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(54) **CROSSBOW COCKING APPARATUS**

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PCT Pub. Date: **Jul. 20, 2017**

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(51) **Int. Cl.**

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F41B 5/14	(2006.01)
B66D 1/04	(2006.01)
B66D 1/06	(2006.01)

(52) **U.S. Cl.**
CPC ***F41B 5/1469*** (2013.01); ***B66D 1/04*** (2013.01); ***B66D 1/06*** (2013.01); ***F41B 5/12*** (2013.01)

(58) **Field of Classification Search**
CPC . F41B 5/1469; F41B 5/12; B66D 1/04; B66D 1/06
See application file for complete search history.

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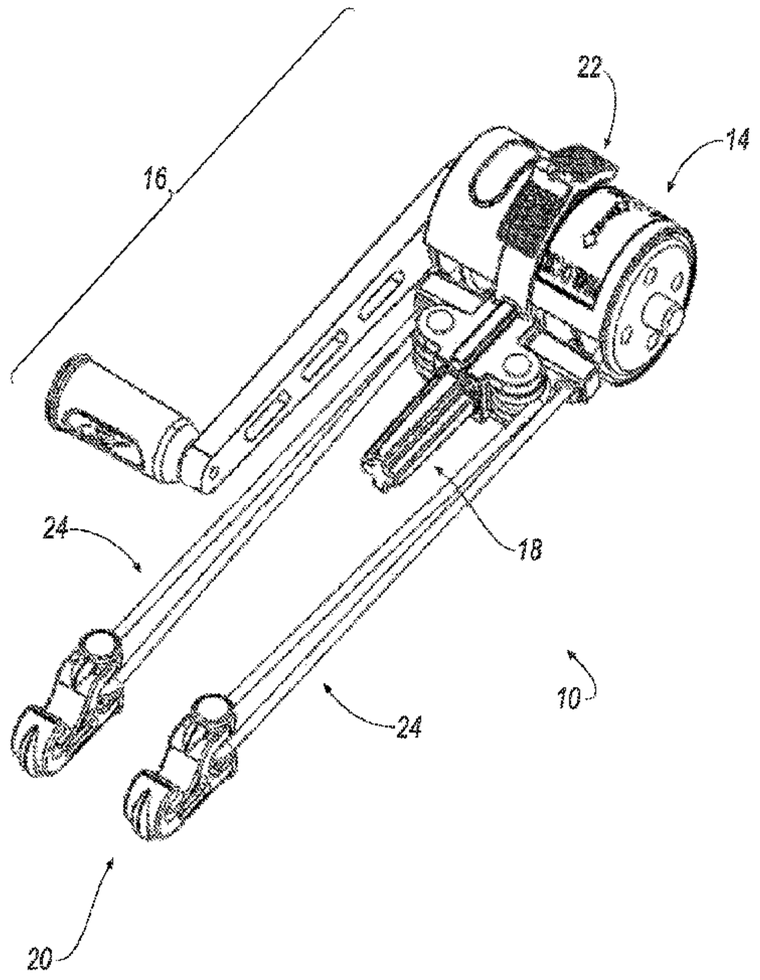
(57) **ABSTRACT**

A cocking mechanism is disclosed. The cocking mechanism comprises an actuator assembly, a hand crank assembly, and a bow string hook assembly. The actuator assembly further comprises clutch assembly having a bearing housing, a bearing cage, a support axle and bearing elements. The bearing housing is defined by an inner peripheral surface having a plurality of inwardly extending annular ramps, wherein the bearing elements contact a portion of the ramps to prevent rotation of the support axle in a first direction, but allows for rotation of the support axle in a second direction when the actuator assembly is in a locked configuration. This provides for immediate braking action against any unforeseen forward motion of the bow string of a crossbow such as when inadvertently or accidently releasing the removable hand crank assembly during the cocking operation.

37 Claims, 11 Drawing Sheets



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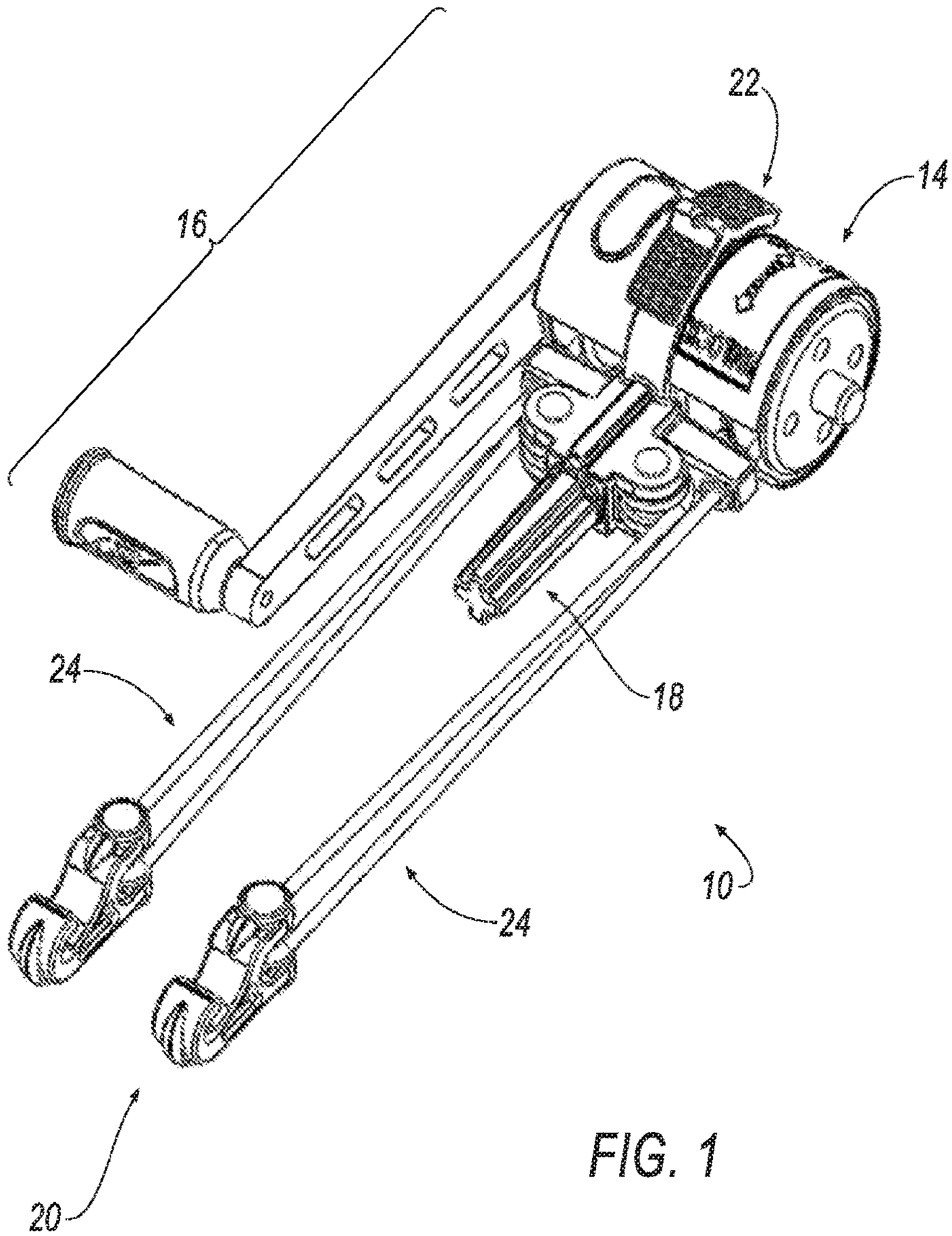

