



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
25.06.2025 Bulletin 2025/26

(51) International Patent Classification (IPC):
B25F 5/00 ^(2006.01) **B25G 1/01** ^(2006.01)
B25G 3/04 ^(2006.01)

(21) Application number: **24220719.9**

(52) Cooperative Patent Classification (CPC):
B25F 5/006

(22) Date of filing: **17.12.2024**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
GE KH MA MD TN

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(30) Priority: **19.12.2023 CN 202323477701 U**

(54) **MULTI-PURPOSE GARDENING TOOL**

(57) Disclosed is a grip-friendly multi-purpose gardening tool, which relates to power tools and overcomes discomfort issues caused to a user due to vibration transmitted from a toolhead to a handle assembly. The multi-purpose gardening tool includes a toolhead including a drive module and an operating attachment, a handle assembly, and a pole, the drive module driving the operating attachment to swing reciprocally; the toolhead is

disposed at a front end of the pole; the handle assembly is disposed at a rear end of the pole; a vibration damper is disposed between the front end of the pole and the toolhead, the vibration damper being configurable to damp the vibration transmitted from the toolhead through the pole to the handle assembly. The disclosure is mainly applied to reduce vibration-induced impact on the user during operating.

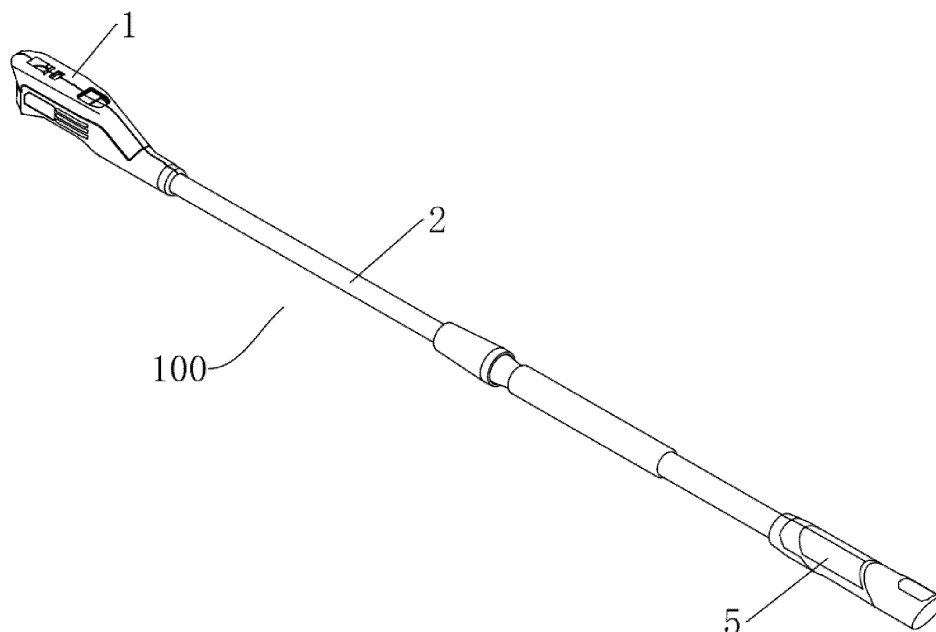


Fig. 8

Description

FIELD

[0001] The subject matter described herein relates to power tools, and more particularly relates to a grip-friendly multi-purpose gardening tool.

BACKGROUND

[0002] With technological advancement, various types of power tools have been increasingly applied in manufacturing and daily tasks. The power tools significantly enhance work efficiency and reduce labor intensity. A reciprocating-swing power tool is a common type of such tools, which uses a drive module accommodated in a housing to drive an operating attachment connected to an output shaft to perform a high-frequency reciprocating swing motion. The high-frequency reciprocating swing produces high-frequency vibration that will be transmitted to a toolhead; the toolhead then transmits the vibration to a pole inserted in the toolhead; and finally, the pole transmits the vibration to a handle end. The vibration at the handle end would cause discomfort to a user operating the tool; in addition, the user would also be annoyed by vibration-induced noise.

SUMMARY

[0003] A grip-friendly multi-purpose gardening tool is described to overcome discomfort issues caused to a user due to vibration transmitted from a toolhead to a handle assembly.

[0004] A grip-friendly multi-purpose gardening tool according to the disclosure comprises:

a pole;
a toolhead disposed at a front end of the pole, the toolhead comprising a drive module and an operating attachment, the drive module being operable to drive the operating attachment to swing reciprocally;
a handle assembly disposed at a rear end of the pole; wherein a vibration damper is arranged between the front end of the pole and the toolhead, the vibration damper being configurable to damp vibration that is transmitted from the toolhead through the pole to the handle assembly.

[0005] This technical solution offers the following benefits to the disclosure: by disposing the vibration damper between the front end of the pole and the toolhead, vibration transmitted from the toolhead through the pole to the handle assembly is reduced, which avoids grip discomfort caused to the user gripping the handle assembly due to the vibration of the toolhead, thereby offering a better grip-friendliness to the user. The vibration damper may further reduce noise induced by vibra-

tion occurring between the toolhead and the pole, thereby offering higher comfort to the user and reducing fatigue over long-time work. Furthermore, the vibration damper may also avoid direct contact between the front end of the pole and the toolhead, facilitating reduction of vibration-induced wear between the toolhead and the front end of the pole.

[0006] Furthermore, a socket is provided at a rear end of the toolhead, the front end of the pole being inserted in the socket, the vibration damper being arranged between the front end of the pole and an inner wall of the socket. By inserting the front end of the pole into the socket at the rear end of the toolhead, assembly between the pole and the toolhead is completed. After the pole is inserted in the socket, the vibration of the toolhead would be transmitted to the pole mainly via the socket engaged with the pole; by disposing the vibration damper between the front end of the pole and the inner wall of the socket, the impact on the pole due to toolhead vibration may be effectively reduced. In addition, the vibration damper may also realize interference-fit between the pole and the socket, thereby ensuring fitting reliability between the front end of the pole and the socket.

