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(54) **CUTTING DEVICE WITH PIVOTING WORKING ASSEMBLY**

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Description

TECHNICAL FIELD

[0001] Example embodiments generally relate to an outdoor power device that is electrically powered and, more particularly, relate to a cutting device that can be pivoted between two cutting orientations.

BACKGROUND

[0002] Handheld outdoor power devices such as trimmers, blowers, chainsaws, and/or the like, are often used to perform tasks relating to yard/grounds maintenance or even commercial resource harvesting activities that require them to be mobile. Such devices often have a working implement adjacent to, or extending from, a battery powered electric motor. In designing these devices, it is important that the one or more handles are ergonomically positioned to ensure safe and comfortable handling of the device. In this regard, the handles must be designed and positioned to ensure optimal tool balance, control, and safe operation.

[0003] However, it is desirable in some situations to operate a handheld power device in multiple orientations. An operator may also wish to use a device in an orientation different than that for which the device was primarily designed. For example, the handle arrangement on a polesaw may be designed to optimize operator ergonomics when cutting in a vertical cutting direction, but it may be desirable to make a cut in the horizontal direction. In order to make such a cut, the operator may need to position the handles awkwardly, thus reducing operator comfort, decreasing leverage and control, and risking fatigue or injury.

[0004] To improve upon this situation, it is desirable to design outdoor power devices in a manner that provides more than one ergonomic mode of operation. While this may be achieved by, for example, adding extra handles or including elongated handles, such alterations add weight and do little to improve ergonomics. Accordingly, a polesaw may be designed to provide ergonomic handling in both the vertical and horizontal cutting orientations without making significant changes to the handle configuration. GB 2233599 A discloses a pole saw with a very small chainsaw (6" bar) powered by a 12V electric motor. The chainsaw is attached to the pole via a ball joint.

BRIEF SUMMARY OF SOME EXAMPLES

[0005] Some example embodiments may therefore provide a cutting device that can provide more than one ergonomic mode of operation by allowing a working assembly of the device to be rotated about an elongated member. In this regard, an orientation adjustment assembly may operably couple a working assembly to an elongated member such that the working assembly may be rotated with respect to the elongated member. As

such, for example, different cutting orientations of the working assembly may be achieved. For example, the working assembly may be oriented vertically for a pruning method of operation, while the working assembly may be oriented horizontally for a clear cutting method of operation. Accordingly, some embodiments may provide for an outdoor power device that has more than one ergonomic mode of operation.

[0006] According to the invention, a hand-held cutting device include a working assembly, a power assembly, an elongated member, a control assembly, and an orientation adjustment assembly. The working assembly include an electric motor and is positionable in a first orientation or a second orientation. The power assembly include an electric power source, and an elongated member extend between the working assembly and power assembly. The control assembly is configured for selectively providing power from the power assembly to the working assembly via the electric motor. The orientation adjustment assembly is disposed at a portion of the elongated member and comprises a locked state in which the working assembly is fixed in the first orientation or the second orientation, and an unlocked state in which the working assembly is rotatable about a longitudinal axis defined by the elongated member between the first orientation and the second orientation.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S)

[0007] Having thus described the invention in general terms, reference will now be made to the accompanying drawings, which are not necessarily drawn to scale, and wherein:

FIG. 1 illustrates a functional block diagram of a device configured in accordance with an example embodiment;

FIG. 2 illustrates a perspective view of a battery powered polesaw in a first orientation, i.e., a pruning orientation, that may be configured in accordance with an example embodiment;

FIG. 3 illustrates a perspective view of a battery powered polesaw in a second orientation, i.e., a clear cutting orientation, that may be configured in accordance with an example embodiment;

FIG. 4 illustrates a close-up perspective view of a work assembly of the polesaw in a first orientation according to an example embodiment;

FIG. 5 illustrates a close-up perspective view of a partially disassembled work assembly of the polesaw according to an example embodiment;

FIG. 6 illustrates a close-up perspective view of a partially disassembled work assembly of the polesaw according to an example embodiment; and

FIG. 7 illustrates a close-up perspective view of a work assembly of the polesaw according to an example embodiment, wherein the working assembly

is in an unlocked state and is transitioning between a first and second orientation.

DETAILED DESCRIPTION

[0008] Some example embodiments now will be described more fully hereinafter with reference to the accompanying drawings, in which some, but not all example embodiments are shown. Indeed, the examples described and pictured herein should not be construed as being limiting as to the scope, applicability or configuration of the present disclosure. Rather, these example embodiments are provided so that this disclosure will satisfy applicable legal requirements. Like reference numerals refer to like elements throughout. Furthermore, as used herein, the term "or" is to be interpreted as a logical operator that results in true whenever one or more of its operands are true. As used herein, operable coupling should be understood to relate to direct or indirect connection that, in either case, enables functional interconnection of components that are operably coupled to each other.

[0009] In the context of the present disclosure, the term "operating position" refers to the default ergonomic orientation of the device when held for operation. In an example embodiment, this orientation may be defined in relation to a reference plane and the ground. In this regard, the left and right half portions of the housing of the power assembly may combine to form a seam that defines a reference plane. When the device is in the operating position, that reference plane is perpendicular to the ground. One of skill in the art will appreciate that the operating position may be defined using other reference planes, depending on the construction of the particular device. In the operating position, the working assembly represents the front of such devices. All other directional references should be understood in this general context. Thus, for example, the power assembly is located at the rear of the device, the bottom of the device faces the ground, and the top of the device faces upwards toward the operator or away from the ground.

[0010] Some example embodiments described herein provide a dual orientation cutting device. In this regard, embodiments employ a work assembly (e.g., a cutting head) that can pivot 90° about the pole on which it is mounted, without changing the positioning of the handles. As such, again for example, a device may provide multiple ergonomic modes of operation. The device is a polesaw with a cutting head that may remain in an upright orientation for a pruning mode of operation, but which may be pivoted such that the cutting blade lies in a horizontal orientation for a clear cutting mode of operation. Notably, in both modes of operation, only the work assembly (e.g., cutting head) is pivoted, while the handle positioning and orientation remains fixed, thereby ensuring ergonomic device handling in both modes of operation. Thus, example embodiments provide for a cutting device that provides multiple ergonomic modes of opera-

tion.

[0011] Referring to the drawings, FIG. 1 shows a functional block diagram of a device configured in accordance with an example embodiment. The device may include a working implement or working assembly 10 that is operably coupled to a power assembly 12. The power assembly 12 may have an elongated member, such as a pole 14 extending therefrom, which is operably connected to the working assembly through an orientation adjustment assembly 16. The power assembly 12 may further comprise an electric power source, such as a battery pack, for powering an electric motor, which may be a part of the working assembly 10. The battery pack may be electrically connected to the electric motor by electrical wires which are passed from the power assembly 12 through the center of the hollow pole 14 to the working assembly 10. A control assembly 18 controls the amount of electric power delivered from the power assembly 12 to the working assembly 10. In some alternatives, the power assembly 12 may include a power source that requires a corded connection (e.g., a corded connection to mains power).

[0012] As discussed below, the orientation adjustment assembly 16 provides a means for connecting the pole 14 extending from the power assembly 12 with the working assembly 10, such that the working assembly 10 may pivot relative to the pole 14 to provide multiple ergonomic modes of operation. As depicted in the figures, the orientation adjustment assembly 16 is disposed proximate to the working assembly 10. However, the orientation adjustment assembly 16 may be disposed anywhere along the pole 14 between the working assembly 10 and the front handle. For example, the working assembly 10 may optionally comprise an extension arm or pole that extends from the working assembly 10 to couple with the orientation adjustment assembly 16.