FIG. 1

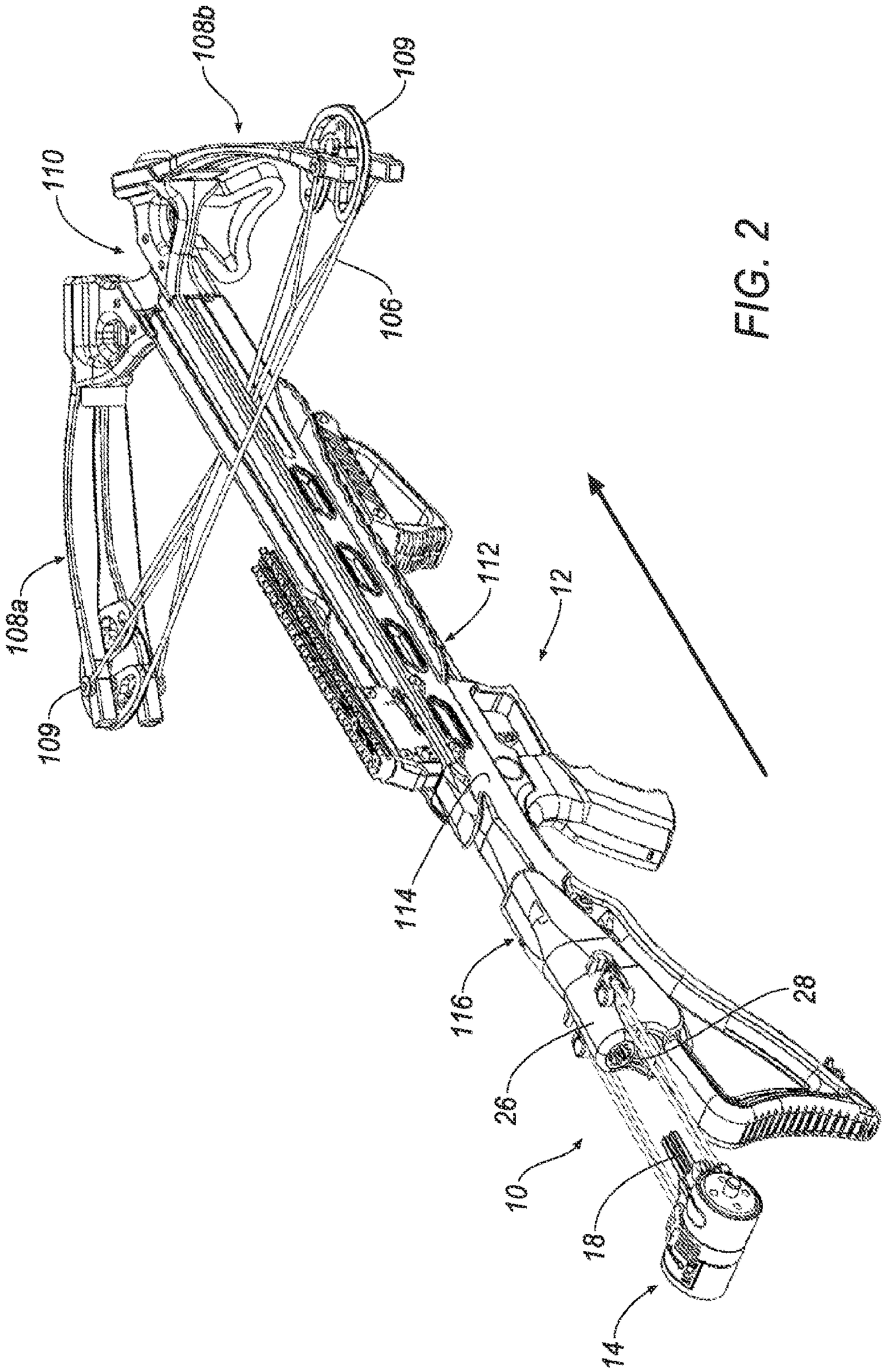

FIG. 2

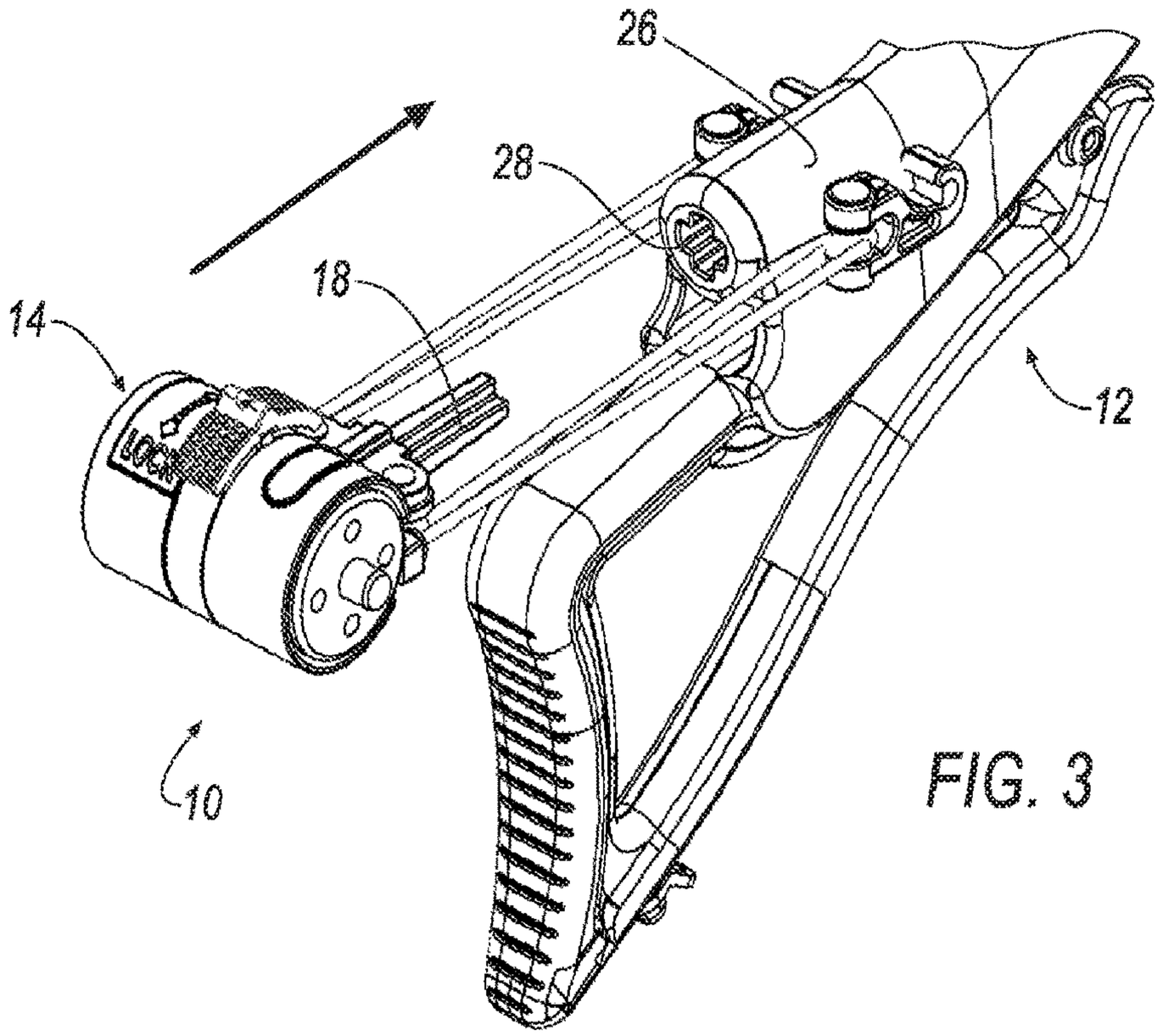

FIG. 3

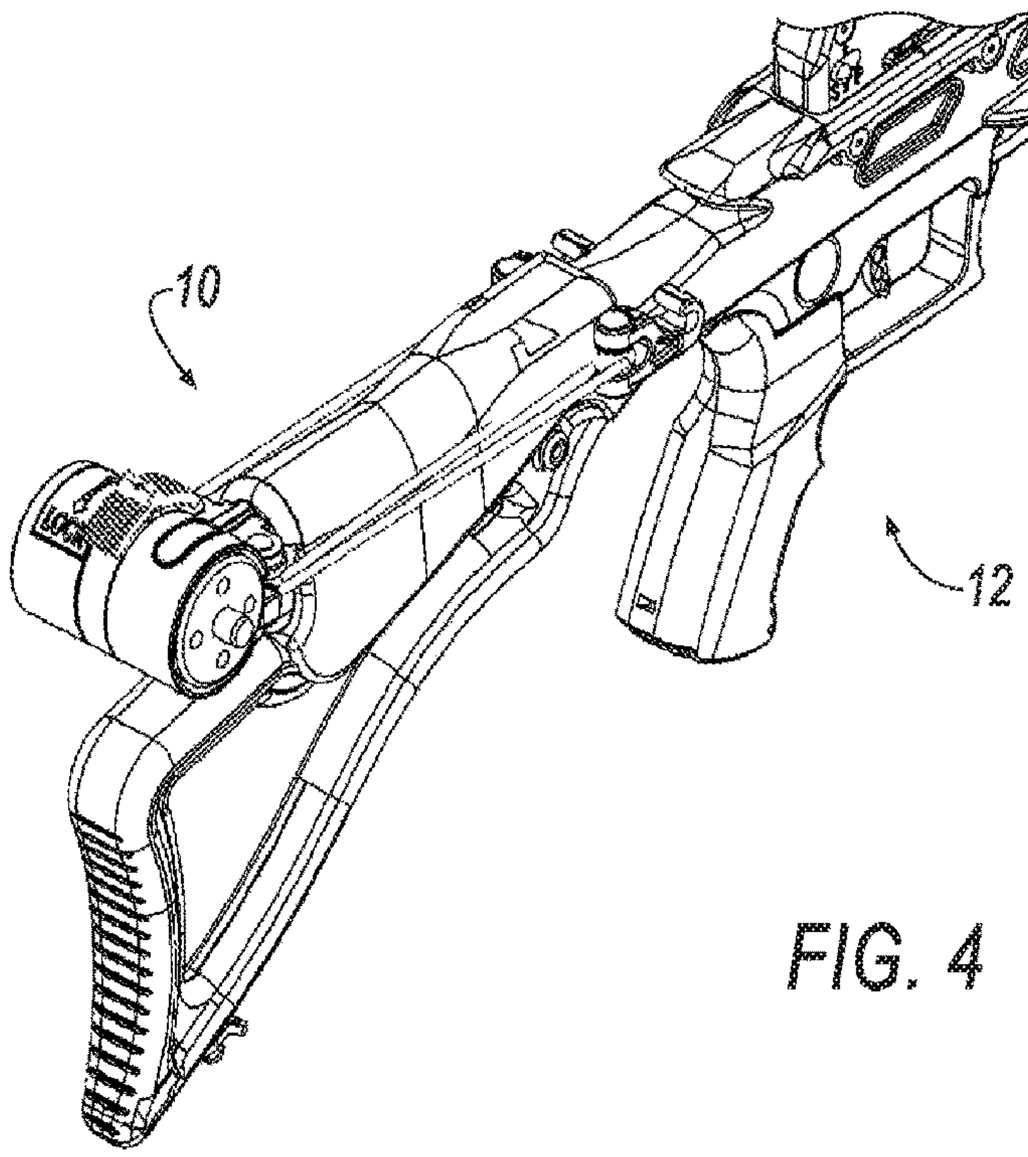

FIG. 4

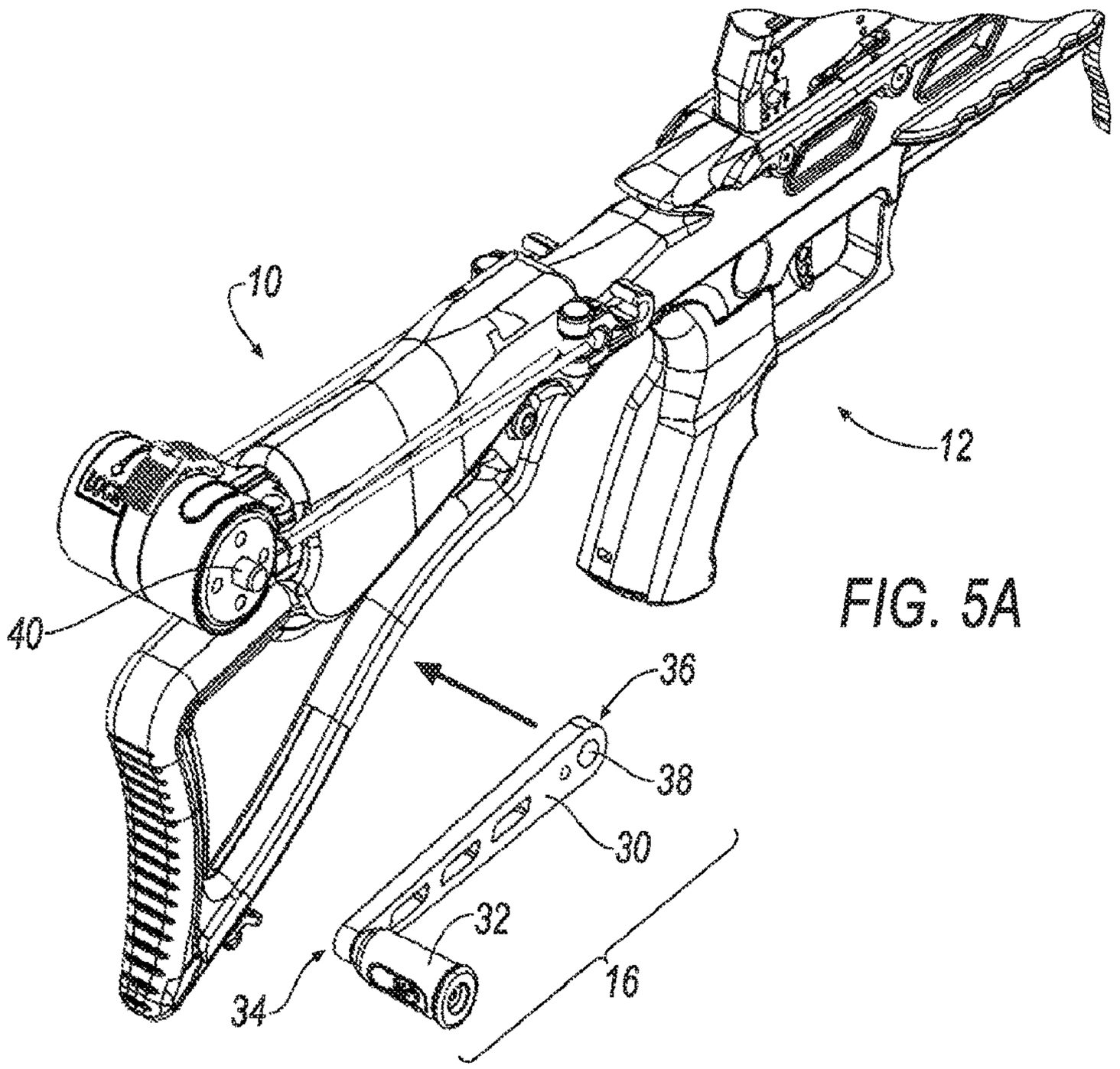

FIG. 5A

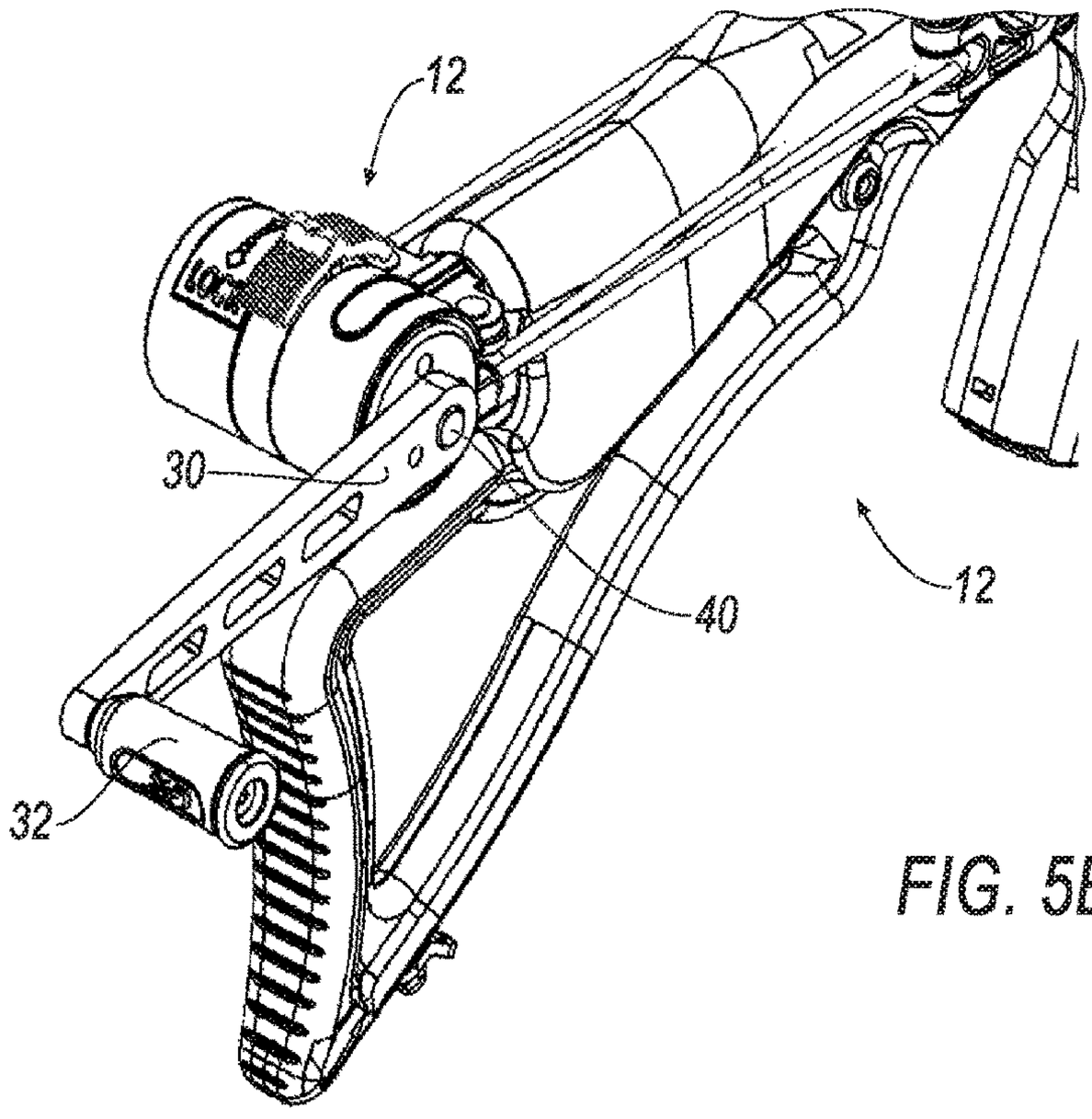

