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(54) **CHAIN SAW**

(57) A chainsaw includes a body housing having a front part, a rear part, and an intermediate part between the front part and the rear part; an electric motor accommodated in the intermediate part of the body housing; a guide plate extending forward from the front part of the body housing; a chain disposed around the guide plate; a handle for a user to hold; a power supply device supplying power to at least the electric motor; and an adjustment device, where the body housing and the handle move relatively through the adjustment device along the extension direction of the adjustment device; the adjustment device includes a telescopic rod assembly having at least a first state and a second state, the length of the telescopic rod assembly in the second state along the front and rear direction is greater than the length of the telescopic rod assembly in the first state along the front and rear direction; in the second state, the center of gravity of the chainsaw is located between the center of the guide plate and the center of the handle.

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Description

TECHNICAL FIELD

[0001] The present application relates to an electric tool, for example, a chain saw.

BACKGROUND

[0002] A chainsaw, also known as a hedge trimmer, is often used for pruning branches or forest trees. The chainsaw is generally a portable small or medium-sized chainsaw. Currently, the portable small or medium-sized chainsaw has a relatively low cutting height and cannot satisfy a working condition in which an object to be cut is slightly higher. A pole saw can satisfy high-position cutting, but cannot satisfy the convenience, lightweight, and flexibility of the portable small or medium-sized chainsaw. In addition to the chainsaw, other handheld power tools, such as electric scissors, a mower, and a handheld circular saw, also face the preceding situation. For portable handheld power tools, the user expects the tools to be compact and lightweight while satisfying the requirements of different pruning heights.

SUMMARY

[0003] A chainsaw includes a body housing having a front part, a rear part, and an intermediate part between the front part and the rear part; an electric motor accommodated in the intermediate part of the body housing; a guide plate extending forward from the front part of the body housing; a chain disposed around the guide plate; a handle for a user to hold; a power supply device supplying power to at least the electric motor; and an adjustment device, where the body housing and the handle move relatively through the adjustment device along the extension direction of the adjustment device. The adjustment device includes a telescopic rod assembly having at least a first state and a second state. The length of the telescopic rod assembly in the second state along the front and rear direction is greater than the length of the telescopic rod assembly in the first state along the front and rear direction. In the second state, the center of gravity of the chainsaw is located between the center of the guide plate and the center of the handle.

[0004] In an example, the handle has a grip; and in the first state, the center of gravity of the chainsaw is located in the grip.

[0005] In an example, the centerline of the handle is basically parallel to the centerline of the guide plate.

[0006] In an example, the centerline of the handle is collinear with the centerline of the guide plate.

[0007] In an example, the telescopic rod assembly is telescopic along the direction of a first straight line, and the first straight line is basically parallel to the centerline of the guide plate.

[0008] In an example, the handle has an upper part and a lower part, a coupling portion is formed on or connected to the lower part of the handle, the power supply device is detachably connected to the coupling portion along the direction of a second straight line, and the second straight line is basically parallel to the centerline of the handle.

[0009] In an example, when the telescopic rod assembly is in the first state, the projection of the power supply device and the projection of the telescopic rod assembly on a projection plane perpendicular to a first plane where the guide plate is located at least partially coincide.

[0010] In an example, a bushing is disposed at the rear end of the telescopic rod assembly, guide ribs parallel to the centerline of the handle are disposed in the handle, and the bushing and the guide ribs mate with each other to guide the telescopic rod assembly to be telescopic along the direction of the first straight line.

[0011] In an example, the handle has an upper part and a lower part, and the chainsaw further includes a circuit board assembly disposed within the lower part of the handle.

[0012] In an example, when the telescopic rod assembly is in the first state, a second plane where the circuit board assembly is located is below the first straight line, and the projection of the circuit board assembly and the projection of the telescopic rod assembly on a projection plane perpendicular to the first plane where the guide plate is located at least partially coincide.

[0013] In an example, the chainsaw further includes a movable wire, a fixed wire, and a first switch disposed on the handle and used for starting and stopping the electric motor, where the movable wire is inserted through the handle and the adjustment device and electrically connected to the power supply device and the electric motor; and the fixed wire is disposed in the handle and electrically connected to the circuit board assembly and the first switch.

[0014] In an example, the chainsaw further includes a first switch for starting and stopping the electric motor and a second switch for locking the starting and stopping states of the electric motor, the first switch and the second switch are disposed on the handle, and the second switch is located in front of the first switch along the direction of the centerline of the handle.

[0015] In an example, in the first state, the adjustment device is at least partially accommodated in the handle.

[0016] In an example, the chainsaw further includes a support assembly disposed on the body housing and/or the handle, where the support assembly is used for supporting the chainsaw and keeping balance when the chainsaw is placed horizontally.

[0017] In an example, the chainsaw further includes a protective part below the handle, and the protective part is used for preventing a broken or fallen chain from injuring the hand of the user.

[0018] The present application further adopts the technical solution below. A chainsaw includes a body housing having a front part, a rear part, and an intermediate part between the front part and the rear part; an electric motor

accommodated in the intermediate part of the body housing; a guide plate extending forward from the front part of the body housing; a chain disposed around the guide plate; a handle for a user to hold; a power supply device supplying power to at least the electric motor; and an adjustment device, where the body housing and the handle move relatively through the adjustment device along the extension direction of the adjustment device. The centerline of the handle is basically parallel to the centerline of the guide plate, and the power supply device is located below the centerline of the handle.

[0019] The present application further adopts the technical solution below. A chainsaw includes a body housing having a front part, a rear part, and an intermediate part between the front part and the rear part; an electric motor disposed in the intermediate part of the body housing; a guide plate extending from the front part of the body housing; a chain disposed around the guide plate; a handle used for a user to hold and having a front end surface and a rear end surface; and an adjustment device, where the body housing and the handle move relatively through the adjustment device along the extension direction of the adjustment device. The ratio of the body length of the body housing to the handle length of the handle is greater than or equal to 0.3 and less than or equal to 0.8, where the body length is the distance between the frontmost side of the front part of the body housing and the rearmost side of the rear part of the body housing, and the handle length is the distance between the front end surface of the handle and the rear end surface of the handle.

[0020] In an example, the ratio of the body length to the handle length is greater than or equal to 0.4 and less than or equal to 0.7.

[0021] In an example, the ratio of the output power of the chainsaw to the body length is greater than or equal to 1.5 W/mm and less than or equal to 3.5 W/mm.

[0022] In an example, the adjustment device includes a telescopic rod assembly, where the telescopic rod assembly is telescopic to at least a first state or a second state along the direction of a first straight line.

[0023] In an example, the ratio of the second length of the chainsaw in the second state to the first length of the chainsaw in the first state is greater than or equal to 1.4 and less than or equal to 2.8.

[0024] In an example, the second length of the chainsaw in the second state is greater than or equal to 800 mm.

[0025] In an example, the telescopic rod assembly includes at least a first connecting rod and a second connecting rod, where the inner diameter of the handle is greater than the outer diameter of the first connecting rod, and the inner diameter of the first connecting rod is greater than the outer diameter of the second connecting rod.

[0026] In an example, the ratio of the outer diameter of the handle to the outer diameter of the first connecting rod is less than or equal to 1.5.

[0027] In an example, the outer diameter of the handle is greater than or equal to 35 mm and less than or equal to 40 mm, and the outer diameter of the first connecting rod is greater than or equal to 25 mm and less than or equal to 30 mm.

[0028] In an example, the ratio of the outer diameter of the first connecting rod to the outer diameter of the second connecting rod is less than or equal to 1.5.

[0029] In an example, the weight of the chainsaw is less than or equal to 2.5 kg.

[0030] The present application further adopts the technical solution below. A chainsaw includes a body housing having a front part, a rear part, and an intermediate part between the front part and the rear part; an electric motor accommodated in the intermediate part of the body housing; a guide plate extending forward from the front part of the body housing; a chain disposed around the guide plate; a handle for a user to hold; a power supply device supplying power to at least the electric motor; and an adjustment device, where the body housing and the handle move relatively through the adjustment device along the extension direction of the adjustment device. The handle has a grip. The chainsaw further includes a protective part connected to the handle and located below the grip, and when the chain is disengaged from the guide plate, the protective part blocks the path on which the chain reaches the grip.

[0031] In an example, the adjustment device includes a telescopic rod assembly, where the telescopic rod assembly has multiple states in which the telescopic rod assembly has different lengths along the front and rear direction.

[0032] In an example, the chainsaw further includes a first switch for starting and stopping the electric motor, and the distance between the rearmost side of the chain exposed outside the body housing and the frontmost side of the first switch along the front and rear direction in at least one state of the telescopic rod assembly is greater than or equal to 125 mm.

[0033] In an example, the distance between the rearmost side of the chain exposed outside the body housing and the frontmost side of the first switch along the front and rear direction in at least one state of the telescopic rod assembly is less than or equal to 125 mm.

[0034] In an example, two ends of the protective part along the front and rear direction are connected to the handle, and the protective part and the handle form a through hole for the hand of the user to pass through.

[0035] In an example, the chainsaw further includes a first switch for starting and stopping the electric motor, and the distance between the frontmost side of the first switch and the rear edge of the through hole along the front and rear direction is greater than or equal to 100 mm.

[0036] In an example, in the projection along the up and down direction, the maximum value of the distance between the outer edge of the protective part on the same side as the guide plate and the outer edge of the handle on the same side as the guide plate in the left and right

direction is greater than or equal to 30 mm.

[0037] In an example, the protective part supports and stabilizes the chainsaw when the chainsaw is placed horizontally.

[0038] In an example, the power supply voltage of the power supply device is greater than or equal to 12 V and less than or equal to 60 V.

BRIEF DESCRIPTION OF DRAWINGS

[0039]

FIG. 1 is a perspective view of a chainsaw in a retracted state as an example of the present application.

FIG. 2 is an exploded view of the chainsaw shown in FIG. 1.

FIG. 3 is a perspective view of the chainsaw shown in FIG. 1 in an extended state.

FIG. 4 is a plan view of the chainsaw shown in FIG. 1.

FIG. 5 is a plan view of part of the internal structure of the chainsaw shown in FIG. 1.

FIG. 6 is a plan view of part of the internal structure of a handle in the chainsaw shown in FIG. 1.

FIG. 7 is a plan view illustrating the body length and the handle length of the chainsaw shown in FIG. 1.

FIG. 8 is a plan view of the first length of the chainsaw shown in FIG. 1.

FIG. 9 is a plan view of the second length of the chainsaw shown in FIG. 3.

FIG. 10 is a plan view illustrating the inner and outer diameters of a handle and the inner and outer diameters of a first connecting rod of the chainsaw shown in FIG. 1.

FIG. 11 is a plan view illustrating the inner and outer diameters of a first connecting rod and the inner and outer diameters of a second connecting rod of the chainsaw shown in FIG. 1.

FIG. 12 is a perspective view of a telescopic rod assembly in the chainsaw shown in FIG. 1 in a first state.

FIG. 13 is a sectional view of the telescopic rod assembly shown in FIG. 12 in the first state.

FIG. 14 is an exploded view of the telescopic rod assembly shown in FIG. 12 in the first state.

FIG. 15 is a perspective view of a telescopic rod assembly in the chainsaw shown in

FIG. 3 in a second state.

FIG. 16 is a sectional view of the telescopic rod assembly shown in FIG. 15 in the second state.

FIG. 17 is an exploded view of the telescopic rod assembly shown in FIG. 15 in the second state.

FIG. 18 is a perspective view of a first locking assembly in a telescopic rod assembly shown in FIG. 1.

FIG. 19 is an exploded view of a second locking assembly in a telescopic rod assembly shown in FIG. 3.

FIG. 20 is a plan view of a protective part of the chainsaw shown in FIG. 1.

DETAILED DESCRIPTION

[0040] In the description of the present application, it is to be noted that orientations or position relations indicated by terms such as "center", "upper", "lower", "left", "right", "front", and "rear" are based on the drawings. These orientations or position relations are intended only to facilitate and simplify the description of the present application and not to indicate or imply that a device or element referred to must have such particular orientations or must be configured or operated in such particular orientations. Thus, these orientations or position relations are not to be construed as limiting the present application. In addition, terms such as "first" and "second" are used merely for the purpose of description or are used for distinguishing between different structures or components, and are not to be construed as indicating or implying relative importance.

[0041] FIG. 1 shows a chainsaw 300 as an example in the present application. As shown in FIGS. 1 to 3, the chainsaw 300 includes a body housing 310, a guide plate 320, a chain 330, and an electric motor 340. At the same time, FIG. 1 defines the directions of the front side, the rear side, the upper side, the lower side, the left side, and the right side in the present application.

[0042] The body housing 310 has a front part 3111, a rear part 3112, and an intermediate part 3113 between the front part 3111 and the rear part 3112, and an accommodation space is formed in the body housing 310. The guide plate 320 extends forward from the front part 3111 of the body housing 310, part of the rear end of the guide plate 320 is located inside the front part 3111 of the body housing 310, and most of the rest of the guide plate 320 extends out of the front part 3111 of the body housing 310. The guide plate 320 supports the chain 330 around the outer periphery of the guide plate 320, and the chain 330 is a functional piece of the chainsaw 300. In some ex-

amples, the chainsaw 300 further includes a protective cover 3121 detachably connected to the front part 3111 of the body housing 310. The protective cover 3121 accommodates part of the guide plate 320 and the chain 330 and protects the chain 330 and the user.