[0013] FIGS. 2 and 3 show an electrically powered polesaw 20 that may be configured in accordance with an example embodiment. It should also be appreciated that the polesaw 20 of FIGS. 2 and 3 is a battery powered device. However, example embodiments could alternatively be employed in connection with corded versions of various electrically powered, outdoor power devices. Moreover, in some cases, example embodiments could also be practiced in connection with combustion engines that are configured to enable conversion of the direction that the output shaft turns. Thus, although an example embodiment will be described hereinafter with specific reference to the battery powered polesaw 20 of FIGS. 2 and 3, the applicability of alternative embodiments relative to other types of devices should be well understood.

[0014] As shown in FIGS. 2 and 3, the polesaw 20 include a working implement or working assembly 10, which in this example includes a rotatable cutting blade assembly 22. The working assembly 10 may further include a motor, such as electric motor 24 disposed in a housing 26 of the working assembly 10. The motor 24 may be used to power a cutting chain (not shown) which is

disposed on the guide bar 28 for the effective cutting of any branches or vegetation. In this regard, in the example embodiment of FIGS. 2 and 3, the motor 24 turns a drive shaft (i.e., a motor shaft) and a sprocket drive wheel (not shown). The cutting chain is operably coupled to the sprocket drive wheel and is supported in a peripheral groove which extends around the guide bar 28. The guide bar 28 is attached to the housing 26 by a tensioning and clamping assembly (not shown) provided at the proximal end of the guide bar 28.

[0015] The motor 24 of the polesaw 20 may be powered, according to this example, by a battery pack 30. The battery pack 30 is received in a battery compartment of the polesaw 20. In an example embodiment, the battery compartment may be a recess or cavity formed in a casing 32 of the power assembly 12. The battery compartment can be located in the top, bottom, or sides of the casing 32 and may penetrate only one side of the casing 32. However, in some examples, the battery compartment may include a through-hole that passes entirely through the casing 32 so that the battery compartment includes openings on opposing sides of the casing 32.

[0016] The casing 32 may substantially enclose the battery compartment, control circuitry, and/or other components associated with powering and/or controlling the operation of the polesaw 20. In some embodiments, the casing 32 may be formed from one or more plastic or other rigid components that may be molded to have a desired shape. For example, in some cases, the casing 32 may be composed of a right half portion and a left half portion that may form a majority of the casing 32. In such an example, a seam 34 may extend along a longitudinal centerline of the casing 32 to divide the casing 32 along the right half and left half portions. As discussed above, this seam 34 may define a reference plane that is perpendicular to the ground when the polesaw 20 is in the operating position.

[0017] An elongated member, such as pole 14 operably couples the working assembly 10 to the power assembly 12, which are disposed at opposite ends of the pole 14. Although depicted as a pole 14 in the example embodiment, the elongated member may be a hollow tube, pipe, rod, or other such member that may be straight or curved in different embodiments. The elongated member may also provide operable communication between the working assembly 10 and the battery pack 30 such that the battery pack 30 can power the working assembly 10. In this regard, wires (indicated by dotted line 36 in Fig. 2) extend from the battery pack 30 through the pole 14 to the working assembly 10 to provide power to the motor 24. However, it should be appreciated that alternative means for electrically connecting the motor 24 and power source are also contemplated. It should also be appreciated that the battery pack of some alternative embodiments may be housed within a backpack that may be worn on the operator's back. In such an example, the battery pack may be connected to the polesaw 20 via a cord or other adaptor.

[0018] The polesaw 20 may include a rear handle 40 and a front handle 42. The rear handle 40 may be disposed in-line with the pole 14 proximate to the casing 32, while the front handle 42 may be disposed between the casing 32 and the working assembly 10 along the pole 14. An operator of the polesaw 20 may use one hand to hold the front handle 42 and the other hand to hold the rear handle 40 while operating the polesaw 20. In some embodiments, the rear handle 40 may include a trigger 44 or other control mechanism for engaging operation of the motor 24 to power the working assembly 10. Although FIG. 2 shows the front handle 42 being positioned forward of the rear handle 40 along the pole 14, it should also be appreciated that other arrangements for holding and operating the polesaw 20 may be provided. For example, in some cases, a "handlebar" embodiment may be provided in which the front and rear handles 42/40 are replaced by a single handle assembly attached to the pole 14, where both handles on the handle assembly are substantially equidistant from the working assembly 10 and disposed spaced apart from the pole 14 on opposite sides thereof on a handlebar assembly. In addition, the front handle 42 may be fully adjustable, and may be rotated about the pole 14 or moved axially with respect to the pole. After being adjusted to the desired position and orientation, the front handle 42 may be fixed by a screw clamp, set screw, or any other suitable securing means. Other arrangements are also possible.

[0019] In an example embodiment, the motor 24 may be a DC motor or a brushless DC motor (BLDC) that is powered by the battery pack 30. The power assembly 12 and battery pack 30 may be controlled by the trigger 44 and/or the control panel 46. In the example embodiments shown in FIGS. 2 and 3, the trigger 44 and control panel 46 are positioned on the casing 32 of the power assembly 12 proximate to the rear handle 40. However, the trigger 44 and control panel 46 could be positioned at any of a number of other locations on the polesaw 20 in alternative embodiments, such as on front handle 42. The control panel 46 may be configured to control numerous aspects of the operation of the polesaw 20. For example, the control panel 46 may monitor motor speed, set speed limits, apply cruise control, etc.

[0020] As explained in more detail below, the orientation adjustment assembly 16 enables the working assembly 10 to be rotated with respect to the pole 14 and power assembly 12. For example, as shown in FIG. 2, the blade assembly 22 is oriented such that the guide bar 28 is extended in a longitudinal direction with respect to the pole 14 and is vertically oriented with respect to the ground. In other words, the guide bar 28 lies in a plane parallel to the reference plane in which seam 34 separates the right half and left half portions of the casing 32. This position is referred to herein as the first orientation, and is often known in the art as a pruning orientation. By contrast, FIG. 3 shows the blade assembly 22 in a second orientation, known in the art as a clear cutting orientation, where the guide bar 28 remains longitudinally extended

with respect to the pole 14, but is rotated 90° about an axis defined by pole 14, such that it is parallel to the ground. In other words, in the second orientation, the guide bar 28 lies in a plane that is perpendicular to the reference plane in which seam 34 separates the right half and left half portions of the casing 32.

[0021] In an example embodiment, multiple cutting operations may be supported by providing different cutting blade 28 orientations. Thus, for example, the blade assembly 22 may be configured to perform one function when oriented in the first orientation, and another function when oriented in the second orientation. FIG. 4 illustrates an example of the working assembly 10 of an example embodiment to more clearly illustrate some of the features of the working assembly 10. In this regard, the working assembly 10 may include a housing 26, which may be partially open, such that the sides of the motor 24 are exposed for improved cooling. In addition, the housing of the motor 24 may comprise a plurality of radially extending fins to improve cooling efficiency. The housing 26 further comprises a chain oil reservoir 48 (see FIG. 3) for lubricating the cutting chain. In the example embodiment, the oil reservoir 48 is disposed below the cutting blade 28 when the working assembly 10 is in the clear cutting orientation. An oil reservoir cap 50 is provided for filling the oil reservoir 48 with lubricating oil.

[0022] FIG. 5 illustrates a close-up perspective view of a partially disassembled work assembly 10 of the pole-saw 20 according to an example embodiment. The orientation adjustment assembly 16 comprises a receiving neck 54 which may be connected to, or may be a unitary portion of, the housing 26. Alternatively, the receiving neck 54 may be disposed at any point along the pole 14. In some cases, the receiving neck 54 may be configured to enable the housing 26 to be turned in either the first orientation or the second orientation relative to the pole 14 without removing the housing 26 from the pole 14.

[0023] As is evident from FIG. 5, wires 36 are fed from the control assembly, through the pole 14, and through the receiving neck 54 to deliver power to the electric motor 24. The receiving neck 54 is configured to receive pole 14, which is inserted therein. To restrict the relative motion between the pole 14 and the receiving neck 54, a protruding member, such as a set screw 66 is inserted through a receiving port 68 in the side of the receiving neck 54. In this manner, the distal end of the set screw 66 protrudes through the receiving neck 54 and engages slot 70 of the pole 14, such that it prevents movement of the working assembly 10 with respect to the longitudinal axis of pole 14, but allows rotation within a limited angular range of motion. This is referred to herein as the unlocked state of the orientation adjustment assembly 16.