FIG. 5B

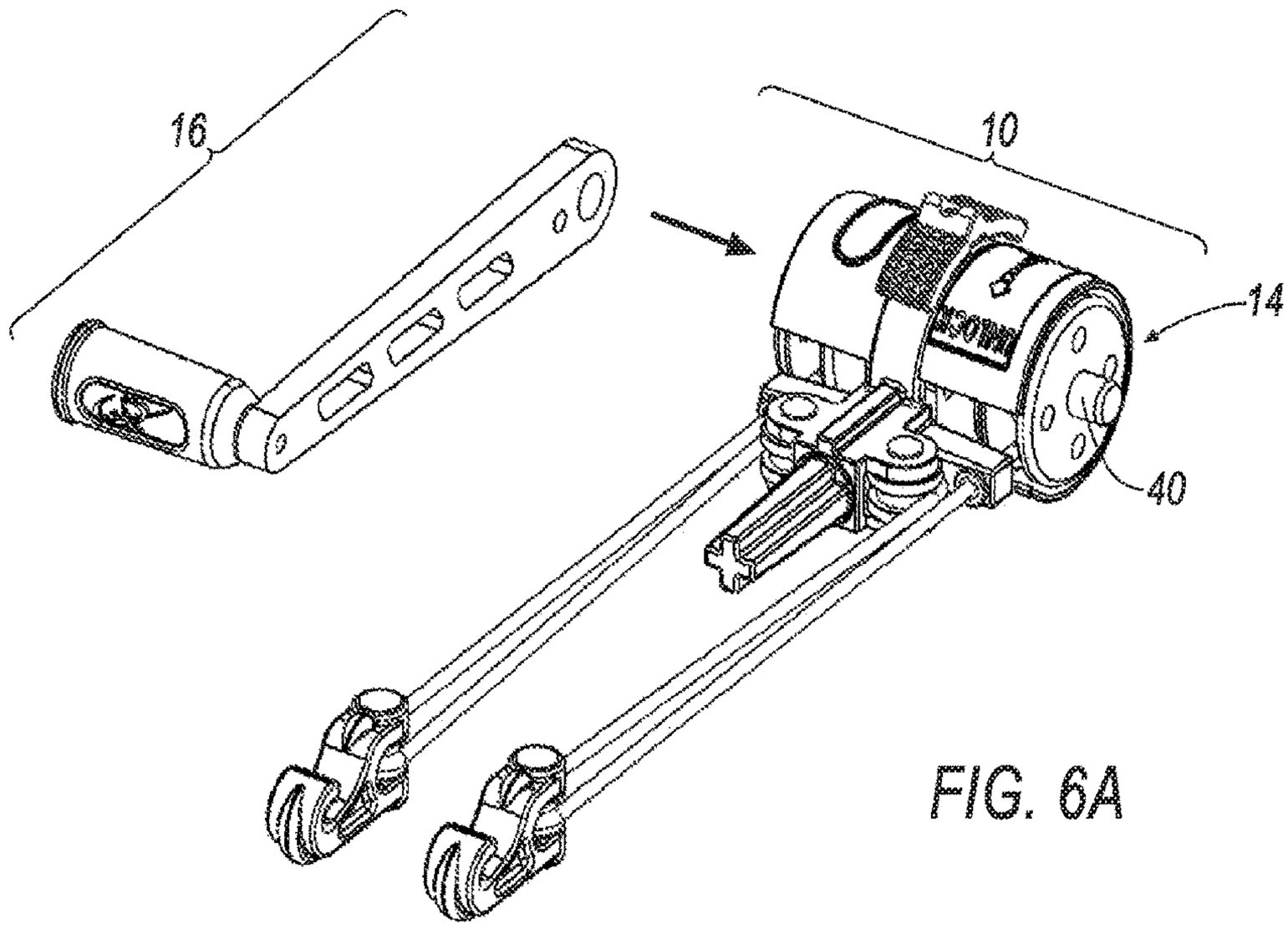

FIG. 6A

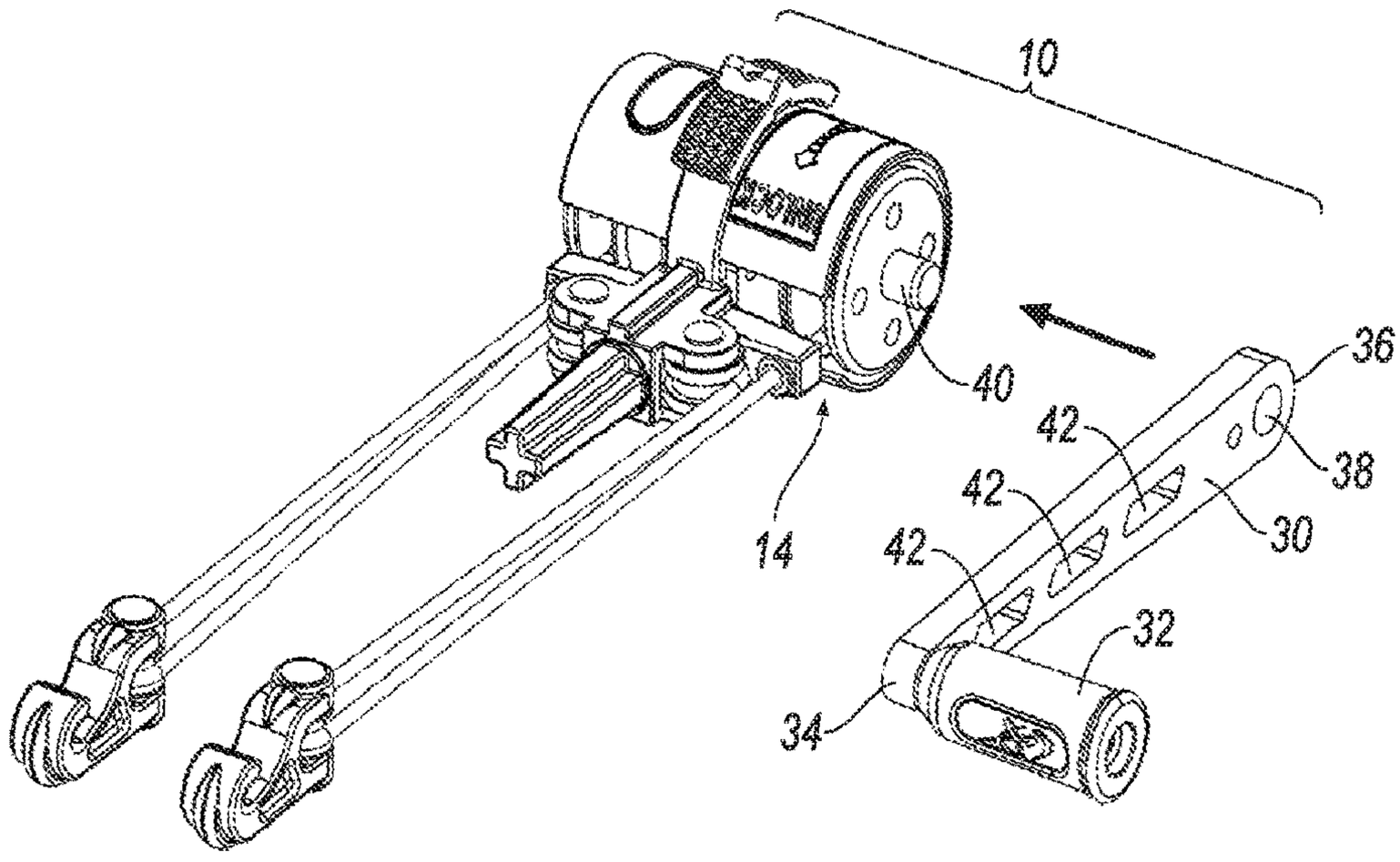

FIG. 6B

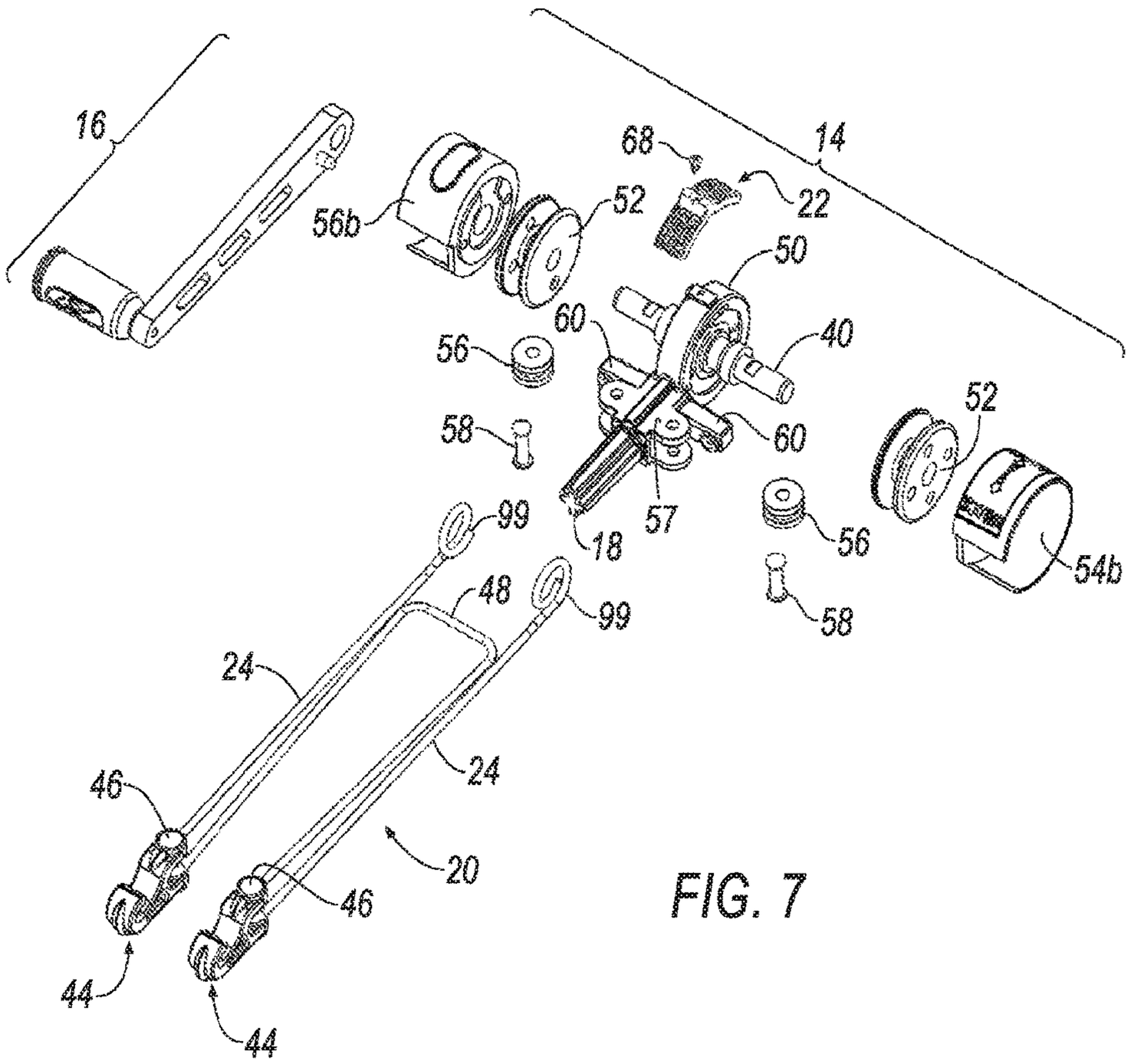
16
14
68
22
56b
52
50
60
40
56
58
99
18
57
52
54b
48
24
46
44