[0043] The electric motor 340 is accommodated in the intermediate part 3113 of the body housing 310. As shown in FIG. 2, in this example, the body housing 310 may include a left body housing 3114 and a right body housing 3115 that can be joined together, and the electric motor 340 may be accommodated in the intermediate part 3113 of the right body housing. After the motor shaft of the electric motor 340 rotates, the chain 330 may be driven directly or indirectly through a transmission assembly so that the chain 330 moves around the guide plate 320 to perform the cutting operation. The motor axis may be basically perpendicular to a first plane 3202 where the guide plate 320 is located. In some examples, the electric motor 340 is a brushless direct current (DC) electric motor 340 so that the dimension of the electric motor 340 is reduced while the performance of the electric motor 340 is maintained.

[0044] The body length L3 is defined as the distance between the frontmost side of the front part 3111 of the body housing 310 and the rearmost side of the rear part 3112 of the body housing 310. In some examples, to take into account both the cutting performance and structural arrangement of the telescopic chainsaw, the ratio of the output power of the chainsaw 300 to the body length L3 may be greater than or equal to 1.5 W/mm and less than or equal to 3.5 W/mm. Specifically, the output power of the chainsaw may be the output power of the electric motor 340, the rated power of the electric motor 340, or the power of an output shaft driving the chain 330 to move. In other examples, the ratio of the output power of the chainsaw 300 to the body length L3 may be greater than or equal to 2 W/mm and less than or equal to 3 W/mm.

[0045] As shown in FIGS. 1 to 3, the chainsaw 300 further includes a handle 350, an adjustment device 360, and a power supply device 370.

[0046] The handle 350 is used for the user to hold and has an upper part 3511 and a lower part 3512, and an accommodation space is formed in the handle 350. The front end of the upper part 3511 of the handle forms a front end 3513 of the handle, the rear end of the upper part 3511 of the handle is connected to the lower part 3512 of the handle, and the rear end of the upper part 3511 of the handle and the rear end of the lower part 3512 of the handle together form a rear end 3514 of the handle. The handle 350 is located on the rear side of the body housing 310. The front end 3513 of the handle is close to the rear part 3112 of the body housing 310, and the rear end 3514 of the handle is away from the body housing 310. A handle grip 3516 actually held by the user is between the front end 3513 and the rear end 3514 of the handle. The cross section of the handle grip 3516 may be quasi-circular or quasi-rectangular, and the centerline 3501 of the handle passes through the handle grip 3516. As shown in FIGS. 4 and 5, the centerline 3501 of the handle 350 is basically parallel to the centerline 3201 of the guide plate 320 to provide a more stable center of gravity of the telescopic chainsaw. In this example, the centerline 3501 of the handle and the centerline 3201 of the guide plate may coincide and are the same straight line to further stabilize the center of gravity. In other cases, the centerline 3501 of the handle may be parallel to the centerline 3201 of the guide plate, and the centerline 3501 of the handle is located above or below the centerline 3201 of the guide plate.

[0047] As shown in FIG. 7, the body length L3 is defined as the distance between the frontmost side of the front part 3111 of the body housing 310 and the rearmost side of the rear part 3112 of the body housing 310, and the handle length L4 is defined as the distance between the front end surface 3513 of the handle and the rear end surface 3514 of the handle. In some examples, to optimize the center of gravity of the telescopic chainsaw and improve the operating feel of the telescopic chainsaw, the ratio of the body length L3 to the handle length L4 may be greater than or equal to 0.3 and less than or equal to 0.8. In other examples, the ratio of the body length L3 to the handle length L4 may be greater than or equal to 0.4 and less than or equal to 0.7. Through the change in the length of the adjustment device 360, the adjustment device 360 causes the body housing 310 and the handle 350 to move relative to each other in the telescopic direction of the adjustment device 360. The adjustment device 360 has the retracted state and the extended state and may further include one or more semi-extended states between the retracted state and the extended state. The length of the chainsaw 300 in the retracted state is shorter, the length of the chainsaw 300 in the extended state or the semi-extended state is longer, and the length of the chainsaw 300 in the extended state is greater than the length of the chainsaw 300 in the semi-extended state. The adjustment device 360 may be implemented by multiple connecting rods sleeved in sequence and a locking assembly, and the specific structure is described in detail below. As shown in FIGS. 1, 4, and 5, when the adjustment device 360 is in the retracted state, the front end surface 3513 of the handle abuts against the rear part 3112 of the body housing 310; and the adjustment device 360 may be entirely accommodated in the handle 350, or the adjustment device 360 may be partially accommodated in the handle 350 and partially accommodated in the body housing 310. As shown in FIGS. 3 and 9, when the adjustment device 360 is in the extended state, the front end surface 3513 of the handle is separated from the rear part 3112 of the body housing 310, the adjustment device 360 may be located between the handle 350 and the body housing 310, part of the rear end of the adjustment device 360 may be located in the handle 350, part of the front end of the adjustment device 360 may be located in the rear part 3112 of the body housing 310, and most of the rest of the adjustment device 360 extends out of the

handle 350 and the body housing 310.

[0048] A first switch 352 for the user to operate is disposed on the handle 350. The first switch 352 may be located near the front end surface 3513 of the handle. The first switch 352 may be used for controlling the starting or stopping of the electric motor 340 and may also be used for controlling the rotational speed of the electric motor 340. In this example, the first switch may be a trigger switch 352. The trigger switch 352 may be located near the front end 3513 of the handle and may rotate around the shaft relative to the handle 350. When the chainsaw 300 is equipped with the power supply device 370, the torque from the first switch 352 to the frontmost side of the chain 330 is less than or equal to 2.6 N·m. In other cases, the first switch 352 may be a toggle switch 52 that is toggled along the front and rear direction or the left and right direction.

[0049] The power supply device 370 can supply power to at least the electric motor 340 so that the electric motor 340 can drive the chain 330 to move around the guide plate 320. In this example, the power supply device 370 is a battery pack 370, and the power supply voltage of the battery pack 370 is greater than or equal to 12 V and less than or equal to 60 V. However, the power supply device 370 is not limited to the battery pack, and the chainsaw 300 may be powered in other forms. In some cases, power supply may be achieved using AC power in conjunction with related circuits such as the transformer circuit, the rectifier circuit, and the voltage regulator circuit or the power adapter. As shown in FIGS. 4 and 5, the power supply device 370 is located below the centerline 3501 of the handle 350 and is connected to the rear end 3514 of the handle. In this example, the lower part 3512 of the handle is formed with or connected to a coupling portion 3515. A battery pack 70 is detachably connected to the coupling portion 3515 along the direction of a second straight line 701. The battery pack 70 may be inserted into the coupling portion 3515 or pulled out from the coupling portion 3515 along the direction of the second straight line 701. In this example, the second straight line 701 is basically parallel to the centerline 3501 of the handle. For example, the plane where the battery pack 70 is located may be perpendicular to the first plane 3202 where the guide plate 320 is located. In other cases, the second straight line 701 may be at a certain angle to the centerline 3501 of the handle.

[0050] In some examples, the total weight of the chainsaw 300 to which the power supply device 370 is not mounted is less than or equal to 2.5 kg. In other examples, the total weight of the chainsaw 300 to which the power supply device 370 is not mounted is less than or equal to 2 kg.

[0051] The chainsaw 300 further includes a circuit board assembly 380 for controlling the power supply status of the power supply device 370 and the operating status of the electric motor 340. As shown in FIGS. 4 and 5, the circuit board assembly 380 is disposed in the lower part 3512 of the handle, located below the centerline 3501 of the handle, and supported by the handle 350. The circuit board centerline 3801 of the circuit board assembly 380 may be parallel to the centerline 3501 of the handle. In some examples, a second plane 3802 where the circuit board assembly 380 is located may be entirely below the centerline 3501 of the handle and may be perpendicular to the first plane 3202 where the guide plate 320 is located.

[0052] The chainsaw 300 further includes a fixed wire 381 and a movable wire 382. The fixed wire 381 may electrically connect the circuit board assembly 380 to the first switch 352, and the position of the fixed wire 381 may be fixed and may be a conventional circuit line. As shown in FIG. 6, the fixed wire 381 may start from the circuit board assembly 380 in the lower part 3512 of the handle, pass through the handle 350 along a wire groove 3519 on the lower inner wall of the upper part 3511 of the handle, and reach the first switch 352 near the front end 3513 of the handle. The movable wire 382 may electrically connect the power supply device 370 to the electric motor 340. Since the adjustment device 360 with varying lengths exists between the power supply device 370 and the electric motor 340, the movable wire 382 may be a spring wire 382 that is telescopic with the adjustment device 360 without affecting the power supply stability. As shown in FIG. 6, the spring wire 382 is inserted through the rear end 3514 of the handle and the adjustment device 360. In some examples, when the adjustment device 360 is in the retracted state, the spring wire 382 may be in a pre-stretched state so that the service life of the spring wire 382 can be extended.

[0053] The lower part 3512 of the handle is further provided with a heat dissipation port 383 on the housing close to the circuit board assembly 380. The heat dissipation port 383 can physically dissipate heat for the circuit board assembly 380. In other cases, the chainsaw 300 further includes a fan, the fan may be mounted on the motor shaft and rotate with the motor shaft, the adjustment device 360 is designed to be in a highly airtight state, the heat dissipation port 383 may be an airflow inlet, and the cooling airflow generated by the fan may flow through the circuit board assembly 380, the adjustment device 360, and the electric motor 340 so that the heat dissipation performance of the telescopic chainsaw can be improved.

[0054] A second switch 353 for the user to operate is further disposed on the handle. The second switch 353 can lock the electric motor 340 to remain in the starting state or the stopping state. In some examples, the second switch 353 may be disposed on the upper side of the first switch 352 along the up and down direction, and the second switch 353 in the handle 350 may be located between the first switch 352 and a telescopic rod assembly 361; however, the second switch 353 located between the first switch 352 and the telescopic rod assembly 361 causes the outer diameter D of the handle 350 to increase, affecting the user's feeling of holding the handle 350. As shown in FIG. 6, in this example, the second

switch 353 may be disposed on the front side of the first switch 352 along the front and rear direction, and the second switch 353 in the handle 350 may be located on the front side of the first switch 352, on the lower side of the telescopic rod assembly 361, and near the front end 3513 of the handle, thereby not causing an increase in the outer diameter of the handle 350 and improving the user's feeling of holding the handle 350. In other examples, the second switch 353 further has an inclined surface at the position of the thumb of the user when the user holds the chainsaw 300 so that the user can rest the thumb on the second switch 353 comfortably.

[0055] The chainsaw 300 further includes a support assembly 390 for enabling the chainsaw 300 to which the power supply device 370 is mounted or not to stand horizontally. That is, when the chainsaw 300 is placed horizontally, the support assembly 390 can support the chainsaw 300 and enable the chainsaw 300 to keep balance and stability. At this time, the centerline 3201 of the guide plate of the chainsaw 300 remains basically parallel to the horizontal plane or at an unchanged included angle to the horizontal plane. In some examples, the support assembly 390 may include at least a first support member 391 and a second support member 392, where the first support member 391 is in front and the second support member 392 is in the rear. The support provided by the first support member 391 or the second support member 392 when the chainsaw 300 stands horizontally may be any one of point support, line support, or surface support or any combination thereof. In some examples, the chainsaw 300 to which the power supply device 370 is mounted or not is supported by the first support member 391 and the second support member 392 to stand horizontally. In other examples, the chainsaw 300 to which the power supply device 370 is not mounted is supported by the first support member 391 and the second support member 392 to stand horizontally, and the chainsaw 300 to which the power supply device 370 is mounted is supported by the first support member 391 and the power supply device 370 mounted on the rear part of the chainsaw 300 to stand horizontally. As shown in FIGS. 3 and 4, in some examples, the first support member 391 is connected to the body housing 310 or is a part of the body housing 310. For example, the first support member 391 may be a triangular support shown in the figure. The second support member 392 is connected to the handle 350. For example, the second support member 392 may be a rectangular handguard shown in the figure. When the chainsaw 300 to which the power supply device 370 is not mounted is placed on a horizontal surface, the chainsaw 300 is supported by the bottom end of the first support member 391 and the front edge of the second support member 392. When the chainsaw 300 to which the power supply device 370 is mounted is placed on a horizontal surface, the chainsaw 300 is supported by the bottom end of the first support member 391 and the bottom surface of the power supply device 370.

[0056] In some examples, the chainsaw 300 further includes a protective part below the grip 3516 of the handle 350, the front and rear ends of the protective part are connected to the handle 350, and the protective part and the handle 350 form a through hole 3502 for the user to pass through so that in unexpected cases, for example, the chain 330 falls off the guide plate 320 or the chain 330 is broken, the path of the chain 330 hitting the human hand is blocked, thereby protecting the user and preventing the unsupported chain 330 from cutting the human hand. In some examples, the protective part and the handle 350 are integrally formed. As shown in FIGS. 8 and 20, in this example, the protective part is a handle baffle, that is, a rectangular handguard 92 that has the functions of a support member and a protective part. In some examples, the distance Lb between the frontmost side of the first switch 352 and the rear edge of the through hole 3502 is greater than or equal to 100 mm. The frontmost side of the first switch 352 is the frontmost end of the intersecting line of the first switch 352 and the handle 350 in the projection along the left and right direction, and the rear edge of the through hole 3502 is the rearmost end that the fingers can reach in the through hole 3502 when the user holds the handle 350 with four fingers. In some examples, in the projection along the up and down direction, the maximum value of the distance Lc between the outer edge 3901 of a protective part 392 on the same side as the guide plate 320 and the outer edge 3503 of the handle 350 on the same side as the guide plate 320 in the left and right direction is greater than or equal to 30 mm. Specifically, the outer edge 3503 of the handle 350 on the same side as the guide plate 320 may be the outer edge 3503 of the grip 3516 of the handle 350.