[0024] Although the protruding member described above is a set screw 66, one skilled in the art will appreciate that any other member sufficient to restrict the relative motion of the pole 14 and working assembly 10 may also be used. For example, the protruding member may alternatively be a detent, such as a spring-loaded ball, a rigid

pin, or the like. In addition, the protruding member may be located proximate to, or some distance from, the collar, or may even extend through the collar. Notably, slot 70 extends circumferentially around the end of the pole 14, in a direction perpendicular to the longitudinal axis of the pole 14, over a range of around 90°. By limiting the rotation angle of the housing 26, the twisting and wear of wires 36 may be reduced.

[0025] In an example embodiment, a clamping member, such as an adjustable collar 74 is disposed circumferentially around the distal end of the receiving neck 54 and may engage pole 14 and/or a portion of the housing 26 proximate to the receiving neck 54. As is best seen in FIG. 6, the receiving neck 54 has an axially extending slot 76 along its circumference to allow a slight adjustment in the diameter of the receiving neck 54. When the working assembly 10 is oriented in the desired cutting direction relative to pole 14, the adjustable collar 74 is tightened by inserting and tightening a collar screw 78. This action tightens the adjustable collar 74 and closes the axially extending slot 76 in the receiving neck 54, thus reducing the diameter of the receiving neck 54 and fixing the pole 14 with respect to the housing 26. This is referred to herein as the locked state of the orientation adjustment assembly 16. By contrast, when the collar screw 78 is loosened or removed, such that the clamping pressure from the adjustable collar 74 is relieved, the axially extending slot 76 reopens and the pole 14 is once again free to rotate relative to the receiving neck 54. For example, as shown in FIG. 7, the collar screw 78 is loosened such that the working assembly 10 is free to rotate about pole 14, and the working assembly 10 is in transition between the first orientation and second orientation.

[0026] Although the means for clamping the pole 14 in the receiving neck 54 are shown as an adjustable collar 74 and collar screw 78, any other means suitable for fixing the working assembly 10 with respect to the pole 14 may be used and remain within the scope of the present invention. For example, another set screw can be inserted through holes drilled in the adjustable collar 74, receiving neck 54, and/or pole 14 to secure the working assembly 10 in its final position relative to the pole 14.

[0027] In sum, assembly of a cutting device in accordance with an example embodiment comprises feeding wires 36 through the receiving neck 54 and connecting the wires to the electric motor 24. The end of pole 14 is then inserted into the receiving neck 54 such that the set screw 66 may be aligned with slot 70. After the slot 70 is properly aligned, set screw 66 may be inserted into the receiving port 68 on the receiving neck 54. At this point the orientation adjustment assembly 16 is in the unlocked state, such that the working assembly 10 is fixed with respect to the longitudinal axis of pole 14, but may rotate within a limited angular range of motion, defined in part by the slot 70, between a first and second orientation. When the working assembly 10 is placed in the desired orientation, the adjustable collar 74 may be tightened to place the orientation adjustment assembly 16 in the locked

state. In the locked state, the working assembly 10 may not rotate relative to the pole 14, and the working assembly 10 is ready for operation.

[0028] In accordance with an example embodiment, a hand-held cutting device (e.g., a polesaw) is provided. The device may include a working assembly, a power assembly, an elongated member, a control assembly, and an orientation adjustment assembly. The working assembly may include an electric motor and may be positionable in a first orientation or a second orientation. The power assembly may include an electric power source, and an elongated member may extend between the working assembly and power assembly. The control assembly may be configured for selectively providing power from the power assembly to the working assembly via the electric motor. The orientation adjustment assembly may be disposed at a portion of the elongated member and may comprise a locked state in which the working assembly is fixed in the first orientation or the second orientation, and an unlocked state in which the working assembly is rotatable about a longitudinal axis defined by the elongated member between the first orientation and the second orientation. The first orientation and the second orientation are about 90° apart.

[0029] The device of some embodiments may include additional features that may be optionally added. For example, in an example embodiment, a front and rear handle may be added, the front handle being disposed along the elongated member and the rear handle being disposed on the casing of the power assembly. In some embodiments, the orientation adjustment assembly may be disposed along the elongated member between the front handle and the working assembly. In some cases, the orientation adjustment assembly may include a receiving neck for receiving a portion of the elongated member, and that receiving neck may be disposed proximate to a housing of the working assembly.

[0030] In yet another example embodiment, the orientation adjustment assembly may include a protruding member for preventing movement of the working assembly along the longitudinal axis of elongated member and limiting the angular range of motion of the working assembly relative to the elongated member in both the locked and unlocked states. In addition, the orientation adjustment assembly may include a clamping member for preventing rotation of the working assembly with respect to the elongated member. That clamping member may include, for example, an adjustable collar and a tightening element to effect a clamping pressure and secure the working assembly to the elongated member and put the orientation adjustment assembly in the locked state. In such an example, the protruding member may be disposed proximate to the adjustable collar.

[0031] In some example embodiments, the orientation adjustment assembly may include a slot that is disposed on the elongated member and extends about 90° about the circumference of the elongated member. This slot may be configured to limit the angular range of motion of

the working assembly. In some embodiments, the protruding member is a set screw which engages the slot in the elongated member. In other embodiments the protruding member is a spring-loaded steel ball.

[0032] According to some example embodiments, the working assembly may include a guide bar with a cutting chain disposed thereon, and the cutting chain may be operably coupled to the electric motor. According to an example embodiment, when the working assembly is in a first orientation, which may correspond to a pruning orientation, the guide bar is longitudinally extended with respect to the elongated member, and lies in a plane parallel to a reference plane that is perpendicular to the ground. When the working assembly is in the second orientation, which may correspond to a clear cutting orientation, the guide bar is longitudinally extended with respect to the elongated member and lies in a plane parallel to the ground.

[0033] In some cases, the device may also include a chain oil reservoir for lubricating the cutting chain that may be supported in a peripheral groove which extends around the guide bar, wherein the chain oil reservoir is disposed below the guide bar when the working assembly is in the second orientation. In addition, the housing of the working assembly may be partially open, such that portions of the electric motor are exposed to aid in cooling the electric motor. In some embodiments, the interior of the elongated member is hollow and wires that connect the electric power source to the electric motor are fed through the inside of the elongated member to the electric motor.

Claims

1. A hand-held cutting device (20), wherein the hand-held cutting device is a polesaw, the hand-held cutting device comprising:

a working assembly (10) comprising an electric motor (24), the working assembly (10) being positionable in a first orientation or a second orientation;

a power assembly (12) comprising an electric power source (30);

an elongated member (14) extending between the working assembly (10) and the power assembly (12);

a control assembly (18) for selectively providing power from the power assembly (12) to the working assembly (10) via the electric motor (24); and

an orientation adjustment assembly (16) disposed at a portion of the elongated member (14),