[0007] Furthermore, a snap-in hole is provided on a side wall of the front end of the pole, and a snap-fit portion is arranged on the vibration damper, the snap-fit portion being fitted with the snap-in hole. The snap-fitting manner between the snap-fit portion on the vibration damper and the snap-in hole on the pole not only facilitates mounting the vibration damper to the front end of the pole, but also facilitates replacement and maintenance of the vibration damper and the pole after removal of the vibration damper.

[0008] Furthermore, the snap-fit portion comprises a boss and a fixing rim arranged along an edge of an end portion of the boss, the boss being inserted in the snap-in hole with the fixing rim abutting against an inner wall of the pole. By inserting the boss in the snap-in hole and arranging the fixing rim to abut against the inner wall of the pole, looseness or undesired relative displacement of the snap-fit portion during operation may be effectively prevented; this arrangement may ensure reliable connection between the vibration damper and the pole, thereby ensuring that the vibration damper can contribute a damping effect. In addition, such arrangement of the snap-fit portion may also contribute a high anti-vibration performance; when the tool is subjected to vibration or shock, the clamping structure formed by the boss and the fixing rim may effectively prevent looseness or disengagement of the snap-fit portion, thereby ensuring stability of the tool.

[0009] Furthermore, the vibration damper is provided with a washer portion held between the front end of the pole and the inner wall of the socket, the washer portion extending in a circumferential and/or axial direction of the pole, a width of the washer portion being gradually shrunk from a central area to peripheral sides thereof. The washer portion may increase a contact interface between

the vibration damper and the inner wall of the socket so as to absorb more vibration from the toolhead, thereby reducing the impact on the pole caused by toolhead vibration. By arranging the washer portion to extend along the peripheral and axial directions of the pole, the area of direct contact between the pole and the socket may be further reduced, which further reduces the vibration-induced impact. Since the operating attachment operates in a reciprocating swing manner, the overall toolhead is subjected to a greater vibration in the circumferential direction than in the axial direction; by forming the width of the washer portion to be gradually shrunk from the central area to the peripheral sides, less material is used in manufacturing the vibration damper, while utilization of the entire vibration damper may be improved.

[0010] Furthermore, vibration dampers are pairwise arranged at opposite sides of a reciprocating swing direction of the operating attachment, respectively. This arrangement may reduce the vibration transmitted from the operating attachment through the toolhead to the pole.

[0011] Furthermore, two pairs of vibration dampers are provided, the two pairs of vibration dampers being disposed in a manner of corresponding to front and rear ends of the socket, respectively. The two pairs of vibration dampers as arranged may offer a stronger vibration damping performance to effectively reduce the vibration and shock from the toolhead, thereby damping the vibration transmitted to the entire pole.

[0012] Furthermore, a seal ring is arranged between the pole and the rear end of the socket. The seal ring may eliminate a mounting interstice between the front end of the pole and the rear end of the socket, preventing foreign liquid or dirt from entering the inside of the toolhead via the mounting interstice.

[0013] Furthermore, a rotation stopper configurable to prevent the pole from rotating relative to the socket is arranged between the front end of the pole and the socket. The rotation stopper prevents the pole from rotating causing the toolhead offset from a processed object when the user is working, which would otherwise affect the work effect; meanwhile, the rotation stopper may also enhance safety of the tool, because if a relative rotation occurs to the pole and the socket, the operating attachment would lose control or cause an accident.

[0014] Furthermore, the rotation stopper comprises: a rotation-stop ridge arranged at one of an outer wall of the front end of the pole and the inner wall of the socket, and a rotation-stop recess arranged at the other one of the outer wall of the front end of the pole and the inner wall of the socket, the rotation-stop ridge being inserted in the rotation-stop recess. Fitting between the rotation-stop ridge and the rotation-stop recess allows for the pole to be circumferentially limited, preventing circumferential rotation of the pole relative to the socket and thereby preventing the operating attachment from losing control. Meanwhile, the fitting between the rotation-stop ridge and the rotation-stop recess is easily realized, facilitating fitting of the rotation stopper, thereby facilitating assembly.

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[0015] Furthermore, the toolhead comprises a housing, the drive module being disposed inside the housing, the operating attachment being disposed outside the housing, a vibration damping structure being arranged between the drive module and the housing. The vibration damping structure may reduce the impact on the housing caused by tool vibration, thereby damping the vibration transmitted from the housing to the pole, while reducing noise induced by mutual vibration between the drive module and the housing, whereby the stability and work effect of the tool are enhanced.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

Fig. 1 is a schematic diagram of connection between a toolhead and a pole;

Fig. 2 is an internal structural diagram of connection between the toolhead and the pole;

Fig. 3 is a structural schematic diagram of a housing;

Fig. 4 is a structural schematic diagram of a vibration damper;

Fig. 5 is a structural schematic diagram of a pole;

Fig. 6 is a schematic diagram of mounting the vibration damper on the pole;

Fig. 7 is a sectional view of the vibration damper and the pole taken in a direction perpendicular to the axial direction;

Fig. 8 is an overall schematic diagram of a multi-purpose gardening tool.

[0017] In the drawings:

100 - multi-purpose gardening tool; 1 - toolhead; 11- operating attachment; 12- drive module; 13 - socket; 132 - rotation-stop ridge; 14 - housing; 15 - vibration damping structure; 16 - securing pin; 2 - pole; 21 - snap-in hole; 22- rotation-stop recess; 3 - vibration damper; 3A- snap-fit portion; 31 - boss; 32 - fixing rim; 33 - washer portion; 34 - securing hole; 4 - seal ring; 5 - handle assembly; 6 - rotation stopper.

DETAILED DESCRIPTION OF EMBODIMENTS

[0018] Hereinafter, the technical solution of the disclosure will be described in detail through specific implementations. It is apparent that the implementations as described are only some implementations of the disclosure, not all of them. The specific implementations described *infra* may be combined or replaced with each

other dependent on actual circumstances, while same or similar concepts or processes may be omitted in some implementations.