[0057] In some examples, the distance La between the rearmost side of the chain 330 exposed outside the body housing 310 and the frontmost side of the first switch 352 in the front and rear direction at least in some states during the telescopic process of the adjustment device 360 is greater than or equal to 125 mm. In some examples, it is not excluded that La is less than 125 mm in some states. The rearmost side of the chain 330 exposed outside the body housing 310 is the rearmost end of the intersecting line of the chain 330 and the body housing 310 in the projection along the left and right direction.

[0058] FIGS. 12 to 17 show the adjustment device 360 in the chainsaw 300 shown in FIGS. 1 and 3. The adjustment device 360 includes the telescopic rod assembly 361, where the telescopic rod assembly 361 is telescopic to at least a first state or a second state along the direction of a first straight line 3101. The first straight line 3101 is basically parallel to the centerline 3201 of the guide plate, that is, the first straight line 3101 is basically parallel to the centerline 3201 of the guide plate and the centerline 3501 of the handle. The telescopic rod assembly 361 is telescopic along the direction of the centerline 3201 of the guide plate or the centerline 3501 of the handle. In some examples, the first straight line 3101, the centerline 3201

of the guide plate, and the centerline 3501 of the handle coincide and are the same straight line.

[0059] As shown in FIGS. 1, 4, 5, and 8, the telescopic rod assembly 361 is in the first state, the adjustment device 360 is in the retracted state, the length of the chainsaw 300 at this time is defined as the first length L1 of the chainsaw 300, and the first length L1 is the minimum length of the telescopic chainsaw 300. As shown in FIGS. 3 and 9, the telescopic rod assembly 361 is in the second state, the adjustment device 360 is in the extended state, the length of the chainsaw 300 at this time is defined as the second length L2 of the chainsaw 300, and the second length L2 is the maximum length of the telescopic chainsaw 300. In some examples, the telescopic rod assembly 361 is in other intermediate states between the first state and the second state, and the adjustment device 360 is in the semi-extended state. At this time, the length of the chainsaw 300 is between the first length L1 and the second length L2.

[0060] In some examples, to take into account both the telescopic function and the good center of gravity, the ratio of the second length L2 to the first length L1 of the chainsaw 300 may be greater than or equal to 1.4 and less than or equal to 2.8. In other examples, the ratio of the second length L2 to the first length L1 of the chainsaw 300 may be greater than or equal to 1.6 and less than or equal to 2.6. In other examples, the first length L1 of the chainsaw 300 is less than or equal to 550 mm, and the second length L2 of the chainsaw 300 is greater than or equal to 800 mm.

[0061] As shown in FIGS. 1, 4, and 5, when the telescopic rod assembly 361 is in the first state, the telescopic rod assembly 361 is retracted and accommodated in the handle 350. Viewed from top to bottom at the rear end 3514 of the handle, the housing of the upper part 3511 of the handle, the telescopic rod assembly 361, the housing of the lower part 3512 of the handle, and the power supply device 370 exist in sequence. The projection of the power supply device 370 and the projection of the telescopic rod assembly 361 on a projection plane perpendicular to the first plane 3202 where the guide plate 320 is located at least partially coincide. In some examples, viewed from top to bottom at the rear end 3514 of the handle, the housing of the upper part 3511 of the handle, the telescopic rod assembly 361, the circuit board assembly 380, the housing of the lower part 3512 of the handle, and the power supply device 370 exist in sequence. The projection of the circuit board assembly 380 and the projection of the telescopic rod assembly 361 on the projection plane perpendicular to the first plane 3202 where the guide plate 320 is located at least partially coincide.

[0062] In this example, when the telescopic rod assembly 361 is in the first state, the center of gravity of the chainsaw 300 to which the power supply device 370 is mounted is located at the handle grip 3516, which is at the purlicue in the axial direction of the handle when the user holds the handle, and the distance between the center of gravity of the chainsaw 300 and the centerline 3501 of the handle in the radial direction of the handle is less than or equal to 10 mm.

[0063] As shown in FIGS. 3 and 9, when the telescopic rod assembly 361 is in the second state, the telescopic rod assembly 361 extends out of the handle 350. Viewed from top to bottom at the rear end 3514 of the handle, the housing of the upper part 3511 of the handle, the housing of the lower part 3512 of the handle, and the power supply device 370 exist in sequence, or the housing of the upper part 3511 of the handle, part of the rear end of the telescopic rod assembly 361, the housing of the lower part 3512 of the handle, and the power supply device 370 exist in sequence. In some examples, viewed from top to bottom at the rear end 3514 of the handle, the housing of the upper part 3511 of the handle, the circuit board assembly 380, the housing of the lower part 3512 of the handle, and the power supply device 370 exist in sequence, or the housing of the upper part 3511 of the handle, part of the rear end of the telescopic rod assembly 361, the circuit board assembly 380, the housing of the lower part 3512 of the handle, and the power supply device 370 exist in sequence.

[0064] In this example, when the telescopic rod assembly 361 is in the second state, the center of gravity of the chainsaw 300 to which the power supply device 370 is mounted is located between the center of the handle 350 and the center of the guide plate 320.

[0065] As shown in FIGS. 12 and 15, the telescopic rod assembly 361 may be formed by multiple connecting rods sleeved in sequence. The telescopic rod assembly 361 includes at least a first connecting rod 3611 and a second connecting rod 3612. The first connecting rod 3611 is closer to the handle 350 when the adjustment device 360 is in the extended state and is slidably connected to the handle 350. The second connecting rod 3612 is closer to the body housing 310 when the adjustment device 360 is in the extended state, and the front end of the second connecting rod 3612 is fixedly connected to the rear part of the body housing 310. In some examples, the first connecting rod 3611 and the second connecting rod 3612 may be made of aluminum alloys, magnesium alloys, or carbon fiber materials to improve the operating feeling of the telescopic chainsaw 300 without affecting the performance of the telescopic chainsaw 300.

[0066] In some examples, the first connecting rod 3611 and the second connecting rod 3612 may be flat tubes or square tubes, thereby enhancing the anti-rotation capability of the telescopic rod assembly 361, keeping the stability of the first connecting rod 3611 and the second connecting rod 3612 in the handle 350, and prevent the rotation of the first connecting rod 3611 and the second connecting rod 3612.

[0067] In some examples, as shown in FIGS. 6, 14, and 17, a bushing 364 is disposed at the rear end of the first connecting rod 3611, and the bushing 364 is clamped with the rear end 3514 of the handle so that the first connecting rod 3611 remains stable in the handle 350;

guide ribs 3518 parallel to the centerline 3501 of the handle are disposed on the inner wall of the handle 350, and the bushing 364 at the rear end of the first connecting rod 3611 and/or the outer wall of the first connecting rod 3611 may mate with the guide ribs 3518 so that the first connecting rod 3611 is telescopic along the direction parallel to the centerline 3501 of the handle, and the stability of the first connecting rod 3611 during the telescopic process is ensured; the bushing 364 may abut against the housing at the front end 3513 of the handle when the telescopic rod assembly 361 is in the second state, thereby preventing the first connecting rod 3611 from being disengaged from the handle 350. In other examples, a bushing is disposed at the rear end of the second connecting rod 3612, and the bushing is clamped with the inner wall of the first connecting rod 3611 so that the second connecting rod 3612 remains stable in the first connecting rod 3611; and when the telescopic rod assembly 361 is in the second state, the bushing abuts against a second locking assembly 363 described below, thereby preventing the second connecting rod 3612 from being disengaged from the first connecting rod 3611.

[0068] As shown in FIGS. 10 and 11, the outer diameter D1 of the first connecting rod 3611 is less than the inner diameter d of the handle, and the outer diameter D2 of the second connecting rod 3612 is less than the inner diameter d1 of the first connecting rod 3611. The following mainly describes the case where the telescopic rod assembly 361 includes the first connecting rod 3611 and the second connecting rod 3612. In other cases, the telescopic rod assembly 361 may include the first connecting rod 3611, the second connecting rod 3612, and at least one intermediate connecting rod. When the adjustment device 360 is in the extended state, the inner diameter of the connecting rod closer to the handle 350 in the front and rear direction is greater than the outer diameter of the connecting rod closer to the rear part 3112 of the body housing 310.

[0069] As shown in FIGS. 10 and 11, in some examples, to improve the operating feel of the telescopic chainsaw 300 and reduce the handle diameter, the ratio of the outer diameter D of the handle 350 to the outer diameter D1 of the first connecting rod 3611 may be less than or equal to 1.5, less than or equal to 1.4, or less than or equal to 1.3. In other examples, to improve the operating feel of the telescopic chainsaw 300, the ratio of the outer diameter D1 of the first connecting rod 3611 to the outer diameter D2 of the second connecting rod 3612 may be less than or equal to 1.5, less than or equal to 1.4, or less than or equal to 1.3. In other examples, to improve the operating feel of the telescopic chainsaw 300, the outer diameter D of the handle 350 is greater than or equal to 35 mm and less than or equal to 40 mm, and the outer diameter D1 of the first connecting rod 3611 is greater than or equal to 25 mm and less than or equal to 30 mm.

[0070] The adjustment device 360 further includes a first locking assembly 362 and a second locking assembly 363. The first locking assembly 362 is used for locking the handle 350, the first connecting rod 3611, the second connecting rod 3612, and the body housing 310 when the telescopic rod assembly 361 is in the first state so that in the first state, the first connecting rod 3611 and the second connecting rod 3612 remains in the state in which the first connecting rod 3611 and the second connecting rod 3612 are retracted and accommodated in the handle 350 and the front end 3513 of the handle closely abuts against the rear part 3112 of the body housing 310. The first locking assembly 362 is further used for locking the handle 350 and the first connecting rod 3611 when the telescopic rod assembly 361 is in the second state so that in the second state, the first connecting rod 3611 remains extended out of the front end 3513 of the handle. The second locking assembly 363 is used for locking the first connecting rod 3611 and the second connecting rod 3612 when the telescopic rod assembly 361 is in the second state so that in the second state, the second connecting rod 3612 remains extended out of the front end 3513 of the handle.

[0071] As shown in FIGS. 14, 17, and 18, in some examples, the first locking assembly 362 is connected to the inner wall of the handle 350. In this example, the first locking assembly 362 includes a first protective plate 3621 fixedly connected to the inner wall of the handle 350, a first seesaw 3623 rotatably connected to the first protective plate 3621 through a first rotary shaft 3622, and a reset torsion spring 3624 sleeved on the first rotary shaft 3622 and connected to the first seesaw 3623. The front end of the first connecting rod 3611 is provided with a first locking hole 3611a, and the front end of the second connecting rod 3612 is provided with a second locking hole 3612a. When the telescopic rod assembly 361 is in the first state, the first locking hole 3611a is aligned with the second locking hole 3612a, and one end of the first seesaw 3623 is inserted through the first locking hole 3611a and the second locking hole 3612a so that the positions of the first connecting rod 3611 and the second connecting rod 3612 are locked. Further, the rear end of the first connecting rod 3611 is provided with a third locking hole 3611b. When the telescopic rod assembly 361 is in the second state, one end of the first seesaw 3623 is inserted into the third locking hole 3611b so that the position of the first connecting rod 3611 is locked. In some examples, the first seesaw 3623 points to the center of the cross section of the handle grip 3516 when inserted into the locking hole.

[0072] As shown in FIGS. 14, 17, and 19, in some examples, the second locking assembly 363 is connected to the outer wall of the first connecting rod 3611. In this example, the second locking assembly 363 includes a second protective plate 3631 fixedly connected to the outer wall of the first connecting rod 3611, a second seesaw 3633 rotatably connected to the second protective plate 3631 through a second rotary shaft 3632, and a resistance spring 3634 sandwiched between the

second protective plate 3631 and the second seesaw 3633. Further, the front end of the first connecting rod 3611 is provided with a fifth locking hole 3611c, and the rear end of the second connecting rod 3612 is provided with a fourth locking hole 3612b. When the telescopic rod assembly 361 is in the second state, one end of the second seesaw 3633 is inserted through the fourth locking hole 3612b and the fifth locking hole 3611c so that the positions of the first connecting rod 3611 and the second connecting rod 3612 are locked. In some examples, the second seesaw 3633 points to the center of the cross section of the handle grip 3516 when inserted into the locking hole. In some examples, the second protective plate 3631 may be annular and form a closed space on the outer wall of the first connecting rod 3611. The closed space accommodates the second seesaw 3633, the resistance spring 3634, and the like, thereby achieving a dust-proof effect and avoiding interference from branch debris during the cutting operation.

[0073] To avoid mutual interference between the first locking assembly 362 and the second locking assembly 363, the third straight line where the first locking hole 3611a, the second locking hole 3612a, and the third locking hole 3611b are located does not coincide with the fourth straight line where the fourth locking hole 3612b and the fifth locking hole 3611c are located. For example, the first locking hole 3611a, the second locking hole 3612a, and the third locking hole 3611b may be disposed on the left inner wall or the right inner wall of the first connecting rod 3611 and the second connecting rod 3612, and the fourth locking hole 3612b and the fifth locking hole 3611c may be disposed on the upper inner wall or the lower inner wall of the first connecting rod 3611 and the second connecting rod 3612. The first locking hole 3611a, the second locking hole 3612a, and the third locking hole 3611b may be disposed on the upper inner wall or the lower inner wall of the first connecting rod 3611 and the second connecting rod 3612, and the fourth locking hole 3612b and the fifth locking hole 3611c may be disposed on the left inner wall or the right inner wall of the first connecting rod 3611 and the second connecting rod 3612.