characterized in that

- the orientation adjustment assembly (16) comprises a locked state in which the working assembly (10) is fixed in the first orientation or the second orientation, and an unlocked state in which the working assembly (10) is rotatable about a longitudinal axis defined by the elongated member (14) between the first orientation and the second orientation, wherein the working assembly (10) comprises a guide bar (28) with a cutting chain disposed thereon, the cutting chain being operably coupled to the electric motor (24), wherein, in the first orientation, the guide bar (28) is longitudinally extended with respect to the elongated member (14) and lies in a plane parallel to a reference plane that is perpendicular to the ground, and wherein, in the second orientation, the guide bar (28) is longitudinally extended with respect to the elongated member (14) and lies in a plane parallel to the ground.
2. The hand-held cutting device (20) of claim 1, wherein the orientation adjustment assembly (16) comprises a slot (70) disposed on the elongated member (14), the slot (70) extending about a periphery of the elongated member (14) and being configured to receive a protruding member to limit the angular range of motion of the working assembly (10) to prevent damage to wires passing through the elongated member
 3. The hand-held cutting device (20) of claim 2, wherein the first orientation and the second orientation are less than 330° apart.
 4. The hand-held cutting device (20) of claim 3, wherein the first orientation and the second orientation are about 90° apart.
 5. The hand-held cutting device (20) of claim 1, further comprising a front handle (42) disposed along the elongated member (14) and a rear handle (40) disposed on a casing (32) of the power assembly (12).
 6. The hand-held cutting device (20) of claim 5, wherein the orientation adjustment assembly (16) is disposed along the elongated member (14) between the front handle (42) and the working assembly (10).
 7. The hand-held cutting device (20) of claim 1, wherein the orientation adjustment assembly (16) comprises a receiving neck (54) for receiving a portion of the elongated member (14).
 8. The hand-held cutting device (20) of claim 7, wherein the receiving neck (54) of the orientation adjustment assembly (16) is disposed proximate to a housing (26) of the working assembly (10).
 9. The hand-held cutting device (20) of claim 1, wherein the orientation adjustment assembly (16) comprises a protruding member for preventing movement of the working assembly (10) along the longitudinal axis of elongated member (14) and limiting the angular range of motion of the working assembly (10) relative to the elongated member (14) in both the locked and unlocked states.
 10. The hand-held cutting device (20) of claim 9, wherein the orientation adjustment assembly (16) further comprises a clamping member for preventing rotation of the working assembly (10) with respect to the elongated member (14).
 11. The hand-held cutting device (20) of claim 10, wherein the clamping member comprises an adjustable collar (74) and a tightening element (78) to effect a clamping pressure and secure the working assembly (10) to the elongated member (14), wherein the orientation adjustment assembly (16) is in the locked state when the tightening element (78) is adjusted to tighten the adjustable collar (74).
 12. The hand-held cutting device (20) of claim 9, wherein the orientation adjustment assembly (16) comprises a slot (70) disposed on the elongated member (14), the slot (70) extending about 90° about the circumference of the elongated member (14) and being configured to limit the angular range of motion of the working assembly (10).
 13. The hand-held cutting device (20) of claim 1, wherein the first orientation of the guide bar (28) corresponds to a pruning orientation.
 14. The hand-held cutting device (20) of claim 1, wherein the second orientation of the guide bar (28) corresponds to a clear cutting orientation.

Patentansprüche

1. Handgehaltene Schneidvorrichtung (20), wobei die handgehaltene Schneidvorrichtung ein Hochentaster ist, wobei die handgehaltene Schneidvorrichtung Folgendes umfasst:
 - eine Arbeitsbaugruppe (10), die einen Elektromotor (24) umfasst, wobei die Arbeitsbaugruppe (10) in einer ersten Ausrichtung oder einer zweiten Ausrichtung positionierbar ist;
 - eine Leistungsbaugruppe (12), die eine elektrische Leistungsquelle (30) umfasst;

ein längliches Element (14), das sich zwischen der Arbeitsbaugruppe (10) und der Leistungsbaugruppe (12) erstreckt;

eine Steuerbaugruppe (18) zum selektiven Bereitstellen von Leistung von der Leistungsbaugruppe (12) über den Elektromotor (24) zu der Arbeitsbaugruppe (10); und

eine Ausrichtungsverstellbaugruppe (16), die an einem Abschnitt des länglichen Elements (14) angeordnet ist,

dadurch gekennzeichnet, dass

die Ausrichtungsverstellbaugruppe (16) einen verriegelten Zustand, in dem die Arbeitsbaugruppe (10) in der ersten Ausrichtung oder der zweiten Ausrichtung fixiert ist, und einen entriegelten Zustand, in dem die Arbeitsbaugruppe (10) um eine durch das längliche Element (14) definierte Längsachse zwischen der ersten Ausrichtung und der zweiten Ausrichtung drehbar ist, umfasst,

wobei die Arbeitsbaugruppe (10) eine Führungsstange (28) mit einer darauf angeordneten Schneidkette umfasst, wobei die Schneidkette mit dem Elektromotor (24) wirkgekoppelt ist, wobei sich in der ersten Ausrichtung die Führungsstange (28) in Bezug auf das längliche Element (14) in Längsrichtung erstreckt und in einer Ebene parallel zu einer Referenzebene liegt, die senkrecht zum Boden steht, und wobei sich in der zweiten Ausrichtung die Führungsstange (28) in Bezug auf das längliche Element (14) in Längsrichtung erstreckt und in einer Ebene parallel zum Boden liegt.

2. Handgehaltene Schneidvorrichtung (20) nach Anspruch 1, wobei die Ausrichtungsverstellbaugruppe (16) einen Schlitz (70) umfasst, der auf dem länglichen Element (14) angeordnet ist, wobei sich der Schlitz (70) um einen Umfang des länglichen Elements (14) erstreckt und dazu ausgelegt ist, ein vorstehendes Element aufzunehmen, um den Winkelbewegungsbereich der Arbeitsbaugruppe (10) zu begrenzen, um eine Beschädigung von durch das längliche Element verlaufenden Drähten zu verhindern.
3. Handgehaltene Schneidvorrichtung (20) nach Anspruch 2, wobei die erste Ausrichtung und die zweite Ausrichtung weniger als 330° voneinander entfernt sind.
4. Handgehaltene Schneidvorrichtung (20) nach Anspruch 3, wobei die erste Ausrichtung und die zweite Ausrichtung etwa 90° voneinander entfernt sind.
5. Handgehaltene Schneidvorrichtung (20) nach Anspruch 1, ferner umfassend einen vorderen Griff (42), der entlang des länglichen Elements (14) an-

geordnet ist, und einen hinteren Griff (40), der auf einer Umhüllung (32) der Leistungsbaugruppe (12) angeordnet ist.

6. Handgehaltene Schneidvorrichtung (20) nach Anspruch 5, wobei die Ausrichtungsverstellbaugruppe (16) entlang des länglichen Elements (14) zwischen dem vorderen Griff (42) und der Arbeitsbaugruppe (10) angeordnet ist.
7. Handgehaltene Schneidvorrichtung (20) nach Anspruch 1, wobei die Ausrichtungsverstellbaugruppe (16) einen Aufnahmehals (54) zum Aufnehmen eines Abschnitts des länglichen Elements (14) umfasst.
8. Handgehaltene Schneidvorrichtung (20) nach Anspruch 7, wobei der Aufnahmehals (54) der Ausrichtungsverstellbaugruppe (16) nahe einem Gehäuse (26) der Arbeitsbaugruppe (10) angeordnet ist.
9. Handgehaltene Schneidvorrichtung (20) nach Anspruch 1, wobei die Ausrichtungsverstellbaugruppe (16) ein vorstehendes Element umfasst, um eine Bewegung der Arbeitsbaugruppe (10) entlang der Längsachse des länglichen Elements (14) zu verhindern und den Winkelbewegungsbereich der Arbeitsbaugruppe (10) relativ zu dem länglichen Element (14) sowohl in dem verriegelten als auch in dem entriegelten Zustand zu begrenzen.
10. Handgehaltene Schneidvorrichtung (20) nach Anspruch 9, wobei die Ausrichtungsverstellbaugruppe (16) ferner ein Klemmelement zum Verhindern einer Drehung der Arbeitsbaugruppe (10) in Bezug auf das längliche Element (14) umfasst.
11. Handgehaltene Schneidvorrichtung (20) nach Anspruch 10, wobei das Klemmelement eine verstellbare Manschette (74) und ein Spannelement (78) umfasst, um einen Klemmdruck zu bewirken und die Arbeitsbaugruppe (10) an dem länglichen Element (14) zu befestigen, wobei sich die Ausrichtungsverstellbaugruppe (16) in dem verriegelten Zustand befindet, wenn das Spannelement (78) verstellt wird, um die verstellbare Manschette (74) festzuziehen.
12. Handgehaltene Schneidvorrichtung (20) nach Anspruch 9, wobei die Ausrichtungsverstellbaugruppe (16) einen Schlitz (70) umfasst, der auf dem länglichen Element (14) angeordnet ist, wobei sich der Schlitz (70) um etwa 90° um den Umfang des länglichen Elements (14) erstreckt und dazu ausgelegt ist, den Winkelbewegungsbereich der Arbeitsbaugruppe (10) zu begrenzen.

