

(19)



(11)

EP 3 360 493 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
27.05.2020 Bulletin 2020/22

(51) Int Cl.:
A61B 17/34 ^(2006.01) **A61B 17/00** ^(2006.01)

(21) Application number: **18150082.8**

(22) Date of filing: **19.02.2008**

(54) IRIS VALVE WITH NOVEL LOCKING MECHANISM AND CONTROL RING

IRISVENTIL MIT NEUARTIGEM SPERRMECHANISMUS UND KONTROLLRING

VANNE DE TYPE IRIS À NOUVEAU MÉCANISME DE VERROUILLAGE ET ANNEAU DE
COMMANDE

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**

(30) Priority: **22.02.2007 US 677820**
22.02.2007 US 677809

(43) Date of publication of application:
15.08.2018 Bulletin 2018/33

(62) Document number(s) of the earlier application(s) in
accordance with Art. 76 EPC:
08730139.6 / 2 131 763

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(56) References cited:
US-A1- 2004 054 353 US-A1- 2005 222 582
US-A1- 2006 247 500

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Description

BACKGROUND

[0001] The present invention relates in general to surgical devices, and more particularly to access devices.

[0002] Surgical procedures are often used to treat and cure a wide range of diseases, conditions, and injuries. Surgery often requires access to internal tissue through open surgical procedures or endoscopic surgical procedures. The term "endoscopic" refers to all types of minimally invasive surgical procedures including laparoscopic and arthroscopic procedures. Endoscopic surgery has numerous advantages compared to traditional open surgical procedures, including reduced trauma, faster recovery, reduced risk of infection, and reduced scarring. Endoscopic surgery is often performed with an insufflatory fluid present within the body cavity, such as carbon dioxide or saline, to provide adequate space to perform the intended surgical procedures. The insufflated cavity is generally under pressure and is sometimes referred to as being in a state of pneumoperitoneum. Access devices are often used to facilitate surgical manipulation of internal tissue while maintaining pneumoperitoneum. For example, trocars are often used to provide a port through which endoscopic surgical instruments are passed. Trocars generally have a sealing valve that prevent the insufflatory fluid from escaping while an instrument is positioned in the trocar. As a further example, hand access devices are also used during endoscopic surgery, sometimes referred to as hand assisted laparoscopic surgery ("HALS"). A HALS access device will typically seal around a surgeon's hand or arm to prevent the insufflatory fluid from escaping while allowing the surgeon to manipulate tissue within the patient's body. Iris valves are sometimes used to provide a seal in access devices.

[0003] While access devices and iris seals are known, no one has previously made or used an access device in accordance with the present invention.

[0004] US2006/0247500A1 describes an access device which includes an intermediate ring disposed between an upper ring and a lower ring. Intermediate ring has a plurality of undercut, upper teeth spaced apart on the perimeter of intermediate ring. Upper teeth may interlock with a like plurality of undercut, lower teeth spaced apart on the perimeter of the lower ring.

BRIEF DESCRIPTION OF DRAWINGS

[0005] While the specification concludes with claims which particularly point out and distinctly claim the invention, it is believed the invention will be better understood from the following description taken in conjunction with the accompanying drawings illustrating some non-limiting examples of the invention. Unless otherwise indicated, like reference numerals identify the same elements.

Fig. 1 depicts a perspective view of an access device

with an iris valve in an opened position;

Fig. 2 depicts a top plan view of an access device with the iris valve in a closed position;

Fig. 3 depicts an exploded view of an access device;

Fig. 4 depicts cross-sectional view of an access device;

Fig. 5 depicts a cross-section of a lock mechanism in a neutral position;

Fig. 6 depicts a cross-section of a lock mechanism in a tightening position;

Fig. 7 depicts a cross-section of a lock mechanism in a loosening position;

Fig. 8 depicts a perspective view of an access device with partially broken section revealing a lock mechanism not forming part of the present invention;

Fig. 9 depicts a cross-section of an access device with a lock mechanism in a neutral position;

Fig. 10 depicts a perspective cross-section of an access device with a lock mechanism in a loosening position; and

Fig. 11 depicts a perspective cross-section of an access device with a lock mechanism in a tightening position.

DETAILED DESCRIPTION

[0006] Figs. 1-3 illustrate an access device (10) with an iris valve (20) adapted for HALS procedures. The access device has a distal face (12) adapted to face the patient and a proximal face (14) adapted to face away from the patient. The access device (10) includes an adjustable iris valve (20) having an opened position and a closed position.. As shown in Fig. 1, the iris valve (20) is in a fully opened position resulting in a passage (21) adapted to receive a surgeon's hand and arm or surgical instruments. As shown in Fig. 2, the iris valve is in a closed position where the passage (21) is closed. The passage (21) is adjustable to a variety of sizes between the opened and closed positions to seal against the surgeon's arm during a HALS procedure and maintain pneumoperitoneum.

[0007] The access device (10) may also include a wound protector (not shown). As one with ordinary skill in the art will recognize, wound protectors are often placed in an abdominal incision to prevent infection, facilitate wound retraction, and seal against the abdominal wall to maintain pneumoperitoneum. Suitable wound protectors may be rigid or flexible and may be fixed or variable length. In this embodiment the tabs (31) are provided to detachably connect the access device (10) to a wound protector; however, it could also be permanently attached.

[0008] In this embodiment the iris valve (20) comprises a flexible and resilient diaphragm member. In the assembled access device (10) as shown in Figs 1 and 2, the iris valve (20) includes a radial extending distal flange portion (22), a radial extending proximal flange portion (23), and an transition portion (24) defining the passage

(21). As shown in Fig. 3, prior to assembly the iris valve (20) is a generally tubular shape made from an resilient material such as polyisoprene, silicone, or polyurethane with a thickness less than about 0.02 inches (0.5 mm), and preferably between 0.009 to .02 inches (0.2-0.5 mm). The flange portions (22, 23) are formed by radially stretching the tube such that the distal and proximal ends (25, 26) attach to lips (32, 52) on the frame members (30, 50), respectively. O-rings (27, 28) also engage the ends (25, 26) near the lips and facilitate the connections and seals. Optionally, the o-rings (27, 28) could be incorporated into the iris valve (20) to minimize the number of components reducing cost and improve assembly techniques.

[0009] In this embodiment the frame members (30, 50) have relative axial positions, with proximal frame member (50) being positioned proximally relative the distal frame member (30). In this embodiment the frame members (30, 50) are ring-shaped and are axially aligned with one another and the passage (21). The ring-shaped frame members (30, 50) define an opening sized to receive a human hand. The frame members (30, 50) can rotate relative one another about a common axis, which in turn adjusts the iris valve (20) between the opened and closed positions. In this embodiment the frame members (30, 50) can rotate relative to one another while maintaining the relative axial positions. In other words, the frame members (30, 50) can rotate without substantial deviation of the relative axial spacing.

[0010] The resilient nature of the iris valve may induce a relative rotational bias between the frame members (30, 50) toward the opened position. A lock may be used to prevent the relative rotational movement induced by the iris valve (20) bias. In the present embodiment the frame members (30, 50) can rotate relative to one another in a first rotational direction to open the iris valve (20) only when the lock is released; however, the lock will not prevent the frame members (30, 50) from rotating relative one another in a second rotational direction to close the iris valve (20).

[0011] The present embodiment includes a control ring (40) that also has a relative axial position relative the frame members (30, 50). All three components (30, 40, 50) are nested within one another. The control ring (40) is operatively to selectively release the lock when turned in the first rotational direction relative the distal frame member (30). In addition, when turned in the second rotational direction relative the distal frame member (30), the control ring (40) engages the proximal frame member (50) and urges the iris valve (20) toward the closed position. During such use, the control ring (40) and the frame members (30, 50) all maintain their the relative axial positions. Thus, the opening and closing the iris valve (20) may be achieved by simply rotating the control ring (40) in the appropriate direction.

[0012] Optionally, the relative rotational movement of the frame members (30, 50) may be constrained to less than 270 degrees. In the present embodiment the control

ring (40) includes an arcuate channel spanning about 245 degrees. A nub extends from the distal frame member (30) and rides in the channel. The two ends of the channel operate as stops against the nub limiting the rotational range of movement to within the channel, thus limiting the relative rotational movement between the control ring (40) and distal frame member (30). Since the rotational position of the proximal frame member (50) is dependent on the position of the control ring (40), the channel and nub cooperate to limit the relative rotational movement of the frame members (30, 50) to about 245 degrees.