FIG. 7

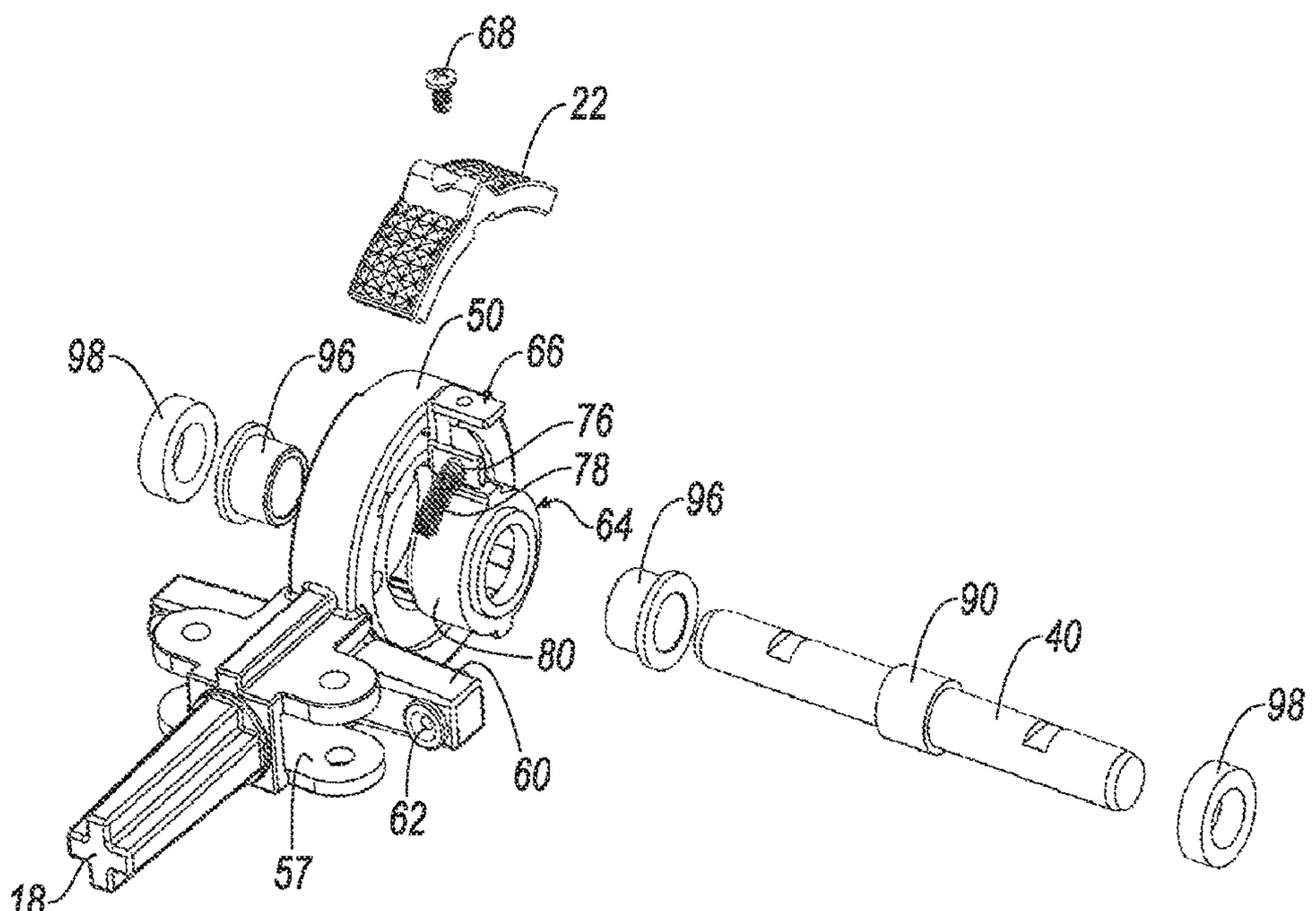
68
22
50
98
96
66
76
78
64
80
60
62
57
18
90
40

FIG. 8

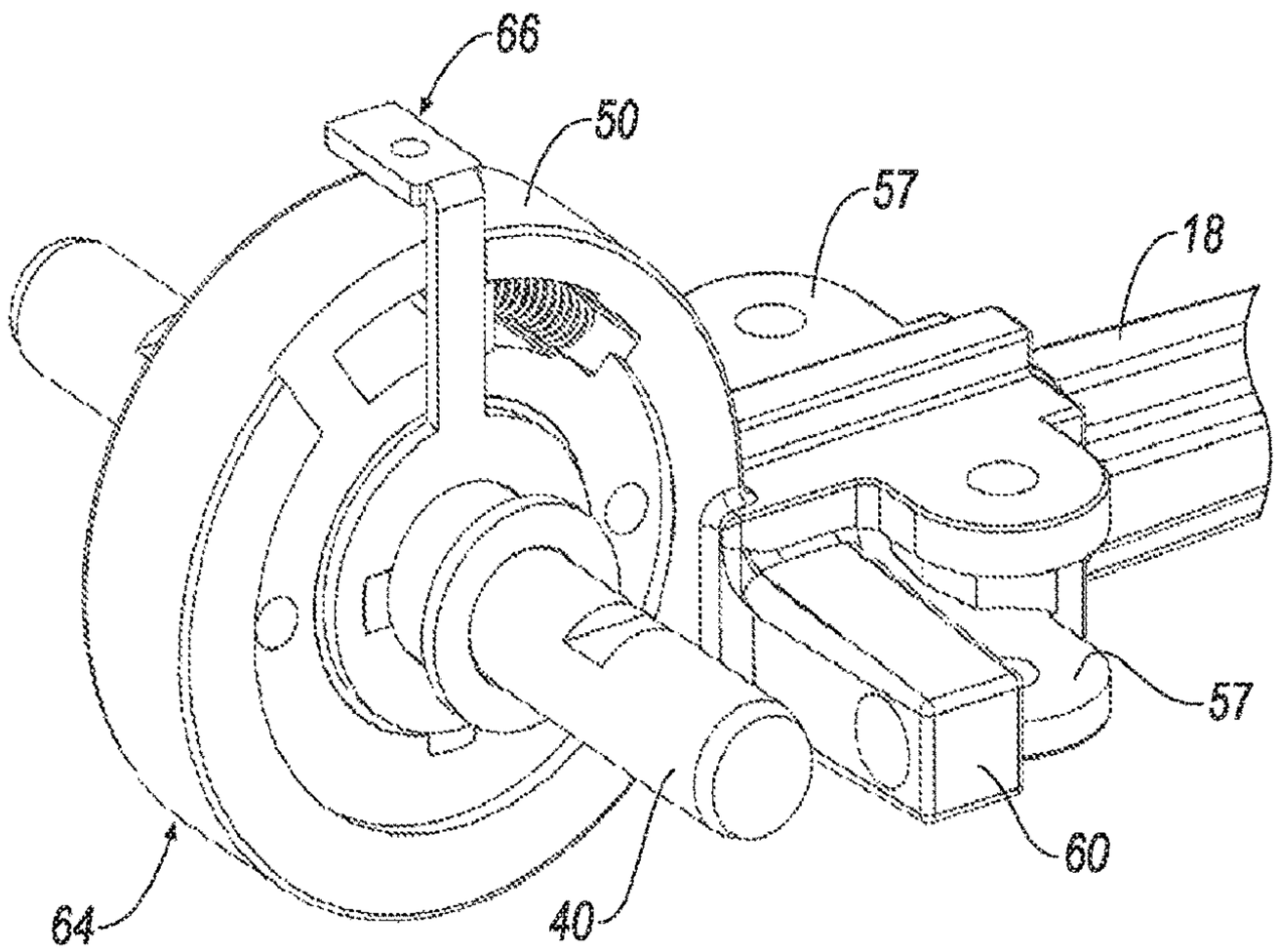
66
50
57
18
57
60
64
40

FIG. 9

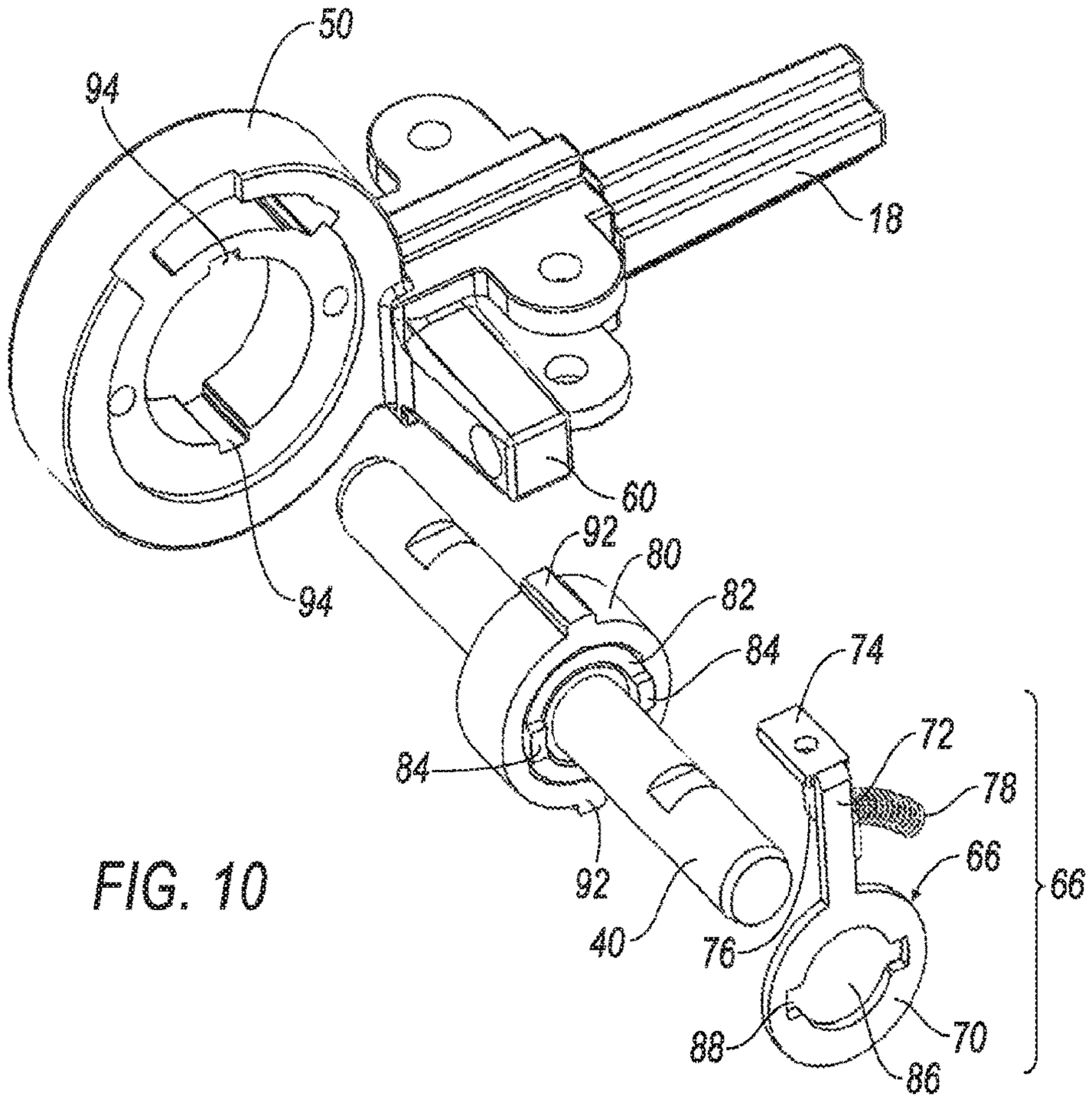
50
94
18
60
92
80
82
84
74
72
78
66
66
84
92
40
76
88
70
86
94

