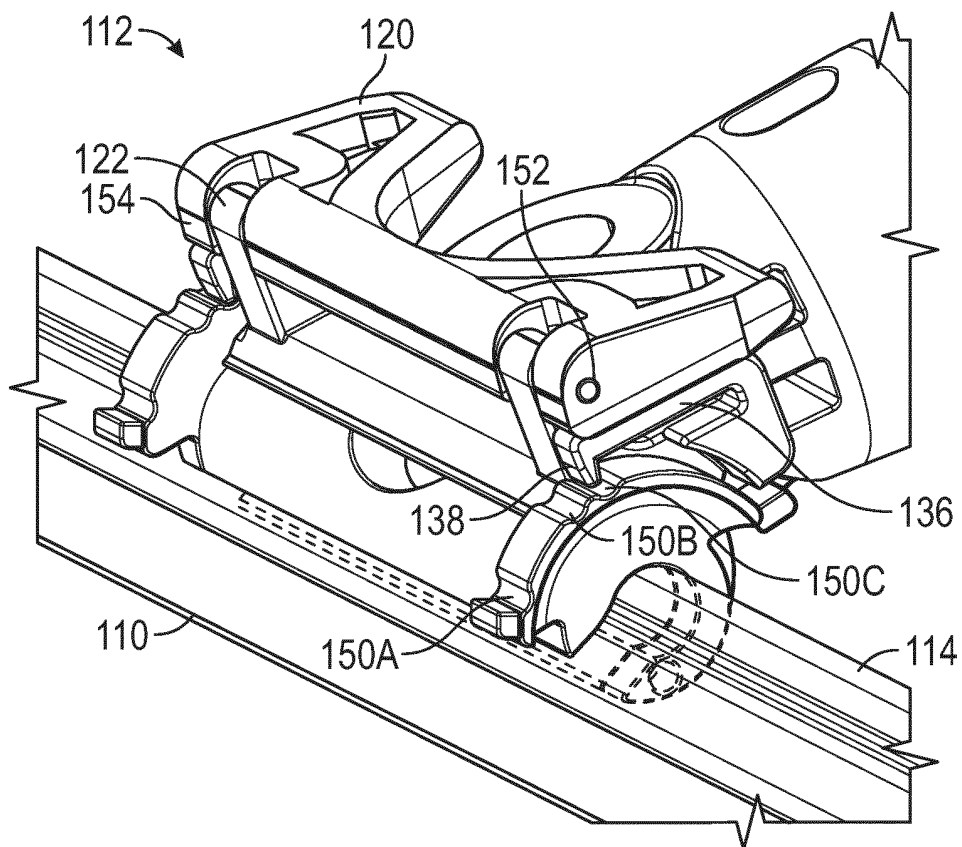


FIG. 4A

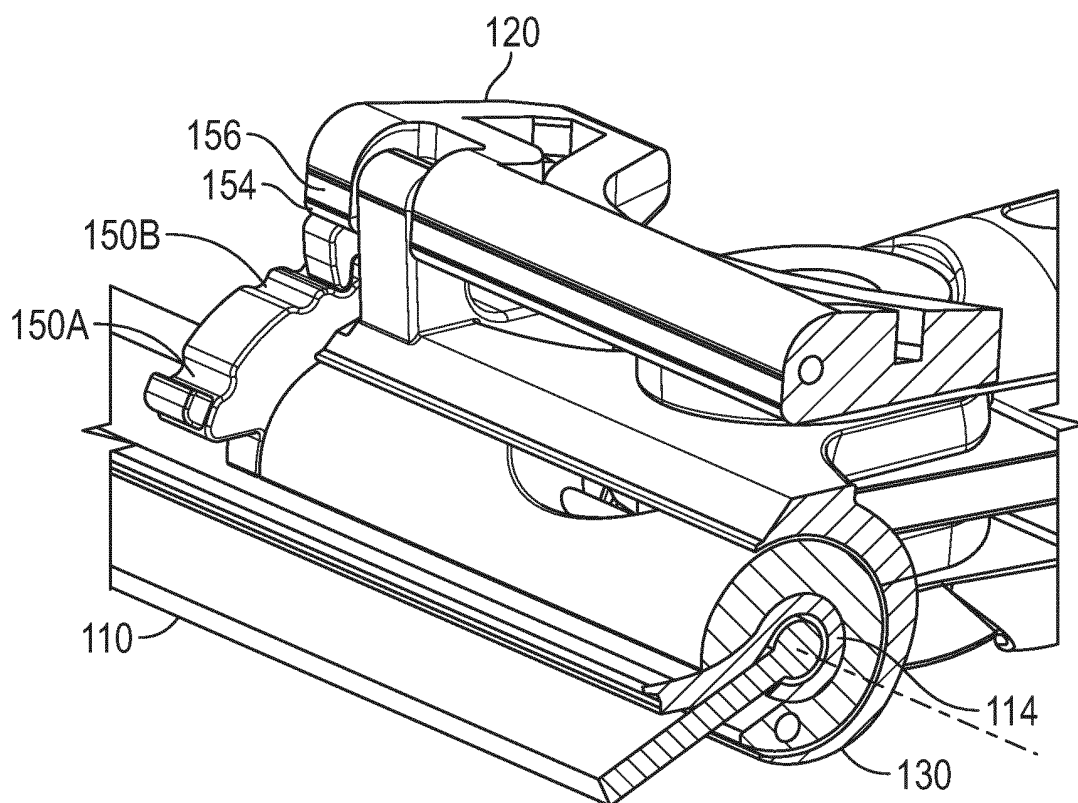


FIG. 4B

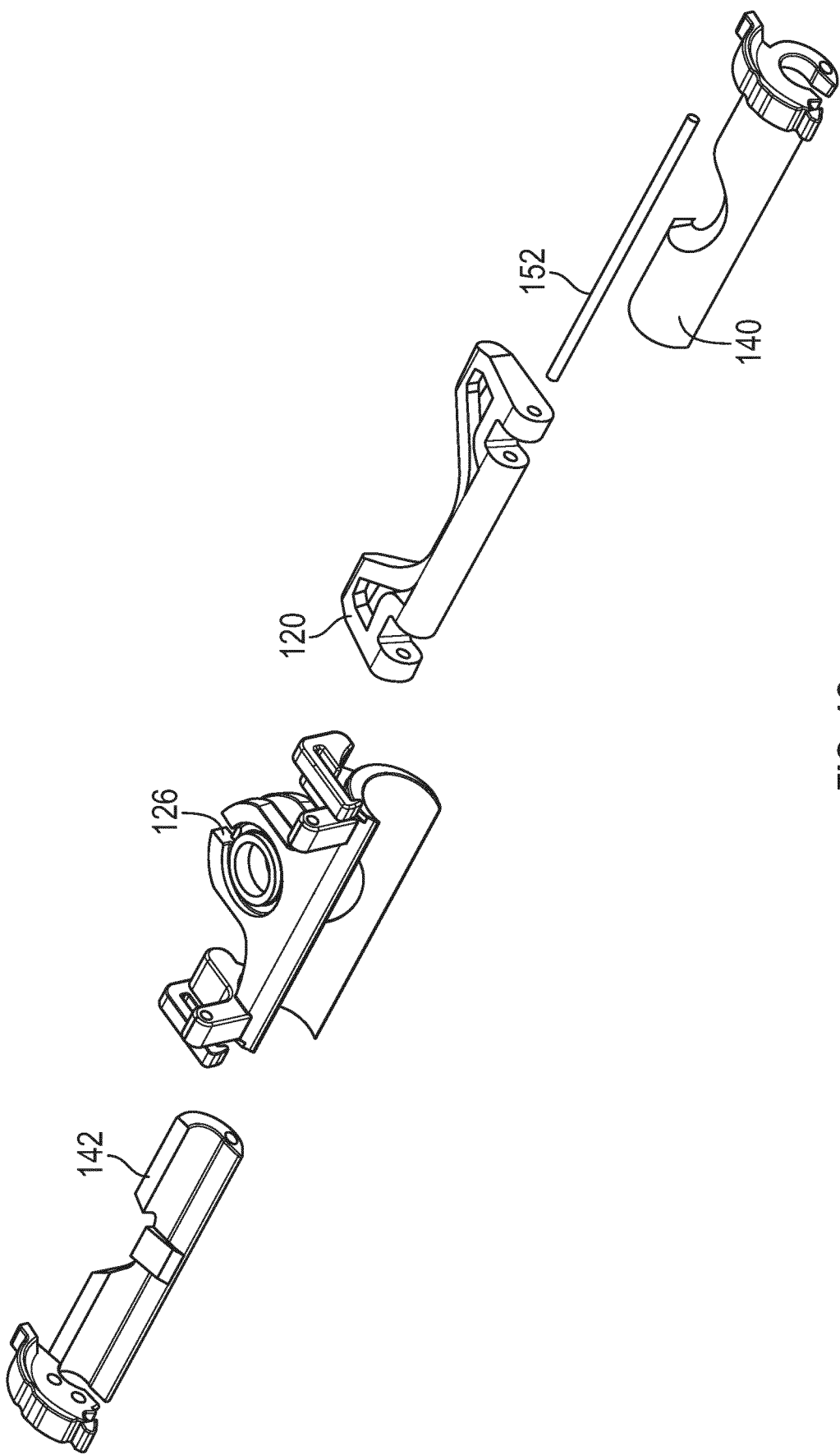


FIG. 4C