[0074] In some examples, the first seesaw 3623 and the second seesaw 3633 may be square seesaws, and the corresponding locking holes are square locking holes so that the locking between the seesaws and the locking holes is more stable.

[0075] An adjustment switch 354 for the user to operate is disposed on the handle 350. The adjustment switch 354 may be disposed at the front end 3513 of the handle and near the handle grip 3516. The adjustment switch 354 is used for enabling or disabling the first locking assembly 362. Specifically, the adjustment switch 354 may include a button 354. When the button 354 is triggered, the pressure is applied to the non-insertion end of the first seesaw 3623 so that the first seesaw 3623 rotates around the shaft, and the insertion end of the first seesaw 3623 is disengaged from the locking hole.

[0076] As shown in FIG. 6, a limiting block 3517 is disposed on the inner wall of the handle 350. The limiting block 3517 may be disposed near the front end surface 3513 of the handle to enable or disable the second locking assembly 363. Specifically, when the limiting block 3517 is triggered, the limiting block 3517 may abut against the second seesaw 3633 and compress the resistance spring 3634 so that the second seesaw 3633 rotates around the shaft, and the insertion end of the second seesaw 3633 is disengaged from the locking hole.

[0077] The following first describes the extension process of the chainsaw 300 when the telescopic rod assembly 361 changes from the first state to the second state.

[0078] It is assumed that the telescopic rod assembly 361 is currently in the first state, and the insertion end of the first seesaw 3623 is inserted through the first locking hole 3611a and the second locking hole 3612a. When the user presses the button 54 to apply pressure to the non-insertion end of the first seesaw 3623, the first seesaw 3623 rotates around the first rotary shaft 3622, and the insertion end of the first seesaw 3623 is disengaged from the first locking hole 3611a and the second locking hole 3612a. If the limiting block 3517 is set in a triggered state when the telescopic rod assembly 361 is in the first state, that is, the limiting block 3517 in the first state abuts against the second seesaw 3633 and compresses the resistance spring 3634, and the insertion end of the second seesaw 3633 is not inserted into the fifth locking hole 3611c, then after the insertion end of the first seesaw 3623 is disengaged from the first locking hole 3611a and the second locking hole 3612a, the user can directly pull out the first connecting rod 3611 and the second connecting rod 3612, and whether the connecting rod extends out of the handle first is the first connecting rod 3611 or the second connecting rod 3612 is determined by the friction between the handle and the first connecting rod 3611 and the friction between the first connecting rod 3611 and the second connecting rod 3612.

[0079] When the first connecting rod and the second connecting rod extend out of the handle in sequence, the second seesaw 3633 abuts against the limiting block 3517 or the outer wall of the second connecting rod 3612 and compresses the resistance spring 3634, and the second seesaw 3633 remains uninserted into the fifth locking hole 3611c or inserted into the fifth locking hole 3611c but not into the fourth locking hole 3612b until the first connecting rod 3611 and the second connecting rod 3612 fully extend out of the handle 350; the second seesaw 3633 moves to the fourth locking hole 3612b and then is driven by the resistance spring 3634 to be inserted through the fourth locking hole 3612b and the fifth locking hole 3611c; and the first seesaw 3623 moves to the third locking hole 3611b and then is driven by the reset torsion spring 3624 to be inserted through the third locking hole 3611b, and the telescopic rod assembly 361 reaches the second state.

[0080] If the limiting block 3517 is set in a non-triggered state when the telescopic rod assembly 361 is in the first state, that is, the limiting block 3517 in the first state does not abut against the second seesaw 3633 or compress the resistance spring 3634, and the insertion end of the second seesaw 3633 is inserted into the fifth locking hole 3611c, then after the insertion end of the first seesaw 3623 is disengaged from the first locking hole 3611a and the second locking hole 3612a, the user can pull out the first connecting rod 3611 or the second connecting rod 3612.

[0081] In the case where the first connecting rod 3611 is pulled out first, the force applied by the user causes the limiting block 3517 to be triggered, the insertion end of the second seesaw 3633 is first disengaged from the fifth locking hole 3611c, the first connecting rod 3611 extends out of the handle, the second seesaw 3633 abuts against the outer wall of the second connecting rod 3612 and compresses the resistance spring 3634, and the second seesaw 3633 remains inserted into the fifth locking hole 3611c but not into the fourth locking hole 3612b until the first connecting rod 3611 and the second connecting rod 3612 fully extend out of the handle 350; the second seesaw 3633 moves to the fourth locking hole 3612b and then is driven by the resistance spring 3634 to be inserted through the fourth locking hole 3612b and the fifth locking hole 3611c; and the first seesaw 3623 moves to the third locking hole 3611b and then is driven by the reset torsion spring 3624 to be inserted through the third locking hole 3611b, and the telescopic rod assembly 361 reaches the second state.

[0082] In the case where the second connecting rod 3612 is pulled out first, the limiting block 3517 limits the extension of the first connecting rod 3611, and the second seesaw 3633 remains inserted into the fifth locking hole 3611c but not into the fourth locking hole 3612b until the second seesaw 3633 moves to the fourth locking hole 3612b and then is inserted through the fourth locking hole 3612b and the fifth locking hole 3611c; before the first seesaw 3623 is inserted into the first locking hole 3611a and the telescopic rod assembly 361 can reach the second state, a third state is reached in which the second connecting rod 3612 extends out of the handle 350 and the first connecting rod 3611 is retracted and accommodated in the handle 350, where the third state is the semi-extended state of the adjustment device 360; and then the user may pull out the first connecting rod 3611. For the subsequent specific process of reaching the second state, reference may be made to the relevant description above, and the details are not repeated here.

[0083] The following describes the retraction process of the chainsaw 300 when the telescopic rod assembly 361 changes from the second state to the first state.

[0084] It is assumed that the telescopic rod assembly 361 is currently in the second state, the insertion end of the first seesaw 3623 is inserted into the third locking hole 3611b, and the insertion end of the second seesaw 3633 is inserted through the fourth locking hole 3612b and the fifth locking hole 3611c. After the user presses the button 354 to apply pressure to the non-insertion end of the first seesaw 3623, the first seesaw 3623 rotates around the shaft, the insertion end of the first seesaw 3623 is disengaged from the third locking hole 3611b, and the first connecting rod 3611 can first retract into the handle 350 until the first seesaw 3623 moves to the first locking hole 3611a; and then the limiting block 3517 on the inner wall of the handle 350 enters the triggered state, and the limiting block 3517 abuts against the second seesaw 3633 and compresses the resistance spring 3634 so that the insertion end of the second seesaw 3633 is disengaged from the fourth locking hole 3612b and the fifth locking hole 3611c, and the second connecting rod 3612 can retract into the handle 350 until the first seesaw 3623 moves to the second locking hole 3612a and is inserted through the first locking hole 3611a and the second locking hole 3612a. In this manner, the telescopic rod assembly 361 reaches the first state.

[0085] In some examples, the adjustment device 360 may further include a greater number of locking assemblies in other forms, the telescopic rod assembly 361 may further include an intermediate connecting rod, and the connecting rods may be provided with a greater number of locking holes. In this manner, the locking assemblies mate with the telescopic rod assembly so that the stepless adjustment of the adjustment device 360 is achieved, and the length of the adjustment device 360 can be locked at any length value within a length range during the adjustment process.

Claims

1. A chainsaw (300), comprising:

a body housing (310) having a front part (3111), a rear part (3112), and an intermediate part (3113) between the front part and the rear part;
an electric motor (340) accommodated in the intermediate part of the body housing;
a guide plate (320) extending forward from the front part of the body housing;
a chain (330) disposed around the guide plate;
a handle (350) for a user to hold;
a power supply device (370) supplying power to at least the electric motor; and
an adjustment device (360), wherein the body housing and the handle move relatively through the adjustment device along an extension direction of the adjustment device;
wherein the adjustment device comprises a telescopic rod assembly (361) having at least a first state and a second state, a length (L2) of the telescopic rod assembly in the second state along a front and rear direction is greater than a length (L1) of the telescopic rod assembly in the first state along the front and rear direction;

and
in the second state, a center of gravity of the chainsaw is located between a center of the guide plate and a center of the handle.

2. The chainsaw of claim 1, wherein the handle comprises a grip (3516), and in the first state, the center of gravity of the chainsaw is located in the grip.

3. The chainsaw of claim 1, wherein the telescopic rod assembly is telescopic along the direction of a first straight line (3101), and the first straight line is basically parallel to a centerline (3201) of the guide plate.

4. The chainsaw of claim 1, wherein a centerline (3501) of the handle is basically parallel to a centerline (3201) of the guide plate.

5. The chainsaw of claim 1, wherein the handle comprises an upper part (3511) and a lower part (3512), a coupling portion (3515) is formed on or connected to the lower part of the handle, the power supply device is detachably connected to the coupling portion along the direction of a second straight line (701), and the second straight line is basically parallel to a centerline (3201) of the handle.

6. The chainsaw of claim 1, wherein when the telescopic rod assembly is in the first state, the projection of the power supply device and the projection of the telescopic rod assembly on a projection plane perpendicular to a first plane (3202) where the guide plate is located at least partially coincide.

7. The chainsaw of claim 1, further comprising a circuit board (380) assembly disposed within the lower part of the handle, the handle comprises an upper part (3511) and a lower part (3512), wherein when the telescopic rod assembly is in the first state, a second plane (3802) where the circuit board assembly is located is below the first straight line, and a projection of the circuit board assembly and a projection of the telescopic rod assembly on a projection plane perpendicular to a first plane (3202) where the guide plate is located at least partially coincide.

8. The chainsaw of claim 7, further comprising a movable wire (382), a fixed wire (381), and a first switch (352) disposed on the handle and used for starting and stopping the electric motor, wherein the movable wire is inserted through the handle and the adjustment device and electrically connected to the power supply device and the electric motor, and the fixed wire is disposed in the handle and electrically connected to the circuit board assembly and the first switch.

9. The chainsaw of claim 1, wherein in the first state, the adjustment device is at least partially accommodated in the handle.

10. The chainsaw of claim 1, further comprising a support assembly (390) disposed on the body housing and/or the handle, wherein the support assembly is used for supporting the chainsaw and keeping balance when the chainsaw is placed horizontally.

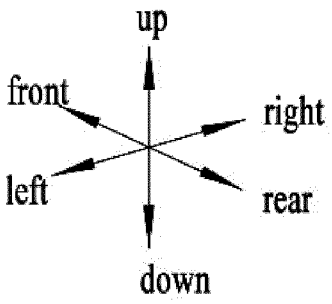
11. The chainsaw of claim 1, further comprising a protective part (392) below the handle, and the protective part is used for preventing a broken or fallen chain from injuring a hand of a user.

12. The chainsaw of claim 11, wherein in a projection along a up and down direction, a maximum value of a distance (Lc) between an outer edge (3901) of the protective part on the same side as the guide plate and an outer edge (3503) of the handle on the same side as the guide plate in the left and right direction is greater than or equal to 30 mm.

13. The chainsaw of claim 11, further comprising a first switch (352) used for starting and stopping the electric motor, wherein a distance (La) between a rearmost side of the chain exposed outside the body housing and a frontmost side of the first switch along the front and rear direction in at least one state of the telescopic rod assembly is less than or equal to 125 mm.

14. The chainsaw of claim 1, wherein a second length (L2) of the chainsaw in the second state is greater than or equal to 800 mm.

15. The chainsaw of claim 1, wherein the telescopic rod assembly comprises at least a first connecting rod (3611) and a second connecting rod (3612), a ratio of an outer diameter (D) of the handle to an outer diameter (D1) of the first connecting rod is less than or equal to 1.5.