FIG. 10

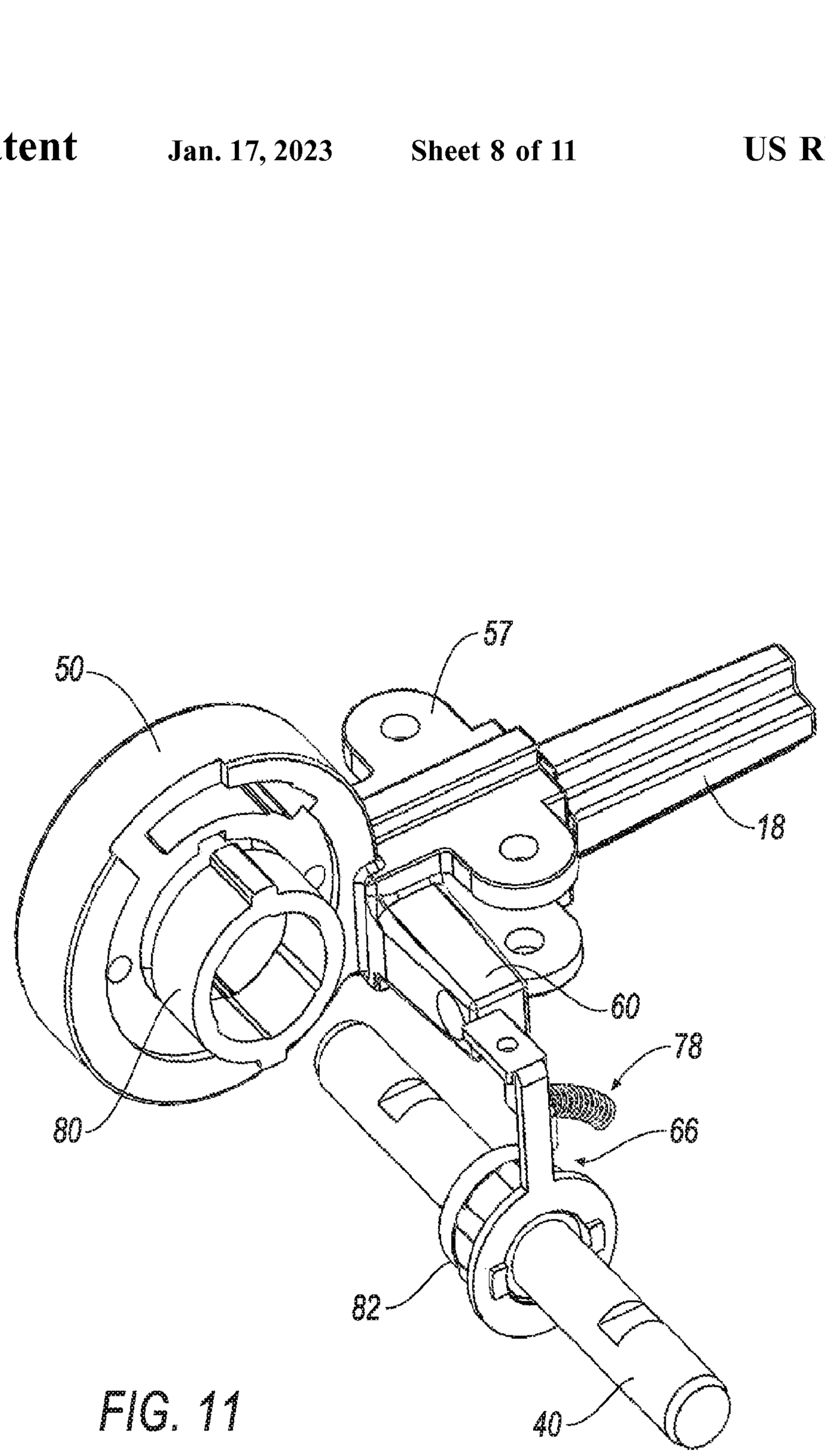

FIG. 11

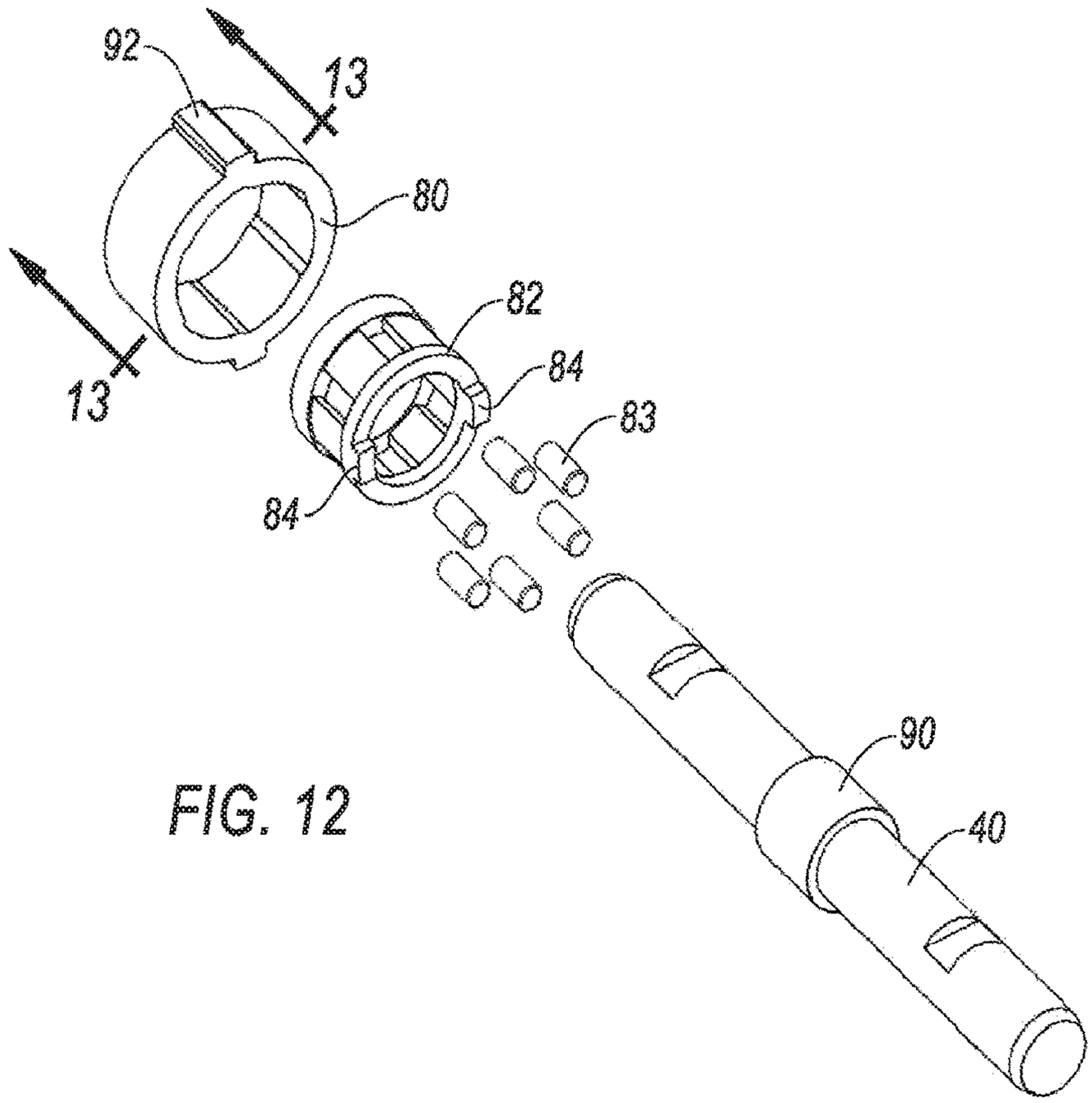
92
13
13
80
82
84
84
83
90
40

FIG. 12

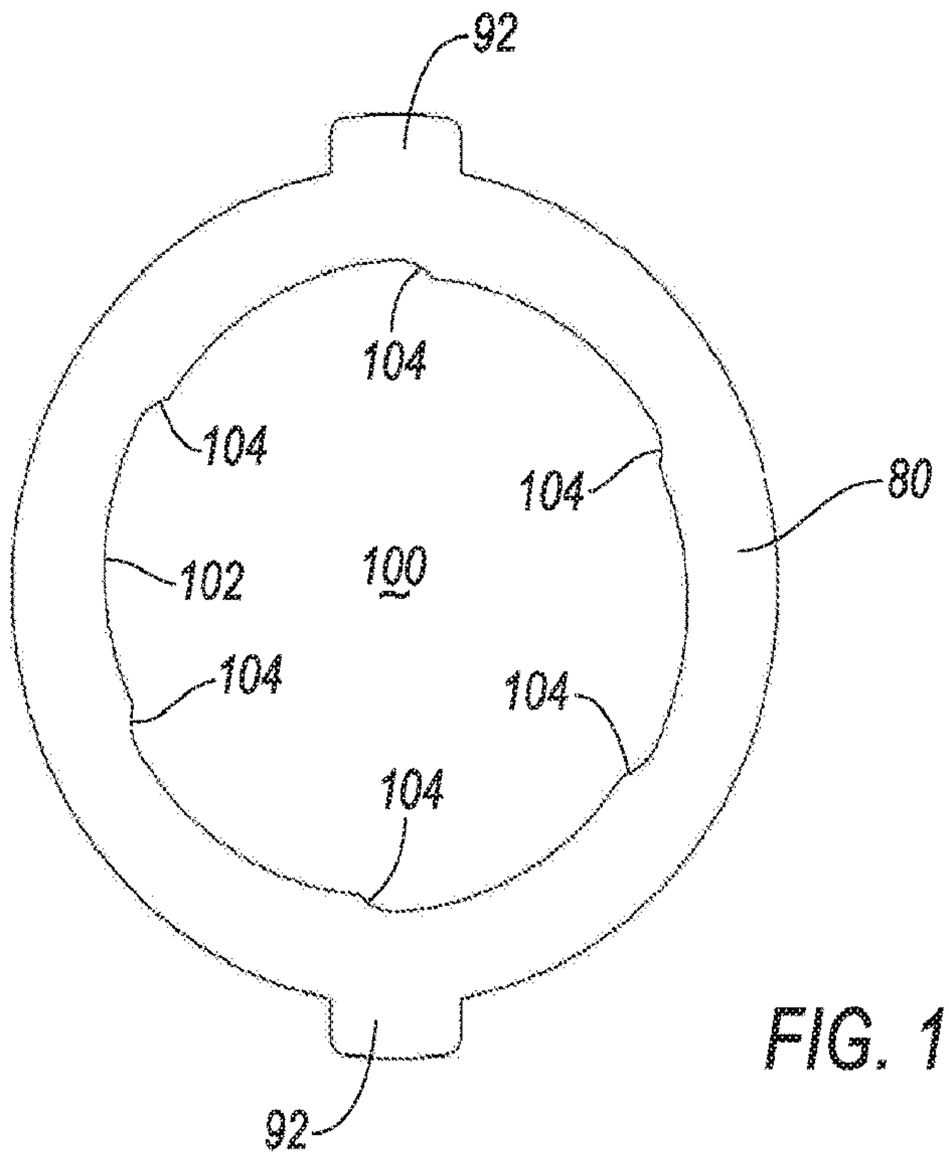
92
104
104
104
80
102
100
104
104
104
92