[0013] Figs. 4-7 illustrate internal features the access device (10). The lock comprises a ratchet (33) and pawl (55) mechanism. The ratchet (33) is attached to the distal frame member (30). Optionally, the ratchet (33) may have an arcuate span less than 270 degrees. The ratchet (33) comprises teeth that are radially oriented and face laterally outward, but other teeth arrangements are also contemplated including axial or medial facing teeth. The pawl (55) pivots about the pin (56) that is attached to the proximal frame member (50). A biasing member (57), shown in this embodiment as a spring, biases the pawl (55) to engage the ratchet (33). A pusher (41) is attached to the control ring (40). As the control ring (40) is rotated in the closing direction, the position of the pusher (41) will move between the pawl (55) and the stop (53) on the proximal frame member (50). The pusher (41) has an angular stroke of between less than about 30 degrees between the pawl (55) and the stop (53). The control ring (40) has three operating positions or states, depending on the position of the pusher (41) within its angular stroke.

[0014] In the neutral position or state, as demonstrated in Fig. 5, the pusher (41) is positioned anywhere within its angular stroke without operatively engaging the pawl (55) or the stop (53). The pawl (55) is engaged with the ratchet (33) to prevent the rotational bias induced by the iris valve (20) towards the opened position, thus locking the iris valve (20) in its current position. In the neutral state it is contemplated that the control ring (40) may have an idle "play" corresponding to the angular stroke of the pusher (41). Optionally, a spring could be added to bias the pusher (41) against the stop (53).

[0015] In the tightening position or state, as demonstrated in Fig. 6, the pusher (41) operatively engages the stop (53) to induced a torque on the proximal frame member (50). When the torque exceeds the bias induced by the iris valve (20), the proximal ring (50) will rotate relative the distal ring (30) and move the iris valve (20) toward the closed position. After sufficient angular movement, the pawl (55) will advance clockwise to the adjacent tooth in the ratchet (33). Accordingly, the iris valve (20) is incrementally closed. Thus, by rotating the control ring (40) clockwise the iris valve (20) will close.

[0016] In the loosening position or state, as illustrated in Fig. 7, the pusher (41) operatively engages the pawl (55) to lift the pawl (55) away from the ratchet (33) and disengage the pawl (55) from the ratchet (33) tooth. The

rotational bias induced by the iris valve (20) will act on the proximal frame member (50) and advance the pawl (55) counterclockwise away from the pusher (41). After the pusher (41) disengages the pawl (55), the spring (57) will bias the pawl (55) to reengage the ratchet (33) at the next tooth. Accordingly, the iris valve (20) is incrementally opened. Thus, by rotating the control ring (40) counterclockwise the iris valve (20) will open.

[0017] Fig. 8 illustrates another embodiment of an access device (100) having a ring-shaped proximal frame member (150) and a ring-shaped distal frame member (130) nested within one another. An iris valve (not shown) would be connected to frame members (130, 150) in a similar manner as the frame members (30, 50) and would be operationally and structurally similar to iris valve (20). The frame members (130, 150) can rotate relative one another while maintaining the relative axial positions to open and close the iris valve. A ratchet (133) and pawl (155) lock mechanism is used to prevent relative rotational movement between the frame members (130, 150). In the present embodiment the frame members (130, 150) can rotate relative one another in the first rotational direction to open the iris valve only when the lock is released; however, the lock will not prevent the frame members (130, 150) from rotating relative one another in a second rotational direction to close the iris valve.

[0018] The ratchet (133) is attached to the distal frame member (130) and has laterally facing teeth. A spring (157) biases the pawl (155) to engage the ratchet (133). When the pawl (155) is engaged with the ratchet (133), relative rotational movement between the frame members (130, 150) in the first rotational direction is prevented. The lock can be released by depressing the actuator button (140), which it acts on the arm (158) to lift the pawl (155) away from the ratchet (133). Thus, by depressing the button (140) the pawl (155) is disengaged and the proximal frame member (150) may be rotated counterclockwise to open the iris valve. Relative rotational movement between the frame members (130, 150) in the second rotational direction will cause the pawl (155) to advance clockwise to the adjacent tooth in the ratchet (133). Accordingly, the iris valve is incrementally closed. Thus, clockwise rotation of the proximal frame member (150) will close the iris valve.

[0019] Figs. 9-11 illustrate another embodiment of an access device (200) having a ring-shaped proximal frame member (250), a ring-shaped distal frame member (230), and a control ring (240) nested within one another. An iris valve (not shown) would be connected to frame members (230, 250) in a similar manner as the frame members (30, 50) and would be operationally and structurally similar to iris valve (20). The frame members (230, 250) can rotate relative one another while maintaining the relative axial positions to open and close the iris valve. A lock mechanism is used to prevent relative rotational movement between the frame members (230, 250). In the present embodiment the frame members (230, 250) can rotate relative one another in a first rotational direction

to open the iris valve only when the lock is released; however, the lock will not prevent the frame members (230, 250) from rotating relative one another in a second rotational direction to close the iris valve.

[0020] Preferably the lock mechanism comprises three or more ball and wedge track mechanisms; however, this embodiment has five ball and wedge track mechanisms. A wall (233) is attached to the distal frame member (230). In this example the wall (233) is textured with axial ribs, but other surfaces could also be used. A track is defined between the wall (233) and the proximal frame member (250). Each track includes a narrow portion (258) that transitions to a wide portion (259). A ball (255) is positioned in the wide portion (259), but the ball (255) is too small to fit in the narrow portion (258). A spring (257) biases the ball (255) toward the narrow portion (258). A pusher (241) is attached to the control ring (240) and is positioned in the narrow portion (258) of the track. As the control ring (240) is rotated, the position of the pusher (241) will move between the ball (255) and the stop (253) on the proximal frame member (250). The pusher (241) has an angular stroke of less than about 30 degrees between the ball (255) and the stop (253). The control ring (240) has three operating positions or states, depending on the position of the pusher (241) within its angular stroke.

[0021] In the neutral position or state, as demonstrated in Fig. 9, the pusher (241) is positioned anywhere within its angular stroke without operatively engaging the ball (255) or the stop (253). The balls (255) are wedged in the track where the narrow portion (258) transitions to the wide portion (259). The wedged balls (255) engage both frame members (230, 250) and prevent relative rotational movement in the first rotational direction to open the iris valve. Thus, the wedged balls (255) resist the rotational bias induced by the iris valve and lock the iris valve in its current position. In the neutral state it is contemplated that the control ring (240) may have an idle "play" corresponding to the angular stroke of the pusher (241).

[0022] In the loosening position or state, as illustrated in Fig. 10, the pusher (241) operatively engages the ball (255) pushing it toward the wide portion (259) thus liberating the ball (255) from being wedged in the track. The rotational bias induced by the iris valve will act on the proximal frame member (250) and advance the proximal frame member (250) counterclockwise disengaging the pusher (241) from the ball (255). The spring (257) will then bias the ball (255) back into its wedged position. Accordingly, the iris valve is incrementally opened. Thus, by rotating the control ring (240) counterclockwise the iris valve will open.

[0023] In the tightening position or state, as demonstrated in Fig. 11, the pusher (241) operatively engages the stop (253) to induced a torque on the proximal frame member (250). When the torque exceeds the rotational bias induced by the iris valve, the proximal ring (250) will rotate relative the distal ring (230) and move the iris valve

toward the closed position. Due to the direction of the track transition between the narrow and wide portions (258, 259), the ball (255) will not prevent relative rotational movement in the second rotational direction to close the iris valve. Accordingly, the iris valve is incrementally closed. Thus, by rotating the control ring (240) clockwise the iris valve will close.

[0024] Preferably, the access devices described above will be processed before surgery. First, a new or used access device is obtained and if necessary cleaned. The access device can then be sterilized. In one sterilization technique the access device is placed in a closed and sealed container, such as a plastic or TYVEK bag. Optionally, the access device can be bundled in the container as a kit with other components, including one or more of the following: a wound protector, a mounting ring for the wound protector, a tube of lubricant, a marker, an incision template or scale, an instruction sheet, and the like. The container and access device, as well as any other components, are then placed in a field of radiation that can penetrate the container, such as gamma radiation, x-rays, or high-energy electrons. The radiation kills bacteria on the access device and in the container. The sterilized access device can then be stored in the sterile container. The sealed container keeps the access device sterile until it is opened in the medical facility.

[0025] Having shown and described various embodiments and examples of the present invention, further adaptations of the devices described herein can be accomplished by appropriate modifications by one of ordinary skill in the art without departing from the scope of the present invention. Several of such potential modifications have been mentioned, and others will be apparent to those skilled in the art. For instance, the specific materials, dimensions, and the scale of drawings will be understood to be non-limiting examples. In addition, the foregoing teachings could be implemented for non-HALS procedures, such as reducing the scale to seal against instruments in traditional laparoscopic procedures. Accordingly, the scope of the present invention should be considered in terms of the following claims and is understood not to be limited to the details of structure, materials, or acts shown and described in the specification and drawings.