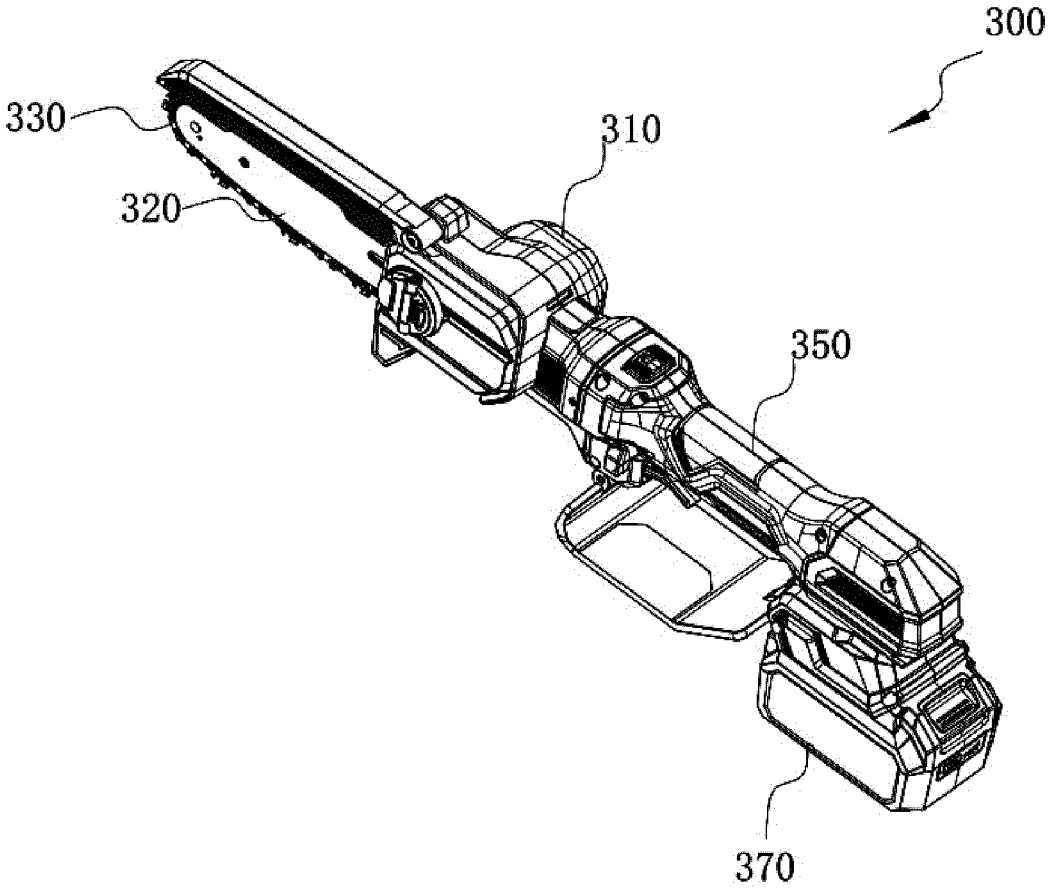


FIG. 1

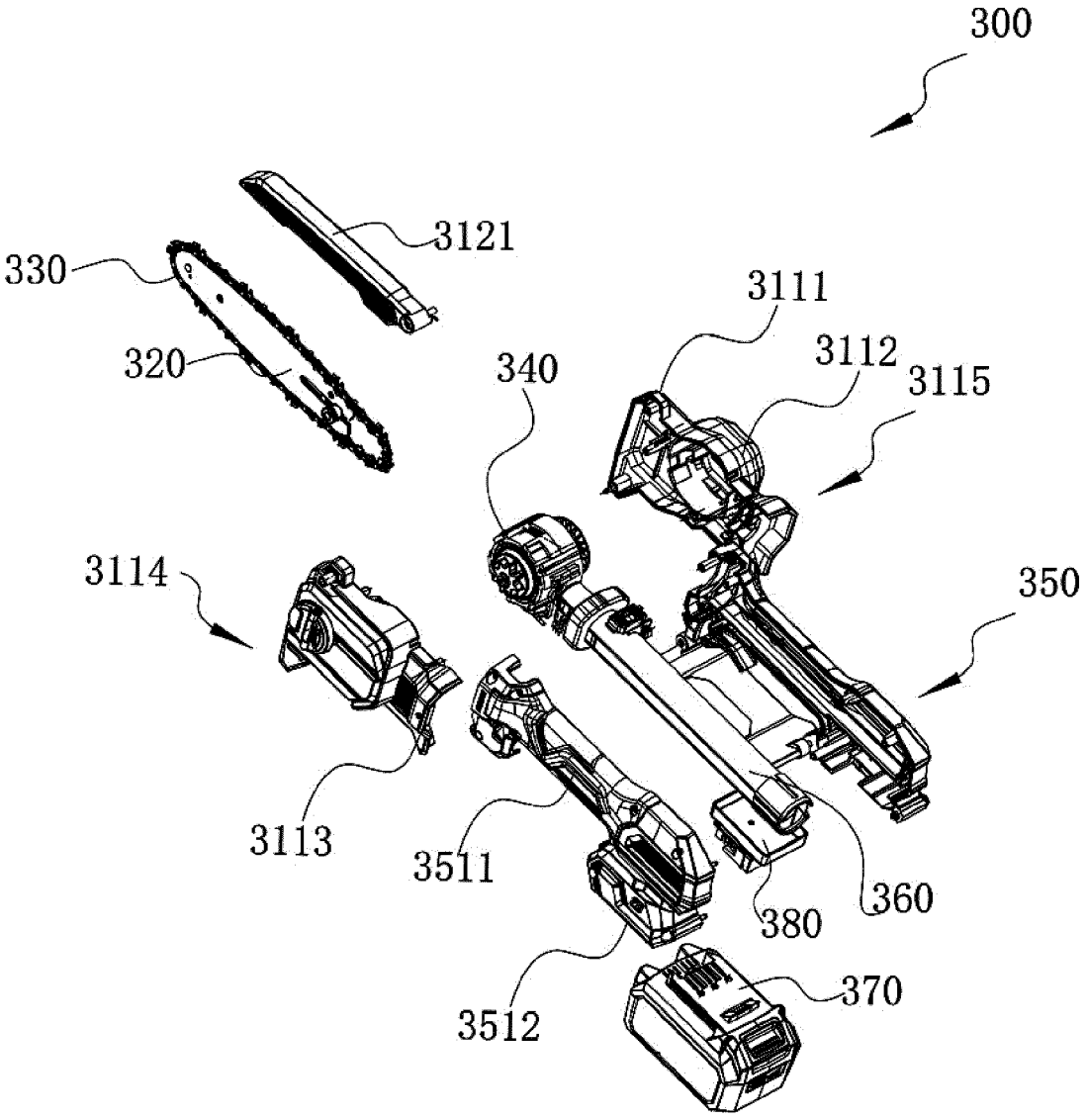

300
3121
330
3111
320
3112
340
3115
3114
350
3113
3511
360
380
370
3512

FIG. 2

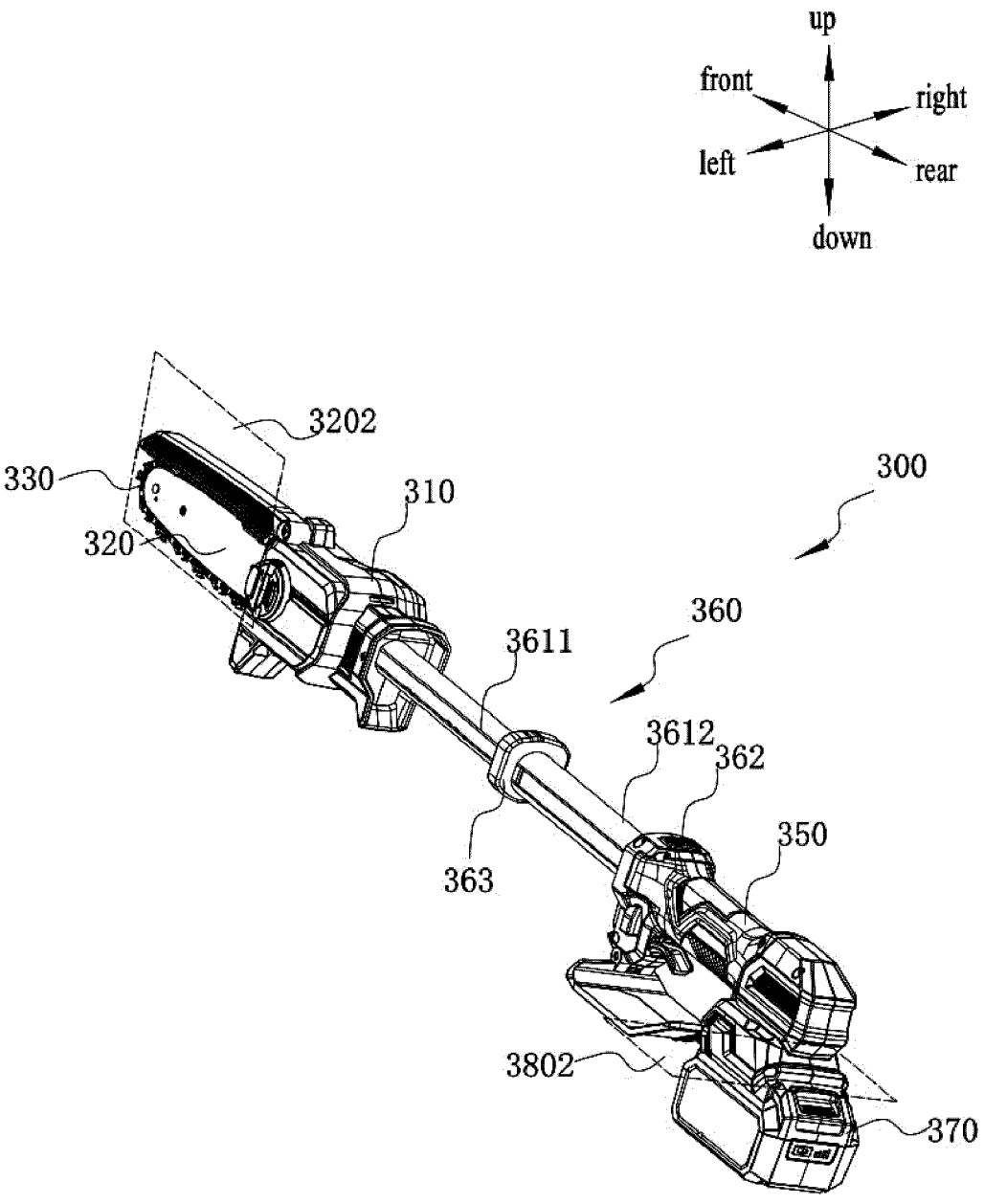

up
front
right
left
rear
down
3202
330
310
300
320
360
3611
3612
362
350
363
3802
370

FIG. 3

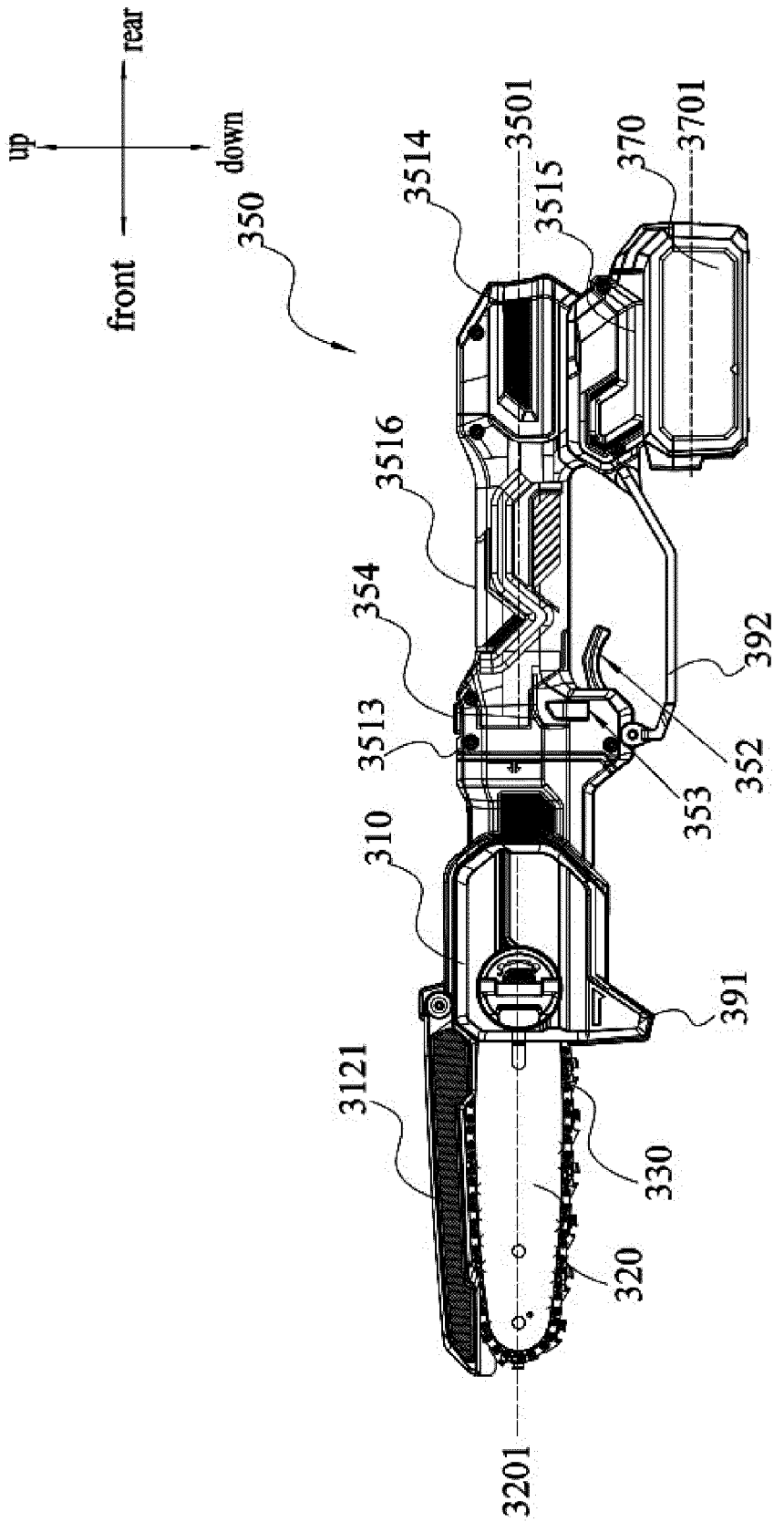

rear
up
down
front
350
3514
3501
3515
370
3701
3516
354
392
3513
352
353
310
391
3121
330
320
3201