[0019] Figs. 1 to 7 illustrate a grip-friendly multi-purpose gardening tool 100 according to the disclosure, comprising: a toolhead 1, a handle assembly 5, and a pole 2; the toolhead 1 comprises a drive module 12 and an operating attachment 11, the drive module 12 being operable to drive the operating attachment 11 to swing reciprocally; the toolhead 1 is disposed at a front end of the pole 2; the handle assembly 5 is disposed at a rear end of the pole 2; a vibration damper 3 is disposed between the front end of the pole 2 and the toolhead 1, the vibration damper 3 being configurable to damp vibration transmitted from the toolhead 1 through the pole 2 to the handle assembly 5.

[0020] In this implementation, the vibration damper 3 is formed of a rubber material, the elasticity of which contributes a desired damping effect; of course, the vibration damper 3 may also be formed of another material with a high elasticity, e.g., polyimide, or polyurethane; in addition, the vibration damper 3 may also be formed of a structure with a soft outer casing and an inner spring, so that the vibration energy is absorbed and dissipated via elasticity of the spring to thereby reduce the vibration-induced impact on the pole 2.

[0021] In this implementation, by disposing the vibration damper 3 between the front end of the pole 2 and the toolhead 1 to reduce vibration transmitted from the toolhead 1 through the pole 2 to the handle assembly 5, grip discomfort caused by the vibration transmitted from the toolhead 1 to the handle assembly 5 may be avoided, thereby offering a higher grip-friendliness to an operator. The vibration damper 3 allows for further reduction of the noise induced by vibration occurring to the toolhead 1 and the pole 2, thereby improving operator-friendliness and reducing fatigue over long-time work. Meanwhile, the vibration damper 3 may further avoid direct contact between the front end of the pole 2 and the toolhead 1, facilitating reduction of vibration-induced wear between the toolhead 1 and the front end of the pole 2.

[0022] In this implementation, as illustrated in Fig. 2, the pole 2 and the toolhead 1 are attached in such a manner that a socket 13 for receiving the pole 2 is provided at a rear end of the toolhead 1, so that by inserting the front end of the pole 2 into the socket 13 at the rear end of the toolhead 1, assembly between the pole 2 and the toolhead 1 is completed. After the pole 2 is inserted in the socket 13, the vibration produced at the toolhead 1 would be transmitted to the pole 2 via the socket 13 engaged with the pole 2; by disposing the vibration damper 3 between the front end of the pole 2 and the inner wall of the socket 13, the impact on the pole 2 due to vibration of the toolhead 1 may be effectively reduced. In addition, the vibration damper 3 may also realize interference-fit between the front end of the pole 2 and the socket 13, thereby ensuring fitting reliability between the pole 2 and the socket 13.

[0023] A snap-in hole 21 is formed on a sidewall of the front end of the pole 2; a snap-fit portion 3A is arranged on the vibration damper 3; snap-fitting between the snap-fit portion 3A on the vibration damper 3 and the snap-in hole 21 on the pole 2 allows for the vibration damper 3 to be mounted to the front end of the pole 2. The snap-fitting manner not only facilitates mounting the vibration damper 3 to the front end of the pole 2, but also facilitates replacement and maintenance of the vibration damper 3 and the pole 2 after removal of the vibration damper 3. In another implementation, the snap-in hole 21 may be arranged on the inner wall of the socket 13 while the vibration damper 3 is mounted on the inner wall of the socket 13, which may also achieve an effect of damping the vibration subjected to the pole 2.

[0024] As illustrated in Fig. 4, the snap-fit portion 3A of the vibration damper 3 comprises a boss 31 and a fixing rim 32 arranged along an edge of a free end of the boss 31, the boss 31 being inserted in the snap-in hole 21 while the fixing rim 32 being tightly clamped with respect to the inner wall of the pole 2. By inserting the boss 31 in the snap-in hole 21 and arranging the fixing rim 32 to abut against the inner wall of the pole 2, looseness or undesired relative displacement of the snap-fit portion 3A during operation may be effectively prevented; this arrangement may ensure reliable connection of the snap-fit portion 3A, thereby ensuring that the vibration damper 3 can contribute a damping effect. In addition, such arrangement of the snap-fit portion 3A may also offer a high anti-vibration performance, which may effectively prevent looseness or disengagement of the snap-fit portion 3A when the tool is subjected to vibration or shock, thereby ensuring stability of the tool.

[0025] In this implementation, the vibration damper 3 is provided with a washer portion 33 held between the front end of the pole 2 and the inner wall of the socket 13, the washer portion 33 extending in a circumferential direction of the pole 2; in addition, the width of the washer portion 33 is gradually shrunk from the central area towards the peripheral sides. The washer portion 33 held between the front end of the pole 2 and the inner wall of the socket 13 may increase a contact interface between the vibration damper 3 and the toolhead 1 so as to absorb more vibration from the toolhead 1, thereby reducing the impact on the pole 2 caused by vibration of the toolhead 1. By arranging the washer portion 33 to extend along the peripheral and axial directions of the pole 2, the area of direct contact between the pole 2 and the socket 13 may be further reduced, which further reduces the vibration-induced impact. Since the operating attachment 11 works in a reciprocating swing manner, the overall toolhead 1 is subjected to a greater vibration in the circumferential direction than in the axial direction; by forming the width of the washer portion 33 to be gradually shrunk from the central area to the peripheral sides, less material is used in manufacturing the vibration damper 3, while utilization of the entire vibration damper 3 may be improved. In another implementation, the washer portion 33 may also

only extend along the circumferential direction of the pole 2 or extend along both of the circumferential direction and the axial direction of the pole 2; specifically, the extension direction of the washer portion 33 may be determined based on a reciprocating swing direction of the operating attachment 11 so as to reduce the impact on the pole 2 in the corresponding swing direction caused by vibration of the toolhead 1.