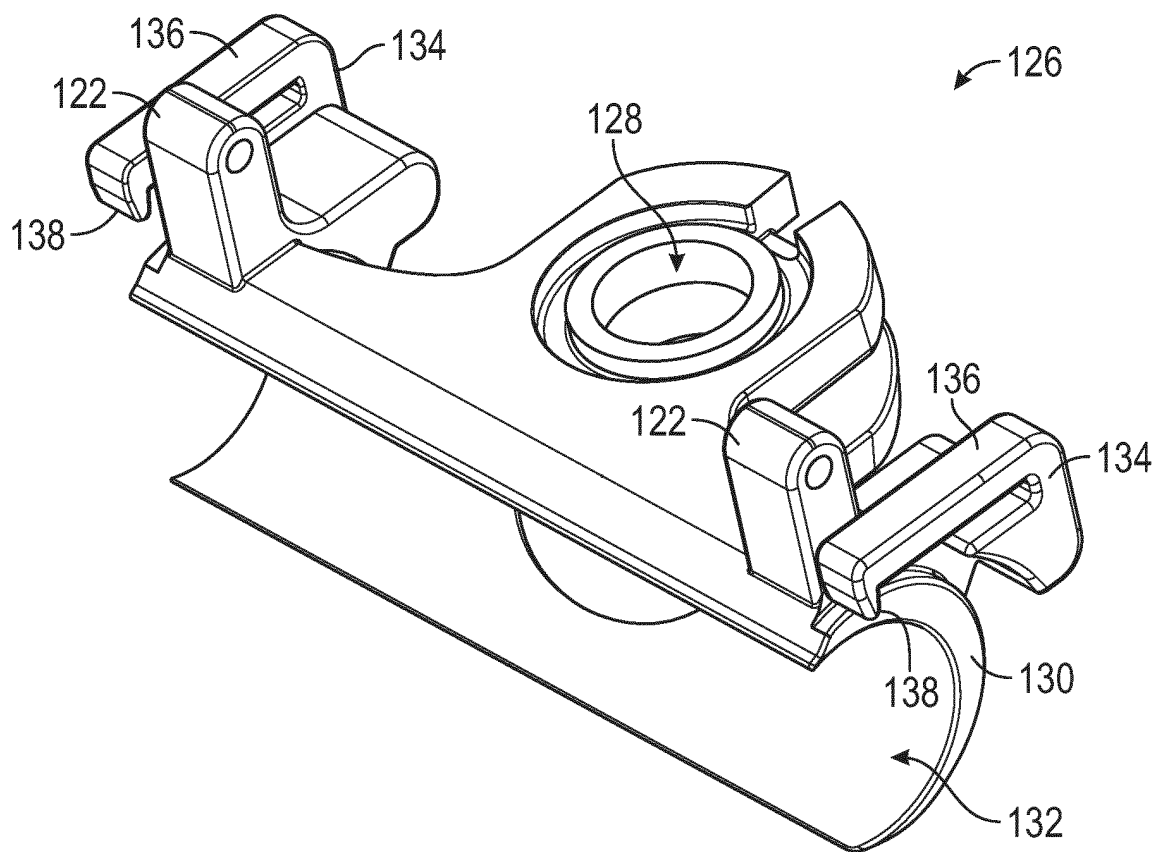


FIG. 4D

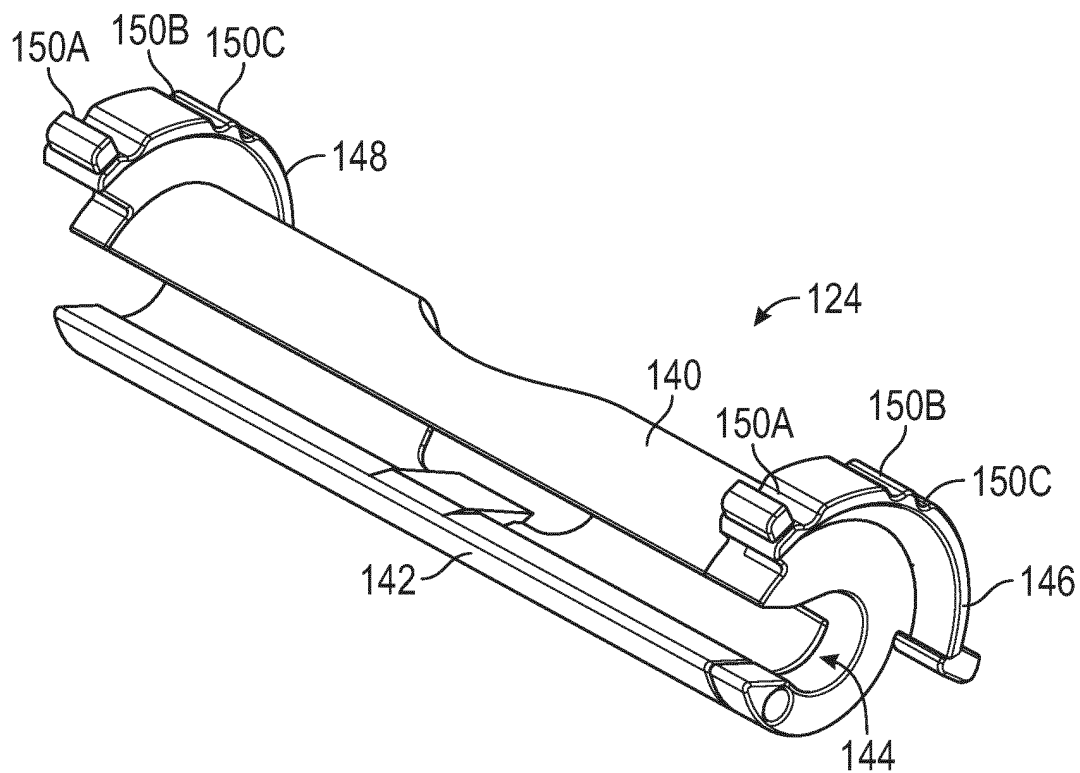


FIG. 4E

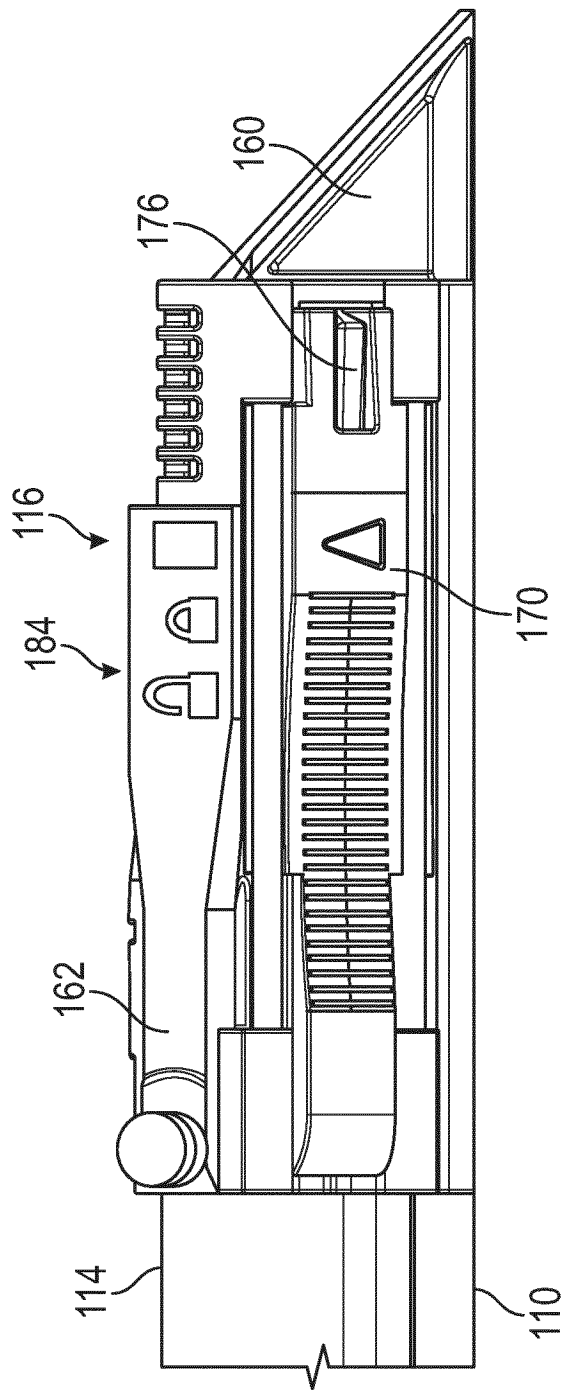


FIG. 5A

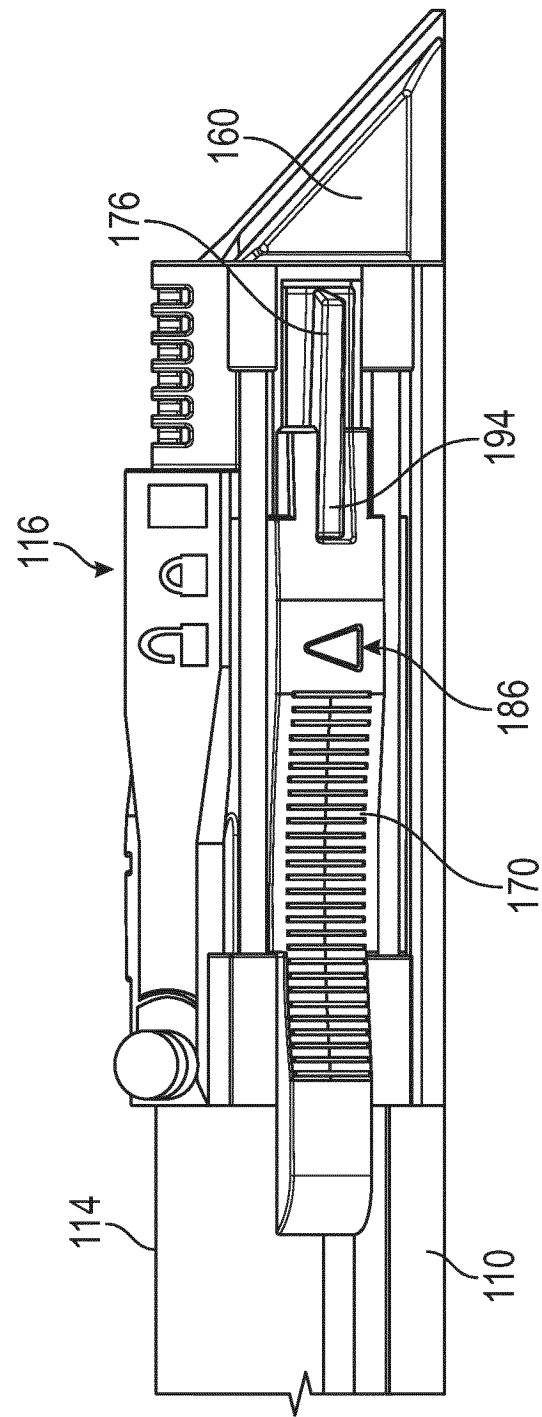