FIG. 4

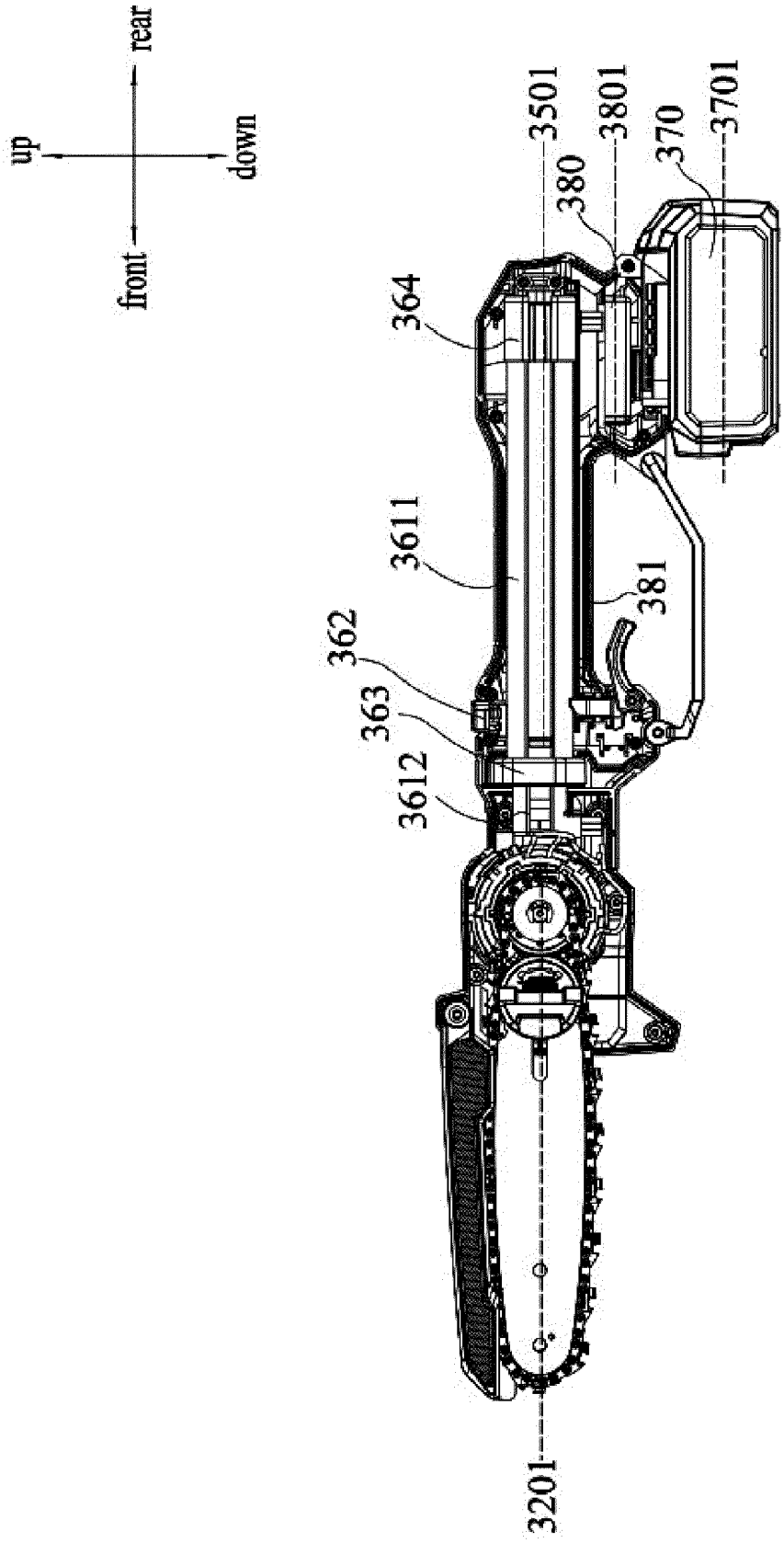

rear
up
down
front
3501
3801
370
3701
380
364
3611
381
362
363
3612
3201

FIG. 5

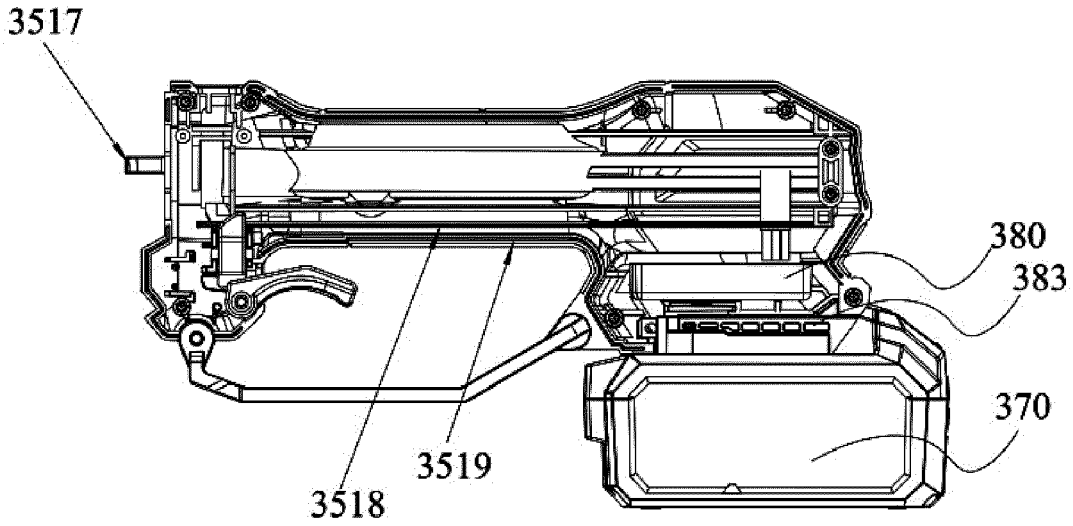


FIG. 6

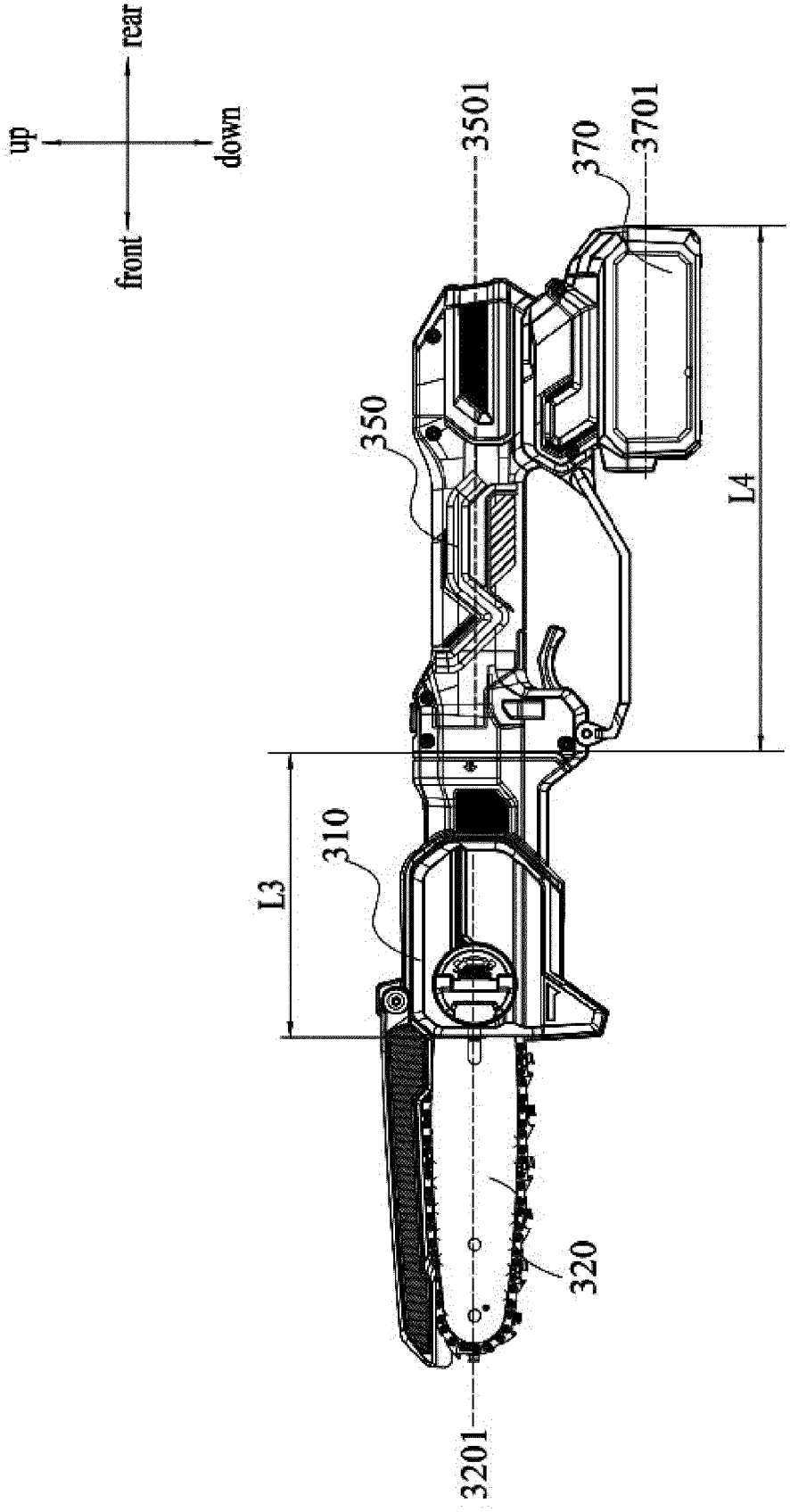


FIG. 7

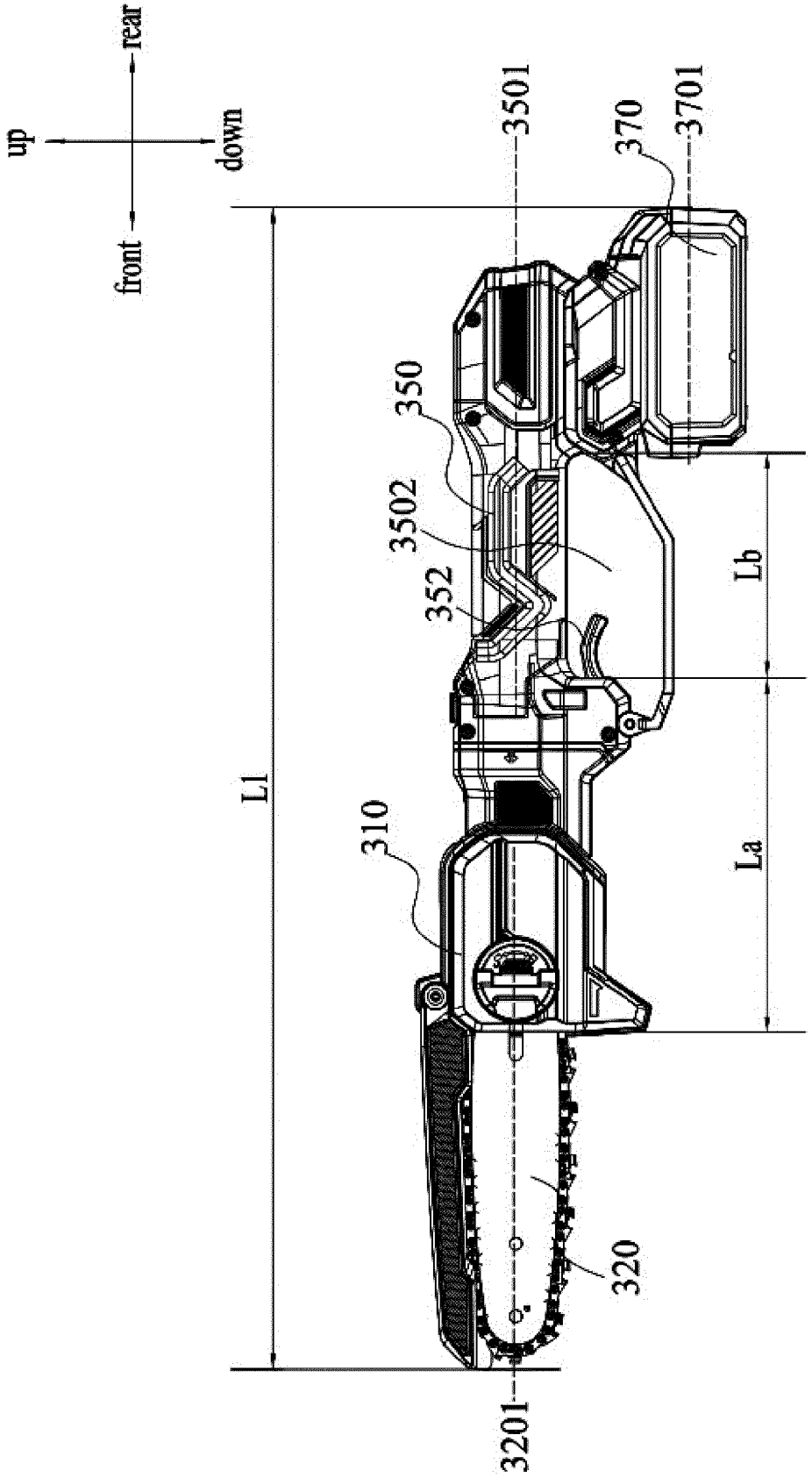

rear
up
down
front
3501
370
3701
350
3502
352
Lb
La
L1
310
320
3201

FIG. 8

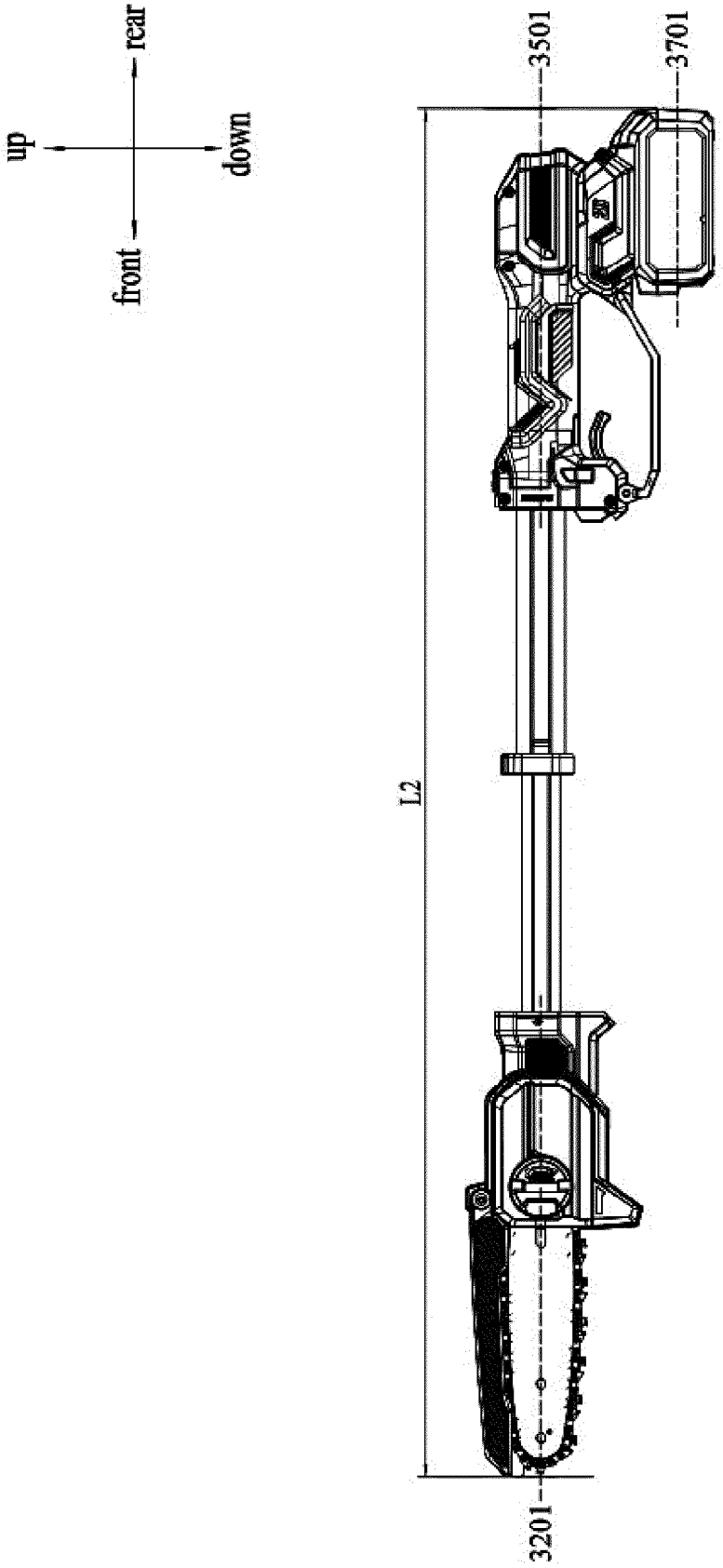


FIG. 9