[0026] In this implementation, the operating attachment 11 swings in a left-right direction with the drive module 12, so that the vibration transmitted to the housing 14 also occurs mainly in the left-right direction, which would bring the toolhead 1 to vibrate in the left-right direction. To avoid the pole 2 from being impacted by the left-right vibration, the vibration dampers 3 are pairwise provided, which are disposed at both left and right sides of the contact position between the pole 2 and the socket 13, respectively, thereby reducing the impact on the pole 2 in the left-right direction caused by vibration of the operating attachment 11 transmitted through the toolhead 1. In another implementation, if the operating attachment 11 swings up and down with the drive module 12, the vibration dampers 3 are pairwise provided, which are disposed at the upper and lower sides of the contact position between the pole 2 and the socket 13, respectively, i.e., the mounting positions of the vibration dampers 3 relative to the pole 2 are determined based on a reciprocating swing direction of the operating attachment 11.

[0027] In addition, a securing pin 16 configurable to prevent the pole 2 from disengaging axially is also arranged in the socket 13, and a securing hole 34 is further arranged on the vibration damper 3, the securing pin 16 passing through the securing hole 34 and then through the pole 2 along the radial direction from the snap-in holes 21 on the left and right sides of the pole 2, thereby securing the pole 2 in the socket 13. The securing pin 16 may not only prevent the pole 2 from escaping out of the socket 13 during operation but also may further secure the vibration damper 3 on the pole 2 to prevent disengagement of the vibration damper 3 leading to loss of the vibration damping effect; meanwhile, the securing pin 16 radially passing through the pole 2 may also prevent circumferential rotation of the pole 2 relative to the socket 13.

[0028] In this implementation, to further enhance the vibration damping effect of the vibration damper 3 with respect to the pole 2, two pairs of vibration dampers 3 are provided in total, which are respectively disposed at front and rear ends in the socket 13, respectively. Compared with provision of one pair of vibration dampers 3, the two pairs of vibration dampers 3 as arranged may offer a stronger vibration damping performance to effectively reduce the vibration and shock from the socket 13, thereby damping the vibration transmitted to the entire pole 2. In another implementation, it is also allowed to arrange only one pair of vibration dampers 3, the one pair of vibration dampers 3 being disposed at left and right sides

of the intermediate area of a fitting portion between the pole 2 and the socket 13, respectively, which may also achieve an effect of reducing vibration subjected to the pole 2; in addition, three pairs of vibration dampers 3 may also be arranged at intervals along the axial direction of the socket 13.

[0029] To prevent the internal components of the toolhead 1 from being damaged by a foreign object, a seal ring 4 is arranged between the pole 2 and the rear end of the socket 13; the seal ring 4 may eliminate a mounting interstice between the pole 2 and the socket 13, preventing foreign liquid or dirt from entering the inside of the toolhead 1 via the mounting interstice causing damages to the internal components of the toolhead 1. In this implementation, the seal ring 4 is an O-shaped rubber ring; the seal ring 4 sleeves the rear end of the fitting portion between the pole 2 and the socket 13. Since the seal ring has certain elasticity, it also contributes a certain vibration damping effect between the pole 2 and the toolhead 1, so as to offer higher comfort to the user gripping the handle assembly 5.

[0030] The pole 2 is formed of a hollow round tube. After the pole 2 is inserted in the socket 13, the pole 2 would rotate circumferentially relative to the socket 13 without a securing component. To prevent this circumstance, a rotation stopper 6 configurable to prevent relative rotation between the front end of the pole 2 and the socket 13 is arranged therebetween. The rotation stopper 6 prevents the toolhead 1 from circumferential rotation relative to the pole 2 causing the toolhead 1 offset from a processed object during operating, which would otherwise affect the work effect; meanwhile, the rotation stopper 6 may also enhance safety of the tool, because if a relative circumferential rotation occurs to the pole 2 and the socket 13, the operating attachment 11 would lose control or cause an accident. Specifically, rotation-stop recesses 22 are arranged at the left and right sides of the front end of the pole 2, respectively, while two corresponding rotation-stop ridges 132 are disposed at positions of the inner wall of the socket 13 abutting against the front end of the pole 2, i.e., the rotation stopper 6 comprises rotation-stop ridges 132 and mated rotation-stop recesses 22. After the front end of the pole 2 is inserted in the socket 13, the rotation-stop ridges 132 are inserted in the rotation-stop recesses 22 so as to be snap-fitted with the front end of the pole 2. Fitting between the rotation-stop ridges 132 and the rotation-stop recesses 22 allows for the pole 2 to be circumferentially limited, preventing circumferential rotation of the pole 2 relative to the socket 13 and thereby preventing the operating attachment 11 from losing control. Meanwhile, the fitting between the rotation-stop ridges 132 and the rotation-stop recesses 22 is easily realized, facilitating fitting between the pole 2 and the rotation stopper 6, thereby facilitating assembly. In another implementation, the rotation-stop recesses 22 may be arranged on the inner wall of the socket 13 while the rotation-stop ridges 132 are disposed at the front end of the pole 2, which may also achieve an effect of pre-

venting the pole 2 from circumferentially rotating relative to the socket 13.

[0031] The toolhead 1 comprises a housing 14, the drive module 12 being disposed in the housing 14, the operating attachment 11 being disposed outside the housing 14. In this implementation, a vibration damping structure 15 is further arranged between the drive module 12 and the housing 14. The vibration damping structure 15 may reduce the impact on the housing 14 caused by the vibrating drive module 12, thereby damping the vibration transmitted from the housing 14 to the pole 2; the vibration damping structure 15 and the vibration damper 3 mounted on the pole 2 cooperate to offer dual damping, further offering higher comfort to the user gripping the handle assembly 5 while reducing noise induced by mutual vibration between the drive module 12 and the housing 14, whereby the stability and work effect of the tool are enhanced. In this implementation, the vibration damping structure 15 is a rubber pad, the rubber property of which contributes to reduction of the vibration transmitted from the drive module 12 to the housing 14; the rubber pad as the vibration damping structure 15 may be tightly held between the drive module 12 and the housing 14. In another implementation, the vibration damping structure may be an elastic support structure, e.g., a spring or a damping pad, which offers an elasticity that absorbs the vibration produced by the drive module 12, thereby damping the vibration transmitted from the drive module 12 to the housing 14.