13. Handgehaltene Schneidvorrichtung (20) nach Anspruch 1, wobei la première Ausrichtung der Führungsstange (28) einer Gehölzschnittausrüstung entspricht.
14. Handgehaltene Schneidvorrichtung (20) nach Anspruch 1, wobei la deuxième Ausrichtung der Führungsstange (28) einer Abholzungsausrüstung entspricht.

Revendications

1. Dispositif de coupe portatif (20), dans lequel le dispositif de coupe portatif est une scie à long manche, le dispositif de coupe portatif comprenant :

un ensemble de travail (10) comprenant un moteur électrique (24), l'ensemble de travail (10) pouvant être positionné suivant une première orientation ou une seconde orientation ;

un ensemble d'alimentation (12) comprenant une source d'alimentation électrique (30) ; un élément allongé (14) s'étendant entre l'ensemble de travail (10) et l'ensemble d'alimentation (12) ;

un ensemble de commande (18) pour fournir de façon sélective une alimentation de l'ensemble d'alimentation (12) à l'ensemble de travail (10) par le biais du moteur électrique (24) ; et

un ensemble de réglage d'orientation (16) disposé sur une partie de l'élément allongé (14), **caractérisé en ce que**

l'ensemble de réglage d'orientation (16) comprend un état verrouillé dans lequel l'ensemble de travail (10) est fixé dans la première orientation ou la seconde orientation, et un état déverrouillé dans lequel l'ensemble de travail (10) peut tourner autour d'un axe longitudinal défini par l'élément allongé (14) entre la première orientation et la seconde orientation, dans lequel l'ensemble de travail (10) comprend une barre de guidage (28) dotée d'une chaîne de coupe disposée dessus, la chaîne de coupe étant couplée en fonctionnement au moteur électrique (24),

dans lequel, dans la première orientation, la barre de guidage (28) est étendue longitudinalement par rapport à l'élément allongé (14) et se trouve dans un plan parallèle à un plan de référence qui est perpendiculaire au sol, et dans lequel, dans la seconde orientation, la barre de guidage (28) est étendue longitudinalement par rapport à l'élément allongé (14) et se trouve dans un plan parallèle au sol.

2. Dispositif de coupe portatif (20) selon la revendication 1, dans lequel l'ensemble de réglage d'orientation

(16) comprend une fente (70) disposée sur l'élément allongé (14), la fente (70) s'étendant autour d'une périphérie de l'élément allongé (14) et étant conçue pour recevoir un élément en saillie pour limiter la plage angulaire de déplacement de l'ensemble de travail (10) afin d'empêcher des dégâts aux câbles passant à travers l'élément allongé.

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3. Dispositif de coupe portatif (20) selon la revendication 2, dans lequel la première orientation et la seconde orientation sont séparées de moins de 330°.

4. Dispositif de coupe portatif (20) selon la revendication 3, dans lequel la première orientation et la seconde orientation sont séparées d'environ 90°.

5. Dispositif de coupe portatif (20) selon la revendication 1, comprenant en outre une poignée avant (42) disposée le long de l'élément allongé (14) et une poignée arrière (40) disposée sur un corps (32) de l'ensemble d'alimentation (12).

6. Dispositif de coupe portatif (20) selon la revendication 5, dans lequel l'ensemble de réglage d'orientation (16) est disposé le long de l'élément allongé (14) entre la poignée avant (42) et l'ensemble de travail (10).

7. Dispositif de coupe portatif (20) selon la revendication 1, dans lequel l'ensemble de réglage d'orientation (16) comprend un collet de réception (54) pour recevoir une partie de l'élément allongé (14).

8. Dispositif de coupe portatif (20) selon la revendication 7, dans lequel le collet de réception (54) de l'ensemble de réglage d'orientation (16) est disposé à proximité d'un logement (26) de l'ensemble de travail (10).

9. Dispositif de coupe portatif (20) selon la revendication 1, dans lequel l'ensemble de réglage d'orientation (16) comprend un élément en saillie pour empêcher le déplacement de l'ensemble de travail (10) le long de l'axe longitudinal de l'élément allongé (14) et limiter la plage angulaire de déplacement de l'ensemble de travail (10) par rapport à l'élément allongé (14) dans les deux états verrouillé et déverrouillé.

10. Dispositif de coupe portatif (20) selon la revendication 9, dans lequel l'ensemble de réglage d'orientation (16) comprend en outre un organe de fixation pour empêcher la rotation de l'ensemble de travail (10) par rapport à l'élément allongé (14).

11. Dispositif de coupe portatif (20) selon la revendication 10, dans lequel l'organe de fixation comprend un collier réglable (74) et un organe de serrage (78) pour effectuer une pression de fixation et fixer l'en-

semble de travail (10) à l'élément allongé (14), dans lequel l'ensemble de réglage d'orientation (16) est dans l'état verrouillé lorsque l'organe de serrage (78) est ajusté pour serrer le collier réglable (74).

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- 12.** Dispositif de coupe portatif (20) selon la revendication 9, dans lequel l'ensemble de réglage d'orientation (16) comprend une fente (70) disposée sur l'élément allongé (14), la fente (70) s'étendant à environ 90° autour de la circonférence de l'élément allongé (14) et étant conçue pour limiter la plage angulaire de déplacement de l'ensemble de travail (10).

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- 13.** Dispositif de coupe portatif (20) selon la revendication 1, dans lequel la première orientation de la barre de guidage (28) correspond à une orientation de taille.

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- 14.** Dispositif de coupe portatif (20) selon la revendication 1, dans lequel la seconde orientation de la barre de guidage (28) correspond à une orientation de coupe totale.

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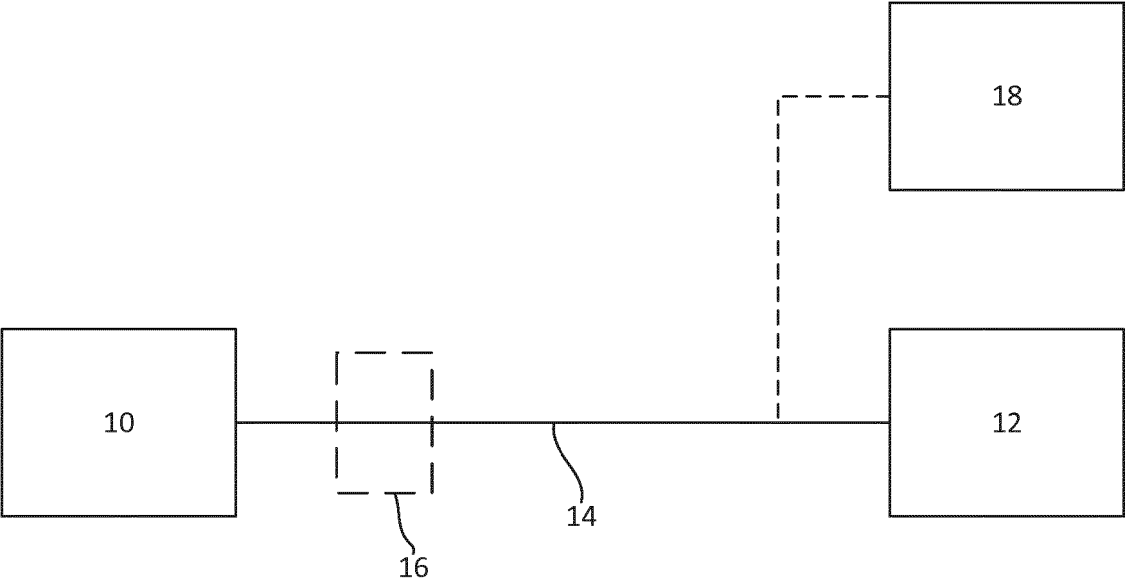