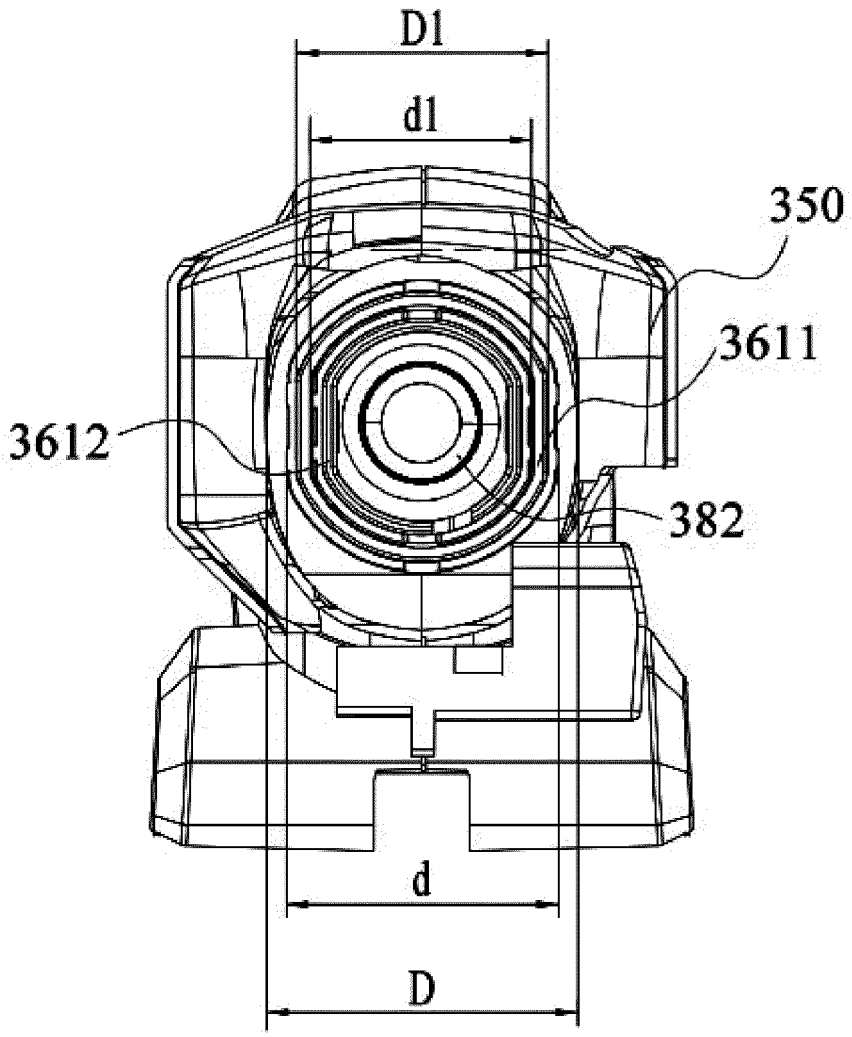


FIG. 10

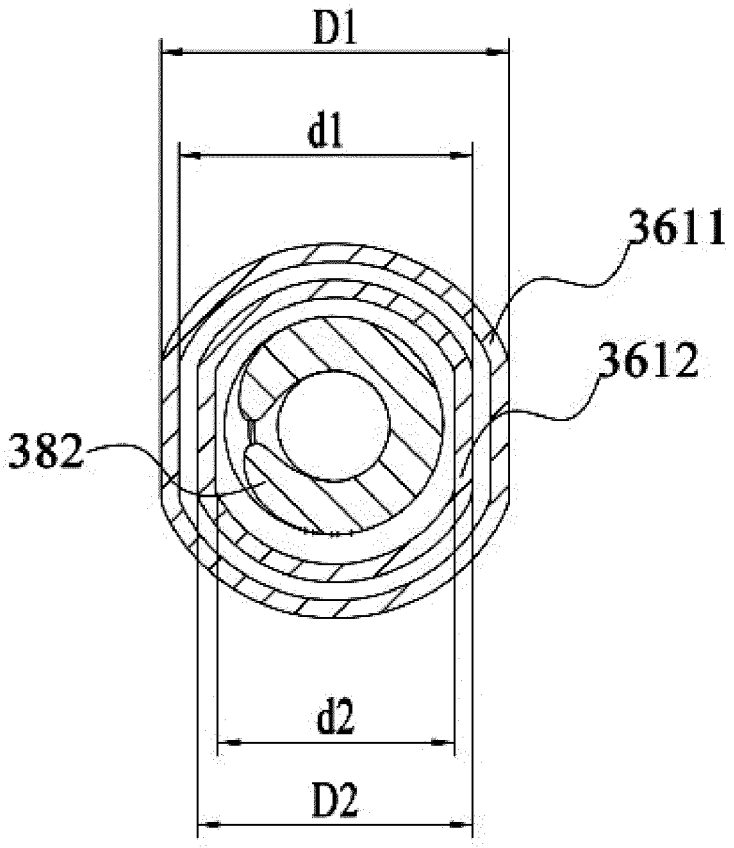

D1
d1
3611
3612
382
d2
D2

FIG. 11

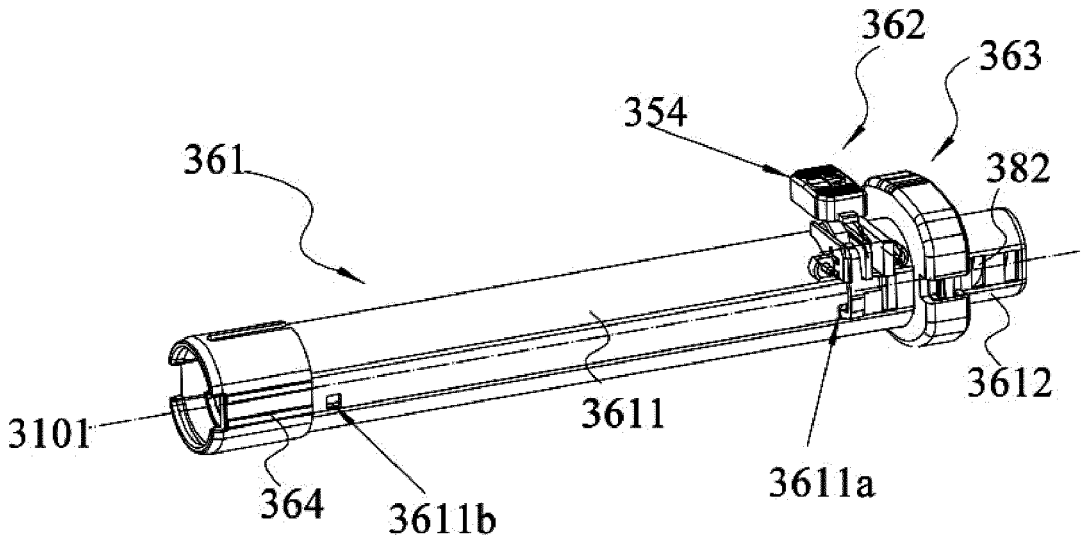
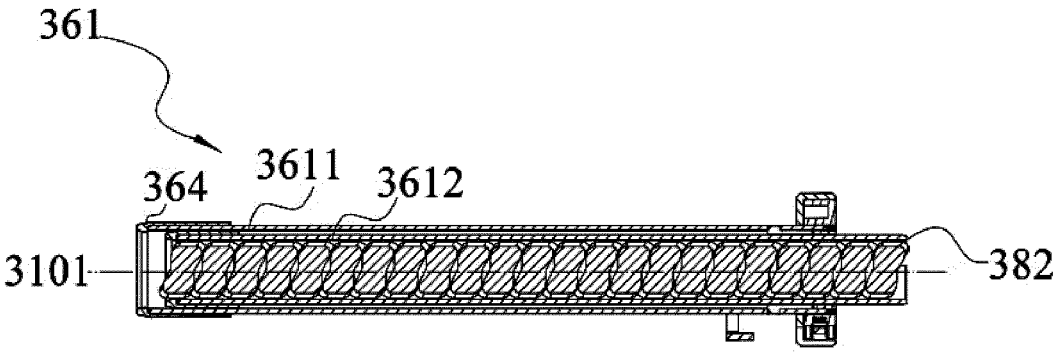

362
363
354
361
382
3612
3611
3101
364
3611b
3611a

FIG. 12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3611
364
3612
3101
382

FIG. 13

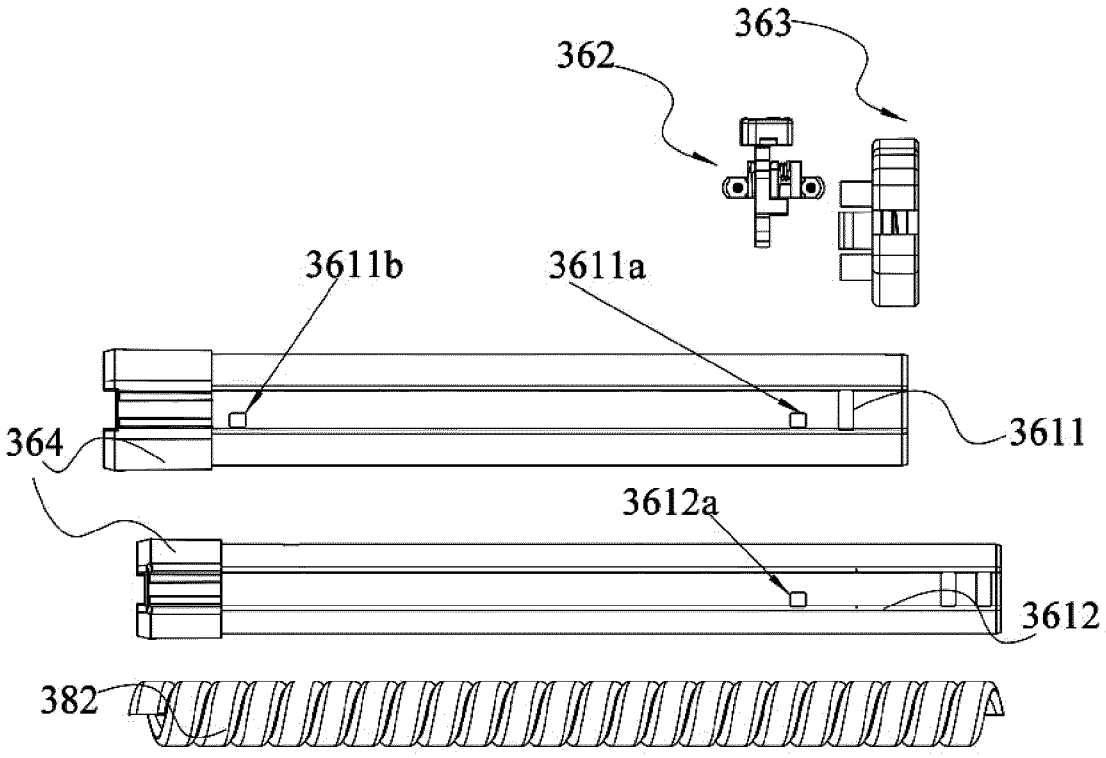
363
362
3611b
3611a
3611
364
3612a
3612
382