FIG. 5B

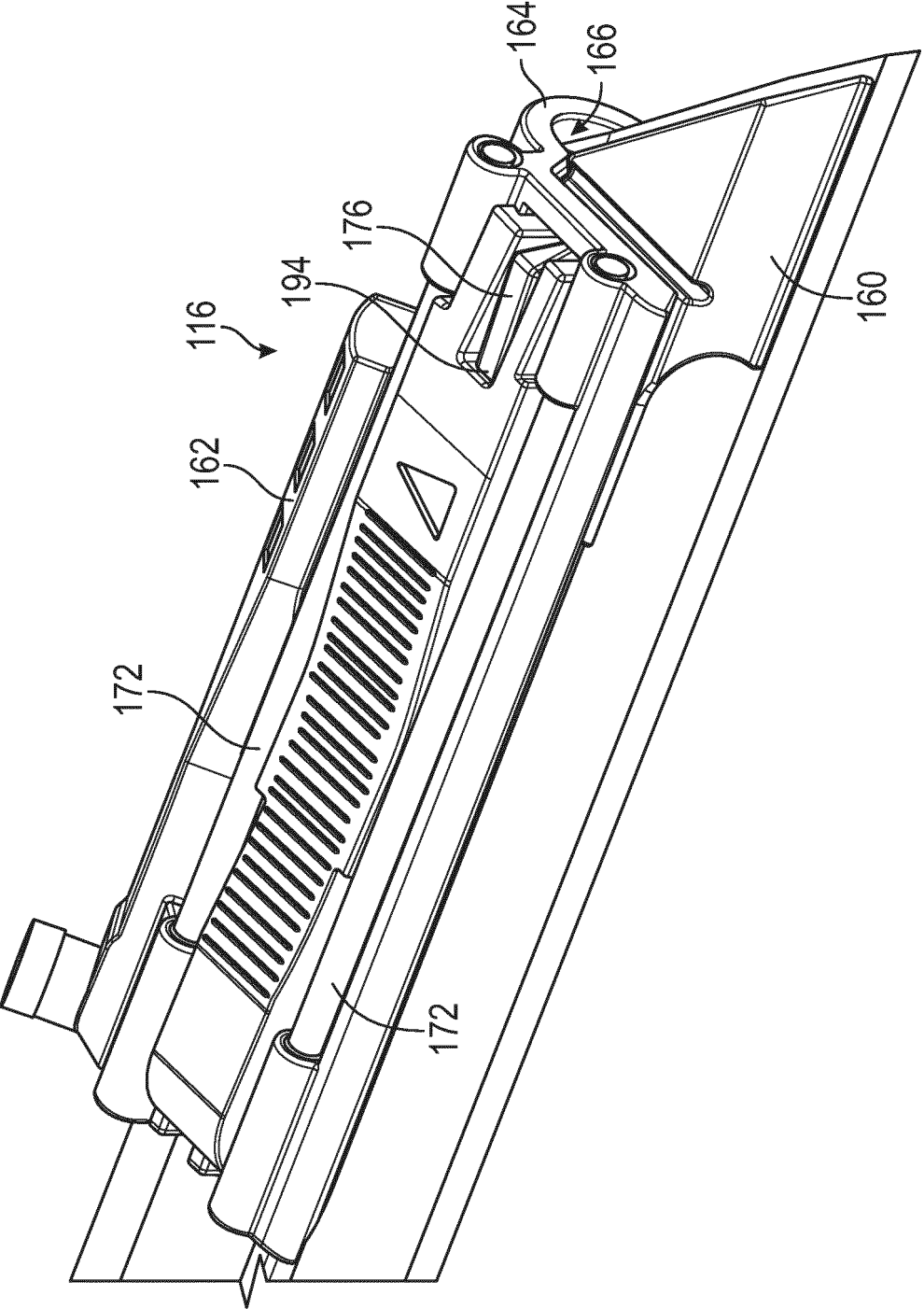


FIG. 5C

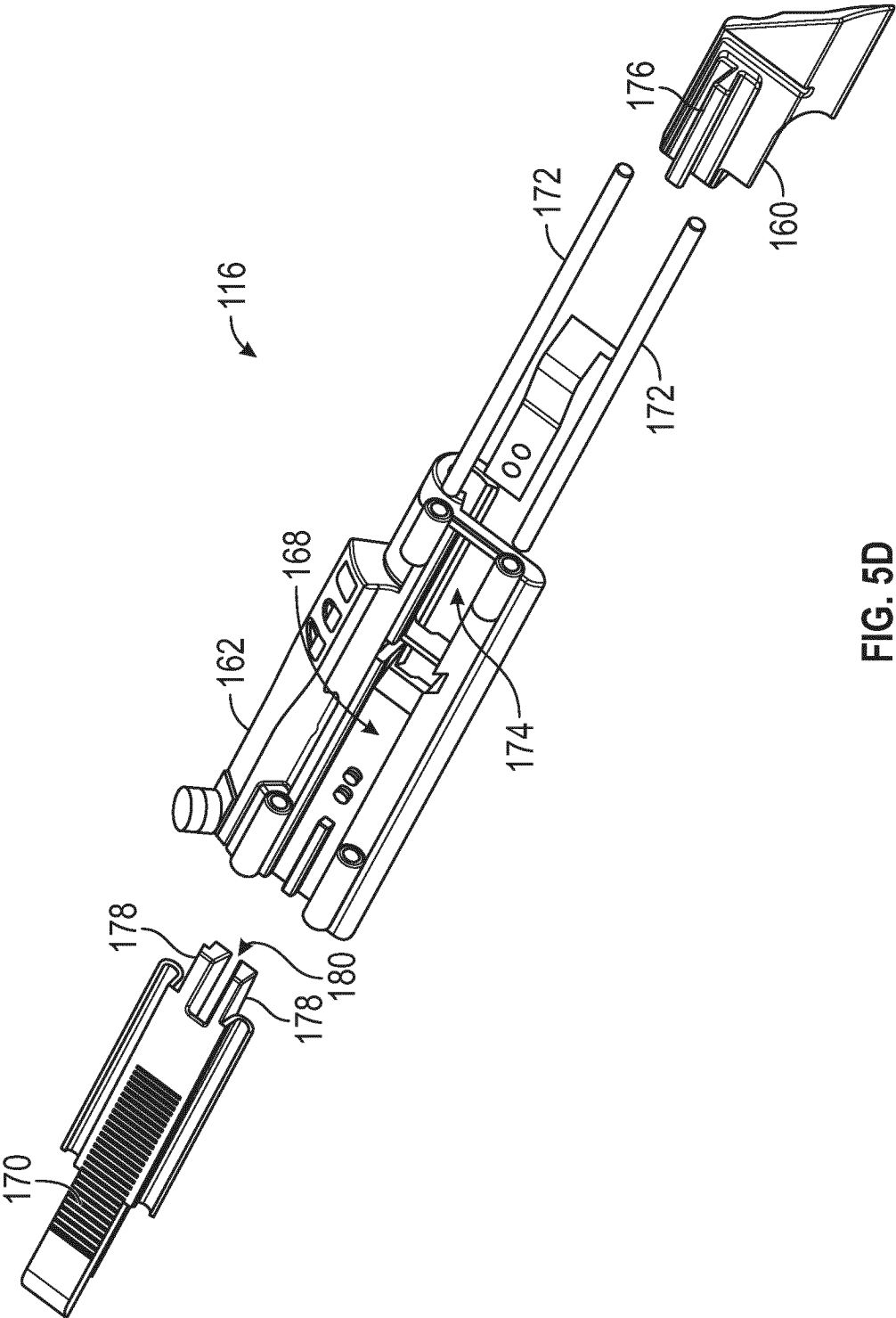


FIG. 5D

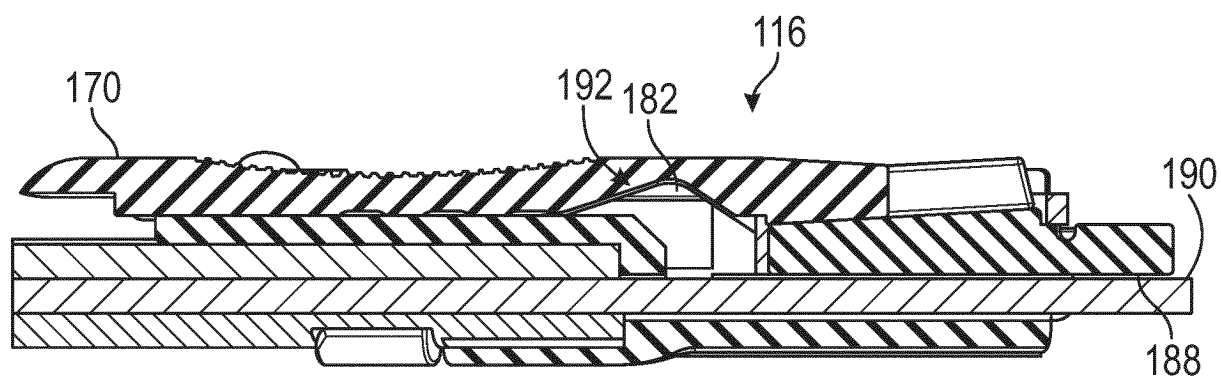


FIG. 5E