[0032] In this implementation, the drive module 12 may be formed of a structure comprising an electric motor, a speed reducer, and a transmission unit, the operating attachment 11 being driven via an output shaft of the transmission unit.

[0033] In this implementation, the handle assembly 5 may only comprise one handle disposed at the rear end of the pole 2 or may comprise two handles arranged at the rear end of the pole 2 in a front-rear direction with an interval.

[0034] In this implementation, the pole 2 may adopt a one-stage structure or may adopt a telescopic two-stage structure.

[0035] In this implementation, the multi-purpose gardening tool 100 may be powered by a battery pack or powered by a power source connected via a power cord with a plug.

[0036] In this implementation, the operating attachment 11 may be a steel wire attachment for weeding or a blade attachment for pruning.

[0037] In addition to the example implementations described *supra*, the disclosure further has other implementations. All other implementations derived by those skilled in the art based on those described herein without exercise of inventive work will fall into the scope of protection of the disclosure.

Claims

1. A multi-purpose gardening tool, comprising:

a pole (2);
a toolhead (1) disposed at a front end of the pole (2), the toolhead (1) comprising a drive module (12) and an operating attachment (11), the drive module (12) being operable to drive the operating attachment (11) to swing reciprocally;
a handle assembly (5) disposed at a rear end of the pole (2);

characterized in that a vibration damper (3) is arranged between the front end of the pole (2) and the toolhead (1), the vibration damper (3) being configurable to damp vibration that is transmitted from the toolhead (1) through the pole (2) to the handle assembly (5).

2. The multi-purpose gardening tool of claim 1, **characterized in that** a socket (13) is provided at a rear end of the toolhead (1), the front end of the pole (2) being inserted in the socket (13), the vibration damper (3) being arranged between the front end of the pole (2) and an inner wall of the socket (13).

3. The multi-purpose gardening tool of claim 2, **characterized in that** a snap-in hole (21) is provided at the front end of the pole (2), and a snap-fit portion (3A) is arranged on the vibration damper (3), the snap-fit portion (3A) being fitted with the snap-in hole (21).

4. The multi-purpose gardening tool of claim 3, **characterized in that** the snap-fit portion (3A) comprises a boss (31) and a fixing rim (32) arranged along an edge of an end portion of the boss (31), the boss (31) being inserted in the snap-in hole (21) with the fixing rim (32) abutting against an inner wall of the pole (2).

5. The multi-purpose gardening tool of claim 3 or claim 4, **characterized in that** the vibration damper (3) is provided with a washer portion (33) held between the front end of the pole (2) and the inner wall of the socket (13), the washer portion (33) extending in a circumferential and/or axial direction of the pole (2), a width of the washer portion (33) being gradually shrunk from a central area to peripheral sides thereof.

6. The multi-purpose gardening tool according to any of the preceding claims, **characterized in that** vibration dampers (3) are pairwise arranged at opposite sides of a reciprocating swing direction of the operating attachment (11), respectively.

7. The multi-purpose gardening tool of claim 6, **characterized in that** two pairs of vibration dampers (3)

are provided, the two pairs of vibration dampers (3) being disposed in a manner of corresponding to front and rear ends of the socket (13), respectively.

8. The multi-purpose gardening tool according to any of the preceding claims 2-7, **characterized in that** a seal ring (4) is arranged between the front end of the pole (2) and the rear end of the socket (13). 5

9. The multi-purpose gardening tool according to any of the preceding claims, **characterized in that** a rotation stopper (6) configurable to prevent the pole (2) from rotating relative to the socket (13) is arranged between the front end of the pole (2) and the socket (13). 10
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10. The multi-purpose gardening tool of claim 9, **characterized in that** the rotation stopper (6) comprises: a rotation-stop ridge (132) arranged at one of the front end of the pole (2) and the inner wall of the socket (13), and a rotation-stop recess (22) arranged at the other one of the front end of the pole (2) and the inner wall of the socket (13), the rotation-stop ridge (132) being inserted in the rotation-stop recess (22). 20
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11. The multi-purpose gardening tool according to any of the preceding claims, **characterized in that** the toolhead (1) comprises a housing (14), the drive module (12) being disposed inside the housing (14), the operating attachment (11) being disposed outside the housing (14), a vibration damping structure (15) being arranged between the drive module (12) and the housing (14). 30

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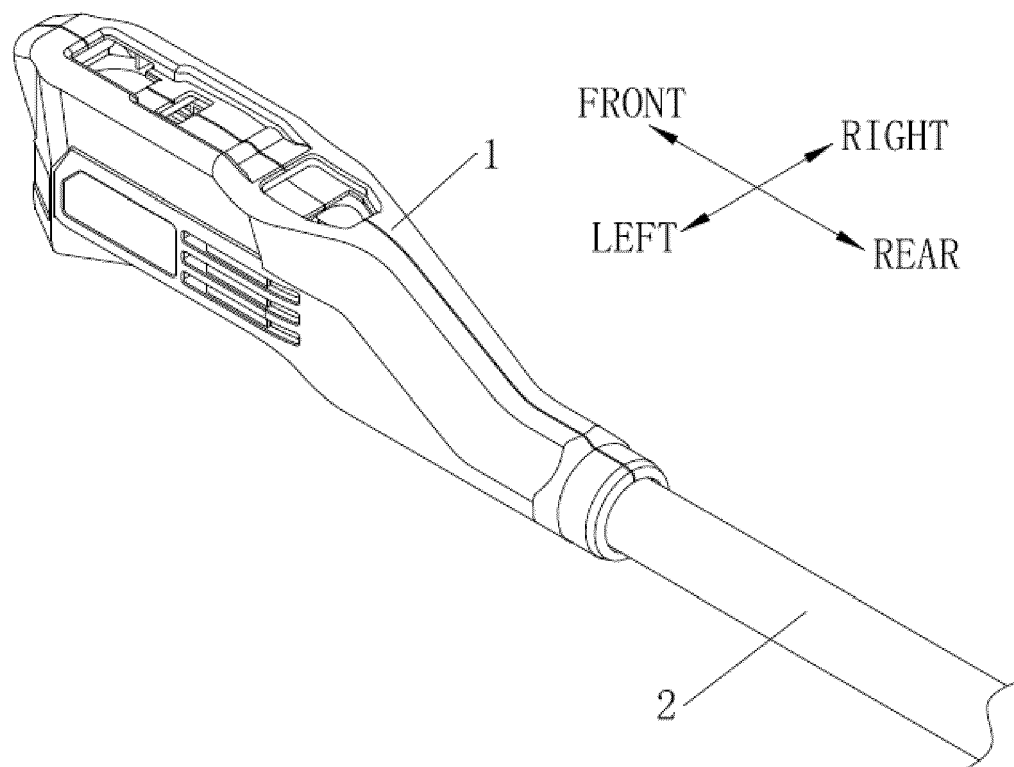