Claims

1. A hand assisted laparoscopic surgical access device (10, 100), comprising:
 - a) a first ring (30, 130) and a second ring (50, 150), the first and second rings being rotateable relative one another about a common axis, the first and second rings being sized to receive a human hand;
 - b) a flexible and resilient iris valve (20) connected to the first and second rings, the iris valve

having a closed position and an opened position based on the relative angular position of the first and second rings; and

c) means for locking and releasing the rings in selective relative angular positions, wherein the means for locking and releasing comprises a ratchet (33, 133), a pawl (55, 155), and **characterized in that** the device (10, 100) further comprises:

a third ring (40) rotateable relative the first and second rings and operable to release the pawl (33, 133) from the ratchet (55, 155) by rotating the third ring (40) and thereby pushing the pawl (55, 155) out of engagement with the ratchet (33, 133).

2. The hand assisted laparoscopic surgical access device (10, 100) of claim 1, wherein the means for locking and releasing further comprises a button (140) operable to release the pawl (155) from the ratchet (133).
3. The hand assisted laparoscopic surgical access device of any one of claims 1 and 2, wherein the ratchet (33, 133) is radially oriented.
4. The hand assisted laparoscopic surgical access device of any one of claims 1 to 3, further comprising a biasing member (57, 157) biasing the pawl toward the ratchet
5. A hand assisted laparoscopic surgical access device (200), comprising:

a) a first ring (230) and a second ring (250), the first and second rings being rotateable relative one another about a common axis, the first and second rings being sized to receive a human hand;

b) a flexible and resilient iris valve connected to the first and second rings, the iris valve having a closed position and an opened position based on the relative angular position of the first and second rings; and

c) means for locking and releasing the rings in selective relative angular positions; and **characterized in that** the means for locking and releasing comprise a wedge track and a ball (255), and further comprises a third ring (24) rotateable relative the first and second rings and operable to push the ball (255) by rotating the third ring (24) and thereby pushing the ball (255) out of engagement with the wedge track.

Patentansprüche

1. Manuell unterstützte chirurgische Laparoskopie-Zu-

griffsvorrichtung (10, 100), umfassend:

- a) einen ersten Ring (30, 130) und einen zweiten Ring (50, 150), wobei der erste und der zweite Ring bezüglich einander um eine gemeinsame Achse drehbar sind, wobei der erste und der zweite Ring zur Aufnahme einer menschlichen Hand bemessen sind, 5
- b) ein flexibles und elastisches Irisventil (20), das mit dem ersten und dem zweiten Ring verbunden ist, wobei das Irisventil auf der Grundlage der relativen Winkelposition des ersten und des zweiten Rings eine geschlossene Position und eine geöffnete Position hat, und 10
- c) ein Mittel zum Verriegeln und Freigeben der Ringe in gezielten relativen Winkelpositionen, wobei das Verriegelungs- und Freigabemittel eine Ratsche (33, 133) und eine Klinke (55, 155) umfasst, **dadurch gekennzeichnet, dass** die Vorrichtung (10, 100) ferner Folgendes umfasst: einen dritten Ring (40), der bezüglich des ersten und des zweiten Rings drehbar und dahingehend betätigbar ist, die Klinke (33, 133) von der Ratsche (55, 155) freizugeben, indem der dritte Ring (40) gedreht und dadurch die Klinke (55, 155) außer Eingriff mit der Ratsche (33, 133) geschoben wird. 20 25
2. Manuell unterstützte chirurgische Laparoskopie-Zugriffsvorrichtung (10, 100) nach Anspruch 1, wobei das Verriegelungs- und Freigabemittel ferner einen Knopf (140) umfasst, der dahingehend betätigbar ist, die Klinke (155) von der Ratsche (133) freizugeben. 30
3. Manuell unterstützte chirurgische Laparoskopie-Zugriffsvorrichtung nach einem der Ansprüche 1 und 2, wobei die Ratsche (33, 133) radial ausgerichtet ist. 35
4. Manuell unterstützte chirurgische Laparoskopie-Zugriffsvorrichtung nach einem der Ansprüche 1 bis 3, ferner umfassend ein Vorspannglied (57, 157), das die Klinke zu der Ratsche hin vorspannt. 40
5. Manuell unterstützte chirurgische Laparoskopie-Zugriffsvorrichtung (200), umfassend: 45
 - a) einen ersten Ring (230) und einen zweiten Ring (250), wobei der erste und der zweite Ring bezüglich einander um eine gemeinsame Achse drehbar sind, wobei der erste und der zweite Ring zur Aufnahme einer menschlichen Hand bemessen sind, ein flexibles und elastisches Irisventil, das mit dem ersten und dem zweiten Ring verbunden ist, wobei das Irisventil auf der Grundlage der relativen Winkelposition des ersten und des zweiten Rings eine geschlossene Position und eine geöffnete Position hat, und ein Mittel zum Verriegeln und Freigeben der Rin-

ge in gezielten relativen Winkelpositionen, **dadurch gekennzeichnet, dass** das Verriegelungs- und Freigabemittel eine Keilspur und eine Kugel (255) umfasst und ferner einen dritten Ring (24) umfasst, der bezüglich des ersten und des zweiten Rings drehbar und dahingehend betätigbar ist, die Kugel (255) zu schieben, indem der dritte Ring (24) gedreht und dadurch die Kugel (255) außer Eingriff mit der Keilspur geschoben wird.

Revendications

1. Dispositif d'accès chirurgical laparoscopique à main (10, 100), comprenant :
 - a) une première bague (30, 130) et une deuxième bague (50, 150), les première et deuxième bagues pouvant tourner l'une par rapport à l'autre autour d'un axe commun, les premières et deuxième bagues étant dimensionnées pour recevoir une main humaine ;
 - b) une valve de type iris souple et élastique (20) raccordée aux première et deuxième bagues, la valve de type iris ayant une position fermée et une position ouverte sur la base de la position angulaire relative des première et deuxième bagues ; et
 - c) des moyens de blocage et de libération des bagues dans des positions angulaires relatives sélectives, les moyens de blocage et de libération comprenant une roue à rochet (33, 133), un cliquet (55, 155), et **caractérisé en ce que** le dispositif (10, 100) comprend en outre : une troisième bague (40) pouvant tourner par rapport aux première et deuxième bagues et exploitable pour libérer le cliquet (33, 133) de la roue à rochet (55, 155) en faisant tourner la troisième bague (40) et de ce fait en poussant le cliquet (55, 155) hors de la prise avec la roue à rochet (33, 133).
2. Dispositif d'accès chirurgical laparoscopique manuel (10, 100) selon la revendication 1, dans lequel les moyens de blocage et de libération comprennent en outre un bouton (140) exploitable pour libérer le cliquet (155) de la roue à rochet (133).
3. Dispositif d'accès chirurgical laparoscopique manuel selon l'une quelconque des revendications 1 et 2, dans lequel la roue à rochet (33, 133) est orientée radialement.
4. Dispositif d'accès chirurgical laparoscopique manuel selon l'une quelconque des revendications 1 à 3, comprenant en outre un élément de sollicitation (57, 157) sollicitant le cliquet vers la roue à rochet.

5. Dispositif d'accès chirurgical laparoscopique manuel (200), comprenant :

a) une première bague (230) et une deuxième bague (250), les première et deuxième bagues pouvant tourner l'une par rapport à l'autre autour d'un axe commun, les première et deuxième bagues étant dimensionnées pour recevoir une main humaine ;

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une valve de type iris souple et élastique raccordée aux première et deuxième bagues, la valve de type iris ayant une position fermée et une position ouverte sur la base de la position angulaire relative des première et deuxième bagues ; et
des moyens de blocage et de libération des bagues dans des positions angulaires relatives sélectives ;
et **caractérisé en ce que** les moyens de blocage et de libération comprennent une rainure de calage et une bille (255), et qui comprend en outre une troisième bague (24) pouvant tourner par rapport aux première et deuxième bagues et exploitable pour pousser la bille (255) en faisant tourner la troisième bague (24) et de ce fait en poussant la bille (255) hors de la prise avec la rainure de calage.