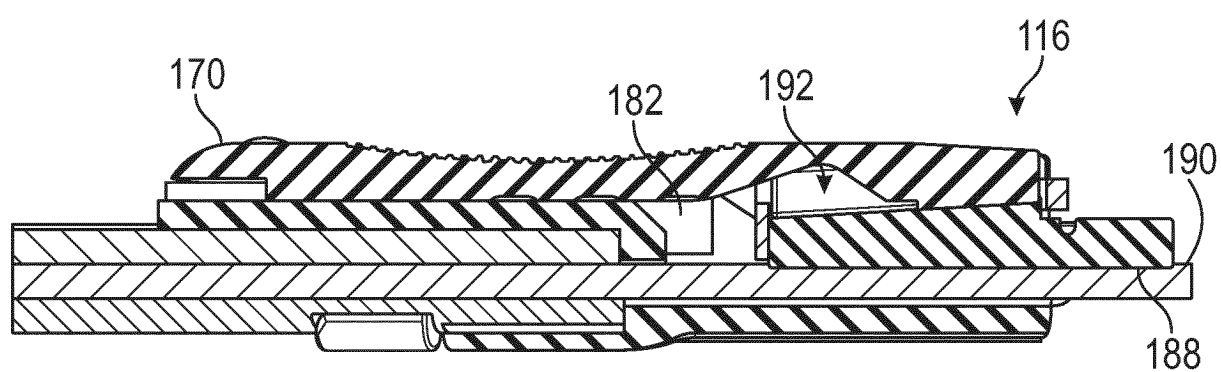


FIG. 5F

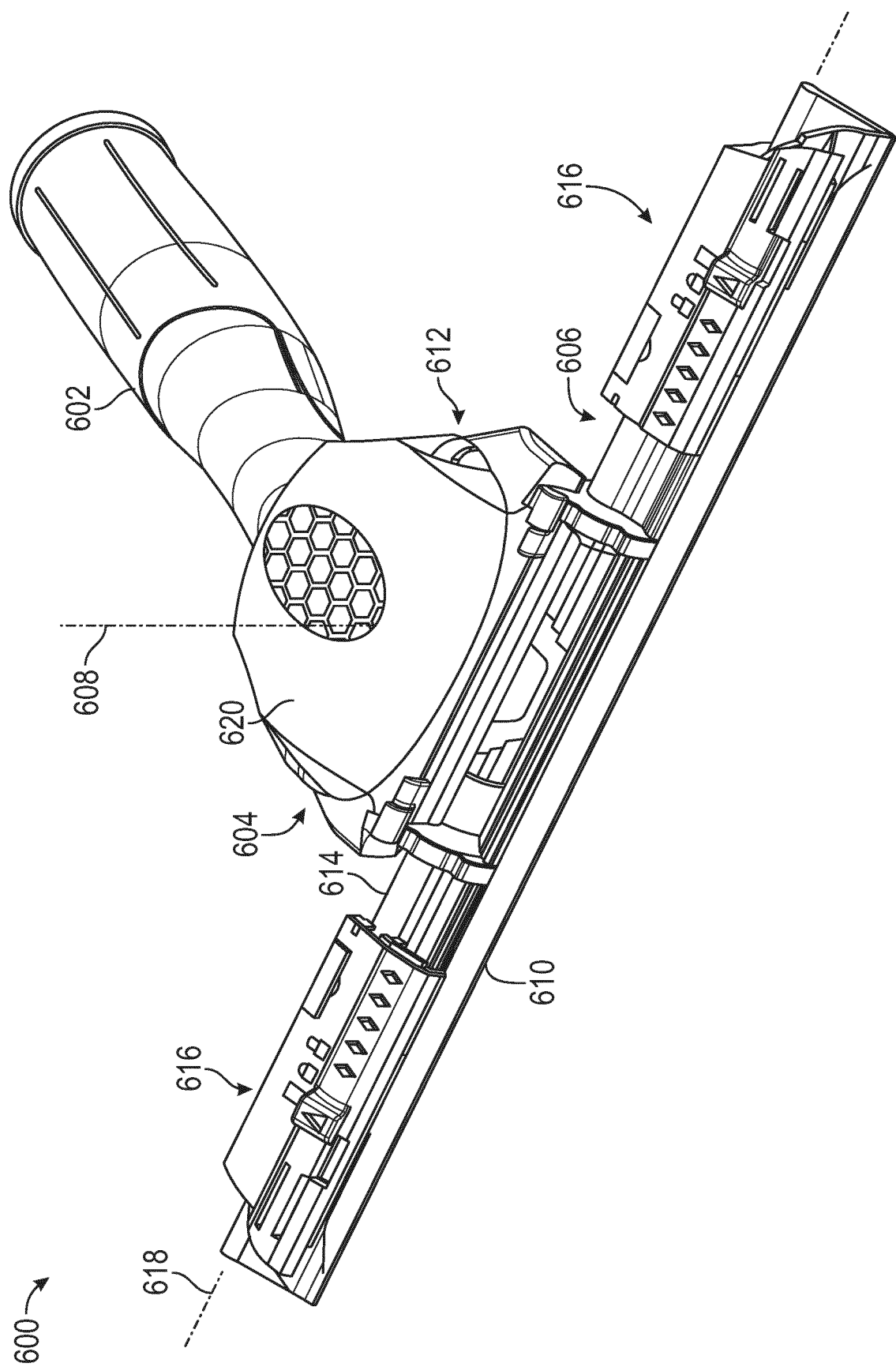
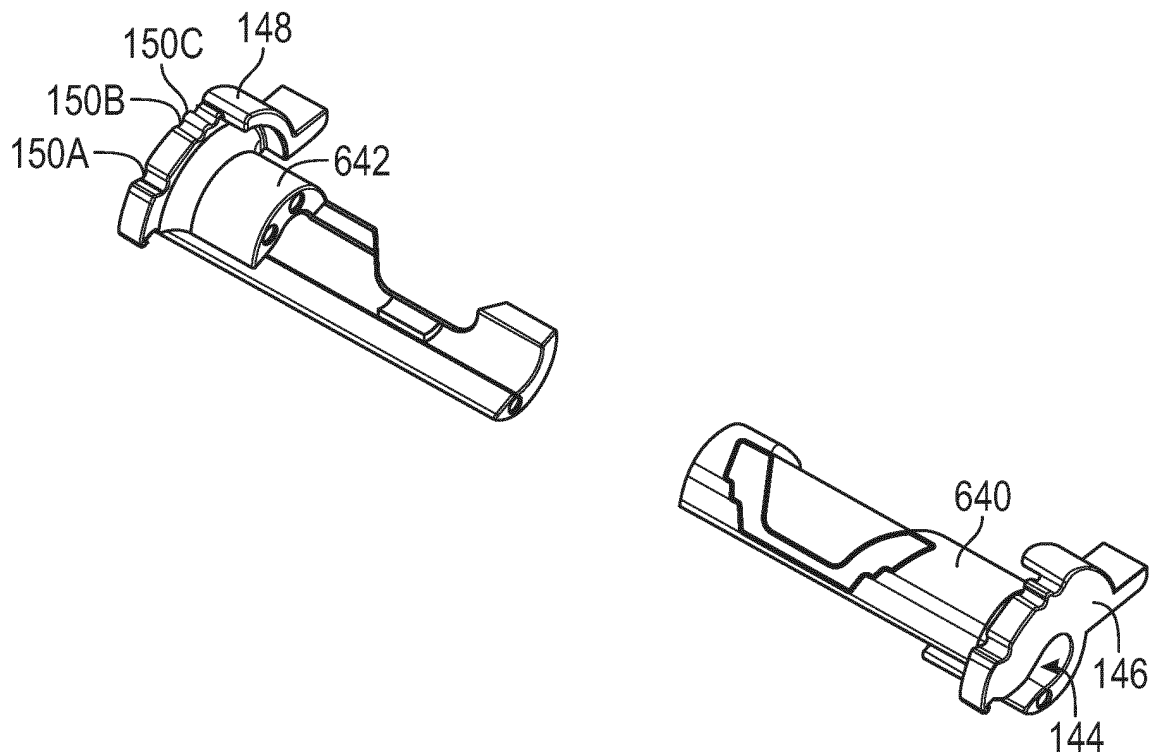
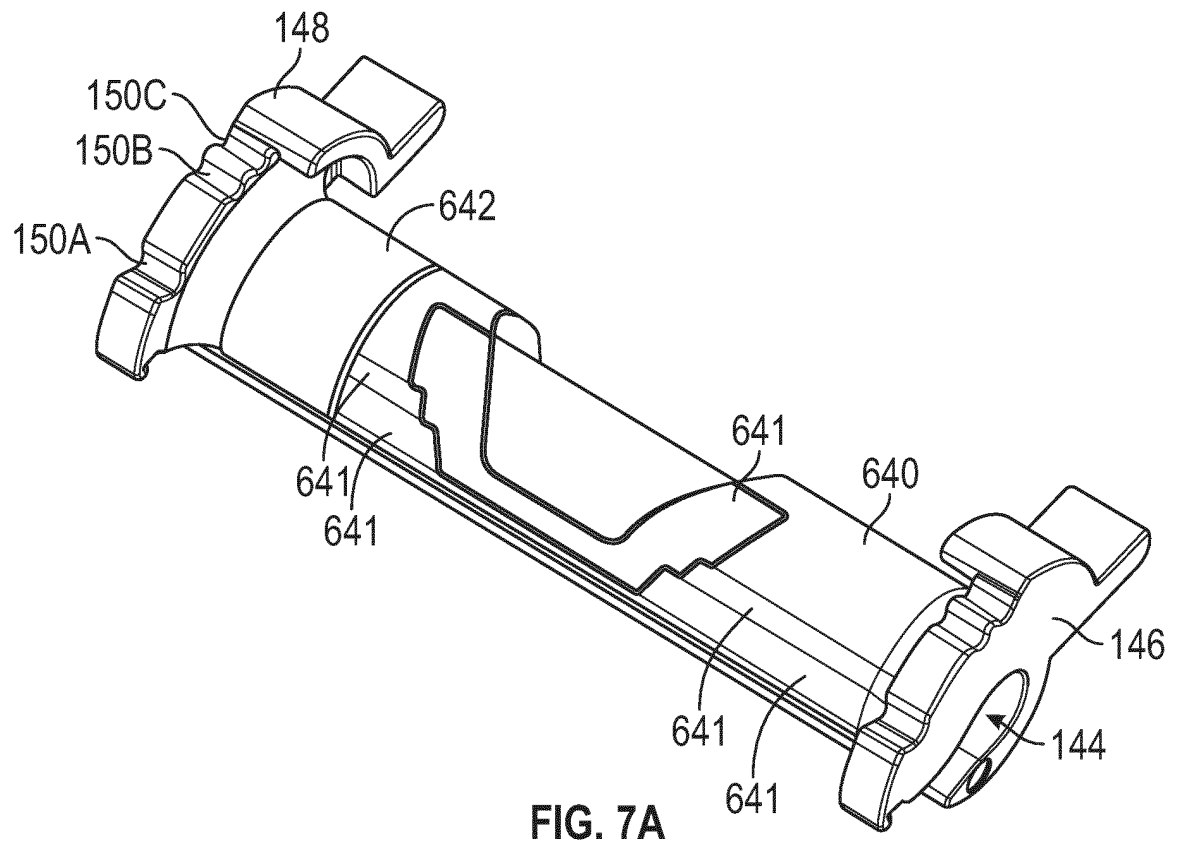