Fig. 1

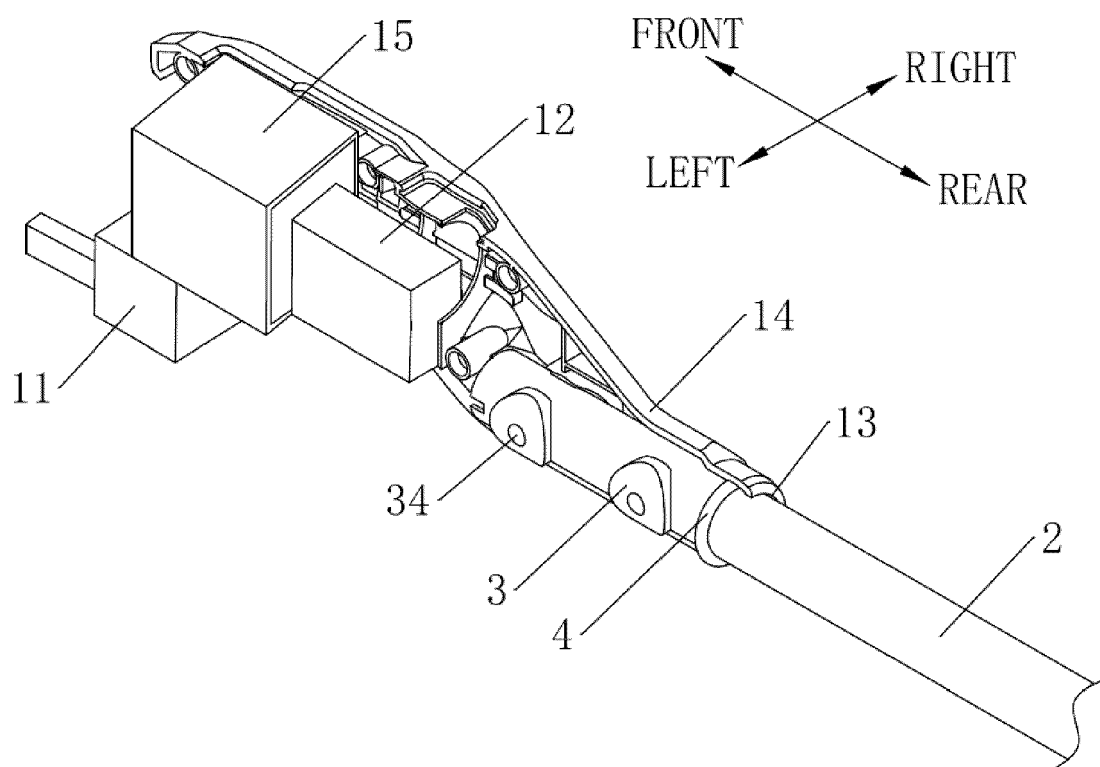


Fig. 2

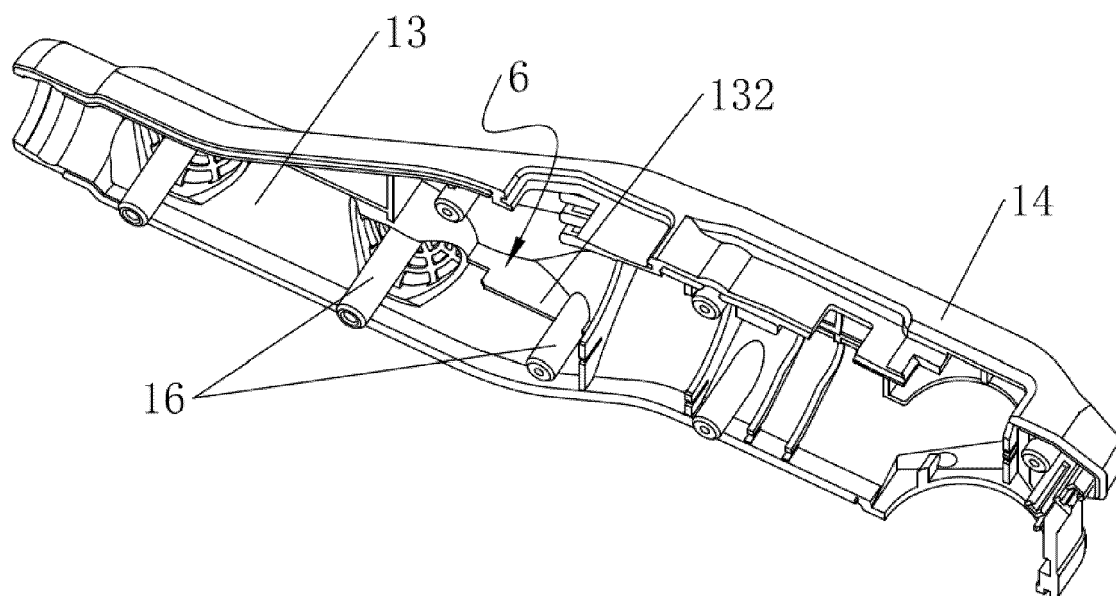


Fig. 3

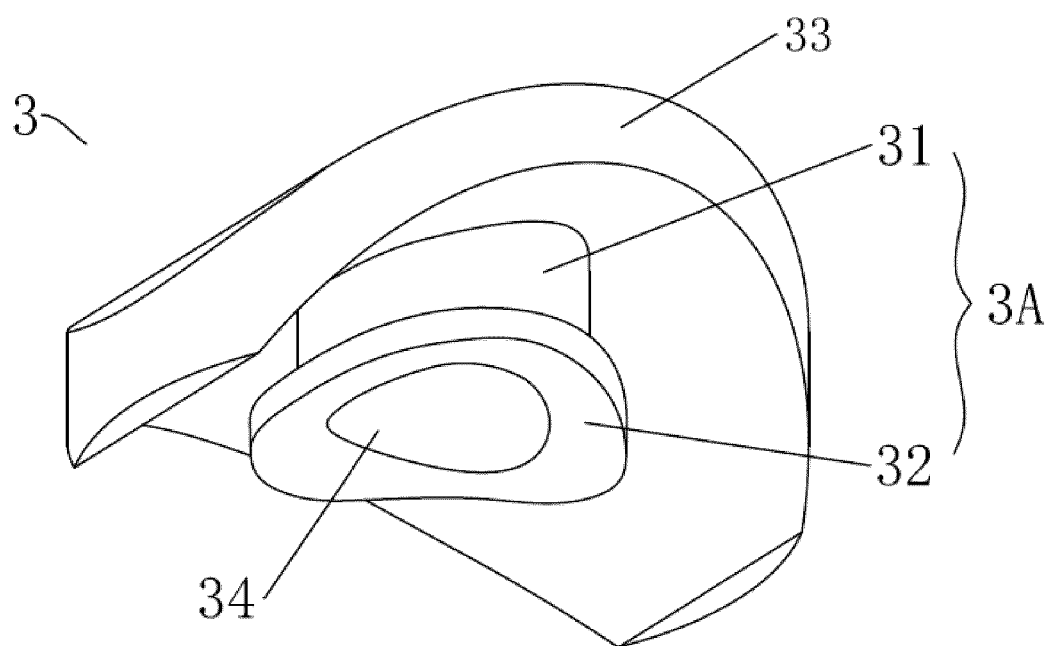


Fig. 4

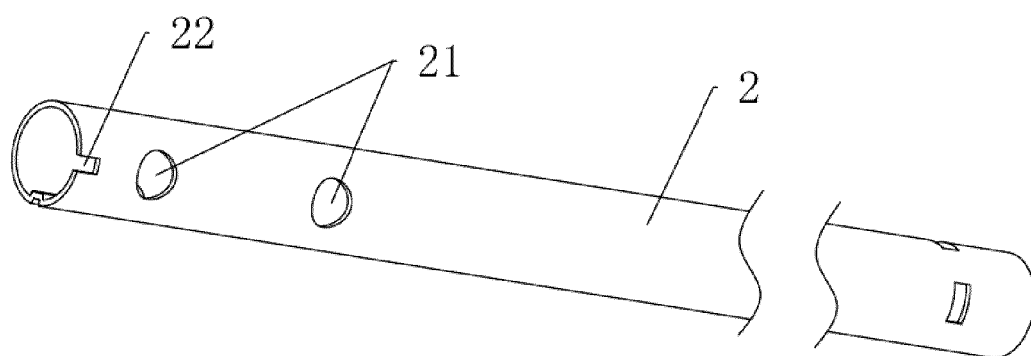


Fig. 5

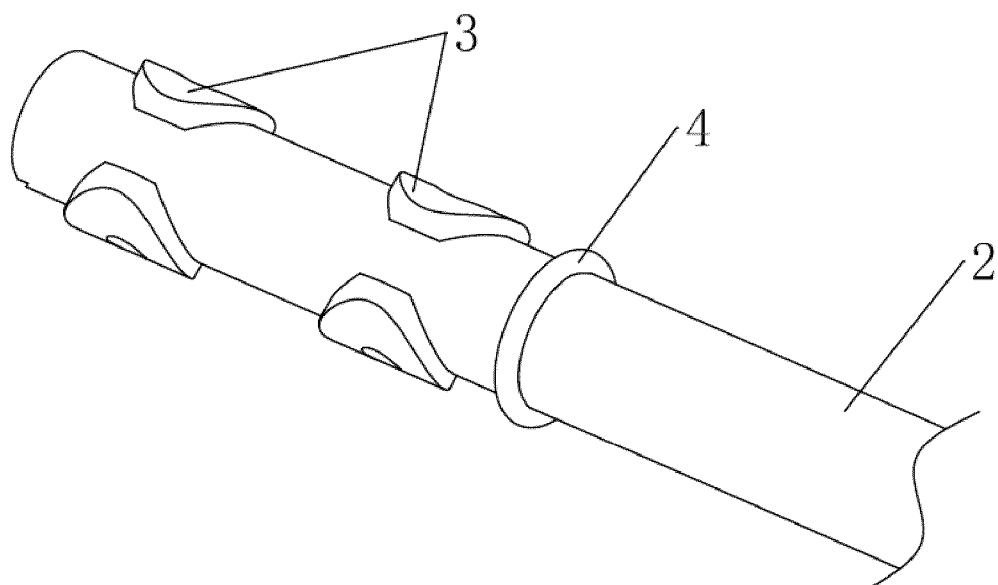


Fig. 6

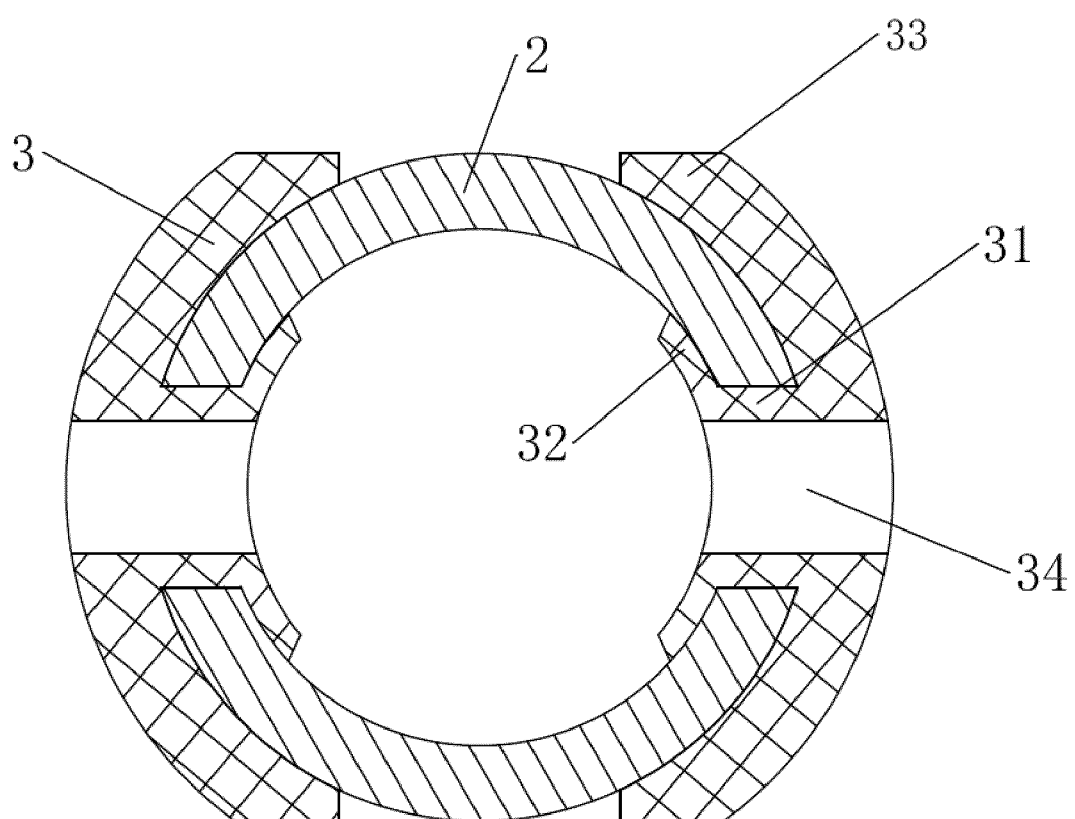


Fig. 7

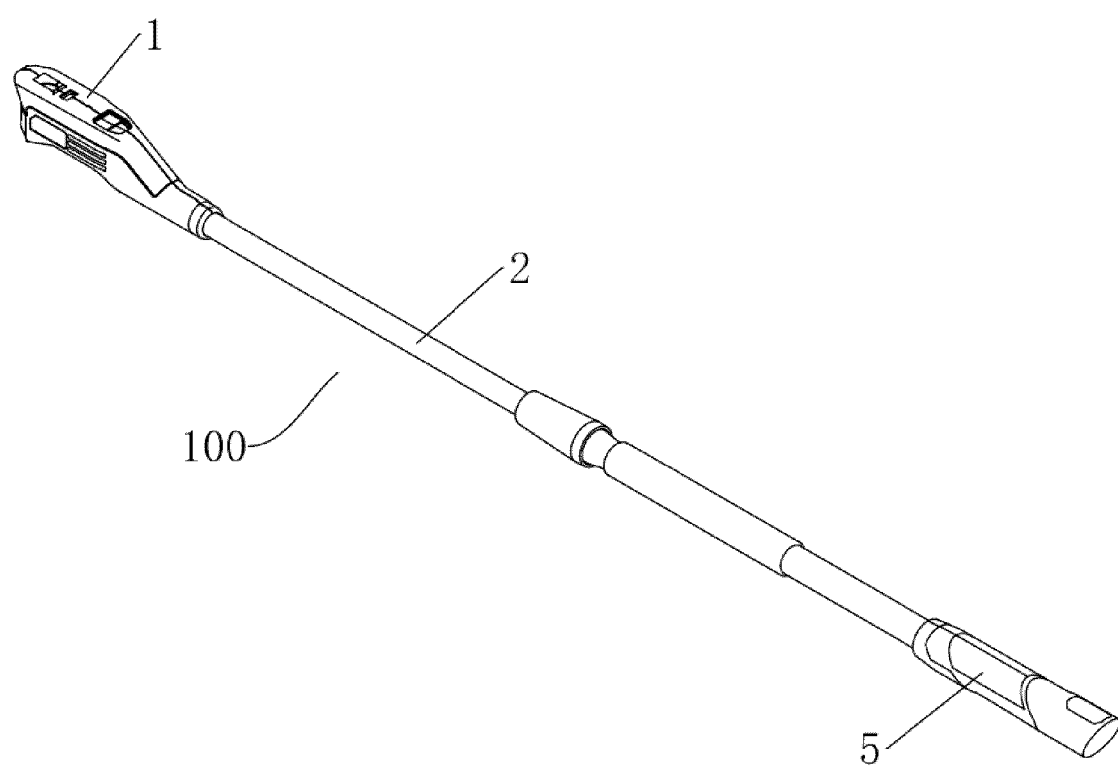


Fig. 8



EUROPEAN SEARCH REPORT

Application Number

EP 24 22 0719

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 3 369 530 A1 (STIHL AG & CO KG ANDREAS [DE]) 5 September 2018 (2018-09-05)	1	INV.
Y	* paragraphs [0021], [0046], [0052];	2,6-11	B25F5/00
A	figure 2 *	3-5	B25G1/01 B25G3/04
Y	US 2019/240827 A1 (MENZEL JOHANNES [DE] ET AL) 8 August 2019 (2019-08-08) * paragraph [0048]; figure 5 *	2,6-8,11	
Y	EP 4 272 544 A1 (STIHL AG & CO KG ANDREAS [DE]) 8 November 2023 (2023-11-08) * claim 1; figures 1-2 *	9,10	
			TECHNICAL FIELDS SEARCHED (IPC)
			B25F B25H B25G
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		25 April 2025	Messai, Sonia
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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