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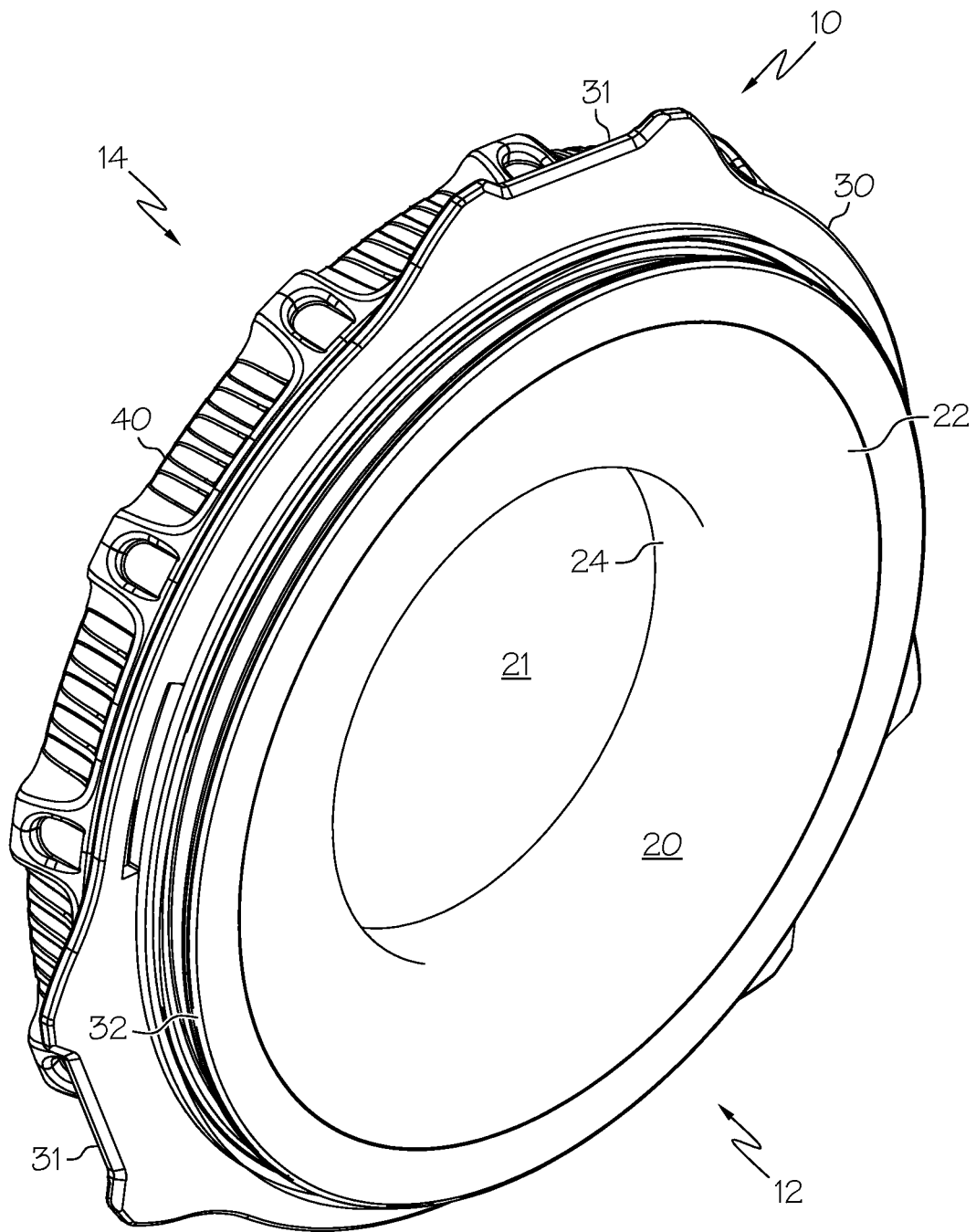