FIG. 1

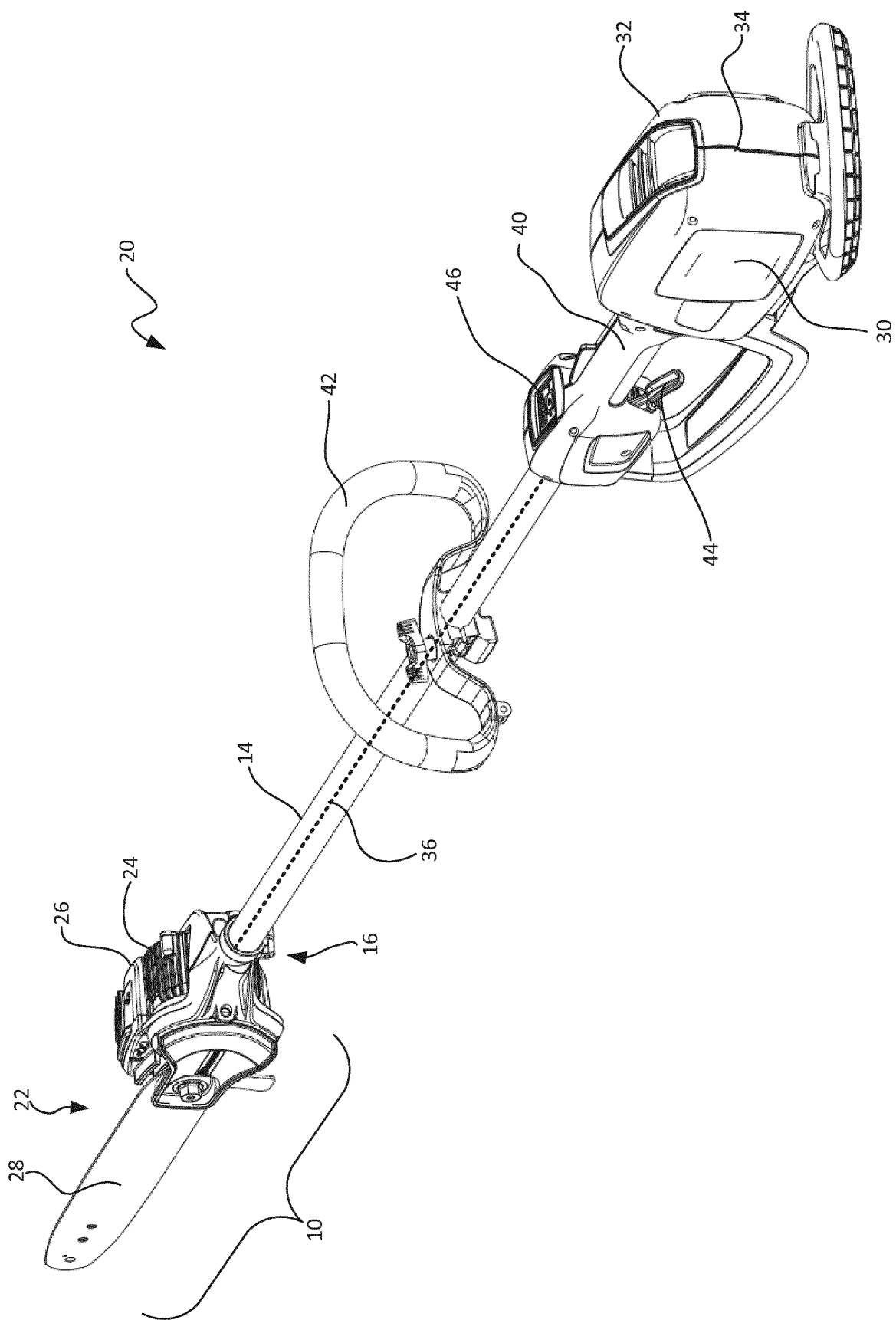


FIG. 2

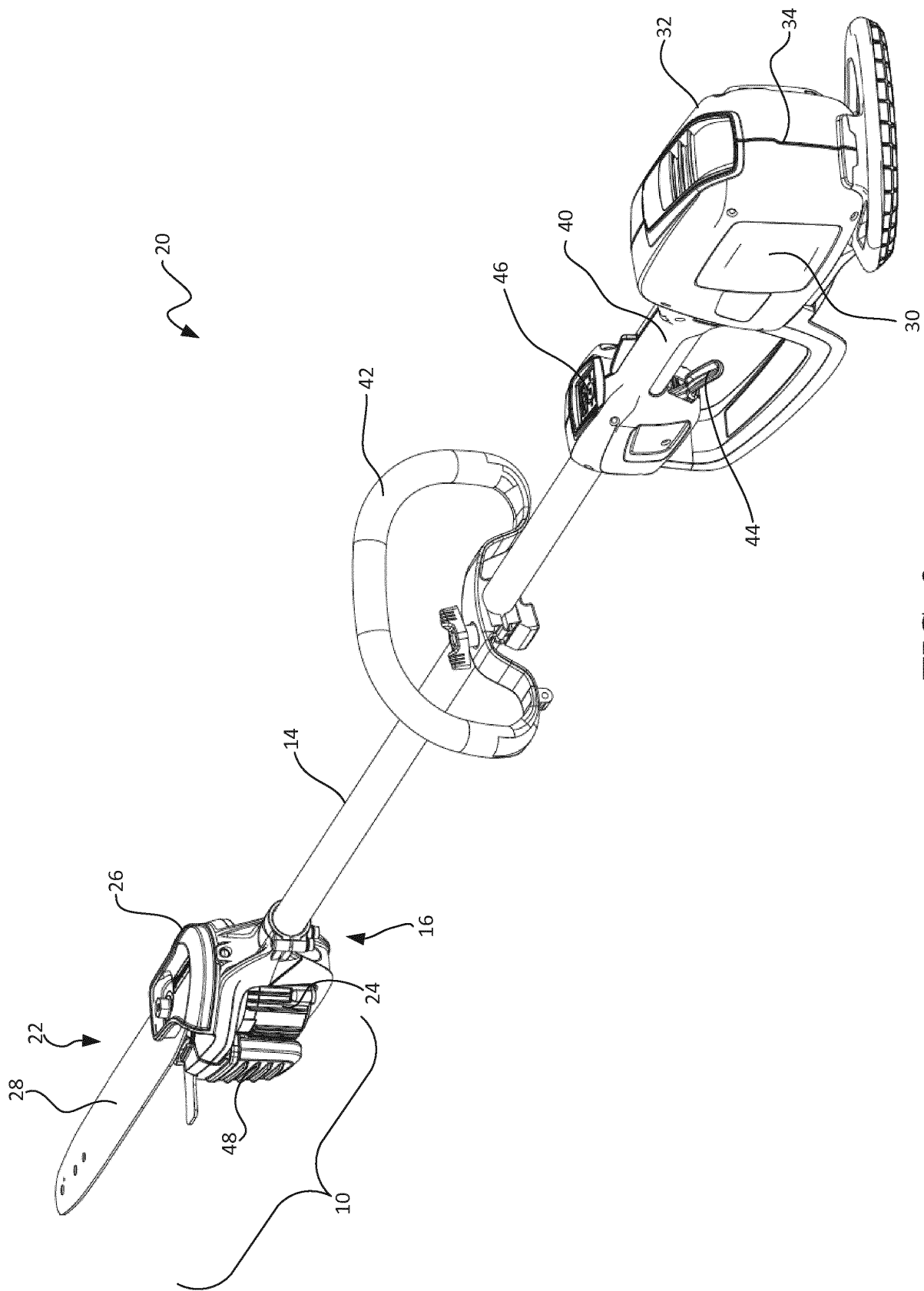


FIG. 3

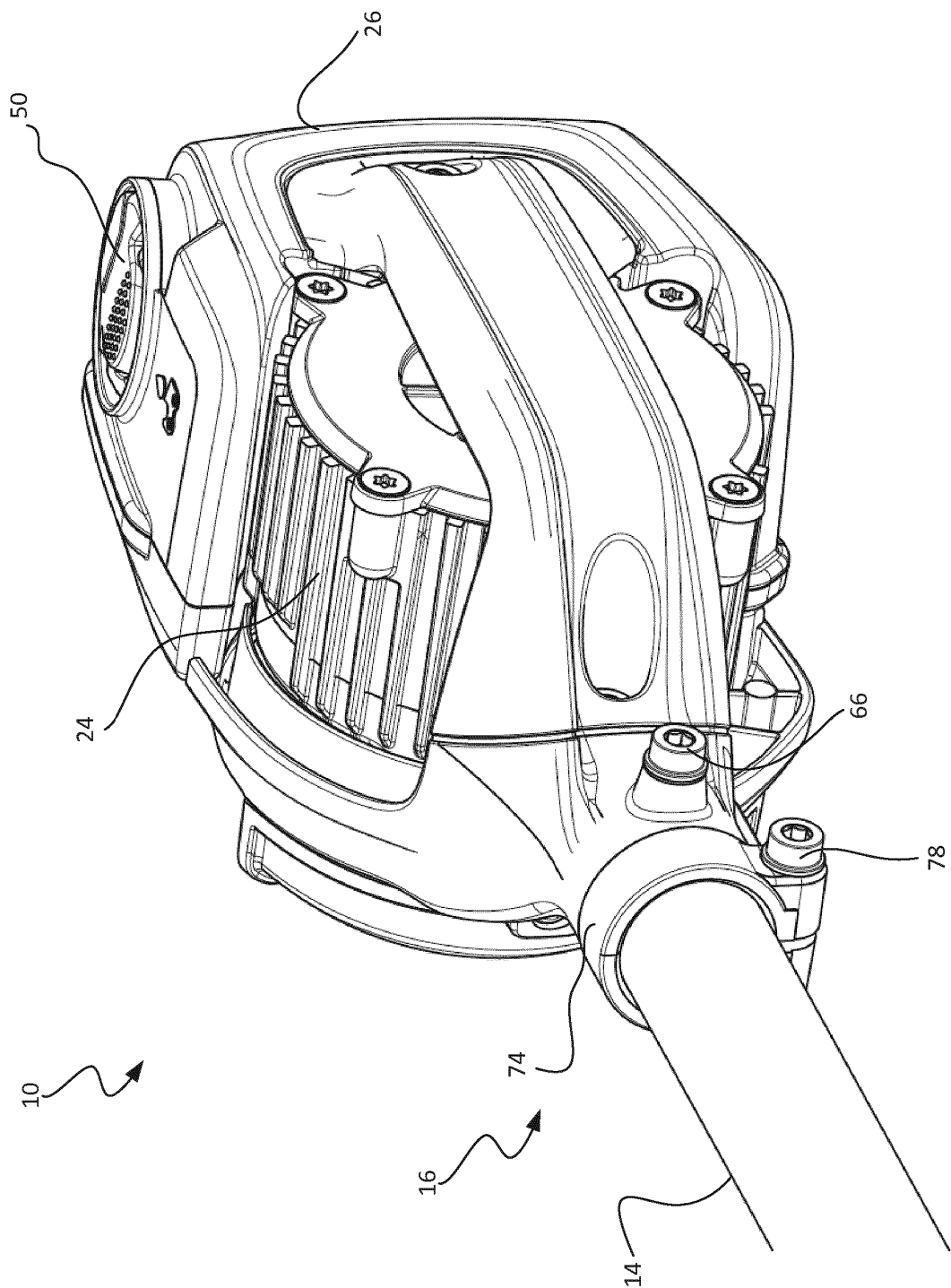