FIG. 6



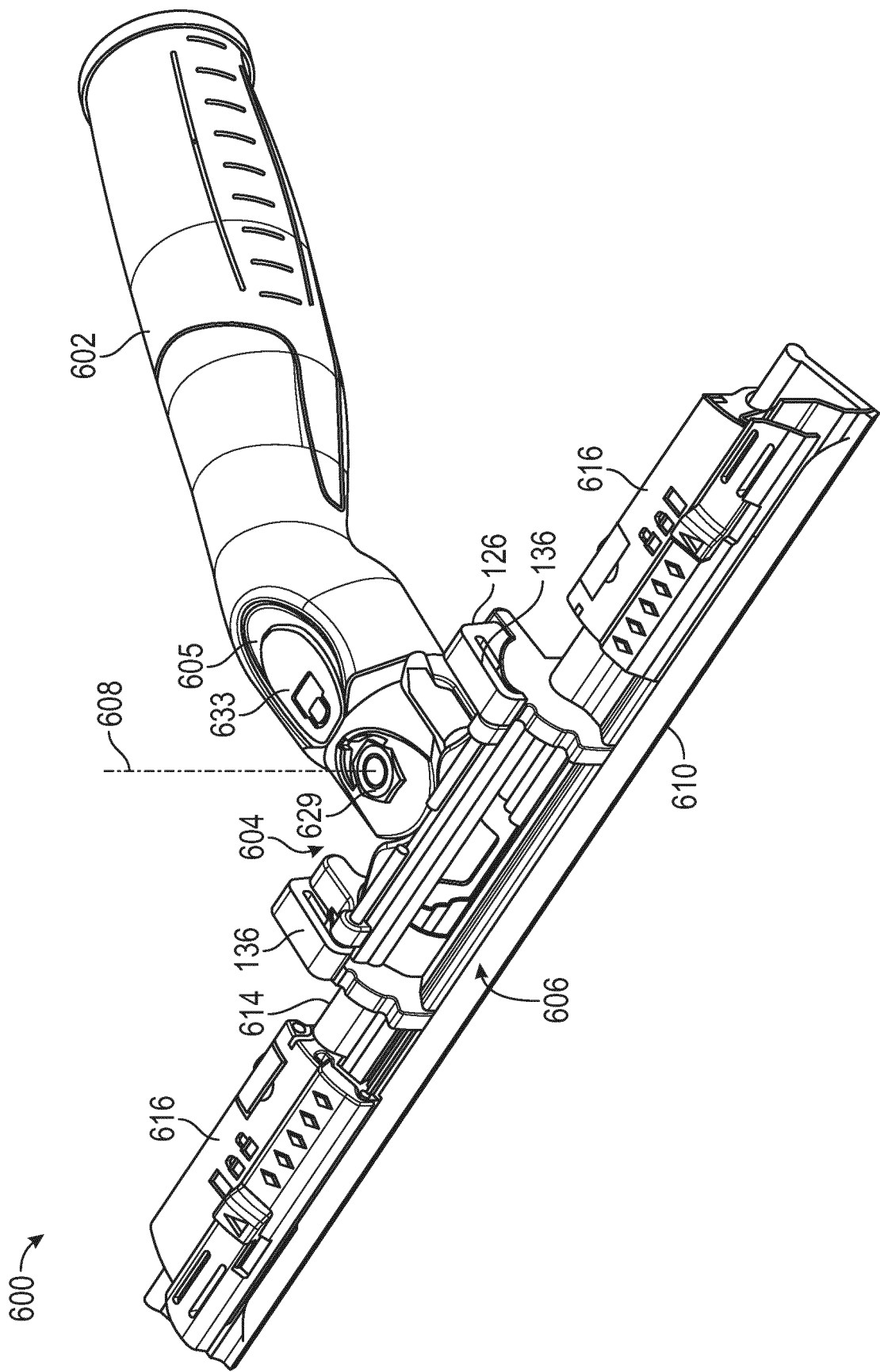


FIG. 8A

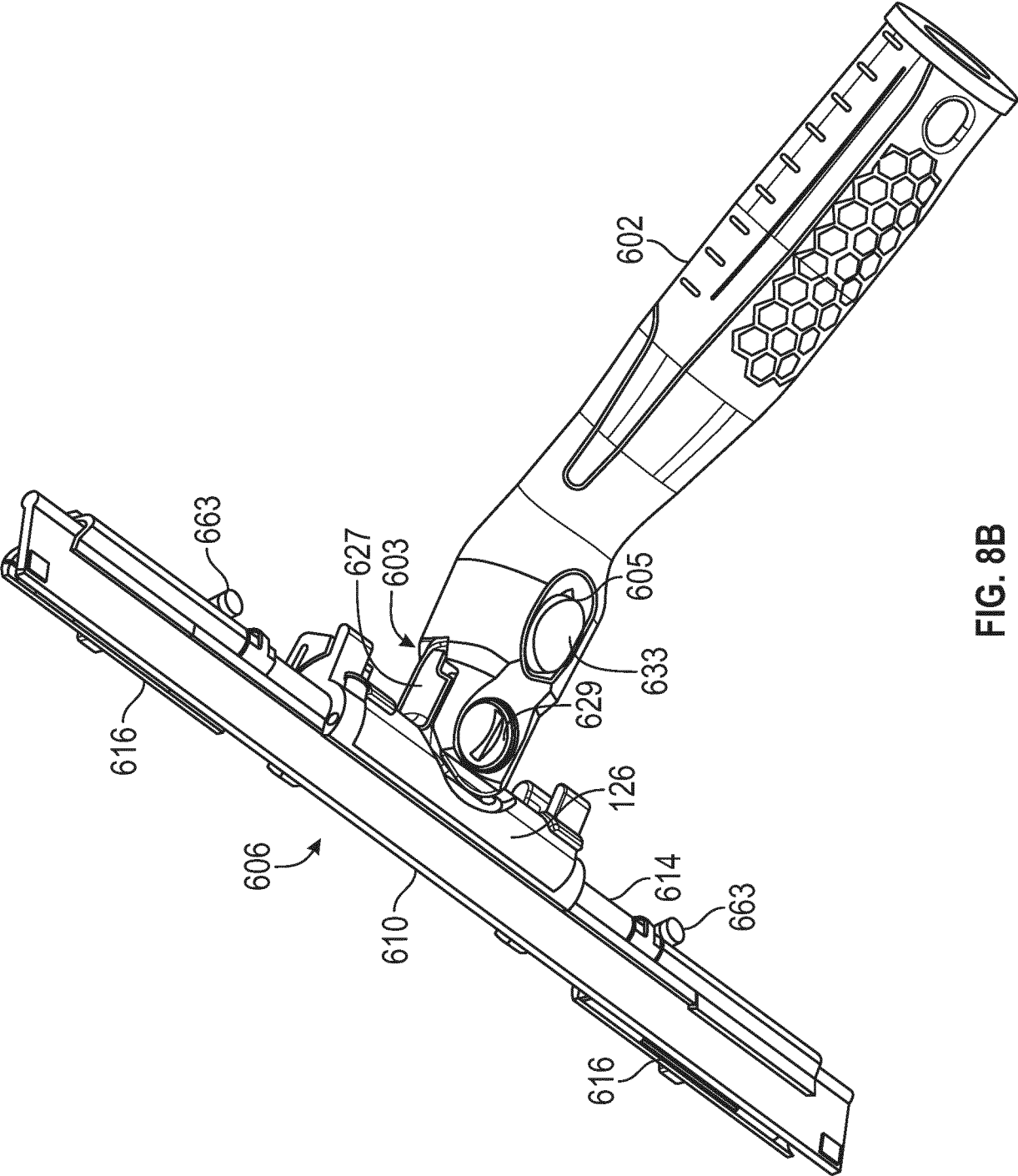


FIG. 8B

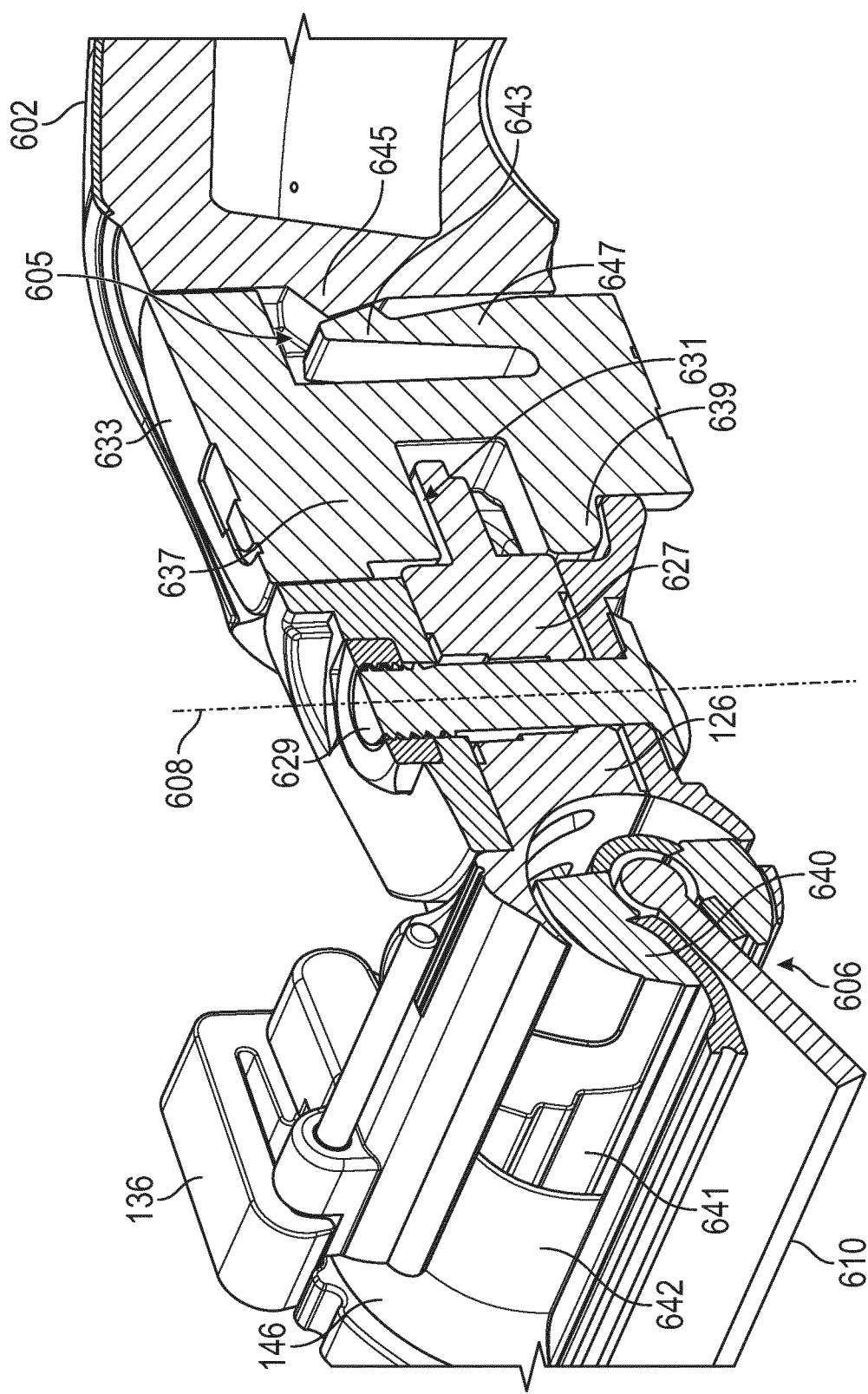


FIG. 8C

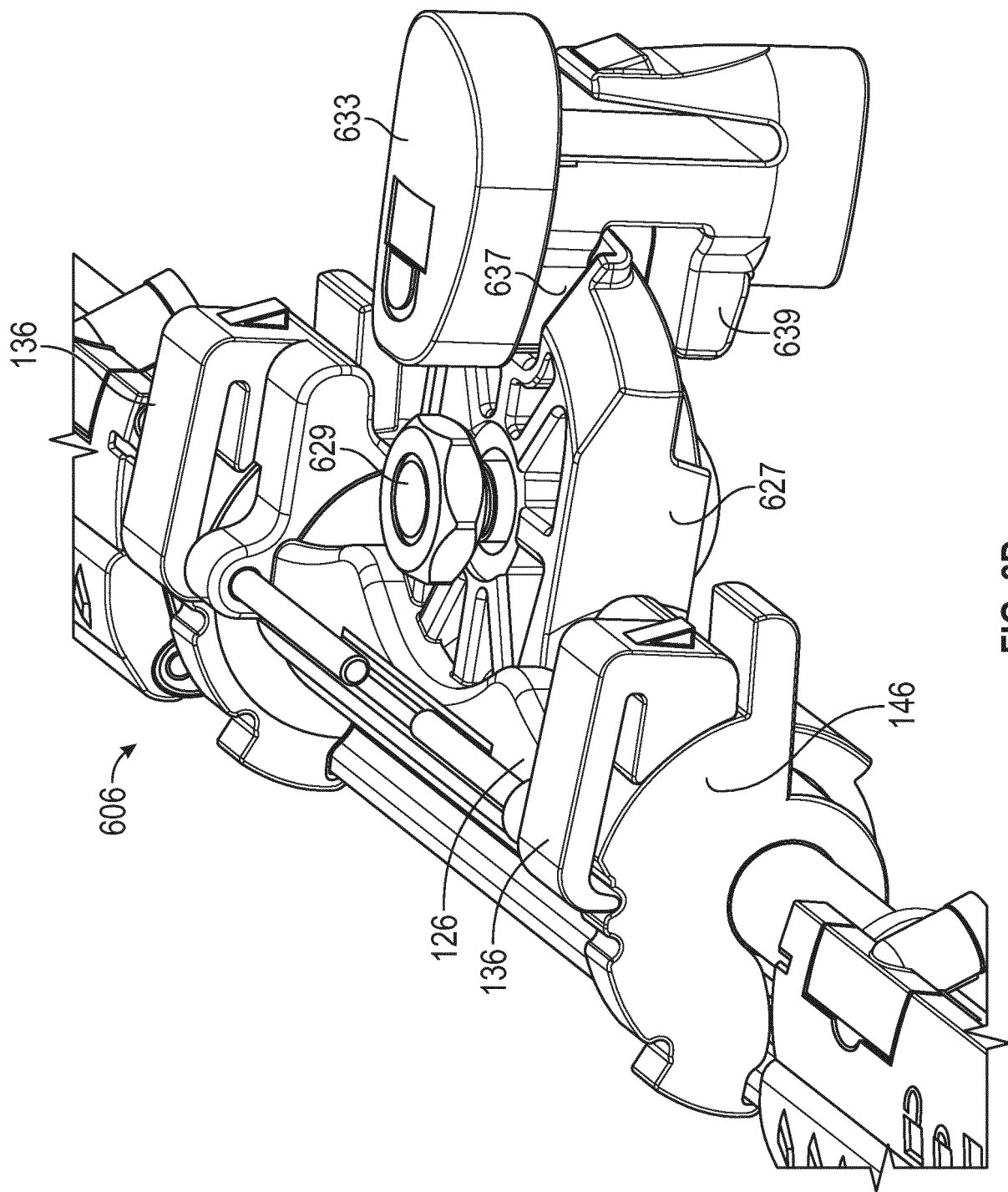


FIG. 8D