FIG. 1

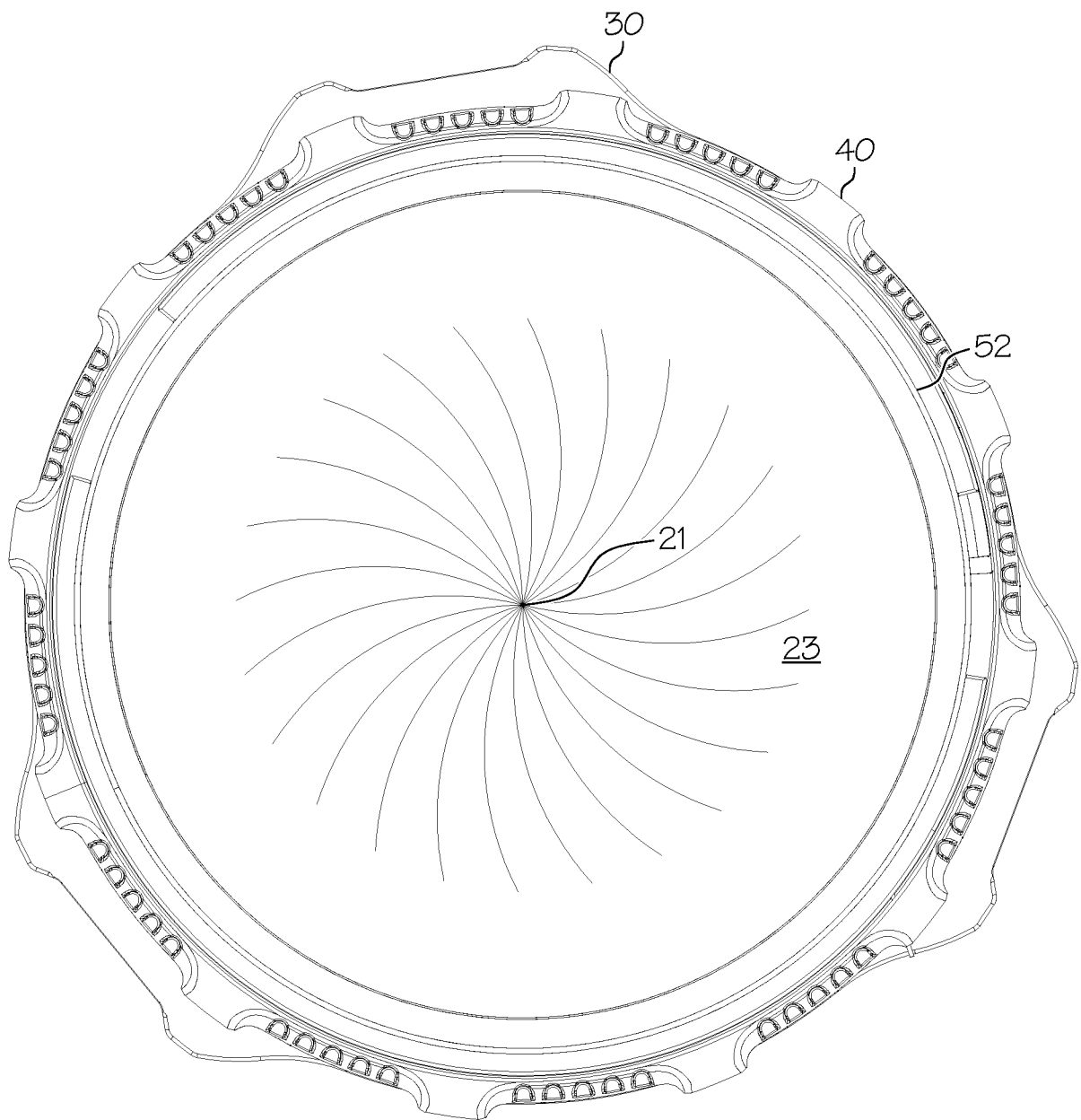


FIG. 2

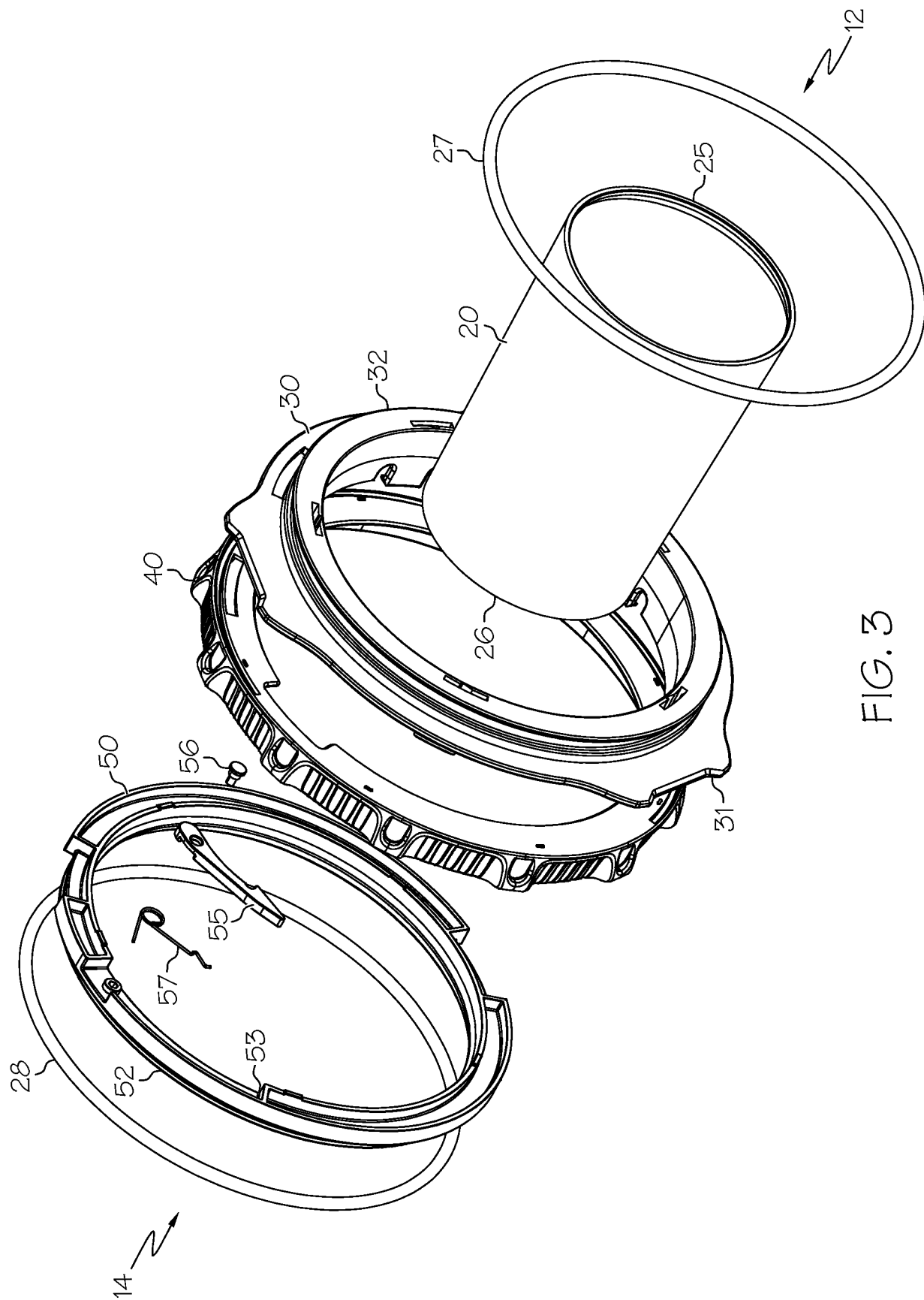


FIG. 3

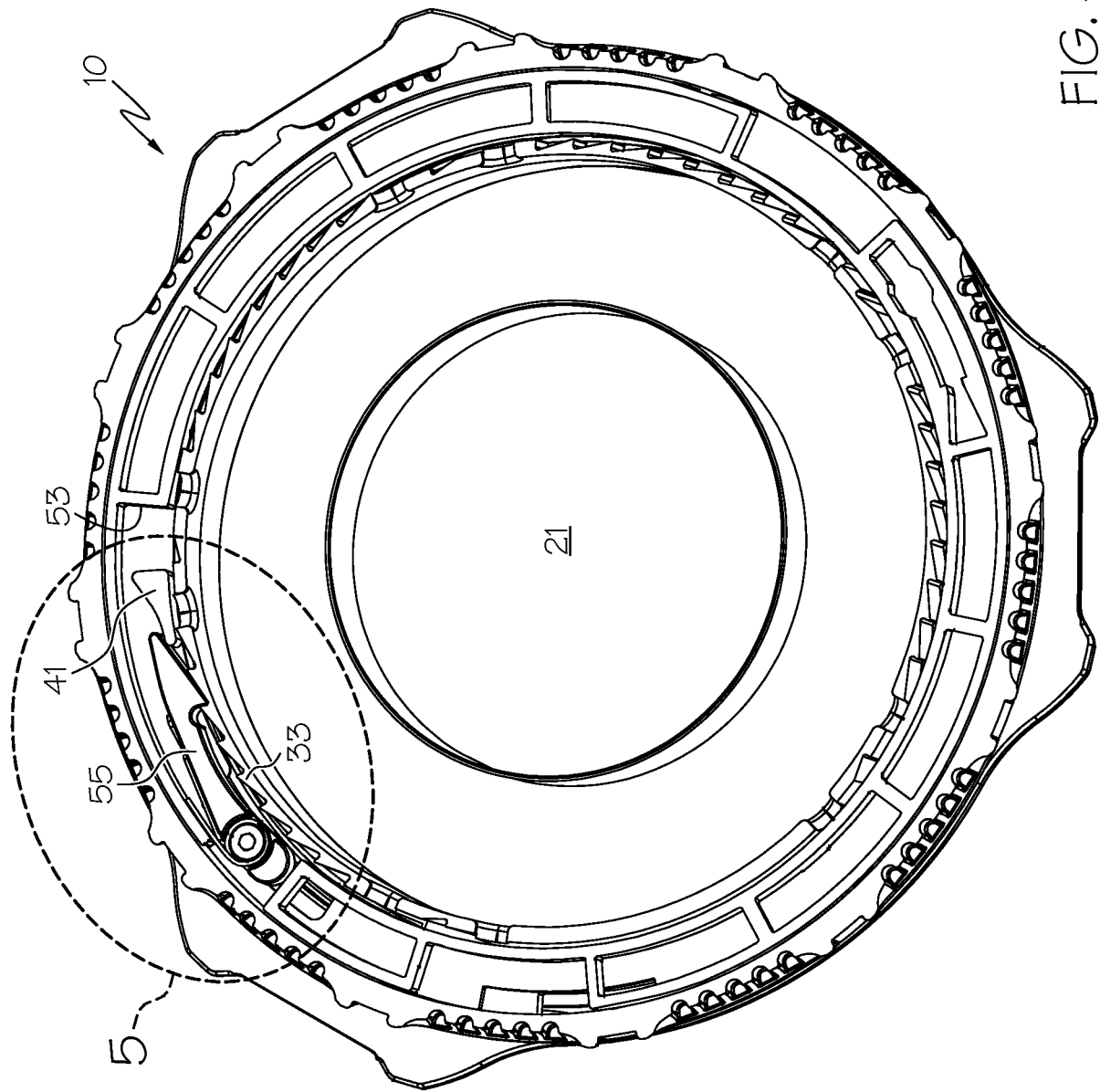