FIG. 14

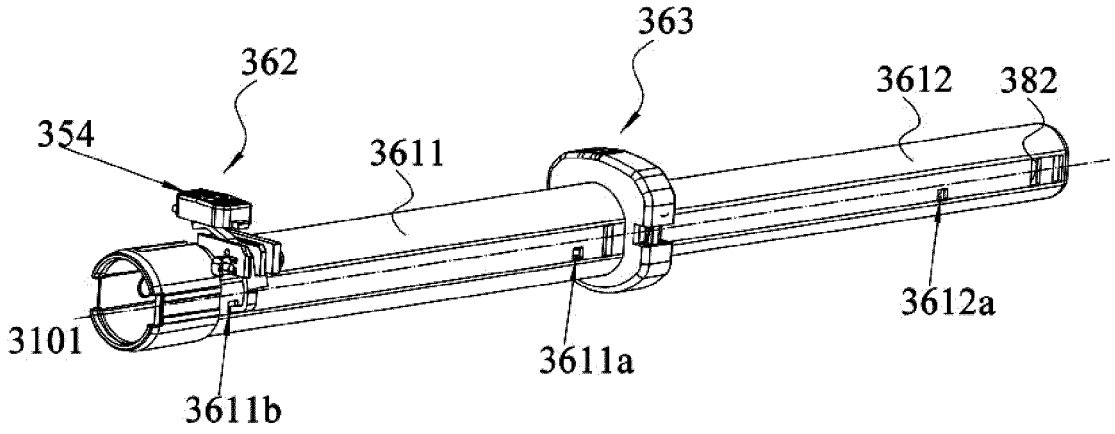

FIG. 15

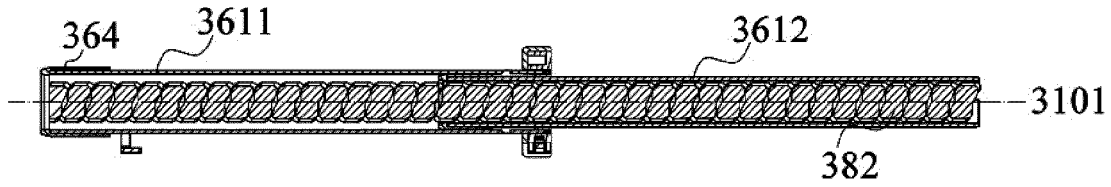

FIG. 16

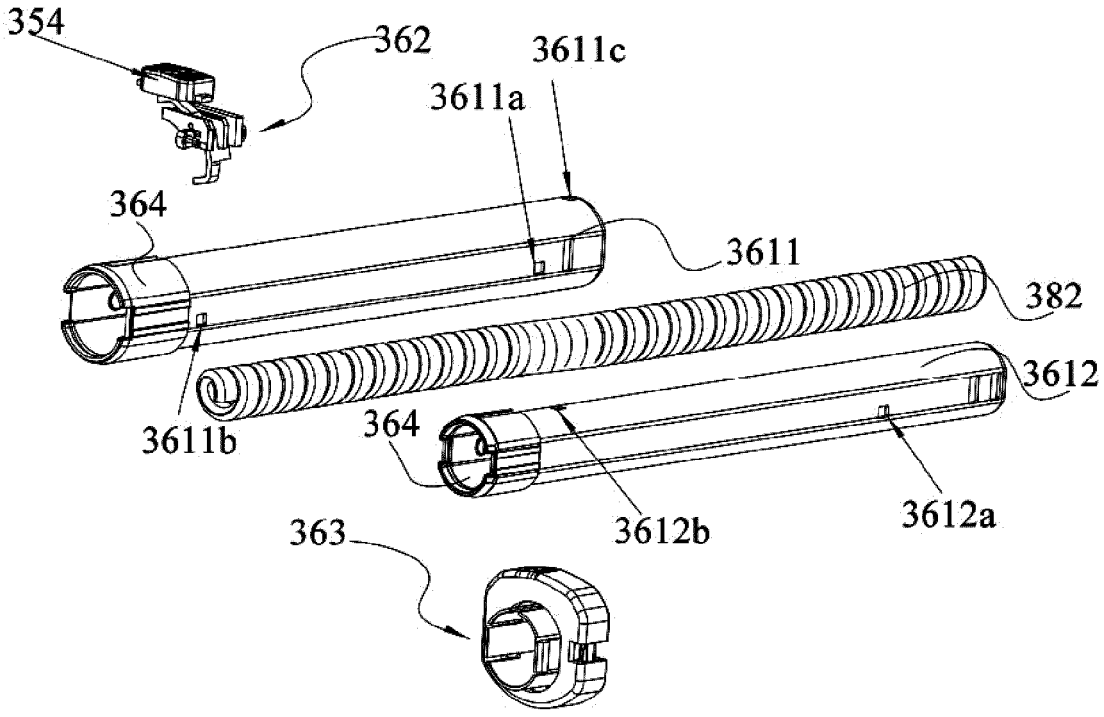

FIG. 17

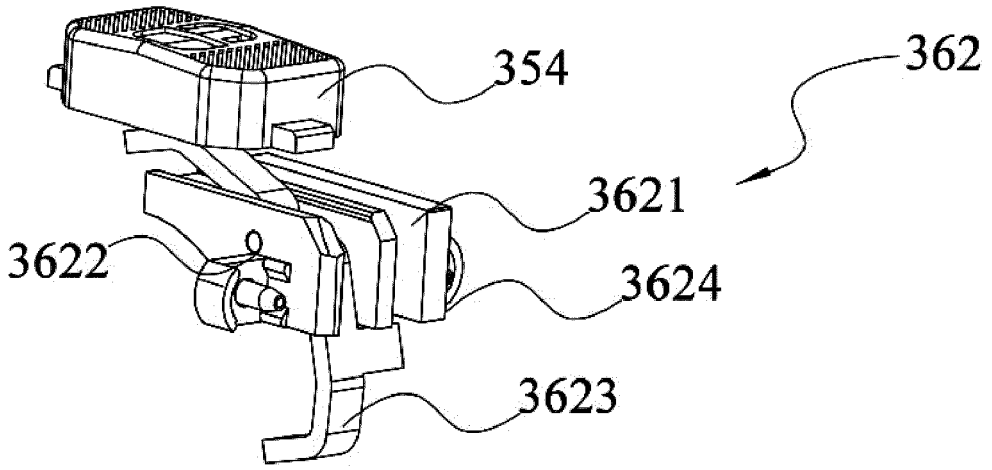

FIG. 18

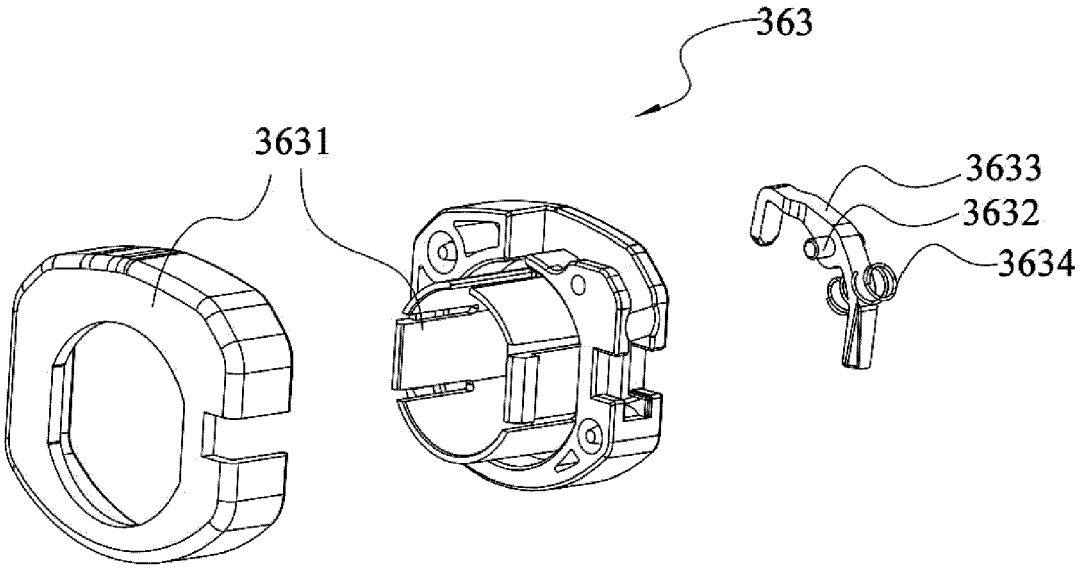

FIG. 19

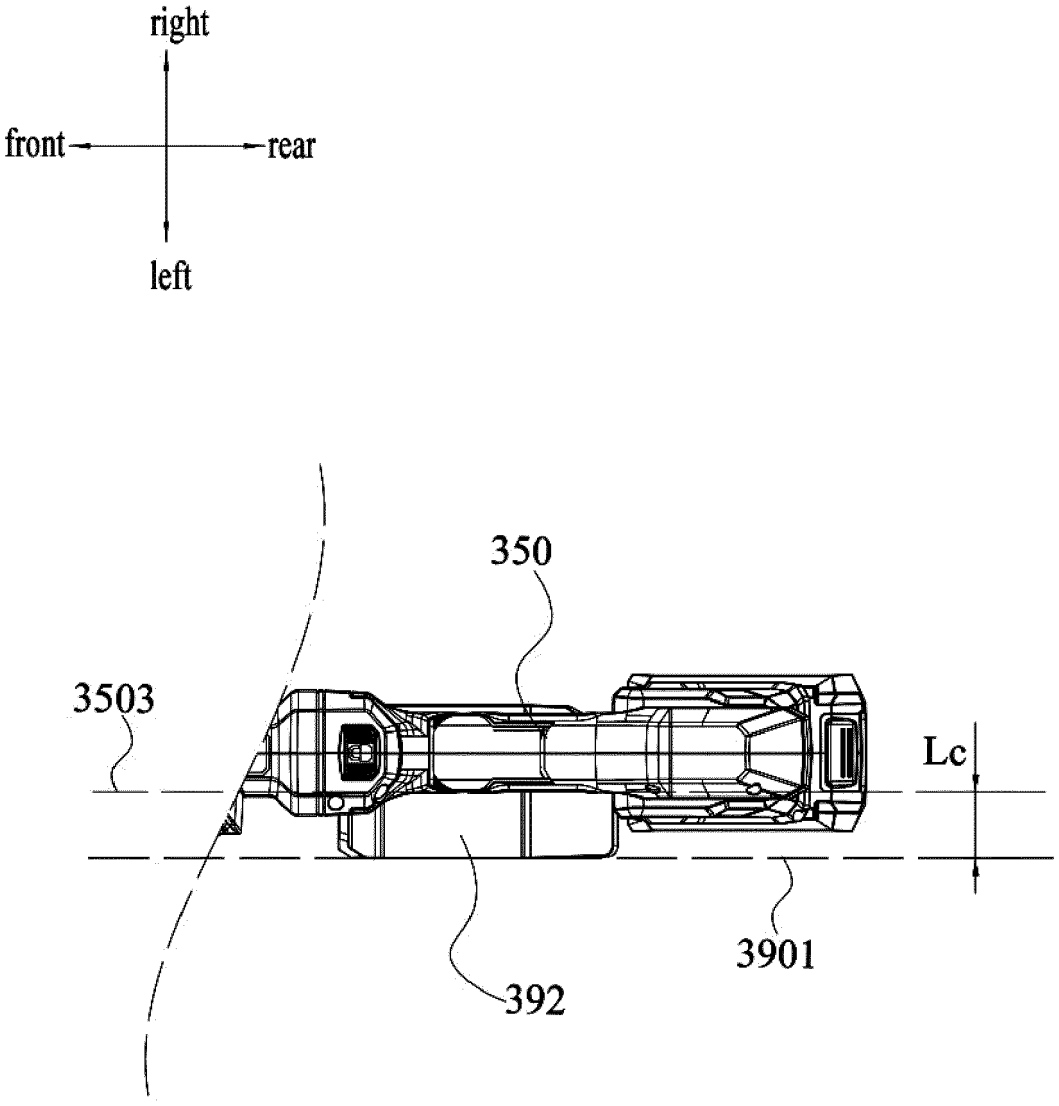

FIG. 20

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EUROPEAN SEARCH REPORT

Application Number
EP 24 18 7891

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2016/375571 A1 (GIESKE JASON [US] ET AL) 29 December 2016 (2016-12-29) * paragraphs [0027], [0031], [0033]; figures 1,12 *	1-15	INV. B27B17/00 B25F5/02 B25G1/04
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B25H
B25F
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	3 February 2025	Popma, Ronald

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