FIG. 4

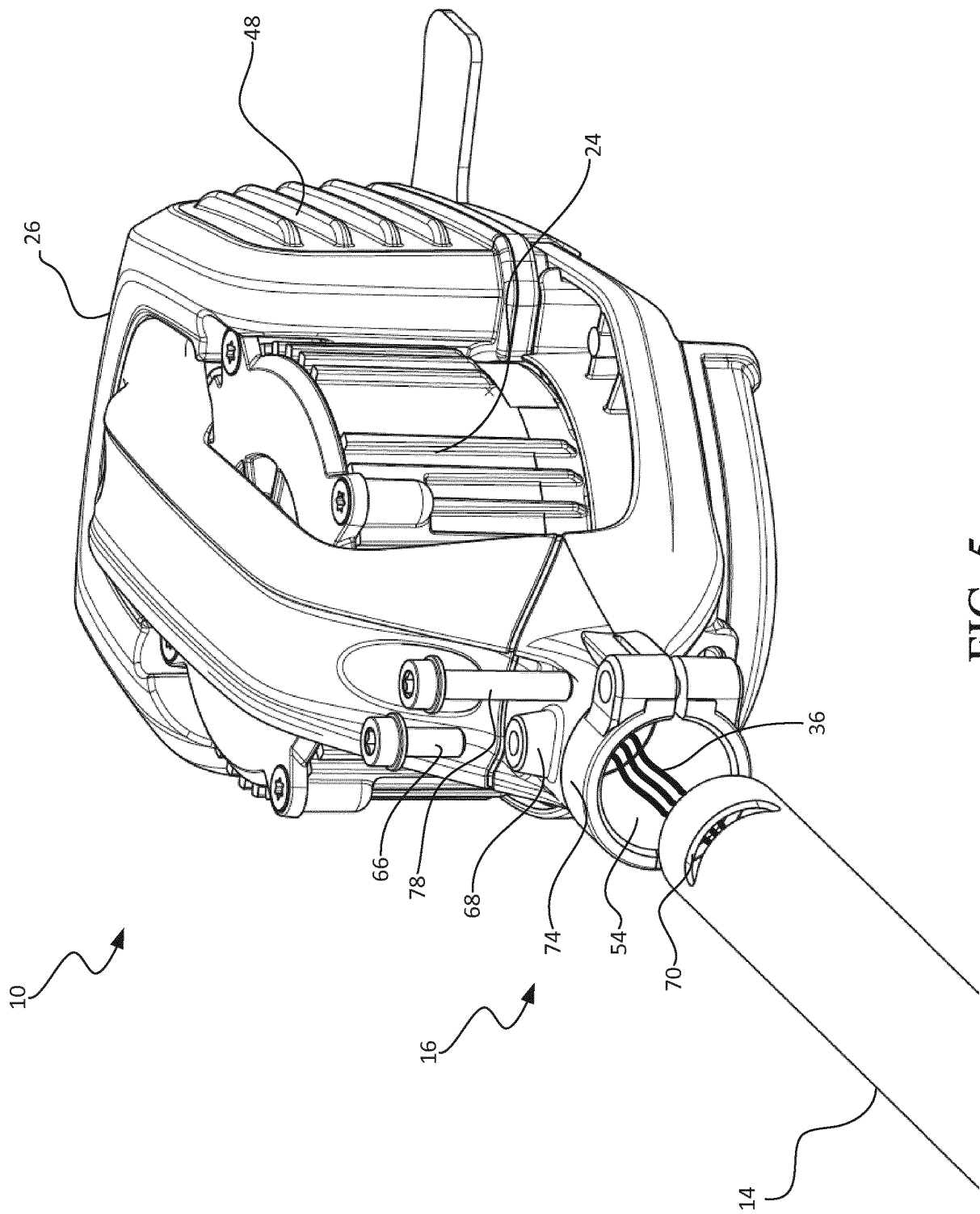


FIG. 5

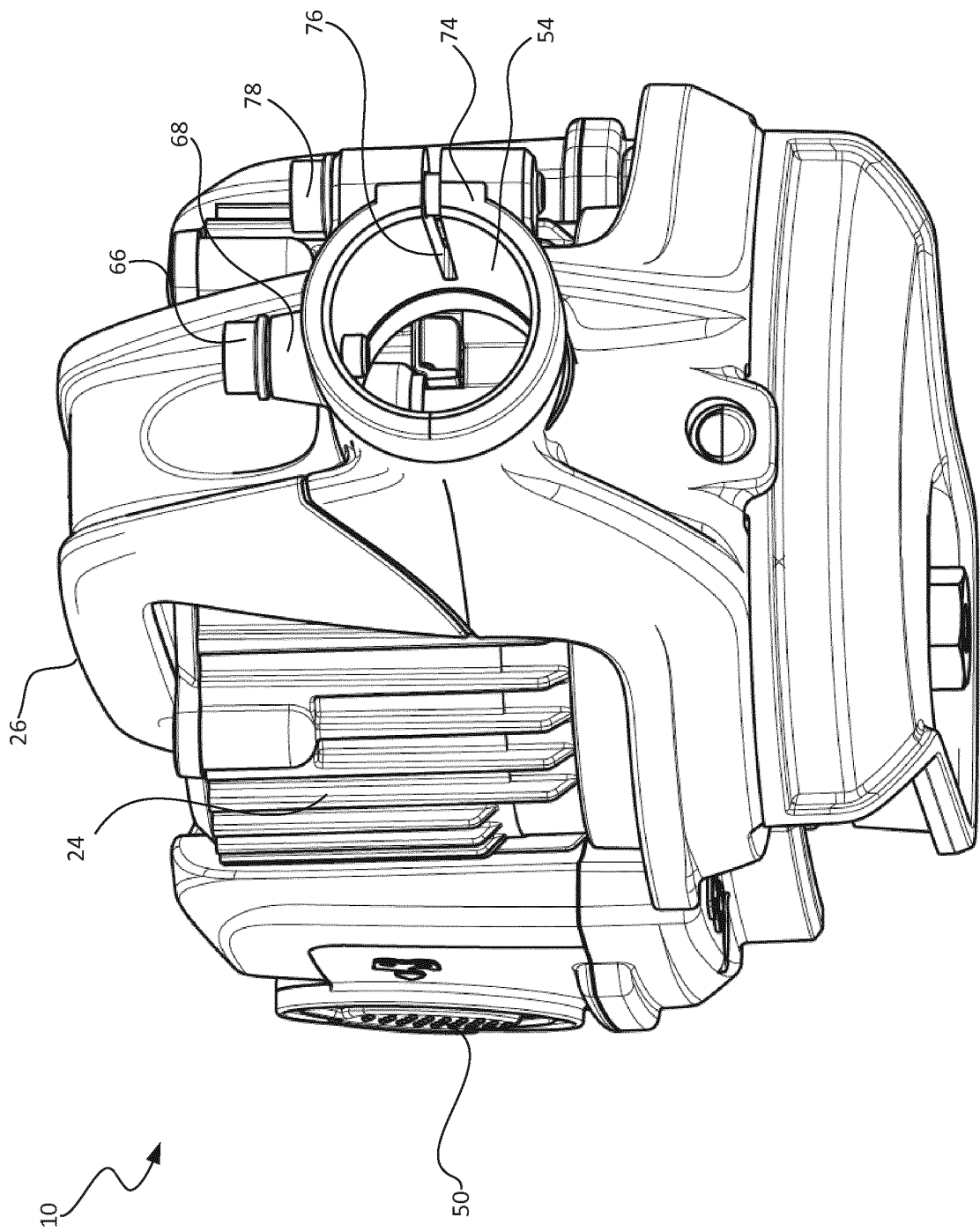


FIG. 6