FIG. 4

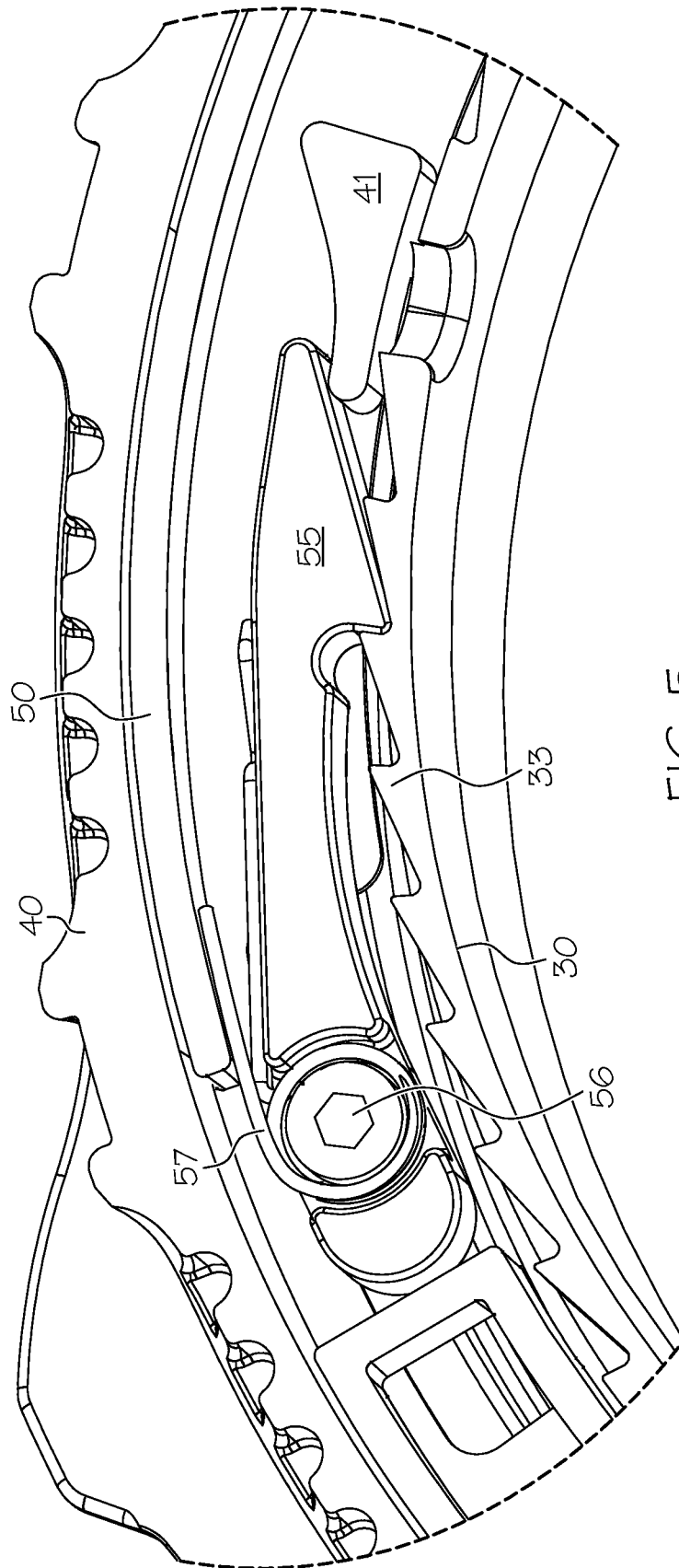


FIG. 5

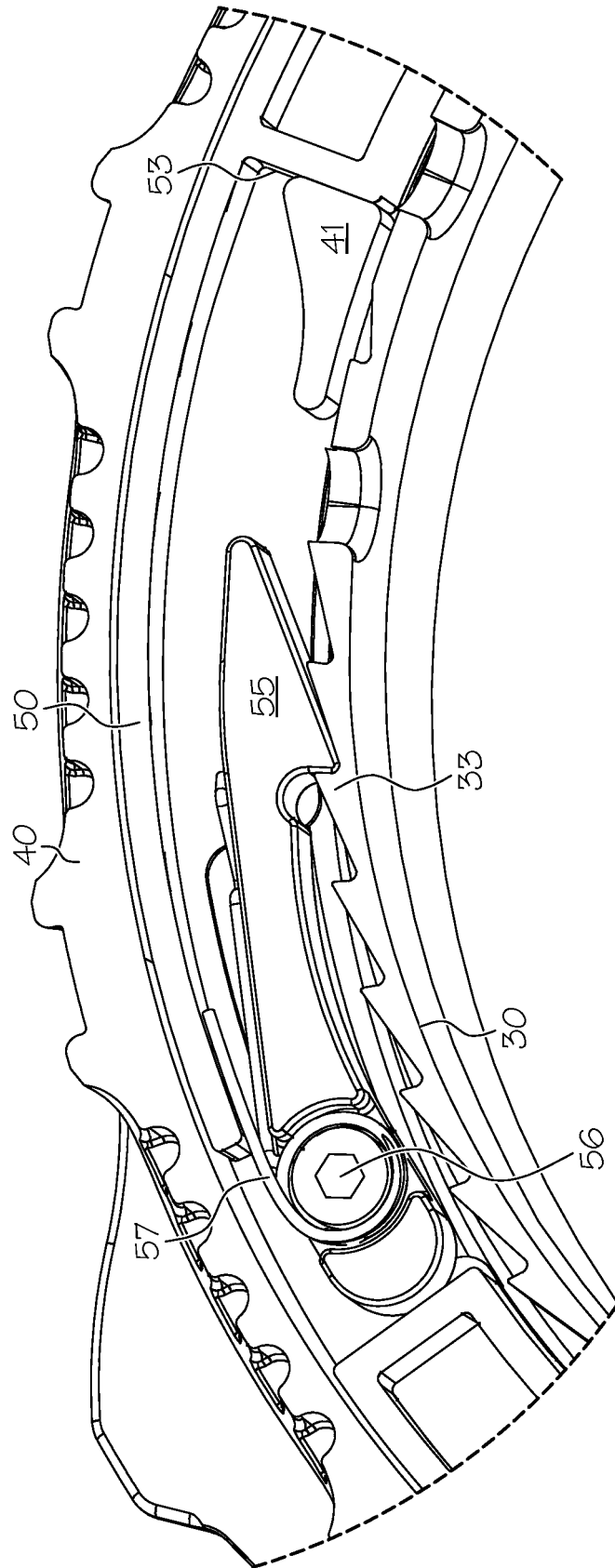


FIG. 6