FIG. 13

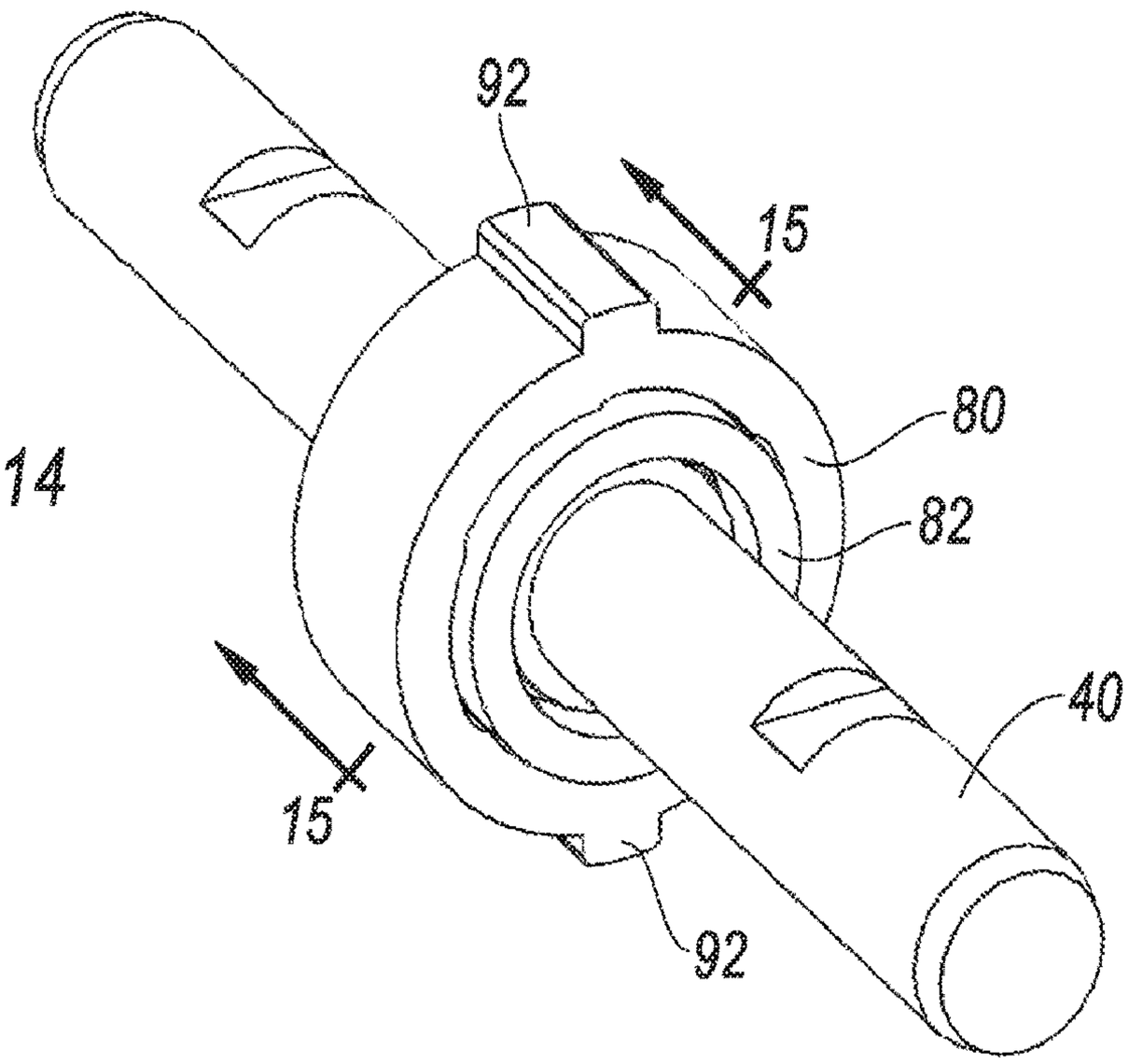

FIG. 14

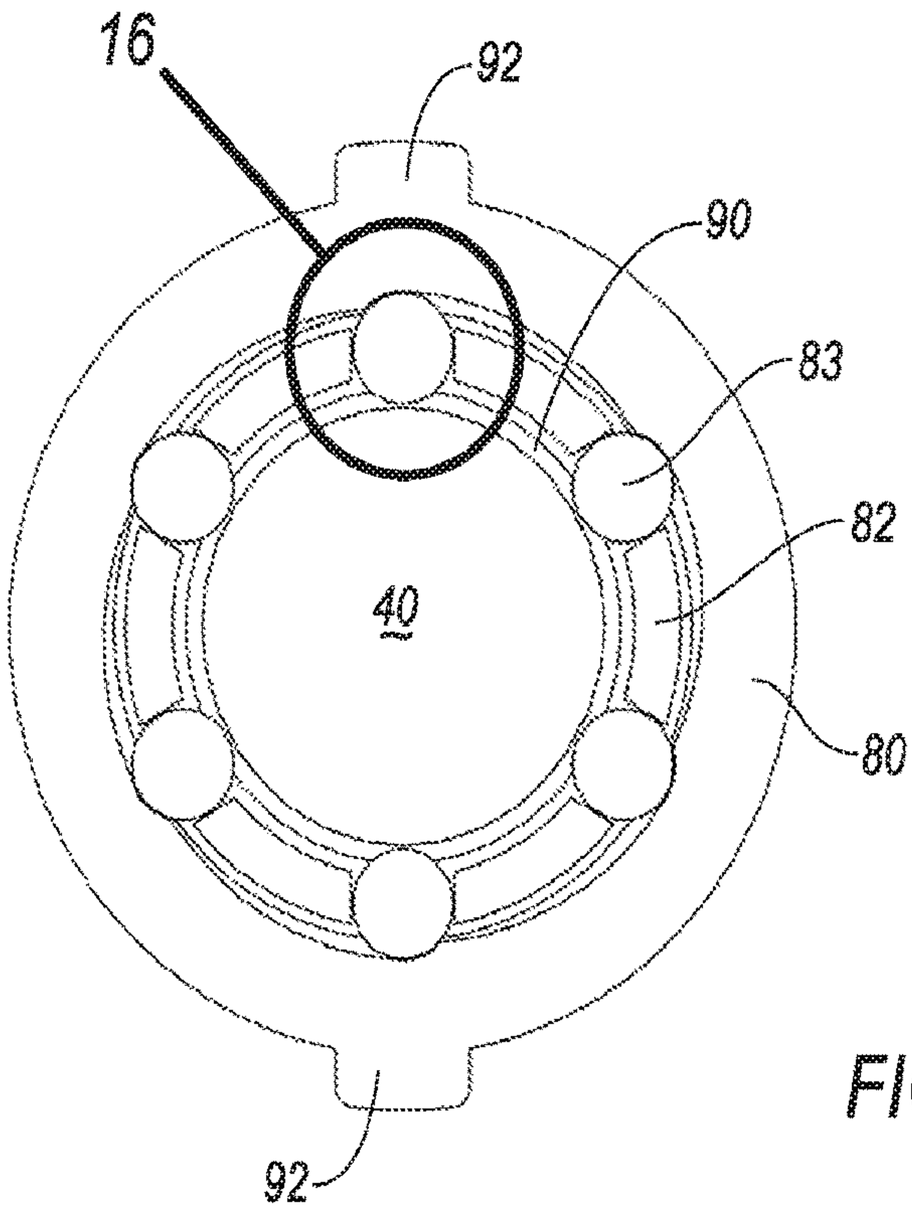

FIG. 15

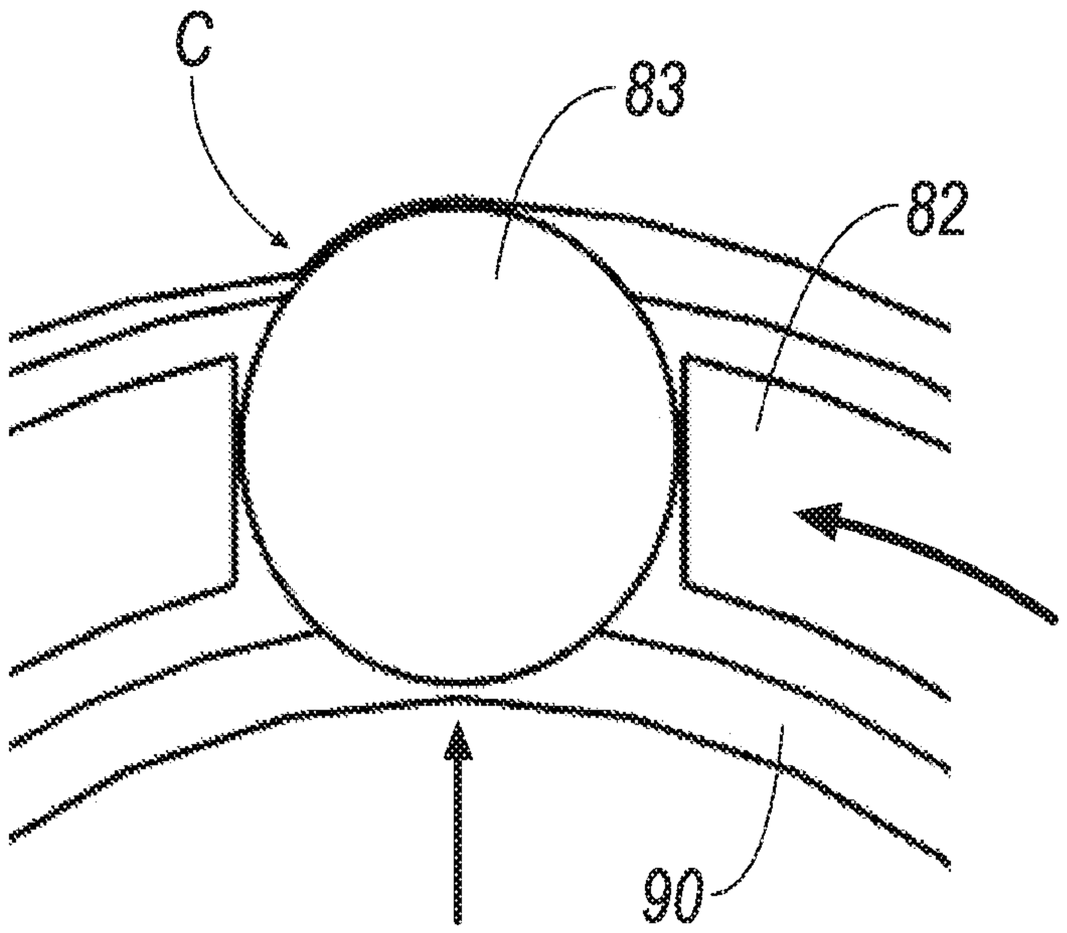

FIG. 16A

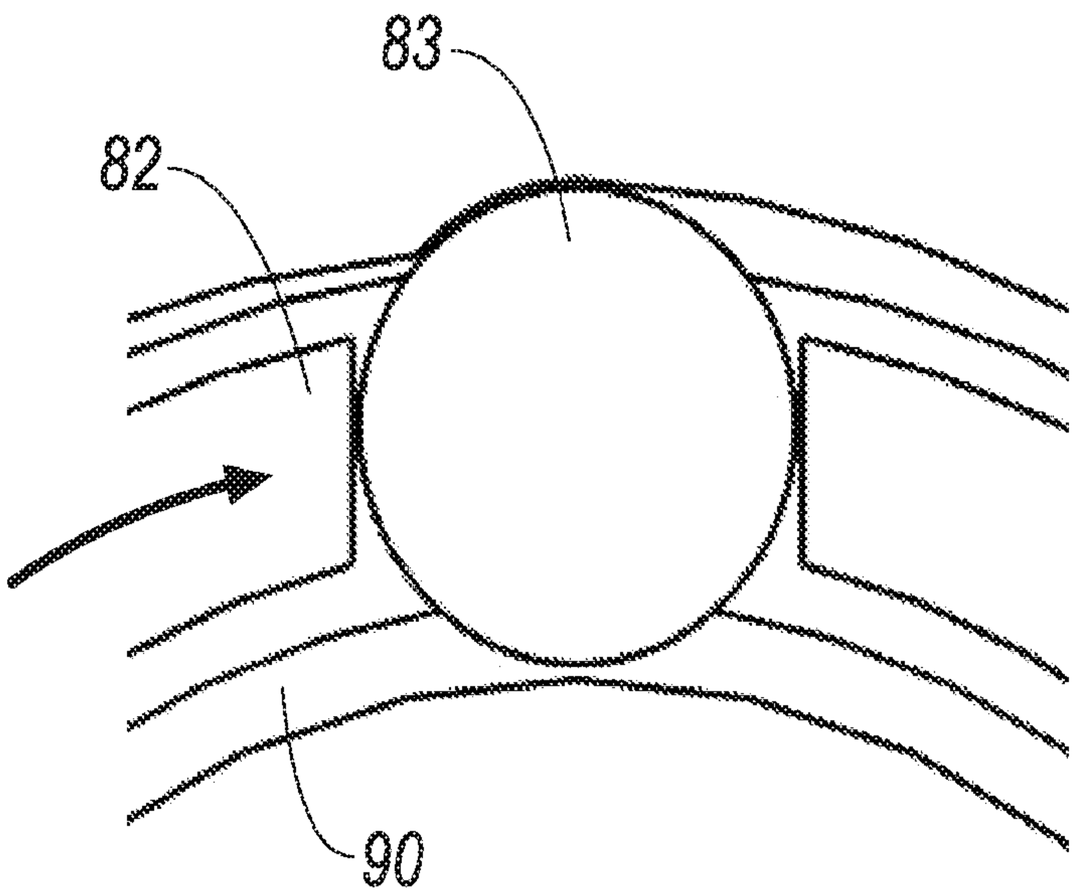

FIG. 16B

CROSSBOW COCKING APPARATUS

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue; a claim printed with strikethrough indicates that the claim was canceled, disclaimed, or held invalid by a prior post-patent action or proceeding.