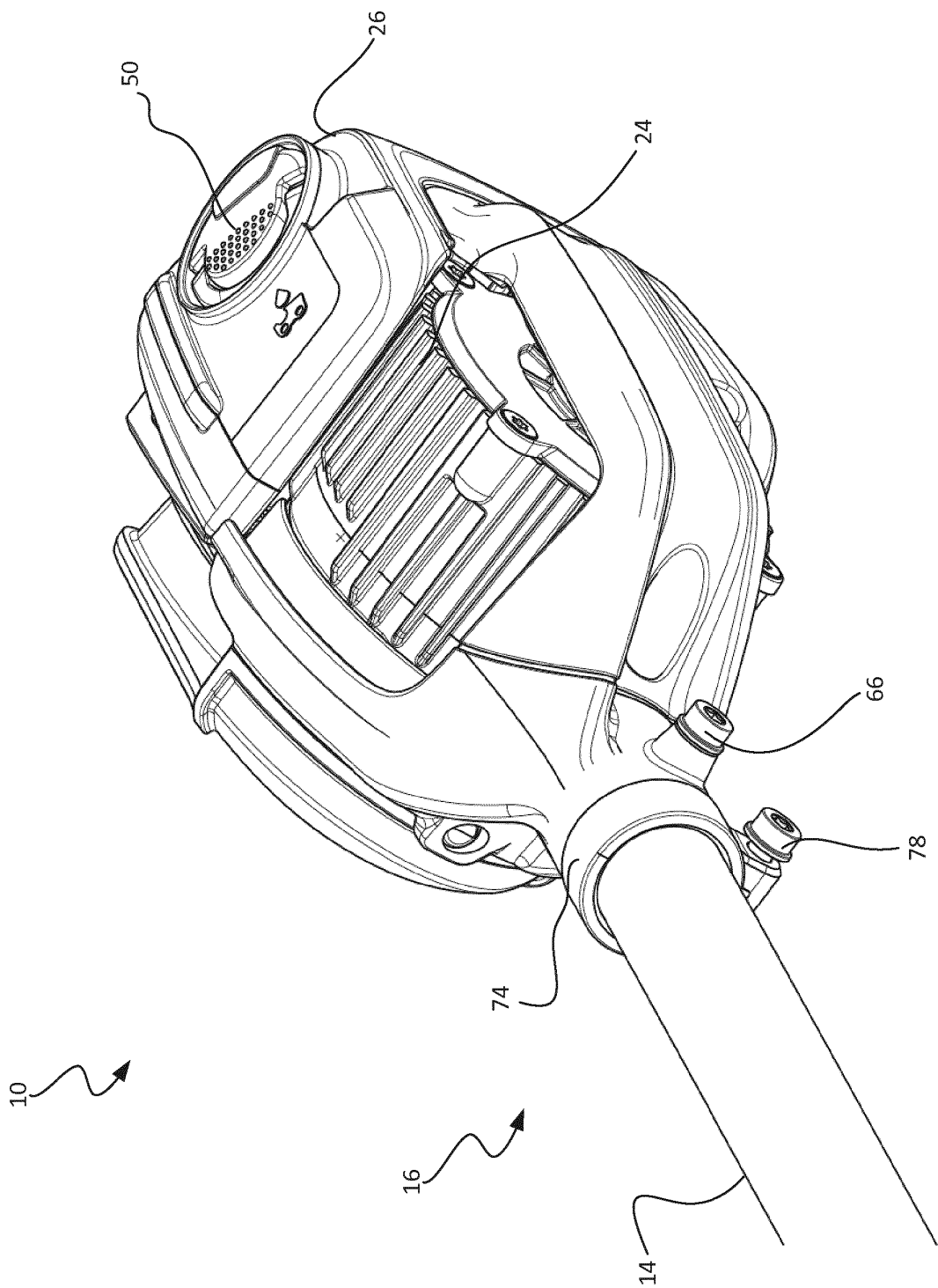


FIG. 7

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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