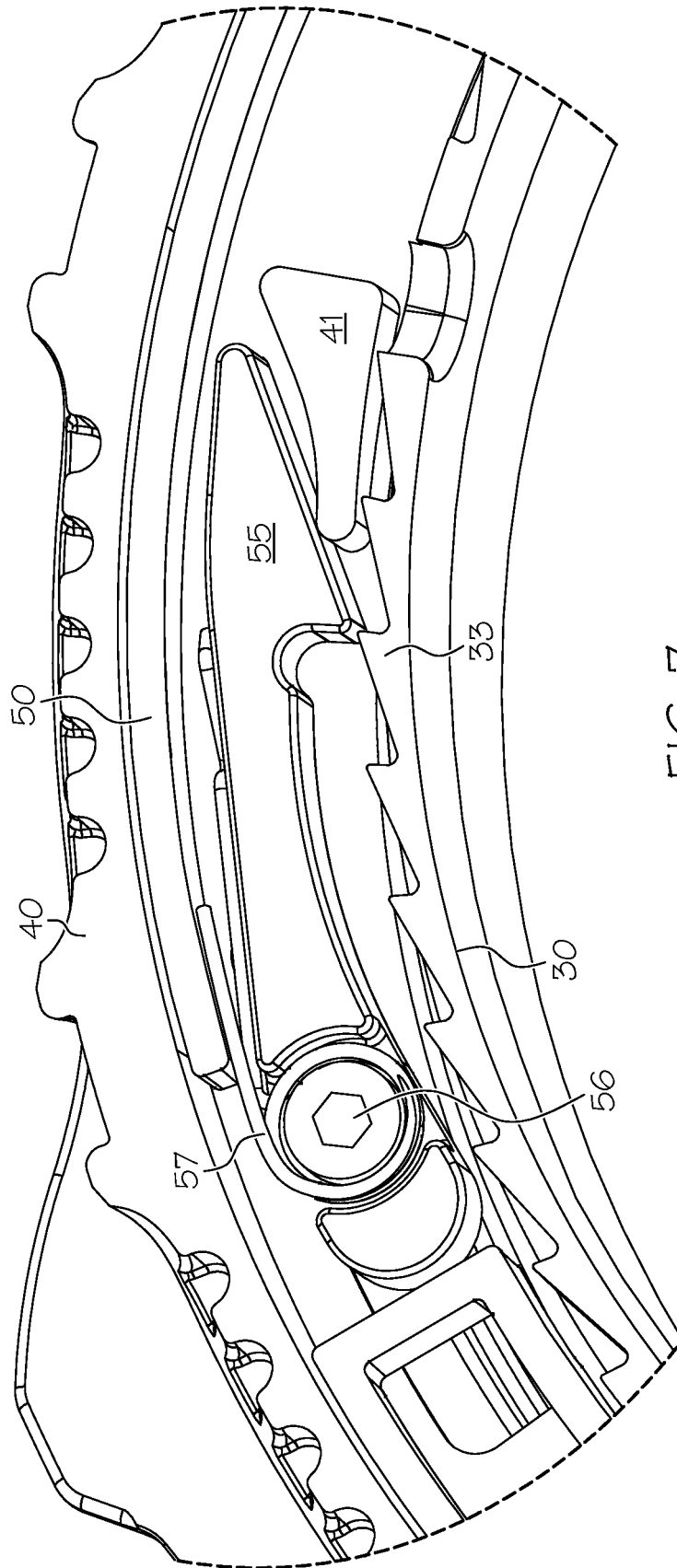


FIG. 7

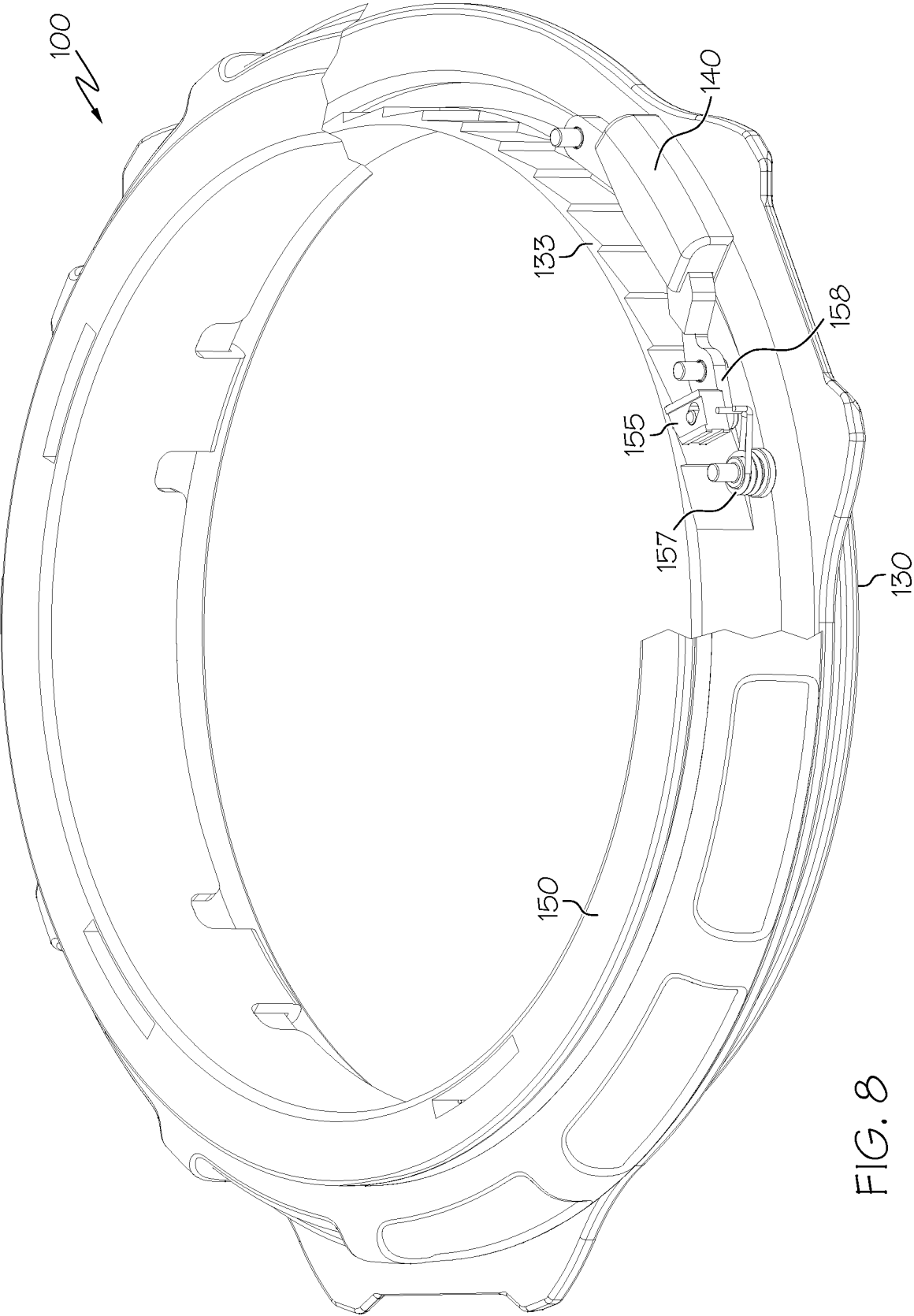
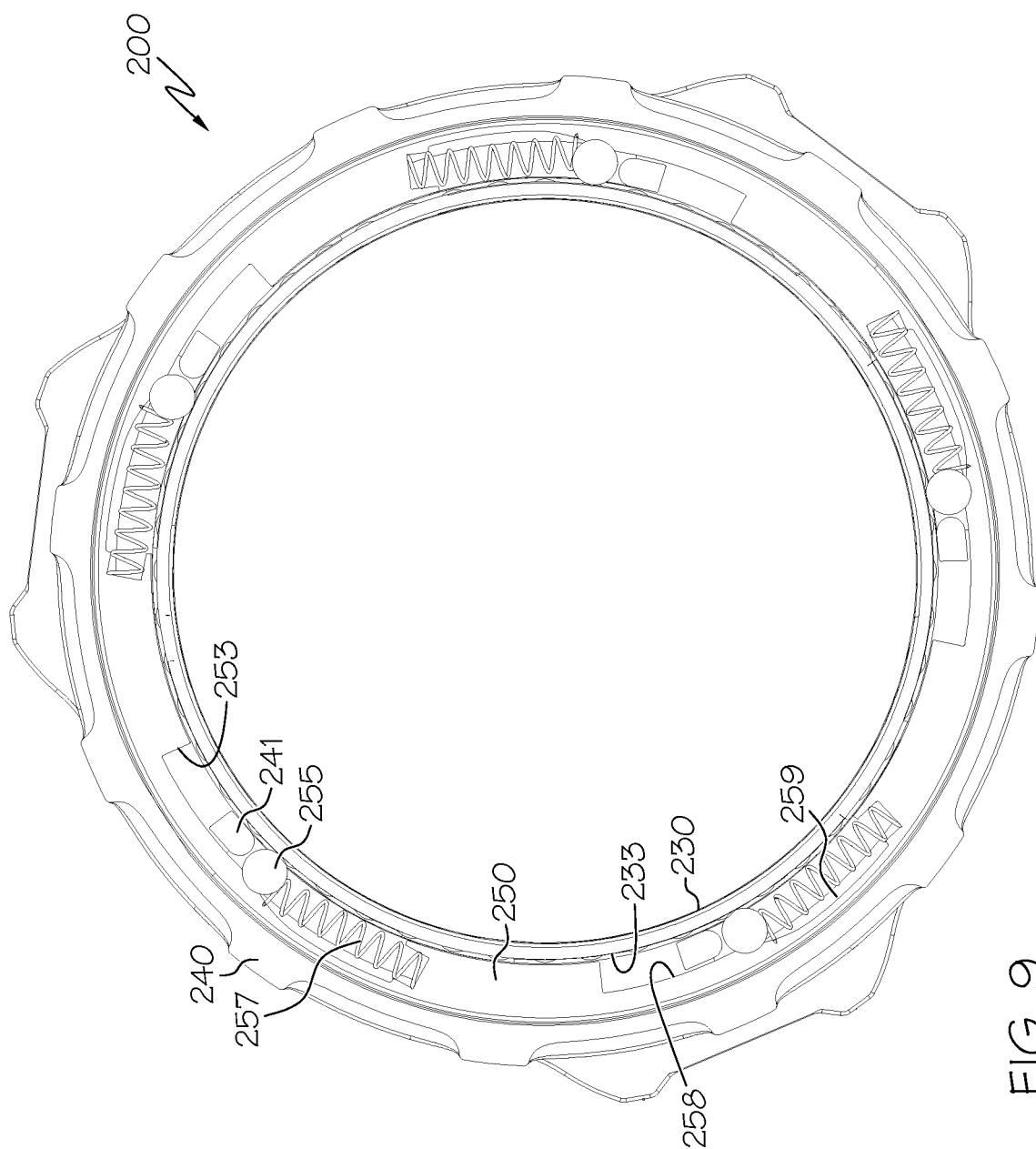