CROSS-REFERENCE TO RELATED APPLICATIONS

This application *is for a reissue of U.S. Pat. No. 10,295,299 B2 issued May 21, 2019, which* is a National Stage application under 35 U.S.C. 371 ("371 Application") of International Patent Application No. PCT/US2017/013091 filed Jan. 12, 2017, which claims the benefit of U.S. Provisional Patent Application No. 62/277,744 filed Jan. 12, 2016, all of which are herein incorporated by reference in their entirety.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable.

TECHNICAL FIELD

The disclosure relates to crossbows. More specifically, the disclosure relates to a cocking mechanism for a crossbow.

BACKGROUND

The use of crossbows for hunting has increased in recent years, especially for those who are elderly, disabled or young, where using a traditional bow or a compound bow may be too physically strenuous. Indeed, crossbows offer these individuals an opportunity to hunt or shoot a bow much more easily. For others, shooting with crossbows may offer variety over using only a traditional bow, or they may simply enjoy using a crossbow.

However, crossbows in general have a very large drawing force, making them difficult to cock without the use of force-multiplying tools. This difficulty is especially true for elderly, disable and young users that may not have the necessary strength and dexterity to cock the crossbow. Further, when on an active hunt, it is desirable to be as quiet as possible when cocking the crossbow, so as not to scare any prey.

While there are known crossbow cocking devices, there exists a need for a quiet or "silent" crossbow cocking that allows for ease of use.

SUMMARY

A cocking mechanism is disclosed. The cocking mechanism comprises an actuator assembly, a hand crank assembly, and a bow string hook assembly. The actuator assembly further comprises clutch assembly having a bearing housing, a bearing cage, a support axle and bearing elements. The bearing elements operatively cooperate with the bearing housing to prevent rotation of the support axle in a first direction, but allow for rotation of the support axle in a second direction when the actuator assembly is in a locked configuration. This provides for immediate braking action against any unforeseen forward motion of the bow string of a crossbow such as when inadvertently or accidently releasing the removable hand crank assembly during the cocking operation.

In another exemplary arrangement, a crossbow having a cocking mechanism is disclosed. The crossbow has a frame, a bow string assembly, first and second limbs and a riser. The bow string assembly is disposed between the first and second limbs and the first and second limbs are attached to the riser. The cocking mechanism for cocking the bow string assembly connected to the crossbow frame, includes an actuator assembly, a hand crank assembly, and a bow string hook assembly. The actuator assembly further comprises clutch assembly having a bearing housing, a bearing cage, a support axle and bearing elements, the bearing element being operatively mounted within the bearing housing to prevent rotation of the support axle in a first direction, but allow for rotation of the support axle in a second direction when the actuator assembly is in a locked configuration.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a cocking mechanism for use with a crossbow;

FIG. **2** is a perspective view of the cocking mechanism of FIG. **1**, mounted to a crossbow;

FIG. **3** is a close up perspective view of an end of the crossbow, as the cocking mechanism is being attached thereto;

FIG. **4** is a close up perspective view of the cocking mechanism mounted to the crossbow;

FIG. **5**A is a close up perspective view of a hand crank being mounted to the cocking mechanism;

FIG. **5**B is a close up perspective view of the hand crank mounted on the cocking mechanism;

FIGS. **6**A-**6**B are close up perspective views of alternative mounting arrangements for the hand crank on the cocking mechanism;

FIG. **7** is an exploded view of the cocking mechanism;

FIG. **8** is an enlarged view of an actuator assembly of the cocking mechanism;

FIG. **9** is a side perspective view of the actuator assembly of FIG. **8**;

FIG. **10** is an exploded view of clutch components of the actuator assembly of FIG. **8**;

FIG. **11** is a partially assembled view of the clutch components of FIG. **10**;

FIG. **12** is an exploded view of a bearing arrangement of the clutch components of FIG. **10**;

FIG. **13** is a cross-sectional view of a bearing housing taken along lines **13-13** of FIG. **12**;

FIG. **14** is a perspective view of the bearing housing with the bearing arrangement assembled;

FIG. **15** is a cross-section view of the bearing arrangement, taken along lines **15-15** of FIG. **14**;

FIG. **16**A illustrates a close up of area **16** in FIG. **15** during a counterclockwise operation; and

FIG. **16**B illustrates a close of up of area **16** in FIG. **15** during a clockwise operation.

DETAILED DESCRIPTION

As required, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention that may be embodied in various and alternative forms. The figures are not necessarily to scale; some features may be exaggerated or minimized to show details of par-

ticular components. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a representative basis for teaching one skilled in the art to variously employ the present invention.

Referring to FIGS. **1-6** of the drawings, an improved cocking mechanism **10** is illustrated. The cocking mechanism **10** is providing for attaching to a crossbow **12** (FIGS. **2-5**), and more specifically for use in cocking the crossbow **12**.

In exemplary arrangement, the cocking mechanism **10** comprises an actuator assembly **14**, a selectively removable hand crank assembly **16**, and a bow string hook assembly **20**. In one exemplary arrangement, an optional alignment member **18** may be provided. An actuator lock member **22** is operatively mounted to the actuator assembly **14**. Tension cables **24** are part of the string hook assembly **20** and are operatively connected to the actuator assembly **14**, as will be discussed in further detail below.

Referring to FIGS. **2-4** illustrate how cocking mechanism **10** may be operatively connected to an end of the crossbow **12**. In one exemplary arrangement, an end **26** of the crossbow **12** may include a mounting channel **28** (best seen in FIG. **3**) which receives the alignment member **18** for frictional engagement. In one arrangement, to insure proper seating of the alignment member **18** within the mounting channel **28**, the mounting channel **28** and alignment member **18** may be provided with complementary shapes. For example, in the arrangement depicted, the alignment member **18** is constructed with a cross-shape, and the mounting channel **28** is provided with an internal shape that corresponds to that cross-shape. However, it is understood that the present disclosure is not limited to the shape of the alignment member **18**. Moreover, it is also contemplated that other mechanisms for attaching the cocking mechanism **10** to a crossbow **12** are also within the scope of the disclosure.

Once the cocking mechanism **10** is mounted to the end **26** of the crossbow **12**, the hand crank assembly **16** may be mounted to the actuator assembly **14**. Referring to FIGS. **5**A-**5**B, hand crank assembly **16** comprises a shaft element **30** and a hand grip **32**. The hand grip **32** is fixedly attached to one side of the shaft element **30** by a suitable fastener (not shown) at a first end **34** of the shaft element **30**. At a second end **36** of the shaft element **30**, an opening **38** is formed. Opening **38** is configured to receive a portion of a support axle **40** of the actuator assembly **14**. To removeably attach the hand crank assembly **16**, the opening **38** is aligned with the support axle **40** on one side of the actuator assembly **14**, and the shaft element **30** is slid over the support axle **40**, through the opening **38**, as shown in FIGS. **5**A-**5**B. As the support axle **40** extends outwardly from the actuator assembly **14** on both sides, hand crank assembly **16** may be selectively mounted on either side to allow for both right and left hand users (as demonstrated in FIGS. **6**A-**6**B). To reduce weight of the hand crank assembly **16**, material may be removed in the shaft element **30**, thereby creating one or more void areas **42**.

Referring to FIGS. **7-16** various components of the bow string hook assembly **20** and actuator assembly **14**, will now be described. The bow string hook assembly **20** includes a pair of hook members **44** to which the tension cable **24** is attached. More specifically, ends of the hook members **44** include a shaft member **46** that the tension cable **24** is directed around. A section **48** of tension cable **24** extends between the hook members **44**, but spaced away from the hook members **44**, as best seen in FIG. **7**.

The actuator assembly **14** comprises a main support body **50**, through which the support axle **40** is mounted, the actuator lock member **22**, a pair of take-up spools **52**, cable guide and take-up spool housings **54**a, **54**b, a pair of pulleys **56**, and a pair of pulley axles **58**. A cable eyelet mount **60** is secured to the main support body **50**. The cable eyelet mount **60** includes eyelet openings **62** through which the tension cable **24** extends. Extending from the cable eyelet mount **60** is the alignment member **18**. A pulley mount **57** is positioned between the cable eyelet mount **60** and the alignment member **18**. The pulleys are positioned within the mount **57** and the pulley axle **58** secures the pulleys **56** thereto.

Referring to FIGS. **8-9**, a clutch assembly **64** is depicted. The clutch assembly **64** includes an actuator lever **66** that extends upwardly and is disposed over the main support body **50**. The actuator lock member **22** attaches to the actuator lever **66** via a fastener **68**, once the actuator assembly **14** is assembled. As shown in FIG. **10**, actuator lever **66** includes an attachment portion **70** and an extension member **72**. Extension member **72** is fixedly attached to, and extends upwardly from, the attachment portion **70**. A lever **74** extends from the extension member **72** and connects to the actuator lock member **22**. An opening **86** (best seen in FIG. **8**) is formed through a spring mount **76** that is secured to the extension member **72**. An actuator return spring **78** is secured to the spring mount **76**.

The clutch assembly **64** further comprises a bearing housing **80** into which a bearing cage **82** is positioned. As shown in FIG. **12**, roller bearings **83** are disposed within bearing cage **82**. Locating elements **84** are positioned on the bearing cage **82**. An opening **86** in the attachment portion **70** of the actuator lever **66** includes locating grooves **88** that are complementary to the locating elements **84**. The locating grooves **88** receive the locating elements **84** to secure the actuator lever **66** to the clutch assembly **64**. The support axle **40** includes an integral collar **90** that is seated within the bearing cage **82**. The bearing housing **80** also includes locating elements **92** on an outside surface thereof. Locating elements **92** are received within mating locating grooves **94** formed in the main support body **50**. This arrangement prevents rotation of the bearing housing **80** within the main support body **50**. Axle bearings **96** (best seen in FIG. **8**) are disposed over the support axle **40**, on either side of the collar **90**, as are outer spacers **98**.

Ends **99** of tension cables **24** are secured to take up spools **52**. The take up spools **52** are mounted onto the support axle **40** on either side of the main support body **50**. The cable guide and take-up spool housings **54**a, **54**b are disposed over the take up spools **52**.

As show in FIG. **13**, an opening **100** through the bearing housing **80** is further defined by an inner peripheral surface **102**. The inner peripheral surface **102** includes a plurality of inwardly protruding annular ramps **104**.

Referring to FIG. **2**, attachment and operation of the cocking mechanism **10** will now be described. The crossbow **12** comprises a frame **112** having a barrel **114**, a stock **116** and a riser **110**. The bow string **106** is secured to first and second limbs **108**a, **108**b, via pulleys **109**. An end of each of the first and second limbs **108**a, **108**b are secured to the riser **110**. The cocking mechanism **10** is secured to the crossbow **12** by mounting the cocking mechanism **10** to the stock **116**. In one exemplary arrangement, the stock **116** is provided with the mounting channel **28** formed on the end of the stock **116** and the cocking mechanism **10** includes an alignment member **18** that is received within the mounting channel **28**.