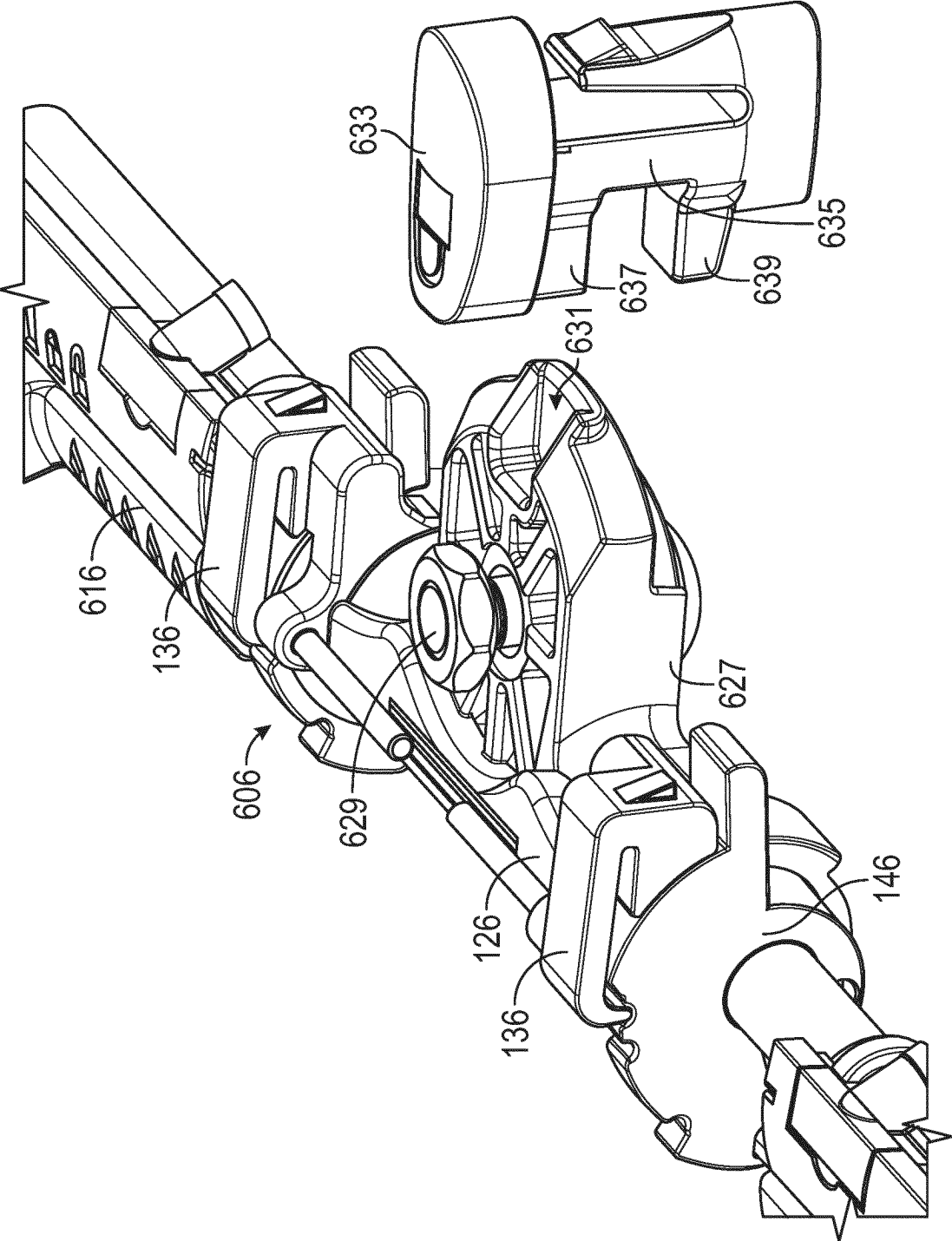


FIG. 8E

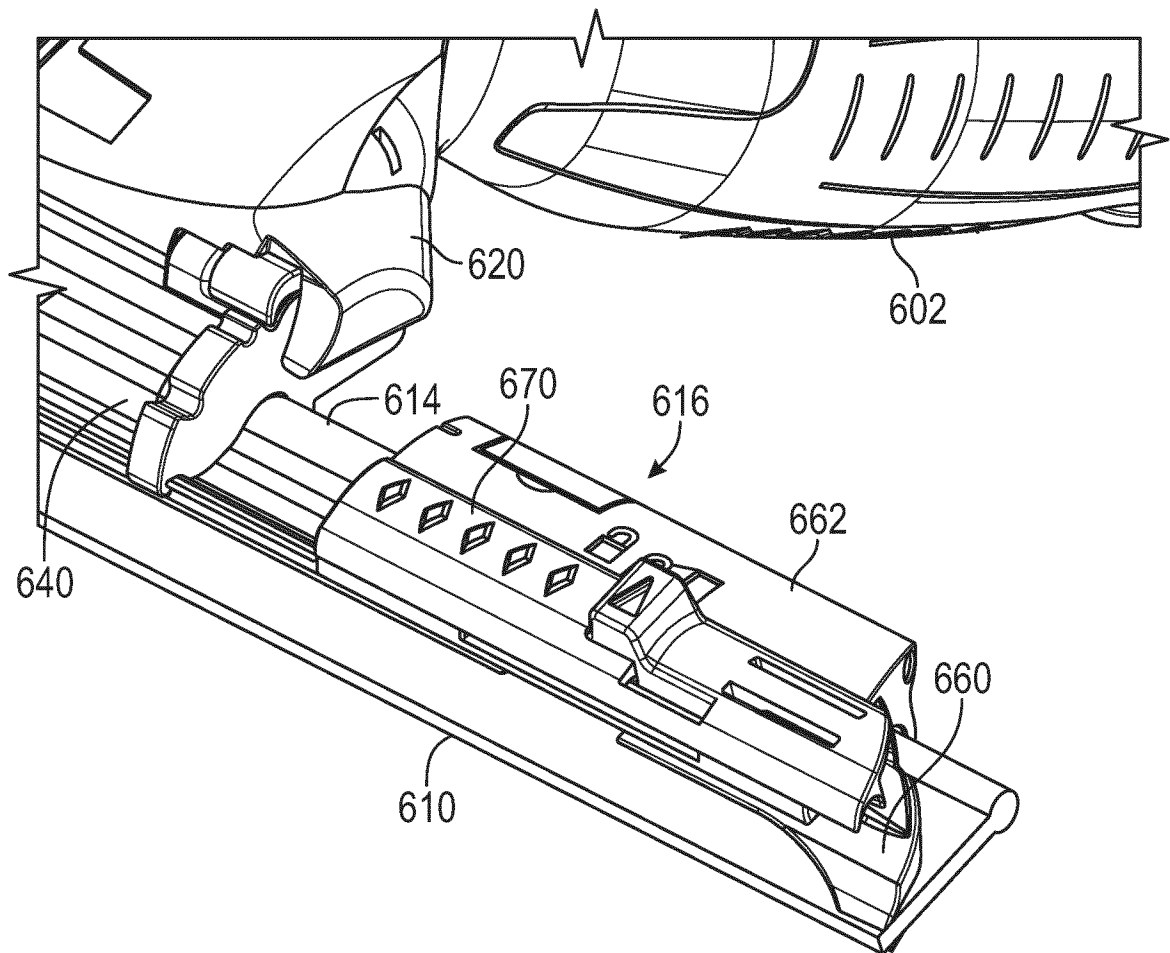


FIG. 9A

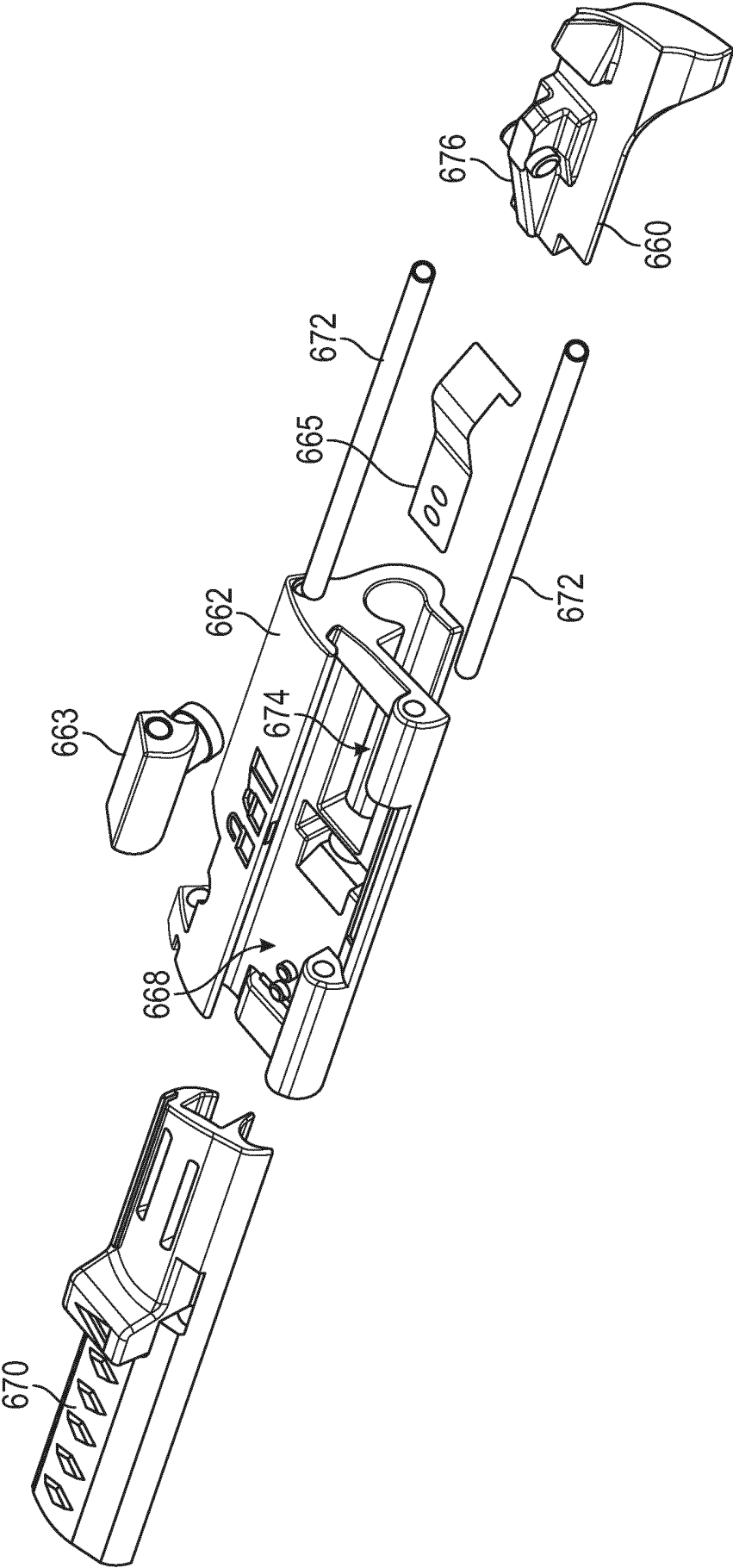


FIG. 9B

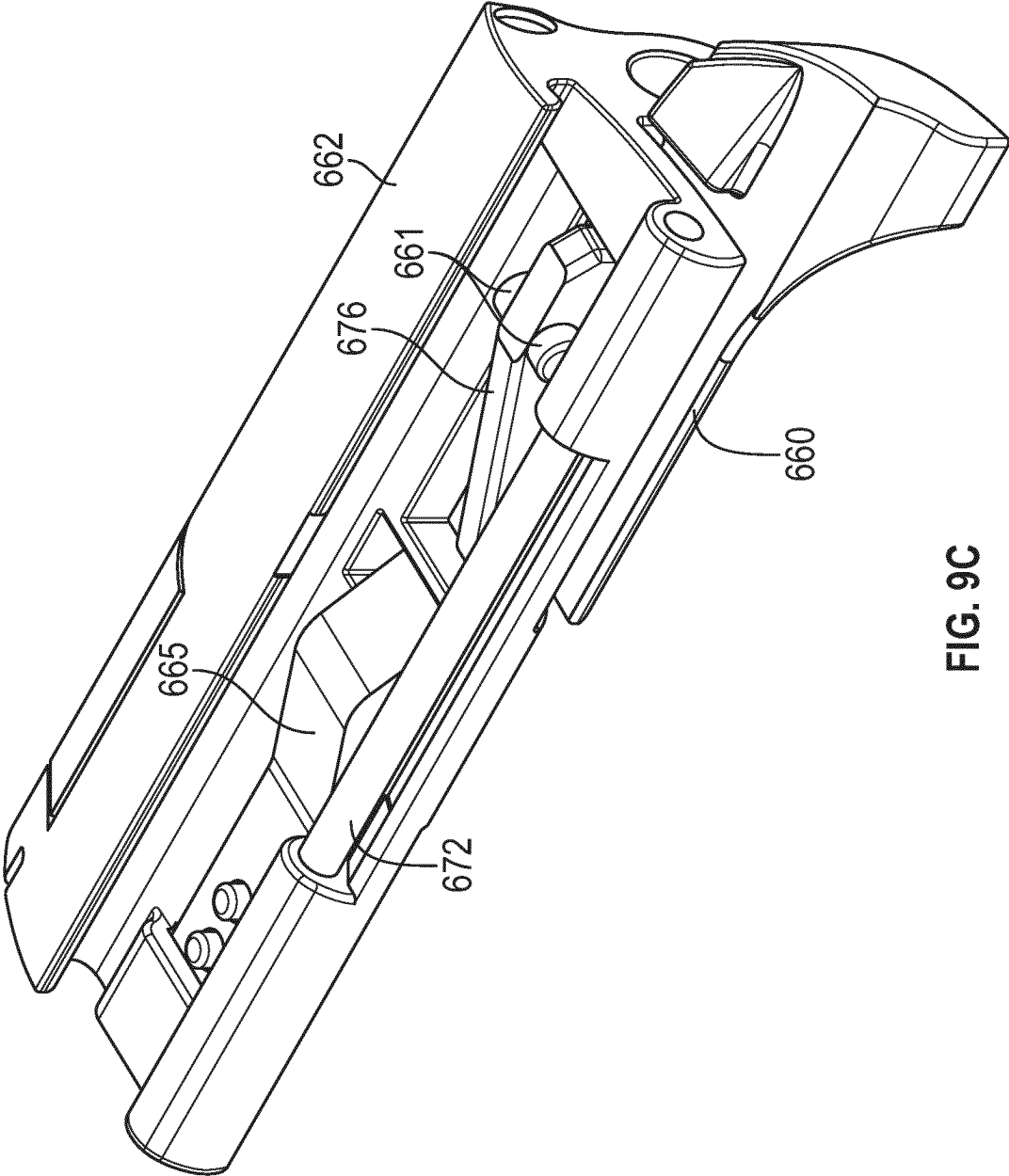


FIG. 9C