FIG. 8



F/G. 9

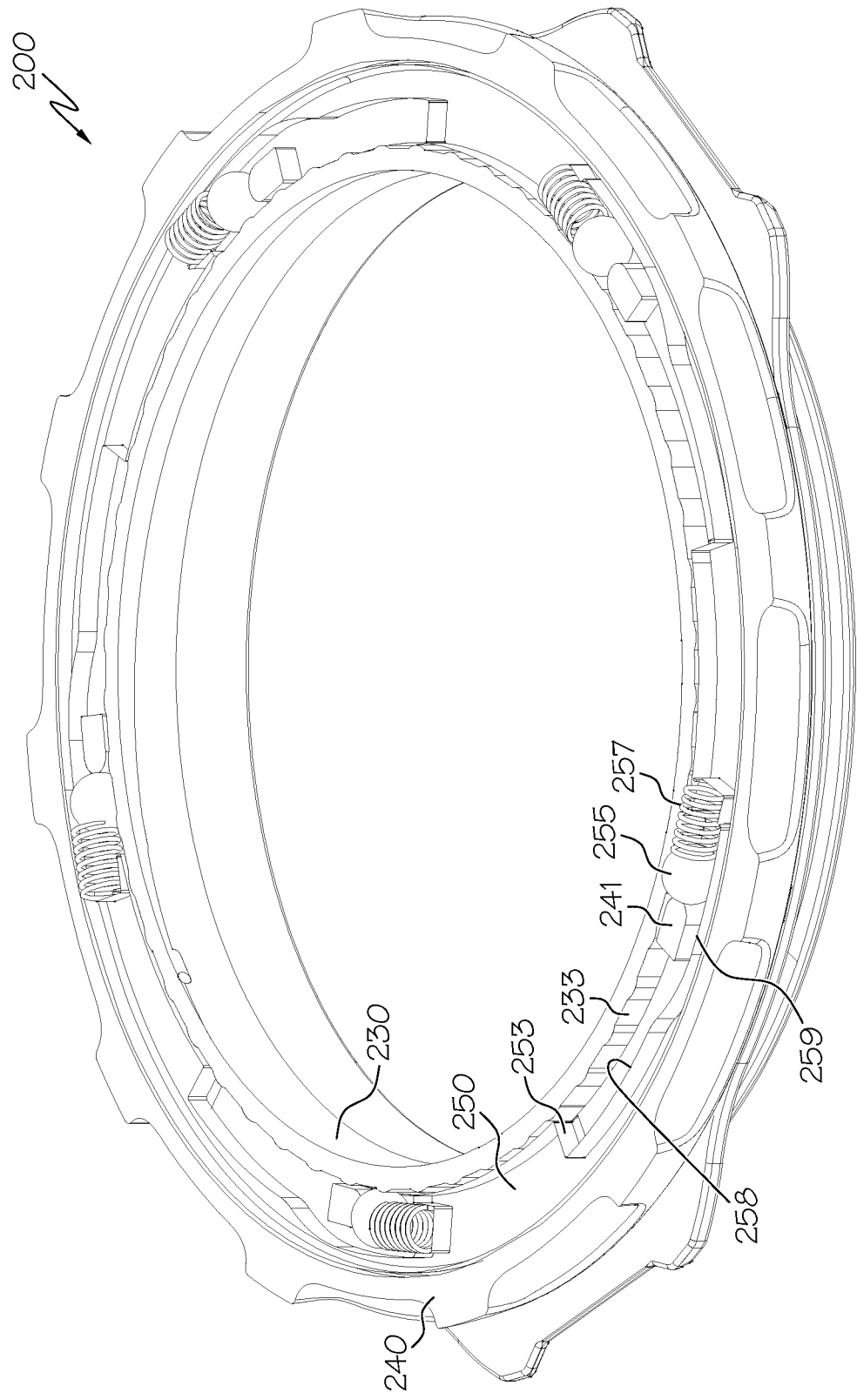


FIG. 10

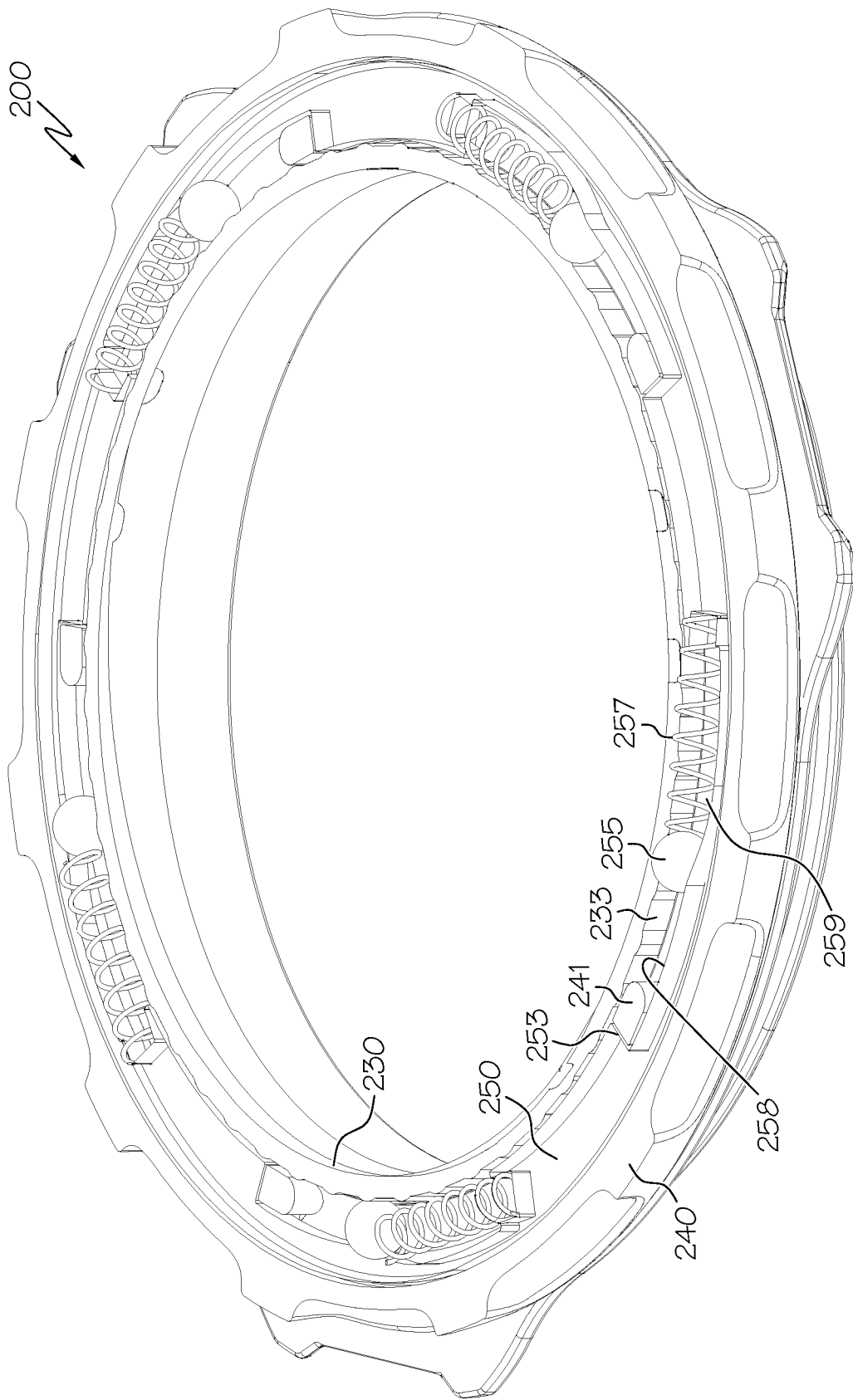


FIG. 11

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 20060247500 A1 [0004]

专利名称(译)	带有新型锁定机构和控制环的虹膜阀		
公开(公告)号	EP3360493B1	公开(公告)日	2020-05-27
申请号	EP2018150082	申请日	2008-02-19
[标]申请(专利权)人(译)	ETHICON , LLC		
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IPC分类号	A61B17/34 A61B17/00		
CPC分类号	A61B17/3423 A61B17/3462 A61B17/3498 A61B2017/00265		
优先权	11/677820 2007-02-22 US 11/677809 2007-02-22 US PCT/US2008/054278 2008-02-19 WO		
其他公开文献	EP3360493A1		
外部链接	Espacenet		

摘要(译)

腹腔镜手术进入装置包括具有相对轴向位置的第一框架和第二框架。柔性且有弹性的虹膜阀连接到第一框架和第二框架，并且基于第一框架和第二框架的相对角位置具有关闭位置和打开位置。锁连接到第一框架和第二框架，该锁选择性地操作以防止沿第一旋转方向的相对旋转运动。一个实施例使用可与控制环一起操作的棘轮和棘爪机构。另一个实施例使用可通过按钮操作的棘轮和棘爪机构。另一个实施例使用楔形履带和球机构。

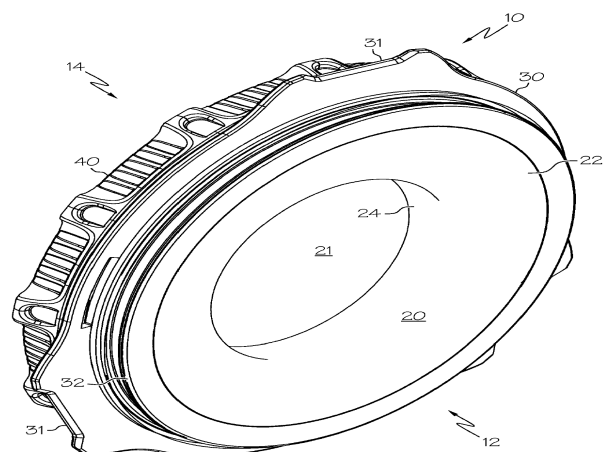


FIG. 1