Once the cocking mechanism **10** is secured to the crossbow **12**, a user pushes the actuator lock member **22** in a first

direction (i.e., forward) to an unlock position, which results in a first rotation direction (i.e., clockwise) of the bearing cage **82**. The roller bearings **83** will now allow the support axle **40** to rotate in either annular direction. With the actuator lock member **22** in the unlock position, the user then pulls the hook members **44** of the bow string hook assembly **20** toward the bow string **106** of the crossbow **12**. After positioning the hook members **44** on the bow string **106**, the user releases the actuator lock member **22** and the spring **78** biases the actuator lock member **22** to a second position. The user may then attach the selectively removable hand crank assembly **16** to the cocking mechanism **10**.

Once the hand crank assembly **16** is attached to the cocking mechanism **10**, the user then rotates the hand crank assembly **16** in the first direction, this results in winding the tension cable **24** onto the take-up spools **52** in a manner of equal force imparted by each hook members **44** onto the bow string **106**. Equal force during the cocking operation is important to the consistency and accuracy of the crossbow shot.

One feature of the present disclosure is that the spring **78** always acts to push the actuator lock member **22** in the second direction (backward) to a lock position, which results in a second rotational direction (i.e., counterclockwise). If the user releases his/her grip on the hand crank assembly **16** at anytime during the cocking operation, the bearings **83** will immediately rotate back into a most counterclockwise position and will apply an immediate braking action to any forward return movement of the bow string **106** to its uncocked position.

Once the bow string **106** is pulled into the fully cocked position via use of the hand crank assembly **16**, the user then pushes the actuator lock member **22** forward once again to release tension on the bow string **106** by rotating the hand crank assembly **16** in the counterclockwise direction. Once the tension is released, the hook members **44** can be removed from the bow string **106**.

The mechanics of the clutch operation are explained below in connection with FIGS. **14-16**. While the bearing cage **82** is in the counterclockwise most position, this orientation causes the roller bearings **83** to roll up the annular ramps **104** that are located on the inner peripheral surface **102** of the bearing housing **80**. While the roller bearings **83** are in this position at the top of the ramps **104**, the roller bearings **83** press firmly against both the inside surface of the bearing housing **80** and the collar **90** of the support axle **40**. Any further counterclockwise rotation of the support axle **40** results in increasing the radial force of the roller bearings **83** against the support axle **40** to a point that no further counterclockwise rotation of the support axle **40** is allowed. More specifically, the roller bearings **83** will come to rest against the point C of the ramp **104**.

Conversely, clockwise rotation of the support axle **40** results in moving the roller bearings **83** down the annular ramps **104** of the bearing housing **80** which then reduce or ultimately eliminate the radial force of the roller bearings **83** against the support axle **40** to a point that both clockwise and counterclockwise rotation of the support axle are both allowed.

While exemplary embodiments are described above, it is not intended that these embodiments describe all possible forms of the invention. Rather, the words used in the specification are words of description rather than limitation, and it is understood that various changes may be made without departing from the spirit and scope of the invention. Additionally, the features of various implementing embodiments may be combined to form further embodiments of the invention.

What is claimed is:

1. A cocking mechanism, comprising:

an actuator assembly comprising:

a main body;

a clutch assembly housed within the main body;

a support axle extending through the clutch assembly;

a pair of take-up spool housings disposed on opposite sides of the main body;

a pair of take-up spools disposed on the support axle and housed within respective take-up spool housing;

a cable eyelet mount comprising a pair of eyelets, the cable eyelet mount secured to the main body such that the eyelets are on opposite sides of the main body; and

a pulley mount comprising a pair of pulleys, the pulley mount disposed adjacent the cable eyelet mount such that the pulleys are on opposite sides of the main body;

a hand crank assembly **[**removable**]** *removably* mounted on the support axle; and

a bow string hook assembly.

2. The cocking mechanism of claim **1**, wherein the clutch assembly comprises:

an actuator lever;

a bearing housing;

a bearing cage disposed within the bearing housing; and

a plurality of roller bearings disposed within the bearing cage.

3. The cocking mechanism of claim **2**, wherein:

the actuator lever comprises an attachment portion having an opening;

the bearing cage and the opening in the attachment portion comprise one or more complimentary features configured for securing the **[**attachment**]** *actuator* lever to the clutch assembly; and

the bearing housing and the main body comprise one or more complimentary features configured for inhibiting rotation of the bearing housing within the main body.

4. The cocking mechanism of claim **3**, comprising:

a collar integral with the support axle and seated within the bearing cage; and

a pair of axle bearings disposed on the support axle on opposite sides of the collar.

5. The cocking mechanism of claim **4**, wherein:

the bearing housing comprises an opening defined by an inner peripheral surface;

the inner peripheral surface comprises a plurality of annular ramps; and

the actuator lever comprises an actuator return spring configured to bias the actuator lever to a locked position when the actuator lever is released.

6. The cocking mechanism of claim **5**, wherein:

the support axle is rotatable in either direction when the actuator lever is moved to an unlocked position;

the support axle is rotatable only in a first direction when the actuator lever is in the locked position; and

the support axle is inhibited from **[**unhindered rotation**]** *rotating* in a second direction when the actuator lever is in the locked position.

7. The cocking mechanism of claim **6**, wherein rotation in the second direction is inhibited by the interaction of the plurality of roller bearings, the inner peripheral surface of the bearing housing, and the integral collar on the support axle with one another.

8. The cocking mechanism of claim 5, wherein the plurality of roller bearings operatively cooperate with the inner peripheral surface of the bearing housing and the integral collar on the support axle to inhibit [unhindered] rotation of the support axle in a second direction when the actuator lever is in the locked position.

9. The cocking mechanism of claim 1, wherein the bow string hook assembly comprises:

a pair of hook members; and

a tension cable extending through the pair of hook members, wherein:

a section of the tension cable between the pair of hook members extends through the pair of pulleys; and

[opposite ends of] the tension cable [extend] *extends* through the pair of eyelets and [are] *is* secured to the pair of take-up spools.

10. The cocking mechanism of claim 9, wherein

the pair of hook members are configured for being removably attached to a bow string[on opposite sides of a crossbow]; and

the cocking mechanism imparts substantially equal force onto the bow string when the tension cable is wound onto the [take-spool] *take-up spools*.

11. The cocking mechanism of claim 1, configured for being removably attached to a crossbow.

12. The cocking mechanism of claim 11, comprising:

an alignment member extending from the cable eyelet mount; and

a mounting channel in the crossbow;

wherein the alignment member and the mounting channel comprise complimentary features.

13. The cocking mechanism of claim 1, wherein the hand crank assembly is mountable on either side of the actuator assembly.

14. A crossbow[assembly], comprising a cocking mechanism comprising:

an actuator assembly comprising:

a main body;

a clutch assembly housed within the main body;

a support axle extending through the clutch assembly;

a pair of take-up spool housings disposed on opposite sides of the main body;

a pair of take-up spools disposed on the support axle and housed within respective take-up spool housing;

a cable eyelet mount comprising a pair of eyelets, the cable eyelet mount secured to the main body such that the eyelets are on opposite sides of the main body; and

a pulley mount comprising a pair of pulleys, the pulley mount disposed adjacent the cable eyelet mount such that the pulleys are on opposite sides of the main body;

a hand crank assembly [removable] *removably* mounted on the support axle; and

a bow string hook assembly.

15. The crossbow [assembly] of claim 14, wherein the clutch assembly comprises:

an actuator lever, comprising:

an actuator return spring configured to bias the actuator lever to a locked position when the actuator lever is released; and

an attachment portion having an opening;

a bearing housing comprising an opening having a plurality of annular ramps on a peripheral surface of the opening;

a bearing cage disposed within the bearing housing; and

a plurality of roller bearings disposed within the bearing cage;

wherein,

the bearing cage and the opening in the attachment portion comprise one or more complimentary features configured for securing the [attachment] *actuator* lever to the clutch assembly; and

the bearing housing and the main body comprise one or more complimentary features configured for inhibiting rotation of the bearing housing within the main body.

16. The crossbow of claim 15, wherein

the support axle is rotatable in either direction when the actuator lever is moved to an unlocked position;

the support axle is rotatable only in a first direction when the actuator lever is in the locked position; and

the support axle is inhibited from [unhindered rotation] *rotating* in a second direction when the actuator lever is in the locked position.

17. The crossbow of claim 16, wherein rotation in the second direction is inhibited by the interaction of the plurality of roller bearings, the inner peripheral surface of the bearing housing, and [the] *an* integral collar on the support axle with one another.

18. The crossbow of claim 17, wherein the bow string hook assembly comprises:

a pair of hook members configured for being removably attached to a bow string[on opposite sides of the crossbow];

a tension cable extending through the pair of hook members, wherein:

a section of the tension cable between the pair of hook members extends through the pair of pulleys; and

[opposite ends of] the tension cable [extend] *extends* through the pair of eyelets and [are] *is* secured to the pair of take-up spools; and

the cocking mechanism imparts substantially equal force onto the bow string when the tension cable is wound onto the [take-spool] *take-up spools*.

19. The crossbow of claim [18] *14*, wherein the cocking mechanism is removably attached to the crossbow.

20. The crossbow of claim 19, comprising:

an alignment member extending from the cable eyelet mount; and

a mounting channel in the crossbow;

wherein the alignment member and the mounting channel comprise complimentary features.

21. A cocking mechanism, comprising:

an actuator assembly comprising:

a main body;

a clutch assembly housed within the main body;

a support axle extending through the clutch assembly; and

a pair of take-up spools mounted on the support axle on opposite sides of the main body;

a bow string hook assembly, comprising:

a pair of hook members; and

a tension cable extending through the pair of hook members;

wherein,

a section of the tension cable between the pair of hook members is spaced away from the hook members; and

opposing ends of the tension cable are secured to the take-up spools; and

a hand crank removably mounted on the support axle.

22. The cocking mechanism of claim 21, wherein the clutch assembly comprises:

a bearing housing;

a bearing cage disposed within the bearing housing; and

a plurality of roller bearings disposed within the bearing cage.

23. The cocking mechanism of claim 22, comprising an actuator lever comprising an attachment portion having an opening, wherein:

the bearing cage and the opening in the attachment portion comprise one or more complimentary features configured for securing the actuator lever to the clutch assembly; and

the bearing housing and the main body comprise one or more complimentary features configured for inhibiting rotation of the bearing housing within the main body.

24. The cocking mechanism of claim 23, comprising:

a collar integral with the support axle and seated within the bearing cage; and

a pair of axle bearings disposed on the support axle on opposite sides of the collar.

25. The cocking mechanism of claim 24, wherein:

the bearing housing comprises an opening defined by an inner peripheral surface; and

the inner peripheral surface comprises a plurality of annular ramps.

26. The cocking mechanism of claim 25, wherein the actuator lever comprises an actuator return spring configured to bias the actuator lever to a locked position when the actuator lever is released.

27. The cocking mechanism of claim 26, wherein:

the support axle is rotatable in either direction when the actuator lever is moved to an unlocked position;

the support axle is rotatable only in a first direction when the actuator lever is in the locked position; and

the support axle is inhibited from unhindered rotation in a second direction when the actuator lever is in the locked position.

28. The cocking mechanism of claim 27, wherein rotation in the second direction is inhibited by the interaction of the plurality of roller bearings, the inner peripheral surface of the bearing housing, and the integral collar on the support axle with one another.

29. The cocking mechanism of claim 26, wherein the plurality of roller bearings operatively cooperate with the inner peripheral surface of the bearing housing and the integral collar on the support axle to inhibit unhindered rotation of the support axle in a second direction when the actuator lever is in the locked position.

30. The cocking mechanism of claim 21, wherein the pair of take-up spools are housed within respective take-up spool housing.

31. The cocking mechanism of claim 21, comprising a pair of eyelets on opposite sides of the main body.

32. The cocking mechanism of claim 31, wherein the tension cable extends through the pair of eyelets.

33. The cocking mechanism of claim 21, comprising a pair of pulleys on opposite sides of the main body.

34. The cocking mechanism of claim 33, wherein the section of the tension cable between the pair of hook members extends around the pair of pulleys.

35. The cocking mechanism of claim 21, wherein

the pair of hook members are configured for being removably attached to a bow string; and

the cocking mechanism imparts substantially equal force onto the bow string when the tension cable is wound onto the take-up spools.

36. The cocking mechanism of claim 21, comprising an alignment member for removably attaching the cocking mechanism to a crossbow.

37. The cocking mechanism of claim 21, wherein the hand crank is mountable on either side of the actuator assembly.

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