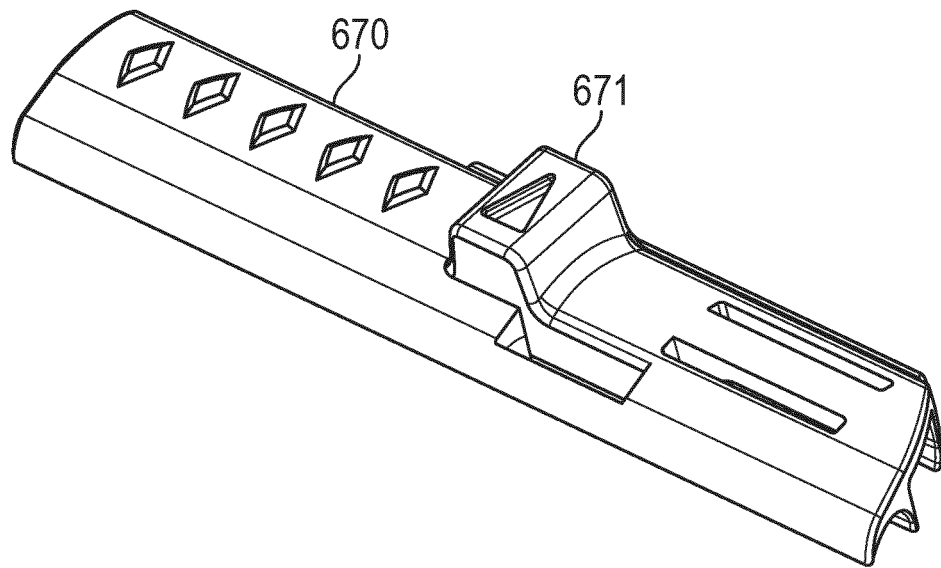


FIG. 9D

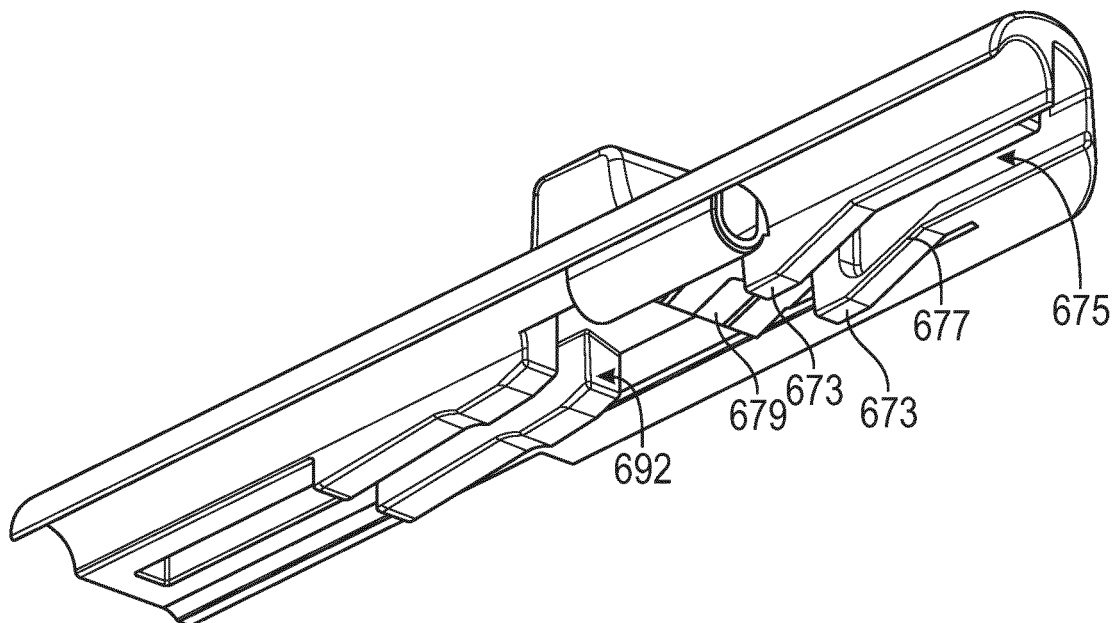


FIG. 9E

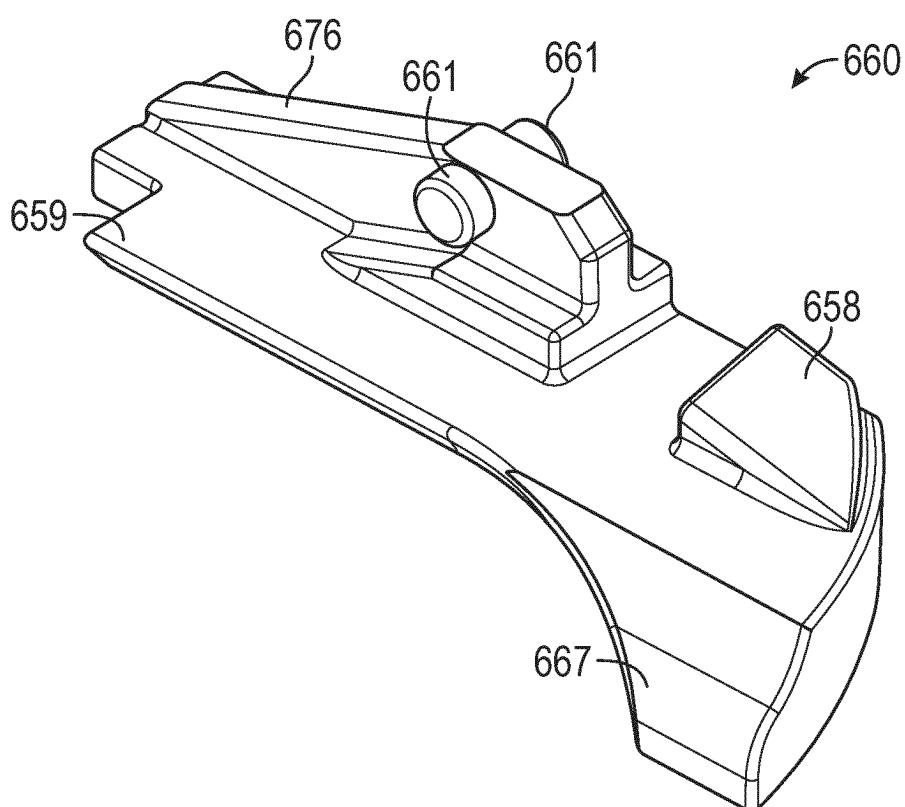


FIG. 9F

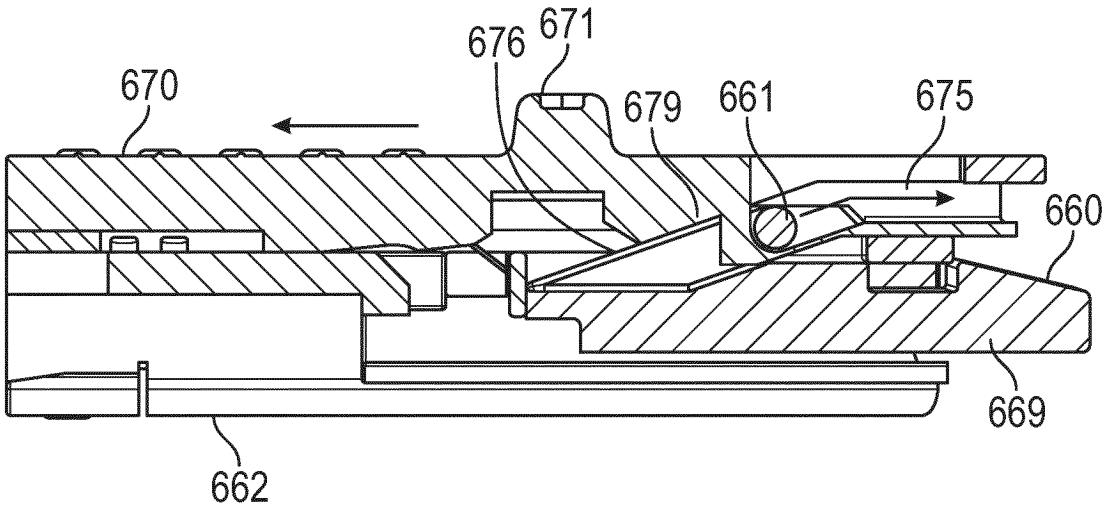


FIG. 9G

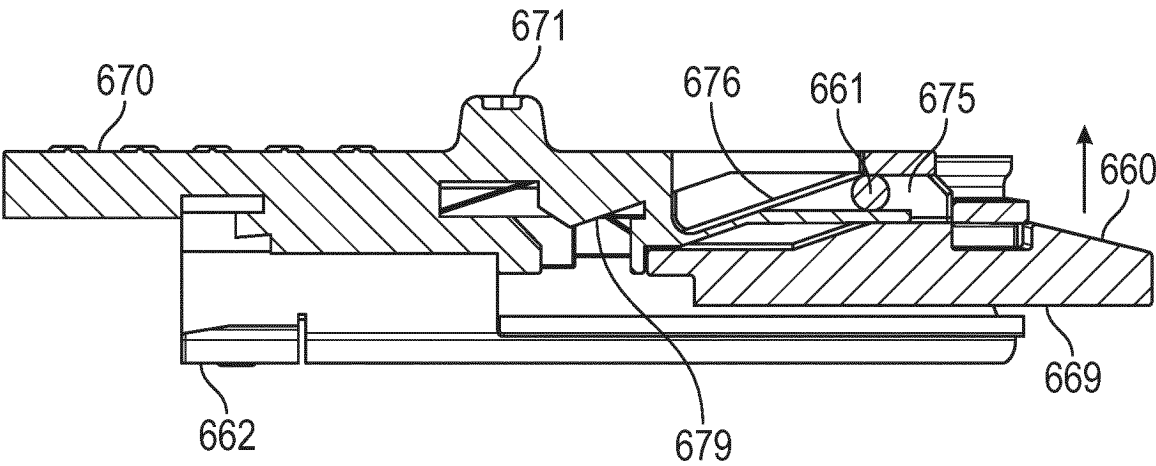


FIG. 9H



EUROPEAN SEARCH REPORT

Application Number

EP 24 20 6610

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		4 March 2025	Rippel, Andreas
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